AIR QUALITY, ENERGY, AND GREENHOUSE GAS EMISSIONS IMPACT ANALYSIS

OAK HILLS WEST TENTATIVE TRACT MAP NO. 38652 RESIDENTIAL PROJECT

CITY OF MENIFEE

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
Air Basin	South Coast Air Basin
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology
BSFC	Brake Specific Fuel Consumption
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFCs	chlorofluorocarbons
Cf_4	tetrafluoromethane
C_2F_6	hexafluoroethane
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
City	City of Menifee
DPM	Diesel particulate matter
EPA	Environmental Protection Agency
ºF	Fahrenheit
FTIP	Federal Transportation Improvement Program
GHG	Greenhouse gas
GWP	Global warming potential
HAP	Hazardous Air Pollutants
HFCs	Hydrofluorocarbons
IPCC	International Panel on Climate Change
kWhr	kilowatt-hour
LCFS	Low Carbon Fuel Standard

LST	Localized Significant Thresholds
MATES	Multiple Air Toxics Exposure Study
$MMTCO_2e$	Million metric tons of carbon dioxide equivalent
MPO	Metropolitan Planning Organization
MWh	Megawatt-hour
NAAQS	National Ambient Air Quality Standards
NO_x	Nitrogen oxides
NO_2	Nitrogen dioxide
OPR	Office of Planning and Research
Pfc	Perfluorocarbons
PM	Particle matter
PM10	Particles that are less than 10 micrometers in diameter
PM2.5	Particles that are less than 2.5 micrometers in diameter
PPM	Parts per million
PPB	Parts per billion
PPT	Parts per trillion
RTIP	Regional Transportation Improvement Plan
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SCAG	Southern California Association of Governments
SF_6	Sulfur Hexafluoride
SIP	State Implementation Plan
SO_x	Sulfur oxides
TAC	Toxic air contaminants
UNFCCC	United Nations' Framework Convention on Climate Change
VOC	Volatile organic compounds

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Air Quality, Energy, and Greenhouse Gas (GHG) Emissions Impact Analysis has been completed to determine the air quality, energy, and GHG emissions impacts associated with the proposed Oak Hills West Tentative Tract Map (TTM) No. 38652 Residential project (proposed project). The following is provided in this report:

- A description of the proposed project;
- A description of the atmospheric setting;
- A description of the criteria pollutants and GHGs;
- A description of the air quality regulatory framework;
- A description of the energy conservation regulatory framework;
- A description of the GHG emissions regulatory framework;
- A description of the air quality, energy, and GHG emissions thresholds including the California Environmental Quality Act (CEQA) significance thresholds;
- An analysis of the conformity of the proposed project with the South Coast Air Quality Management District (SCAQMD) Air Quality Management Plan (AQMP);
- An analysis of the short-term construction related and long-term operational air quality, energy, and GHG emissions impacts; and
- An analysis of the conformity of the proposed project with all applicable energy and GHG emissions reduction plans and policies.

1.2 Site Locations and Study Area

The project site is located in the western portion of the City of Menifee (City). The approximately 78-acre project site is currently vacant and is bounded by open space to the north, single-family homes to the east, single-family homes, Boulder Crest Way and open space to the south, and single-family homes to the west. The project local study area is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest sensitive receptors to the project site are single-family homes located on Boulder Crest Way and as near as four feet to the south of the project site. There are also single-family homes located as near as 28 feet east of the project site. The nearest school is Ridgemoor Elementary School, which is located as near as 0.4 mile east of the project site.

1.3 Proposed Project Description

The proposed project would consist of developing the project site with 37 residential lots and an associated onsite road system and water detention facilities on approximately 14.4 acres and the remaining approximately 64 acres would be preserved as natural open space that would not be disturbed as part of the proposed project. Each residential lot would be developed with a duplex, which would result in a total of 74 residential units. The proposed site plan is shown in Figure 2.

1.4 Executive Summary

Standard Air Quality, Energy, and GHG Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the SCAQMD and State of California (State).

South Coast Air Quality Management District Rules

The following lists the SCAQMD rules that are applicable, but not limited to the proposed project.

- Rule 402 Nuisance – Controls the emissions of odors and other air contaminants;
- Rule 403 Fugitive Dust – Controls the emissions of fugitive dust;
- Rule 445 Fireplaces – Controls the emissions of fireplaces and restricts all new fireplaces to natural gas only;
- Rules 1108 and 1108.1 Cutback and Emulsified Asphalt – Controls the VOC content in asphalt;
- Rule 1113 Architectural Coatings – Controls the VOC content in paints and solvents; and
- Rule 1143 Paint Thinners – Controls the VOC content in paint thinners;

State of California Rules

The following lists the State of California Code of Regulations (CCR) air quality emission rules that are applicable, but not limited to the proposed project.

- CCR Title 13, Article 4.8, Chapter 9, Section 2449 – In use Off-Road Diesel Vehicles;
- CCR Title 13, Section 2025 – On-Road Diesel Truck Fleets;
- CCR Title 24 Part 6 – California Building Energy Standards; and
- CCR Title 24 Part 11 – California Green Building Standards.

Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines air quality, energy, and GHG emissions checklist questions.

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

Less than significant impact.

Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?

Less than significant impact.

Expose sensitive receptors to substantial pollutant concentrations?

Less than significant impact.

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

Less than significant impact.

Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation;

Less than significant impact.

Conflict with or obstruct a state or local plan for renewable energy;

Less than significant impact.

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

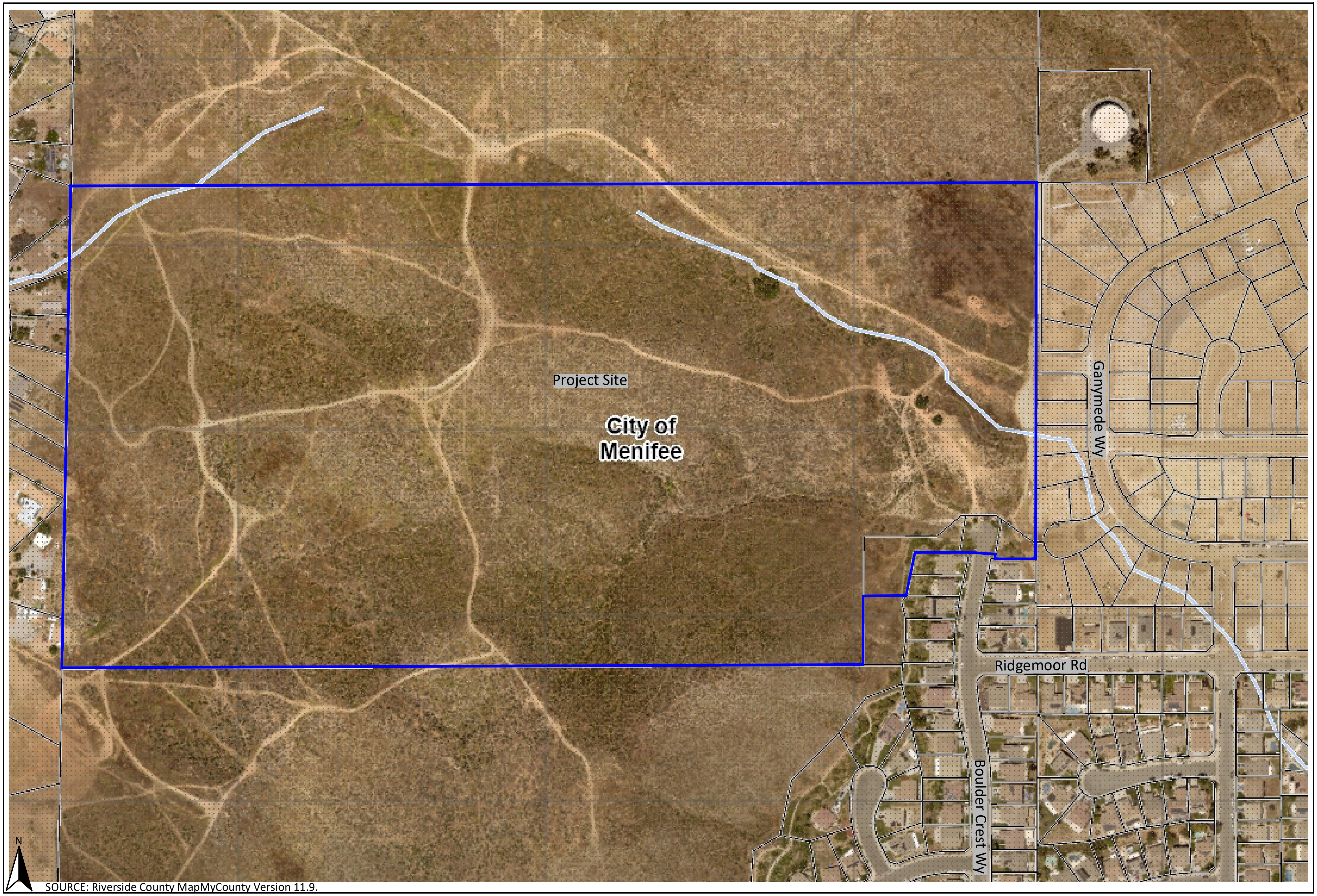
Less than significant impact.

Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?

Less than significant impact.

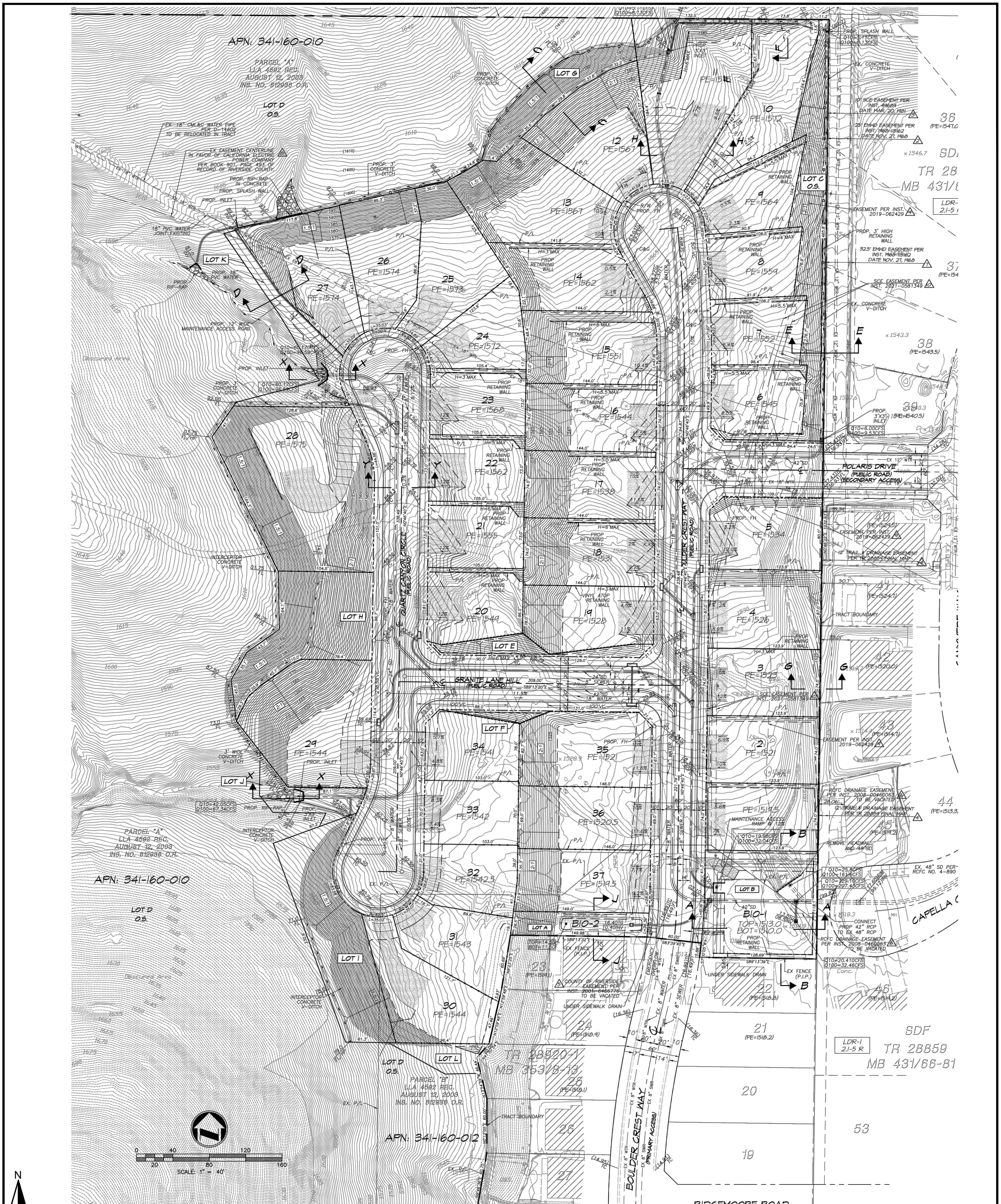
1.5 Mitigation Measures for the Proposed Project

This analysis found that implementation of the State and SCAQMD air quality, energy, and GHG emissions reductions regulations were adequate to limit criteria pollutants, toxic air contaminants, odors, and energy emissions from the proposed project to less than significant levels. No mitigation measures are required for the proposed project with respect to air quality and energy.



VISTA
ENVIRONMENTAL

Figure 1
Project Local Study Area



SOURCE: Adkan Engineers.

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Figure 2
Proposed Site Plan

2.0 AIR POLLUTANTS

Air pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). A summary of federal and state ambient air quality standards is provided in the Regulatory Framework section.

2.1 Criteria Pollutants and Ozone Precursors

The criteria pollutants consist of: ozone, nitrogen oxides (NOx), CO, sulfur oxides (SOx), lead, and particulate matter (PM). The ozone precursors consist of NO_x and VOC. These pollutants can harm your health and the environment, and cause property damage. The Environmental Protection Agency (EPA) calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria for setting permissible levels. The following provides descriptions of each of the criteria pollutants and ozone precursors.

Nitrogen Oxides

NOx is the generic term for a group of highly reactive gases which contain nitrogen and oxygen. While most NOx are colorless and odorless, concentrations of nitrogen dioxide (NO_2) can often be seen as a reddish-brown layer over many urban areas. NOx form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuel. NOx reacts with other pollutants to form, ground-level ozone, nitrate particles, acid aerosols, as well as NO_2, which cause respiratory problems. NO_x and the pollutants formed from NO_x can be transported over long distances, following the patterns of prevailing winds. Therefore, controlling NOx is often most effective if done from a regional perspective, rather than focusing on the nearest sources.

Ozone

Ozone is not usually emitted directly into the air, instead it is created by a chemical reaction between NOx and VOCs in the presence of sunlight. Motor vehicle exhaust, industrial emissions, gasoline vapors, chemical solvents as well as natural sources emit NOx and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form with the greatest concentrations usually occurring downwind from urban areas. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Because NOx and VOC are ozone precursors, the health effects associated with ozone are also indirect health effects associated with significant levels of NOx and VOC emissions.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes approximately 56 percent of all CO emissions nationwide. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are indoor sources of CO. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air. CO is described as having only a local influence because it dissipates quickly. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Sulfur Oxides

SOx gases are formed when fuel containing sulfur, such as coal and oil is burned, as well as from the refining of gasoline. SOx dissolves easily in water vapor to form acid and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and the environment. Exposure to SO_x gases can cause respiratory symptoms (bronchoconstriction, possible wheezing or shortness of breath) during exercise or physical activity in persons with asthma and cause possible allergic sensitization, airway inflammation, and asthma development.

Lead

Lead is a metal found naturally in the environment as well as manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is now the primary source of lead emissions to the air. High levels of lead in the air are typically only found near lead smelters, waste incinerators, utilities, and lead-acid battery manufacturers. Exposure of fetuses, infants and children to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Particulate Matter

PM is the term for a mixture of solid particles and liquid droplets found in the air. PM is made up of a number of components including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. Particles that are less than 10 micrometers in diameter (PM10) that are also known as *Respirable Particulate Matter* are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Particles that are less than 2.5 micrometers in diameter (PM2.5) that are also known as *Fine Particulate Matter* have been designated as a subset of PM10 due to their increased negative health impacts and its ability to remain suspended in the air longer and travel further.

Volatile Organic Compounds

Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of ozone are referred to and regulated as VOCs (also referred to as reactive organic gases). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

VOC is not classified as a criteria pollutant, since VOCs by themselves are not a known source of adverse health effects. The primary health effects of VOCs result from the formation of ozone and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for VOCs as a group.

2.2 Other Pollutants of Concern

Toxic Air Contaminants

In addition to the above-listed criteria pollutants, TACs are another group of pollutants of concern. TACs is a term that is defined under the California Clean Air Act and consists of the same substances that are defined as Hazardous Air Pollutants (HAPs) in the Federal Clean Air Act. There are over 700 hundred 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. Cars and trucks release at least 40 different toxic air contaminants. The most important of these TACs, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to TACs can result from emissions from normal operations as well as from accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

TACs are less pervasive in the urban atmosphere than criteria air pollutants, however they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of TACs with varying degrees of toxicity. Sources of TACs include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

According to *The California Almanac of Emissions and Air Quality 2013 Edition*, the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM). DPM is a subset of PM2.5 because the size of diesel particles are typically 2.5 microns and smaller. The identification of DPM as a TAC in 1998 led the California Air Resources Board (CARB) to adopt the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles in October 2000. The plan's goals are a 75-percent reduction in DPM by 2010 and an 85-percent reduction by 2020 from the 2000 baseline. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or "soot." Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances. California's identification of DPM as a TAC was based on its potential to cause cancer, premature deaths, and other health problems. Exposure to DPM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California's potential airborne cancer risk from combustion sources.

Asbestos

Asbestos is listed as a TAC by CARB and as a HAP by the EPA. Asbestos occurs naturally in mineral formations and crushing or breaking these rocks, through construction or other means, can release asbestiform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease is dependent upon the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma. The nearest likely locations of naturally occurring asbestos, as identified in the *General Location Guide for Ultramafic Rocks in California*, prepared by the California Division of Mines and Geology, is located in Santa Barbara County. The nearest historic asbestos mine to the project site, as identified in the *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California,* prepared by U.S. Geological Survey, is located at Asbestos Mountain, which is approximately 42 miles east of the project site in the San Jacinto Mountains. Due to the distance to the nearest natural occurrences of asbestos, the project site is not likely to contain asbestos.

3.0 GREENHOUSE GASES

3.1 Greenhouse Gases

Constituent gases of the Earth's atmosphere, called atmospheric GHGs, play a critical role in the Earth's radiation amount by trapping infrared radiation from the Earth's surface, which otherwise would have escaped to space. Prominent GHGs contributing to this process include carbon dioxide (CO_2), methane, ozone, water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Anthropogenic (caused or produced by humans) emissions of these GHGs in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth's natural climate, known as global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses. Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2, where CO_2 is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean. The following provides a description of each of the GHGs and their global warming potential.

Water Vapor

Water vapor is the most abundant, important, and variable GHG in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. The feedback loop in which water is involved is critically important to projecting future climate change. As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to "hold" more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there is also dynamics that put the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up).

Carbon Dioxide

The natural production and absorption of CO_2 is achieved through the terrestrial biosphere and the ocean. However, humankind has altered the natural carbon cycle by burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid 1700s, each of these activities has increased in scale and distribution. CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration with the first conclusive measurements being made in the last half of the 20th century. Prior to the industrial revolution, concentrations were fairly stable at 280 parts per million (ppm). The International Panel on Climate Change (IPCC) indicates that concentrations were 379 ppm in 2005, an increase of more than 30 percent. Left unchecked, the IPCC projects that concentration of CO_2 in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources. This could result in an average global temperature rise of at least two degrees Celsius or 3.6 degrees Fahrenheit.

Methane

Methane is an extremely effective absorber of radiation, although its atmospheric concentration is less than that of CO_2. Its lifetime in the atmosphere is brief (10 to 12 years), compared to some other GHGs (such as CO_2, N_2O, and CFCs). CH_4 has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil-fuel combustion and biomass burning.

Nitrous Oxide

Concentrations of N_2O also began to rise at the beginning of the industrial revolution. In 1998, the global concentration of this GHG was documented at 314 parts per billion (ppb). N_2O is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. N_2O is also commonly used as an aerosol spray propellant (i.e., in whipped cream bottles, in potato chip bags to keep chips fresh, and in rocket engines and race cars).

Chlorofluorocarbons

CFCs are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the Earth's surface). CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants, and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and in 1989 the European Community agreed to ban CFCs by 2000 and subsequent treaties banned CFCs worldwide by 2010. This effort was extremely successful, and the levels of the major CFCs are now remaining level or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

Hydrofluorocarbons

Hydrofluorocarbons (HFCs) are synthetic man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CF_3CH_2F), and HFC-152a (CH_3CHF_2). Prior to 1990, the only significant emissions were HFC-23. HFC-134a use is increasing due to its use as a refrigerant. Concentrations of HFC-23 and HFC-134a in the atmosphere are now about 10 parts per trillion (ppt) each. Concentrations of HFC-152a are about 1 ppt. HFCs are manmade for applications such as automobile air conditioners and refrigerants.

Perfluorocarbons

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays about 60 kilometers above Earth's surface are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF_4) and hexafluoroethane (C_2F_6). Concentrations of CF_4 in the atmosphere are over 70 ppt. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing.

Sulfur Hexafluoride

Sulfur Hexafluoride (SF_6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 has the highest global warming potential of any gas evaluated; 23,900 times that of CO_2. Concentrations in the 1990s were about 4 ppt. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Aerosols

Aerosols are particles emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols. Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during biomass burning due to the incomplete combustion of fossil fuels. Particulate matter regulation has been lowering aerosol concentrations in the United States; however, global concentrations are likely increasing.

3.2 Global Warming Potential

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to CO_2. The GHGs listed by the IPCC and the CEQA Guidelines are discussed in this section in order of abundance in the atmosphere. Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic (human-made) sources. To simplify reporting and analysis, GHGs are commonly defined in terms of their GWP. The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2 equivalent (CO_2e). As such, the GWP of CO_2 is equal to 1. The GWP values used in this analysis are based on the 2007 IPCC Fourth Assessment Report, which are used in CARB's 2014 Scoping Plan Update and the CalEEMod Model Version 2022.1 and are detailed in Table A. The IPCC has updated the GWP of some gases in their Fifth Assessment Report, however the new values have not yet been incorporated into the CalEEMod model that has been utilized in this analysis.

Table A – Global Warming Potentials, Atmospheric Lifetimes and Abundances of GHGs

Gas	Atmospheric Lifetime (years)[1]	Global Warming Potential (100 Year Horizon)[2]	Atmospheric Abundance
Carbon Dioxide (CO_2)	50-200	1	379 ppm
Methane (CH_4)	9-15	25	1,774 ppb
Nitrous Oxide (N_2O)	114	298	319 ppb
HFC-23	270	14,800	18 ppt
HFC-134a	14	1,430	35 ppt
HFC-152a	1.4	124	3.9 ppt
PFC: Tetrafluoromethane (CF_4)	50,000	7,390	74 ppt
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200	2.9 ppt
Sulfur Hexafluoride (SF_6)	3,200	22,800	5.6 ppt

Notes:
[1] Defined as the half-life of the gas.
[2] Compared to the same quantity of CO_2 emissions and is based on the Intergovernmental Panel On Climate Change (IPCC) 2007 standard, which is utilized in CalEEMod (Version 2022.1),that is used in this report (CalEEMod user guide: Appendix A).
Definitions: ppm = parts per million; ppb = parts per billion; ppt = parts per trillion

Source: IPCC 2007, EPA 2015

3.3 Greenhouse Gas Emissions Inventory

According to the Carbon Dioxide Information Analysis Center[1], 9,855 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) emissions were created globally in the year 2014. According to the EPA, the breakdown of global GHG emissions by sector consists of: 25 percent from electricity and heat production; 21 percent from industry; 24 percent from agriculture, forestry and other land use activities; 14 percent from transportation; 6 percent from building energy use; and 10 percent from all other sources of energy use[2].

According to *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2021,* prepared by EPA, April 2023, total U.S. GHG emissions in the year 2021 were 6,340.2 $MMTCO_2e$. Total U.S. emissions have decreased by 2.3 percent between 1990 and 2021, which is down from a high of 15.8 percent above 1990 levels in 2007. Emissions increased from 2020 to 2021 by 5.2 percent. There was a decline in 2020 emission due to the impacts of the COVID-19 pandemic on travel and other economic activity. Between 2020 and 2021, the increase in GHG emissions were driven largely by an increase in fossil fuel combustion due to economic activity rebounding after the height of the COVID-19 pandemic.

According to *California Greenhouse Gas Emissions for 2000 to 2021 Trends of Emissions and Other Indicators*, prepared by the CARB, December 14, 2023, the State of California created 381.3 $MMTCO_2e$ in 2021. The 2021 emissions were 12.6 $MMTCO_2e$ higher than 2020 but 23.1 $MMTCO_2e$ lower than 2019 levels. Both the 2019 to 2020 decrease and the 2020 to 2021 increase in emissions are likely due in part to the impacts of the COVID-19 pandemic that were felt globally. The transportation sector showed the largest increase in emissions of 10 $MMTCO_2e$ (7.4 percent) compared to 2020, which is most likely from passenger vehicles whose activity and emissions rebounded after COVID-19 shelter in place orders were lifted.

1 Obtained from: https://cdiac.ess-dive.lbl.gov/trends/emis/tre_glob_2014.html

2 Obtained from: https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data

4.0 AIR QUALITY MANAGEMENT

The air quality at the project site is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality are discussed below.

4.1 Federal – United States Environmental Protection Agency

The Clean Air Act, first passed in 1963 with major amendments in 1970, 1977 and 1990, is the overarching legislation covering regulation of air pollution in the United States. The Clean Air Act has established the mandate for requiring regulation of both mobile and stationary sources of air pollution at the state and federal level. The EPA was created in 1970 in order to consolidate research, monitoring, standard-setting and enforcement authority into a single agency.

The EPA is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. NAAQS pollutants were identified using medical evidence and are shown below in Table B.

Table B – State and Federal Criteria Pollutant Standards

Air Pollutant	Concentration / Averaging Time		Most Relevant Effects
	California Standards	Federal Primary Standards	
Ozone (O_3)	0.09 ppm / 1-hour 0.07 ppm / 8-hour	0.070 ppm, / 8-hour	a) Pulmonary function decrements and localized lung injury in humans and animals; (b) asthma exacerbation; (c) chronic obstructive pulmonary disease (COPD) exacerbation; (d) respiratory infection; (e) increased school absences, and hospital admissions and emergency department (ED) visits for combined respiratory diseases; (e) increased mortality; (f) possible metabolic effects. Vegetation damage; property damage
Carbon Monoxide (CO)	20.0 ppm / 1-hour 9.0 ppm / 8-hour	35.0 ppm / 1-hour 9.0 ppm / 8-hour	Visibility reduction (a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) possible impairment of central nervous system functions; (d) possible increased risk to fetuses; (f) possible increased risk of pulmonary disease; (g) possible emergency department visits for respiratory diseases overall and visits for asthma.
Nitrogen Dioxide (NO_2)	0.18 ppm / 1-hour 0.030 ppm / annual	100 ppb / 1-hour 0.053 ppm / annual	Short-term (a) asthma exacerbations ("asthma attacks") Long-term (a) asthma development; (b) higher risk of all-cause, cardiovascular, and respiratory mortality. Both short and long term NO2 exposure is also associated with chronic obstructive pulmonary disease (COPD) risk. Potential impacts on cardiovascular health, mortality and cancer, aggravate chronic respiratory disease. Contribution to atmospheric discoloration

Air Pollutant	Concentration / Averaging Time California Standards	Federal Primary Standards	Most Relevant Effects
Sulfur Dioxide (SO_2)	0.25 ppm / 1-hour 0.04 ppm / 24-hour	75 ppb / 1-hour	Respiratory symptoms (bronchoconstriction, possible wheezing or shortness of breath) during exercise or physical activity in persons with asthma. Possible allergic sensitization, airway inflammation, asthma development.
Respirable Particulate Matter (PM_{10})	50 μg/m^3 / 24-hour 20 μg/m^3 / annual	150 μg/m^3 / 24-hour	Short -term (a) increase in mortality rates; (b) increase in respiratory infections; (c) increase in number and severity of asthma attacks; (d) COPD exacerbation; (e) increase in combined respiratory-diseases and number of hospital admissions; (f) increased mortality due to cardiovascular or respiratory diseases; (g) increase in hospital admissions for acute respiratory conditions; (h) increase in school absences; (i) increase in lost work days; (j) decrease in respiratory function in children; (k) increase medication use in children and adults with asthma. Long-term (a) reduced lung function growth in children; (b) changes in lung development; (c) development of asthma in children; (d) increased risk of cardiovascular diseases; (e) increased total mortality from lung cancer; (f) increased risk of premature death. Possible link to metabolic, nervous system, and reproductive and developmental effects for short-term and long-term exposure to PM2.5.
Suspended Particulate Matter ($PM_{2.5}$)	12 μg/m^3 / annual	35 μg/m^3 / 24-hour 12 μg/m^3 / annual	
Sulfates	25 μg/m^3 / 24-hour	No Federal Standards	(a) Decrease in lung function; (b) aggravation of asthmatic symptoms; (c) vegetation damage; (d) Degradation of visibility; (e) property damage
Lead	1.5 μg/m^3 / 30-day	0.15 μg/m^3 /3-month rolling	(a) Learning disabilities; (b) impairment of blood formation and nerve function; (c) cardiovascular effects, including coronary heart disease and hypertension Possible male reproductive system effects
Hydrogen Sulfide	0.03 ppm / 1-hour	No Federal Standards	Exposure to lower ambient concentrations above the standard may result in objectionable odor and may be accompanied by symptoms such as headaches, nausea, dizziness, nasal irritation, cough, and shortness of breath

Source: 2022 AQMP, SCAQMD, 2022.

As part of its enforcement responsibilities, the EPA requires each state with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the national standards. The SIP must integrate federal, state, and local components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP. The CARB defines attainment as the category given to an area with no violations in the past three years. As indicated below in Table C, the Air Basin has been designated by EPA for the national standards as a non-attainment area for ozone and PM2.5 and partial non-attainment for lead. Currently, the Air Basin is in attainment with the national ambient air quality standards for CO, PM10, SO_2, and NO_2.

Table C – National Air Quality Standards Attainment Status – South Coast Air Basin

Criteria Pollutant	Averaging Time	Designation[a]	Attainment Date[b]
Ozone	1979 1-Hour (0.12 ppm)	Nonattainment (Extreme)	2/6/2023 (revised deadline)
	2015 8-Hour (0.07 ppm)[d]	Nonattainment (Extreme)	8/3/2038
	2008 8-Hour (0.075 ppm)[d]	Nonattainment (Extreme)	7/20/2032
	1997 8-Hour (0.08 ppm)[d]	Nonattainment (Extreme)	6/15/2024
PM2.5[e]	2006 24-Hour (35 µg/m^3)	Nonattainment (Serious)	12/31/2019
	2012 Annual (12 µg/m^3)	Nonattainment (Serious)	12/31/2021
	1997 Annual (15 µg/m^3)	Attainment (final determination pending)	4/5/2015 (attained 2013)
PM10[f]	1987 24-Hour (150 µg/m^3)	Attainment (Maintenance)	7/26/2013 (attained)
Lead[g]	2008 3-Months Rolling (0.15 µg/m^3)	Nonattainment (Partial) (Attainment determination requested)	12/31/2015
CO	1971 1-Hour (35 ppm)	Attainment (Maintenance)	6/11/2007
	1971 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007
NO_2[h]	2010 1-Hour (100 ppb)	Unclassifiable/Attainment	N/A (attained)
	1971 Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998 (attained)
SO_2[i]	2010 1-Hour (75 ppb)	Unclassifiable/Attainment	1/9/2018
	1971 24-Hour (0.14 ppm)	Unclassifiable/Attainment	3/19/1979

Source: SCAQMD, 2022

Notes:

a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable.

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration.

c) The 1979 1-hour ozone NAAQS (0.12 ppm) was revoked, effective June 15, 2005; however, the Basin has not attained this standard and therefore has some continuing obligations with respect to the revoked standard; original attainment date was 11/15/2010; the revised attainment date is 2/6/2023.

d) The 2008 8-hour ozone NAAQS (0.075 ppm) was revised to 0.070 ppm, effective 12/28/20115 with classifications and implementation goals to be finalized by 10/1/2017; the 1997 8-hour ozone NAAQS (0.08 ppm) was revoked in the 2008 ozone implementation rule, effective 4/6/2015; there are continuing obligations under the revoked 1997 and revised 2008 ozone NAAQS until they are attained.

e) The attainment deadline for the 2006 24-Hour PM2.5 NAAQS was 12/31/15 for the former "moderate" classification; the EPA approved reclassification to "serious", effective 2/12/16 with an attainment deadline of 12/31/2019; the 2012 (proposal year) annual PM2.5 NAAQS was revised on 1/15/2013, effective 3/18/2013, from 15 to 12 µg/m^3; new annual designations were final 1/15/2015, effective 4/15/2015; on 7/25/2016 the EPA finalized a determination that the Basin attained the 1997 annual (15.0 µg/m^3) and 24-hour PM2.5 (65 µg/m^3) NAAQS, effective 8/24/2016.

f) The annual PM10 standard was revoked, effective 12/18/2006; the 24-hour PM10 NAAQS deadline was 12/31/2006; the Basin's Attainment Re-designation Request and PM10 Maintenance Plan was approved by the EPA on 6/26/2103, effective 7/26/2013.

g) Partial Nonattainment designation – Los Angeles County portion of the Basin only for near-source monitors; expect to remain in attainment based on current monitoring data; attainment re-designation request pending.

h) New 1-hour NO_2 NAAQS became effective 8/2/2010, with attainment designations 1/20/2012; annual NO_2 NAAQS retained.

i) The 1971 annual and 24-hour SO_2 NAAQS were revoked, effective 8/23/2010.

Despite substantial improvements in air quality over the past few decades, some air monitoring stations in the Air Basin still exceed the NAAQS and frequently record the highest ozone levels in the United States. In 2020, monitoring stations in the Air Basin exceeded the most current federal standards on a total of 181 days (49 percent of the year), including: 8-hour ozone (157 days over the 2015 ozone NAAQS), 24-hour PM2.5 (39 days), PM10 (3 days), and NO_2 (1 day). Nine of the top 10 stations in the nation most frequently exceeding the 2015 8-hour ozone NAAQS in 2020 were located within the Air Basin, including stations in San Bernardino, Riverside, and Los Angeles Counties (SCAQMD, 2022).

PM2.5 levels in the Air Basin have improved significantly in recent years. Since 2015, none of the monitoring stations in the Air Basin have recorded violations of the former 1997 annual PM2.5 NAAQS (15.0 µg/m^3). On July 25, 2016 the U.S. EPA finalized a determination that the Air Basin attained the 1997 annual (15.0 µg/m^3) and 24-hour PM2.5 (65 µg/m^3) NAAQS, effective August 24, 2016. However, the Air Basin does not meet the 2012 annual PM2.5 NAAQS (12.0 µg/m^3), with six monitoring stations having design values above the standard for the 2018-2020 period (SCAQMD, 2022).

4.2 State – California Air Resources Board

The CARB, which is a part of the California Environmental Protection Agency (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets the California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. The CAAQS for criteria pollutants in the Air Basin are shown in Table D. In addition, the CARB establishes emission standards for motor vehicles sold in California, consumer products (e.g. hairspray, aerosol paints, and barbeque lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

Table D – California Ambient Air Quality Standards Attainment Status – South Coast Air Basin

Criteria Pollutant	Averaging Time	Level[a]	Designation[b]
Ozone	1-Hour	0.09 ppm	Nonattainment
	8-Hour	0.070 ppm	Nonattainment
PM2.5	Annual	12 µg/m^3	Nonattainment
PM10	24-Hour	50 µg/m^3	Nonattainment
	Annual	20 µg/m^3	Nonattainment
Lead	30-Day Average	1.5 µg/m^3	Attainment
CO	1-Hour	20 ppm	Attainment
	8-Hour	9.0 ppm	Attainment
NO_2	1-Hour	0.18 ppm	Attainment
	Annual	0.030	Attainment[c]
SO_2	1-Hour	0.25 ppm	Attainment
	24-Hour	0.04 ppm	Attainment
Sulfates	24-Hour	25 µg/m^3	Attainment
Hydrogen Sulfide[c]	1-Hour	0.03 ppm	Unclassified

Source: SCAQMD, 2022

Notes:

a) CA State standards, or CAAQS, for ozone, SO_2, NO_2, PM10 and PM2.5 are values not to be exceeded; lead, sulfates and H_2S standards are values not to be equaled or exceeded; CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b) CA State designations shown were updated by CARB in 2019, based on the 2016-2018 3-year period; stated designations are based on a 3-year data period after consideration of outliers and exceptional events.

c) The CA-60 near road portion of San Bernardino, Riverside and Los Angeles Counties has recently been redesignated as an attainment area based on data collected between 2018 and 2020.

As shown in Table D, the Air Basin has been designated by the CARB as a non-attainment area for ozone, PM10 and PM2.5. Currently, the Air Basin is in attainment with the ambient air quality standards for lead, CO, NO_2, SO_2 and sulfates, and is unclassified for Hydrogen Sulfide.

The following lists the State of California Code of Regulations (CCR) air quality emission rules that are applicable, but not limited to all residential projects in the State.

Assembly Bill 2588

The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588, 1987, Connelly) was enacted in 1987 as a means to establish a formal air toxics emission inventory risk quantification program. AB 2588, as amended, establishes a process that requires stationary sources to report the type and quantities of certain substances their facilities routinely release in California. The data is ranked by high, intermediate, and low categories, which are determined by: the potency, toxicity, quantity, volume, and proximity of the facility to nearby receptors.

CARB Regulation for In-Use Off-Road Diesel Vehicles

On July 26, 2007, the CARB adopted CCR Title 13, Article 4.8, Chapter 9, Section 2449 to reduce DPM and NOx emissions from in-use off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. Performance requirements of the rule are based on a fleet's average NOx emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirement making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501-5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less). Currently, no commercial operation in California may add any equipment to their fleet that has a Tier 0, Tier 1, or Tier 2 engine. It should be noted that commercial fleets may continue to use their existing Tier 0, 1 and 2 equipment, if they can demonstrate that the average emissions from their entire fleet emissions meet the NOx emissions targets.

CARB Resolution 08-43 for On-Road Diesel Truck Fleets

On December 12, 2008 the CARB adopted Resolution 08-43, which limits NOx, PM10 and PM2.5 emissions from on-road diesel truck fleets that operate in California. On October 12, 2009 Executive Order R-09-010 was adopted that codified Resolution 08-43 into CCR Title 13, Section 2025. This regulation requires that by the year 2023 all commercial diesel trucks that operate in California shall meet model year 2010 (Tier 4 Final) or latter emission standards. This regulation also provides a few exemptions including a onetime per year 3-day pass for trucks registered outside of California. All on-road diesel trucks utilized during construction of the proposed project will be required to comply with Resolution 08-43.

4.3 Regional – Southern California

The SCAQMD is the agency principally responsible for comprehensive air pollution control in the South Coast Air Basin. To that end, as a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), county transportation commissions, and local governments and cooperates actively with all federal and state agencies.

South Coast Air Quality Management District

SCAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emission sources, and enforces such measures through educational programs or fines, when necessary. SCAQMD is directly responsible for reducing emissions from stationary, mobile, and indirect sources. It has responded to this requirement by preparing a sequence of AQMPs. The *Final 2022 Air Quality Management Plan* (2022 AQMP) was adopted by CARB on January 26, 2023 and has been submitted to the U.S. EPA for final approval, which is anticipated to occur sometime this year. After the 2022 AQMP has been adopted by the U.S. EPA, the 2022 AQMP will be incorporated into the SIP. The

2022 AQMP establishes actions and strategies to reduce ozone levels to the U.S. EPA 2015 ozone standard of 70 ppb by 2037. The 2022 AQMP promotes extensive use of zero-emission technologies across all stationary and mobile sources coupled with rules and regulations, investment strategies, and incentives.

Although SCAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate air quality issues associated with plans and new development projects throughout the Air Basin. Instead, this is controlled through local jurisdictions in accordance with CEQA. In order to assist local jurisdictions with air quality compliance issues the *CEQA Air Quality Handbook* (SCAQMD CEQA Handbook), prepared by SCAQMD, 1993, with the most current updates found at http://www.aqmd.gov/ceqa/hdbk.html, was developed in accordance with the projections and programs detailed in the AQMPs. The purpose of the SCAQMD CEQA Handbook is to assist Lead Agencies, as well as consultants, project proponents, and other interested parties in evaluating a proposed project's potential air quality impacts. Specifically, the SCAQMD CEQA Handbook explains the procedures that SCAQMD recommends be followed for the environmental review process required by CEQA. The SCAQMD CEQA Handbook provides direction on how to evaluate potential air quality impacts, how to determine whether these impacts are significant, and how to mitigate these impacts. The SCAQMD intends that by providing this guidance, the air quality impacts of plans and development proposals will be analyzed accurately and consistently throughout the Air Basin, and adverse impacts will be minimized.

The following lists the SCAQMD rules that are applicable but not limited to residential development projects in the Air Basin.

Rule 402 - Nuisance

Rule 402 prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which causes 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. Compliance with Rule 402 will reduce local air quality and odor impacts to nearby sensitive receptors.

Rule 403- Fugitive Dust

Rule 403 governs emissions of fugitive dust during construction activities and requires that no person shall cause or allow the emissions of fugitive dust such that dust remains visible in the atmosphere beyond the property line or the dust emission exceeds 20 percent opacity, if the dust is from the operation of a motorized vehicle. Compliance with this rule is achieved through application of standard Best Available Control Measures, which include but are not limited to the measures below. Compliance with these rules would reduce local air quality impacts to nearby sensitive receptors.

- Utilize either a pad of washed gravel 50 feet long, 100 feet of paved surface, a wheel shaker, or a wheel washing device to remove material from vehicle tires and undercarriages before leaving project site.
- Do not allow any track out of material to extend more than 25 feet onto a public roadway and remove all track out at the end of each workday.
- Water all exposed areas on active sites at least three times per day and pre-water all areas prior to clearing and soil moving activities.

- Apply nontoxic chemical stabilizers according to manufacturer specifications to all construction areas that will remain inactive for 10 days or longer.
- Pre-water all material to be exported prior to loading, and either cover all loads or maintain at least 2 feet of freeboard in accordance with the requirements of California Vehicle Code Section 23114.
- Replant all disturbed area as soon as practical.
- Suspend all grading activities when wind speeds (including wind gusts) exceed 25 miles per hour.
- Restrict traffic speeds on all unpaved roads to 15 miles per hour or less.

Rule 445- Fireplaces

Rule 445 governs emissions from fireplaces. This rule restricts the installation of wood-burning fireplaces into any new development and only allows the installation of dedicated gaseous-fueled fireplaces.

Rules 1108 and 1108.1 – Cutback and Emulsified Asphalt

Rules 1108 and 1108.1 govern the sale, use, and manufacturing of asphalt and limits the VOC content in asphalt. This rule regulates the VOC contents of asphalt used during construction as well as any on-going maintenance during operations. Therefore, all asphalt used during construction and operation of the proposed project must comply with SCAQMD Rules 1108 and 1108.1.

Rule 1113 – Architectural Coatings

Rule 1113 governs the sale, use, and manufacturing of architectural coatings and limits the VOC content in sealers, coatings, paints and solvents. This rule regulates the VOC contents of paints available during construction. Therefore, all paints and solvents used during construction and operation of the proposed project must comply with SCAQMD Rule 1113.

Rule 1143 – Paint Thinners

Rule 1143 governs the sale, use, and manufacturing of paint thinners and multi-purpose solvents that are used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations. This rule regulates the VOC content of solvents used during construction. Solvents used during construction and operation of the proposed project must comply with SCAQMD Rule 1143.

Southern California Association of Governments

The SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and addresses regional issues relating to transportation, the economy, community development and the environment. SCAG is the federally designated Metropolitan Planning Organization (MPO) for the majority of the southern California region and is the largest MPO in the nation. With respect to air quality planning, SCAG has prepared the *2024-2050 Regional Transportation Plan/Sustainable Communities Strategy* (Connect SoCal 2024), adopted by SCAG on April 4, 2024 which is based on the regional development and growth forecasts provided in the *2023 Federal Transportation Improvement* Program (2023 FTIP), adopted October 2022. However, per SB 375, SCAG and CARB are required to work together until CARB staff conclude that the calculations and quantifications provided would yield accurate estimates of GHG emission reductions. Since CARB staff continue to have significant outstanding concerns about the technical methodology utilized in the Connect SoCal 2024, the current approved RTP/SCS is the *2020-2045 Regional Transportation Plan/Sustainable Communities Strategy* (Connect SoCal 2020), adopted September 3, 2020, which is based on the 2019 *Federal Transportation Improvement* Program (2019 FTIP), adopted September 2018.

Although the Connect SoCal 2020 and 2019 FTIP are primarily planning documents for future transportation projects, a key component of these plans are to integrate land use planning with transportation planning that promotes higher density infill development in close proximity to existing transit service. These plans form the basis for the land use and transportation components of the 2022 AQMP, which are utilized in the preparation of air quality forecasts and in the consistency analysis included in the 2022 AQMP. The Connect SoCal 2020, 2019 FTIP, and 2022 AQMP are based on projections originating within the City and County General Plans.

4.4 Local – City of Menifee

Local jurisdictions, such as the City of Menifee, have the authority and responsibility to reduce air pollution through its police power and decision-making authority. Specifically, the City is responsible for the assessment and mitigation of air emissions resulting from its land use decisions. The City is also responsible for the implementation of transportation control measures as outlined in the AQMPs. Examples of such measures include bus turnouts, energy-efficient streetlights, and synchronized traffic signals. In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, and monitors and enforces implementation of such mitigation.

In accordance with the CEQA requirements, the City does not, however, have the expertise to develop plans, programs, procedures, and methodologies to ensure that air quality within the City and region will meet federal and state standards. Instead, the City relies on the expertise of the SCAQMD and utilizes the SCAQMD CEQA Handbook as the guidance document for the environmental review of plans and development proposals within its jurisdiction.

5.0 ENERGY CONSERVATION MANAGEMENT

The regulatory setting related to energy conservation is primarily addressed through State and City regulations, which are discussed below.

5.1 State

Energy conservation management in the State was initiated by the 1974 Warren-Alquist State Energy Resources Conservation and Development Act that created the California Energy Resource Conservation and Development Commission (currently named California Energy Commission [CEC]), which was originally tasked with certifying new electric generating plants based on the need for the plant and the suitability of the site of the plant. In 1976 the Warren-Alquist Act was expanded to include new restrictions on nuclear generating plants, that effectively resulted in a moratorium of any new nuclear generating plants in the State. The following details specific regulations adopted by the State in order to reduce the consumption of energy.

California Code of Regulations Title 20

On November 3, 1976 the CEC adopted the *Regulations for Appliance Efficiency Standards Relating to Refrigerators, Refrigerator-Freezers and Freezers and Air Conditioners,* which were the first energy-efficiency standards for appliances. The appliance efficiency regulations have been updated several times by the CEC and the most current version is the *2016 Appliance Efficiency Regulations*, adopted January 2017 which includes almost all types of appliances and lamps that use electricity, natural gas as well as plumbing fixtures. The authority for the CEC to control the energy-efficiency of appliances is detailed in CCR Title 20, Division 2, Chapter 4, Article 4, Sections 1601-1609.

California Code of Regulations Title 24, Part 6

The CEC is also responsible for implementing the CCR Title 24, Part 6: *California's Energy Efficiency Standards for Residential and Nonresidential Buildings* (Title 24 Part 6) that were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. In 2008 the State set an energy-use reduction goal of zero-net-energy use of all new homes by 2020 and the CEC was mandated to meet this goal through revisions to the Title 24, Part 6 regulations.

The Title 24 standards are updated on a three-year schedule and since 2008 the standards have been incrementally moving to the 2020 goal of the zero-net-energy use. The 2022 Title 24 standards are the current standards that went into effect on January 1, 2023.

According to the Title 24 Part 6 Fact Sheet, the CEC estimates that over 30 years the 2022 Title 24 standards will reduce 10 $MMTCO_2e$ of GHG emissions, which is equivalent to taking nearly 2.2 million cars off the road for a year. For single-family homes, the CEC estimates that the 2022 Title 24 changes from using natural gas furnaces to electric heat pumps to heat new homes and would reduce net CO_2 emissions by 16,230 $MTCO_2e$ per year, when compared to the 2019 Title 24 standards, which is equivalent of taking 3,641 gas cars off the road each year. The 2022 Title 24 standards will: (1) Increase onsite renewable energy generation; (2) Increases electric load flexibility to support grid reliability; (3) Reduces emissions from newly constructed buildings; (4) Reduces air pollution for improved public health; and (5) Encourages adoption of environmentally beneficial efficient electric technologies.

California Code of Regulations (CCR) Title 24, Part 11

CCR Title 24, Part 11: *California Green Building Standards* (CalGreen Code) was developed in response to continued efforts to reduce GHG emissions associated with energy consumption. The CalGreen Code is also updated every three years and the current version is the 2022 CalGreen Code that went into effect on January 1, 2023.

The CalGreen Code contains requirements for construction site selection; storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for verifying that all building systems (e.g., heating and cooling equipment and lighting systems) are functioning at their maximum efficiency.

The CalGreen Code provides standards for bicycle parking, carpool/vanpool/electric vehicle spaces, light and glare reduction, grading and paving, energy efficient appliances, renewable energy, graywater systems, water efficient plumbing fixtures, recycling and recycled materials, pollutant controls (including moisture control and indoor air quality), acoustical controls, storm water management, building design, insulation, flooring, and framing, among others. Implementation of the CalGreen Code measures reduces energy consumption and vehicle trips and encourages the use of alternative-fuel vehicles, which reduces pollutant emissions.

Some of the notable changes in the 2022 CalGreen Code over the prior 2019 CalGreen Code for nonresidential development mandatory requirements include the repeal of designated parking spaces for clean air vehicles and an increase in the number of electric vehicle (EV) ready parking spaces. The 2022 CalGreen Code also added new requirements for installed Level 2 or direct-current fast charger EV charging stations for autos, EV charging readiness for loading docks, enhanced thermal insulation, and acoustical ceilings.

Executive Order N-79-20

The California Governor issued Executive Order N-79-20 on September 23, 2020 that requires all new passenger cars and trucks and commercial drayage trucks sold in California to be zero-emissions by the year 2035 and all medium- heavy-duty vehicles (commercial trucks) sold in the state to be zero-emission by 2045 for all operations where feasible. Executive Order N-79-20 also requires all off-road vehicles and equipment to transition to 100 percent zero-emission equipment, where feasible by 2035.

Senate Bill 100

Senate Bill 100 (SB 100) was adopted September 2018 and requires that by December 1, 2045 that 100 percent of retail sales of electricity to be generated from renewable or zero-carbon emission sources of electricity. SB 100 supersedes the renewable energy requirements set by SB 350, SB 1078, SB 107, and SB X1-2. SB 100 codified the interim renewable energy thresholds from the prior Bills of: 33 percent by 2020, 40 percent by December 31, 2024, 45 percent by December 31, 2027, and 50 percent by December 31, 2030.

Executive Order B-48-18 and Assembly Bill 2127

The California Governor issued Executive Order B-48-18 on January 26, 2018 that orders all state entities to work with the private sector to put at least five million zero-emission vehicles on California roads by 2030 and to install 200 hydrogen fueling stations and 250,000 electric vehicle chargers by 2025. Currently there are approximately 350,000 electric vehicles operating in California, which represents approximately 1.5 percent of the 24 million vehicles total currently operating in California. Implementation of Executive Order B-48-18 would result in approximately 20 percent of all vehicles in California to be zero emission electric vehicles. Assembly Bill 2127 (AB 2127) was codified into statute on September 13, 2018 and requires that the CEC working with CARB prepare biannual assessments of the statewide electric vehicle charging infrastructure needed to support the levels of zero emission vehicle adoption required for the State to meet its goals of putting at least 5 million zero-emission vehicles on California roads by 2030.

Assembly Bill 1109

California Assembly Bill 1109 (AB 1109) was adopted October 2007, also known as the Lighting Efficiency and Toxics Reduction Act, prohibits the manufacturing of lights after January 1, 2010 that contain levels of hazardous substances prohibited by the European Union pursuant to the Restriction of Hazardous Substances Directive. AB 1109 also requires reductions in energy usage for lighting and is structured to reduce lighting electrical consumption by: (1) At least 50 percent reduction from 2007 levels for indoor residential lighting; and (2) At least 25 percent reduction from 2007 levels for indoor commercial and all outdoor lighting by 2018. AB 1109 would reduce GHG emissions through reducing the amount of electricity required to be generated by fossil fuels in California.

Assembly Bill 1493

California Assembly Bill 1493 (also known as the Pavley Bill, in reference to its author Fran Pavley) was enacted on July 22, 2002 and required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. In 2004, CARB approved the "Pavley I" regulations limiting the amount of GHGs that may be released from new passenger automobiles that are being phased in between model years 2009 through 2016. These regulations will reduce GHG emissions by 30 percent from 2002 levels by 2016. In June 2009, the EPA granted California the authority to implement GHG emission reduction standards for light duty vehicles, in September 2009, amendments to the Pavley I regulations were adopted by CARB and implementation of the "Pavley I" regulations started in 2009.

The second set of regulations "Pavley II" was developed in 2010, and is being phased in between model years 2017 through 2025 with the goal of reducing GHG emissions by 45 percent by the year 2020 as compared to the 2002 fleet. The Pavley II standards were developed by linking the GHG emissions and formerly separate toxic tailpipe emissions standards previously known as the "LEV III" (third stage of the Low Emission Vehicle standards) into a single regulatory framework. The new rules reduce emissions from gasoline-powered cars as well as promote zero-emissions auto technologies such as electricity and hydrogen, and through increasing the infrastructure for fueling hydrogen vehicles. In 2009, the U.S. EPA granted California the authority to implement the GHG standards for passenger cars, pickup trucks and sport utility vehicles and these GHG emissions standards are currently being implemented nationwide.

The EPA has performed a midterm evaluation of the longer-term standards for model years 2022-2025, and based on the findings of this midterm evaluation, the EPA proposed The Safer Affordable Fuel Efficient (SAFE) Vehicles Proposed Rule for Model Years 2021-2026 that amends the corporate average fuel economy (CAFE) and GHG emissions standards for light vehicles for model years 2021 through 2026. The SAFE Vehicles Rule was published on April 30, 2020 and made effective on June 29, 2020.

5.2 Local - City of Menifee

The applicable energy plan for the proposed project is the *City of Menifee General Plan Open Space and Conservation Element,* adopted 2013. The energy-related goals and policies from the Open Space Conservation Element are shown below.

Goal OSC-4: Efficient and environmentally use and management of energy and mineral resources to ensure their availability for future generations.

<u>Policies</u>

OCS-4.1: Apply energy efficiency and conservation practices in land use, transportation demand management, and subdivision and building design.

OCS-4.2: Evaluate public and private efforts to develop and operate alternative systems of energy production, including solar, wind, and fuel cell.

OCS-4.3: Advocate for cost-effective and reliable production and delivery of electrical power to residents and businesses throughout the community.

OCS-4.4: Require that any future mining activities be in compliance with the State Mining Reclamation Act, federal and state environmental regulations, and local ordinances.

OCS-4.5: Limit the impacts of mining operations on the city's natural open space, biological and scenic resources, cultural resources and landscapes, and any adjacent land uses.

6.0 GLOBAL CLIMATE CHANGE MANAGEMENT

The regulatory setting related to global climate change is addressed through the efforts of various international, federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to reduce GHG emissions through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for global climate change regulations are discussed below.

6.1 International

In 1988, the United Nations established the IPCC to evaluate the impacts of global climate change and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States joined other countries around the world in signing the United Nations' Framework Convention on Climate Change (UNFCCC) agreement with the goal of controlling GHG emissions. The parties of the UNFCCC adopted the Kyoto Protocol, which set binding GHG reduction targets for 37 industrialized countries, the objective of reducing their collective GHG emissions by five percent below 1990 levels by 2012. The Kyoto Protocol has been ratified by 182 countries, but has not been ratified by the United States. It should be noted that Japan and Canada opted out of the Kyoto Protocol and the remaining developed countries that ratified the Kyoto Protocol have not met their Kyoto targets. The Kyoto Protocol expired in 2012 and the amendment for the second commitment period from 2013 to 2020 has not yet entered into legal force. The Parties to the Kyoto Protocol negotiated the Paris Agreement in December 2015, agreeing to set a goal of limiting global warming to less than 2 degrees Celsius compared with pre-industrial levels. The Paris Agreement has been adopted by 195 nations with 147 ratifying it, including the United States by President Obama, who ratified it by Executive Order on September 3, 2016. On June 1, 2017, President Trump announced that the United States is withdrawing from the Paris Agreement and on January 21, 2021 President Biden signed an executive order rejoining the Paris Agreement.

Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere—CFCs, halons, carbon tetrachloride, and methyl chloroform—were to be phased out, with the first three by the year 2000 and methyl chloroform by 2005.

6.2 Federal – United States Environmental Protection Agency

The EPA is responsible for implementing federal policy to address global climate change. The Federal government administers a wide array of public-private partnerships to reduce U.S. GHG intensity. These programs focus on energy efficiency, renewable energy, methane, and other non-CO_2 gases, agricultural practices and implementation of technologies to achieve GHG reductions. EPA implements several voluntary programs that substantially contribute to the reduction of GHG emissions.

In Massachusetts v. Environmental Protection Agency (Docket No. 05–1120), argued November 29, 2006 and decided April 2, 2007, the U.S. Supreme Court held that not only did the EPA have authority to regulate GHGs, but the EPA's reasons for not regulating this area did not fit the statutory requirements. As such, the U.S. Supreme Court ruled that the EPA should be required to regulate CO2 and other GHGs as pollutants under the federal Clean Air Act (CAA).

In response to the Consolidations Appropriations Act, 2008 (H.R. 2764; Public Law 110-161), EPA proposed a rule on March 10, 2009 that requires mandatory reporting of GHG emissions from large sources in the

United States. On September 22, 2009, the Final Mandatory Reporting of GHG Rule was signed and published in the Federal Register on October 30, 2009. The rule became effective on December 29, 2009. This rule requires suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions to submit annual reports to the EPA.

On December 7, 2009, the EPA Administrator signed two distinct findings under section 202(a) of the Clean Air Act. One is an endangerment finding that finds concentrations of the six GHGs in the atmosphere threaten the public health and welfare of current and future generations. The other is a cause or contribute finding, that finds emissions from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare. These actions did not impose any requirements on industry or other entities, however, since 2009 the EPA has been providing GHG emission standards for vehicles and other stationary sources of GHG emissions that are regulated by the EPA. On September 13, 2013 the EPA Administrator signed 40 CFR Part 60, that limits emissions from new sources to 1,100 pounds of CO_2 per mega-watt hour (MWh) for fossil fuel-fired utility boilers and 1,000 pounds of CO_2 per MWh for large natural gas-fired combustion units.

On August 3, 2015, the EPA announced the Clean Power Plan, emissions guidelines for U.S. states to follow in developing plans to reduce GHG emissions from existing fossil fuel-fired power plants (Federal Register Vol. 80, No. 205, October 23 2015). On October 11, 2017, the EPA issued a formal proposal to repeal the Clean Power Plan and on June 19, 2019 the EPA replaced the Clean Power Plan with the Affordable Clean Energy rule that is anticipated to lower power sector GHG emissions by 11 million tons by the year 2030.

On April 30, 2020, the EPA and the National Highway Safety Administration published the Final Rule for the *Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks* (SAFE Vehicles Rule). Part One of the Rule revokes California's authority to set its own GHG emissions standards and zero-emission vehicle mandates in California, which results in one emission standard to be used nationally for all passenger cars and light trucks that is set by the EPA.

6.3 State

The CARB has the primary responsible for implementing state policy to address global climate change, however there are State regulations related to global climate change that affect a variety of State agencies. CARB, which is a part of the CalEPA, is responsible for the coordination and administration of both the federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets CAAQS, compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. In addition, the CARB establishes emission standards for motor vehicles sold in California, consumer products (e.g. hairspray, aerosol paints, and barbeque lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

In 2008, CARB approved a Climate Change Scoping Plan that proposes a "comprehensive set of actions designed to reduce overall carbon GHG emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health" (CARB 2008). The Climate Change Scoping Plan has a range of GHG reduction actions which include direct regulations; alternative compliance mechanisms; monetary and non-monetary incentives; voluntary actions; market-based mechanisms such as a cap-and-trade system. In 2014, CARB approved the First Update to the Climate Change Scoping Plan (CARB, 2014) that identifies additional strategies moving beyond the 2020 targets to the year 2050. On December 14, 2017 CARB adopted the California's 2017 Climate Change Scoping Plan, November 2017 (CARB, 2017) that provides specific statewide policies and measures to achieve the 2030 GHG reduction target of 40 percent below 1990 levels by 2030 and the aspirational 2050 GHG reduction target of 80 percent below 1990 levels by 2050. In addition, the State has passed the following laws directing CARB to develop actions to reduce GHG emissions, which are listed below in chronological order, with the most current first.

Executive Order B-55-18 and Assembly Bill 1279

The California Governor issued Executive Order B-55-18 in September 2018 that establishes a new statewide goal to achieve carbon neutrality as soon as possible, but no later than 2045. This executive order directs the CARB to work with relevant State agencies to develop a framework for implementation and accounting that tracks progress toward this goal as well as ensuring future scoping plans identify and recommend measures to achieve this carbon neutrality goal. Assembly Bill 1279 was passed by the legislature in September 2022 that codifies the carbon neutrality targets provided in Executive Order B-55-18. The *2022 Scoping Plan for Achieving Carbon Neutrality,* adopted by CARB on December 16, 2022, was prepared in order to meet the carbon neutrality goal targets developed in Executive Order B-55-18 and codified in Assembly Bill 1279.

Executive Order N-79-20

Executive Order N-79-20 establish targets for when all new vehicles and equipment are zero-emission and is described in more detail above in Section 5.1 under Energy Conservation Management.

California Code of Regulations Title 24, Part 6

The Title 24 Part 6 standards have been developed by the CEC primarily for energy conservation and is described in more detail above in Section 5.1 under Energy Conservation Management. It should be noted that implementation of the Title 24 Part 6 building standards would also reduce GHG emissions, since energy use for residential and commercial buildings creates 9.7 percent of the GHG emissions in the State.

California Code of Regulations Title 24, Part 11

The CalGreen Building standards have been developed by the CEC primarily for energy conservation and is described in more detail above in Section 5.1 under Energy Conservation Management. It should be noted that implementation of the CalGreen Building standards would also reduce GHG emissions, since as detailed above under Title 23, Part 6, energy usage from buildings creates 9.7 percent of GHG emissions in the State.

Senate Bill 100

SB 100 requires that by December 1, 2045 that 100 percent of retail sales of electricity to be generated from renewable or zero-carbon emission sources of electricity and is described in more detail above in Section 5.1 under Energy Conservation Management.

Executive Order B-48-18 and Assembly Bill 2127

Executive Order B-48-18 and AB 2127 provides measures to put at least five million zero-emission vehicles on California roads by 2030 and to install 200 hydrogen fueling stations and 250,000 electric vehicle chargers by 2025 and is described in more detail above in Section 5.1 under Energy Conservation Management.

Executive Order B-30-15, Senate Bill 32 and Assembly Bill 197

The California Governor issued Executive Order B-30-15 on April 29, 2015 that aims to reduce California's GHG emissions 40 percent below 1990 levels by 2030. This executive order aligns California's GHG reduction targets with those of other international governments, such as the European Union that set the same target for 2030 in October, 2014. This target will make it possible to reach the ultimate goal of reducing GHG emissions 80 percent under 1990 levels by 2050 that is based on scientifically established levels needed in the U.S.A to limit global warming below 2 degrees Celsius – the warming threshold at which scientists say there will likely be major climate disruptions such as super droughts and rising sea levels. Assembly Bill 197 (AB 197) (September 8, 2016) and Senate Bill 32 (SB 32) (September 8, 2016) codified into statute the GHG emissions reduction targets of at least 40 percent below 1990 levels by 2030 as detailed in Executive Order B-30-15. AB 197 also requires additional GHG emissions reporting that is broken down to sub-county levels and requires CARB to consider the social costs of emissions impacting disadvantaged communities.

Executive Order B-29-15

The California Governor issued Executive Order B-29-15 on April 1, 2015 and directed the State Water Resources Control Board to impose restrictions to achieve a statewide 25 percent reduction in urban water usage and directed the Department of Water Resources to replace 50 million square feet of lawn with drought tolerant landscaping through an update to the State's Model Water Efficient Landscape Ordinance. The Ordinance also requires installation of more efficient irrigation systems, promotion of greywater usage and onsite stormwater capture, and limits the turf planted in new residential landscapes to 25 percent of the total area and restricts turf from being planted in median strips or in parkways unless the parkway is next to a parking strip and a flat surface is required to enter and exit vehicles. Executive Order B-29-15 would reduce GHG emissions associated with the energy used to transport and filter water.

Assembly Bill 341 and Senate Bills 939 and 1374

Senate Bill 939 (SB 939) requires that each jurisdiction in California to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. Senate Bill 1374 (SB 1374) requires the California Integrated Waste Management Board to adopt a model ordinance by March 1, 2004 suitable for adoption by any local agency to require 50 to 75 percent diversion of construction and demolition of waste materials from landfills. Assembly Bill 341 (AB 341) was adopted in 2011 and builds upon the waste reduction measures of SB 939 and 1374, and sets a new target of a 75 percent reduction in solid waste generated by the year 2020.

Senate Bill 375

Senate Bill 375 (SB 375) was adopted September 2008 in order to support the State's climate action goals to reduce GHG emissions through coordinated regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires CARB to set regional targets for GHG emissions reductions from passenger vehicle use. In 2010, CARB established targets for 2020 and 2035 for each MPO within the State. It was up to each MPO to adopt a sustainable communities strategy (SCS) that will prescribe land use allocation in that MPOs Regional Transportation Plan (RTP) to meet CARB's 2020 and 2035 GHG emission reduction targets. These reduction targets are required to be updated every eight years and the most current targets are detailed at: https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets, which provides GHG emissions reduction targets for SCAG of 8 percent by 2020 and 19 percent by 2035.

The Connect SoCal 2020 (SCAG, 2020) provides a 2035 GHG emission reduction target of 19 percent reduction over the 2005 per capita emissions levels. The Connect SoCal 2020 include new initiatives of land use, transportation and technology to meet the 2035 new 19 percent GHG emission reduction target for 2035. CARB is also charged with reviewing SCAG's RTP/SCS for consistency with its assigned targets.

City and County land use policies, including General Plans, are not required to be consistent with the RTP and associated SCS. However, new provisions of CEQA incentivize, through streamlining and other provisions, qualified projects that are consistent with an approved SCS and categorized as "transit priority projects."

Assembly Bill 1109

AB 1109 requires reductions in energy usage for lighting and is described in more detail above in Section 5.1 under Energy Conservation Management.

Executive Order S-1-07

Executive Order S-1-07 was issued in 2007 and proclaims that the transportation sector is the main source of GHG emissions in the State, since it generates more than 40 percent of the State's GHG emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in the State by at least ten percent by 2020. This Executive Order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

In 2009 CARB approved the proposed regulation to implement the LCFS. The standard was challenged in the courts, but has been in effect since 2011 and was re-approved by the CARB in 2015. The LCFS is anticipated to reduce GHG emissions by about 16 MMT per year by 2020. The LCFS is designed to provide a framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet annually. Reformulated gasoline mixed with corn-derived ethanol and low-sulfur diesel fuel represent the baseline fuels. Lower carbon fuels may be ethanol, biodiesel, renewable diesel, or blends of these fuels with gasoline or diesel. Compressed natural gas and liquefied natural gas also may be low-carbon fuels. Hydrogen and electricity, when used in fuel cells or electric vehicles, are also considered as low-carbon fuels.

Senate Bill 97

Senate Bill 97 (SB 97) was adopted August 2007 and acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. SB 97 directed the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify and adopt those guidelines by January 1, 2010.

Pursuant to the requirements of SB 97 as stated above, on December 30, 2009 the Natural Resources Agency adopted amendments to the State CEQA guidelines that addresses GHG emissions. The CEQA Guidelines Amendments changed 14 sections of the CEQA Guidelines and incorporated GHG language throughout the Guidelines. However, no GHG emissions thresholds of significance were provided and no specific mitigation measures were identified. The GHG emission reduction amendments went into effect on March 18, 2010 and are summarized below:

- Climate Action Plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the GHG emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of GHG emissions in Appendix F of the CEQA Guidelines.
- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."
- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports must specifically consider a project's energy use and energy efficiency potential.

Assembly Bill 32

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires CARB, to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020 through an enforceable statewide emission cap which will be phased in starting in 2012. Emission reductions shall include carbon sequestration projects that would remove carbon from the atmosphere and utilize best management practices that are technologically feasible and cost effective.

In 2007 CARB released the calculated Year 1990 GHG emissions of 431 $MMTCO_2e$. The 2020 target of 431 $MMTCO_2e$ requires the reduction of 78 $MMTCO_2e$, or approximately 16 percent from the State's projected 2020 business as usual emissions of 509 $MMTCO_2e$ (CARB, 2014). Under AB 32, CARB was required to adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 cap by 2020. Early measures CARB took to lower GHG emissions included requiring operators of the largest industrial facilities that emit 25,000 metric tons of CO_2 in a calendar year to submit verification of GHG emissions by December 1, 2010. The CARB Board also approved nine discrete early action measures that include regulations affecting landfills, motor vehicle fuels, refrigerants in cars, port operations and other sources, all of which became enforceable on or before January 1, 2010.

CARB's Scoping Plan that was adopted in 2009, proposes a variety of measures including: strengthening energy efficiency and building standards; targeted fees on water and energy use; a market-based cap-and-trade system; achieving a 33 percent renewable energy mix; and a fee regulation to fund the program. The 2014 update to the Scoping Plan identifies strategies moving beyond the 2020 targets to the year 2050.

The Cap and Trade Program established under the Scoping Plan sets a statewide limit on sources responsible for 85 percent of California's GHG emissions, and has established a market for long-term investment in energy efficiency and cleaner fuels since 2012.

Assembly Bill 1493

AB 1493 or the Pavley Bill sets tailpipe GHG emissions limits for passenger vehicles in California as well as fuel economy standards and is described in more detail above in Section 5.1 under Energy Conservation Management.

6.4 Regional – Southern California

The SCAQMD is the agency principally responsible for comprehensive air pollution control in the Air Basin. To that end, as a regional agency, the SCAQMD works directly with SCAG, county transportation commissions, and local governments and cooperates actively with all federal and state agencies.

South Coast Air Quality Management District

SCAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emission sources, and enforces such measures through educational programs or fines, when necessary. SCAQMD is directly responsible for reducing emissions from stationary, mobile, and indirect sources. The SCAQMD is also responsible for GHG emissions for projects where it is the lead agency. However, for other projects in the Air Basin where it is not the lead agency, it is limited to providing resources to other lead agencies in order to assist them in determining GHG emission thresholds and GHG reduction measures. In order to assist local agencies with direction on GHG emissions, the SCAQMD organized a working group, which is described below.

SCAQMD Working Group

In order to identify significance criteria under CEQA for all land use projects, SCAQMD initiated a Working Group, which provided detailed methodology for evaluating significance under CEQA. At the September 28, 2010 Working Group meeting, the SCAQMD released its most current version of the draft GHG emissions thresholds, which recommends a tiered approach that includes the following Tiers:

- Tier 1: Applicable CEQA Exemptions (e.g., SB 97, categorical and statutory exemptions).
- Tier 2: Consistency with a GHG Reduction Plan (an adopted plan by a local agency).
- Tier 3: Quantitative Screening Values. The following quantitative thresholds were proposed:
    - 3,000 $MTCO_2e$ per year for all land use types; or
    - 3,500 $MTCO_2e$ per year for residential;
    - 1,400 $MTCO_2e$ per year for commercial;
    - 3,000 $MTCO_2e$ per year for mixed-use; and
    - 10,000 $MTCO_2e$ per year for industrial.
- Tier 4: Performance Standards. The following options were proposed as performance standards:

- Option 1: Percent Emission Reduction Target (Provide an undefined percent reduction in GHG emissions over business-as-usual emissions).
- Option 2: Early Implementation of Applicable AB32 Scoping Plan Measures (Require a set of AB32 Scoping Plan measures to be implemented).
- Option 3: SCAQMD Efficiency Targets. The following targets were proposed:
  - Year 2020 Targets
    - 4.8 $MTCO_2e$ per year per service population for project level threshold (land use employment only)
    - 6.6 $MTCO_2e$ per year per service population for plan level threshold
  - Year 2035 Targets
    - 3.0 $MTCO_2e$ per year per service population for project level threshold.
    - 4.1 $MTCO_2e$ per year per service population for plan level threshold

- Tier 5: Mitigation Offsets (either alone or in combination with above tiers to achieve target threshold).

Southern California Association of Governments

As detailed above in Section 4.3, the current applicable RTP/SCS for the project area region is the Connect SoCal 2020 and 2019 FTIP, which have been prepared to meet the GHG emissions reduction targets set by SB 375 for the SCAG region of 19 percent reduction over the 2005 per capita emissions levels. The Connect SoCal 2020 includes new land use, transportation, and technology strategies to meet the new 19 percent GHG emission reduction target for 2035.

Although the Connect SoCal 2020 and 2019 FTIP are primarily planning documents for future transportation projects, a key component of these plans are to integrate land use planning with transportation planning that promotes higher density infill development in close proximity to existing transit service. These plans form the basis for the land use and transportation components of the 2022 AQMP, which are utilized in the preparation of air quality forecasts and in the consistency analysis included in the 2022 AQMP. The Connect SoCal 2020, 2019 FTIP, and 2022 AQMP are based on projections originating within the City and County General Plans.

6.5 Local – City of Menifee

Local jurisdictions, such as the City of Menifee, have the authority and responsibility to reduce GHG emissions through their police power and decision-making authority. Specifically, the City is responsible for the assessment and mitigation of GHG emissions resulting from its land use decisions. In accordance with CEQA requirements and the CEQA review process, the City assesses the global climate change potential of new development projects, requires mitigation of potentially significant global climate change impacts by conditioning discretionary permits, and monitors and enforces implementation of such mitigation.

The applicable GHG plan for the proposed project is the *City of Menifee General Plan Open Space and Conservation Element,* adopted 2013. The GHG-related goals and policies from the Open Space Conservation Element are shown below.

Goal OSC-10: An environmentally aware community that is responsive to changing climate conditions and actively seeks to reduce local greenhouse gas emissions.

Policies

OCS-10.1: Align the city's local GHG reduction targets to be consistent with the statewide GHG reduction target of AB 32.

OCS-10.2: Align the city's long-term GHG reduction goal consistent with the statewide GHG goal of Executive Order S-03-05.

OCS-10.3: Participate in regional greenhouse gas emission reduction initiatives.

OCS-10.4: Consider impacts to climate change as a factor in evaluating policies, strategies, and projects.

7.0 ATMOSPHERIC SETTING

7.1 South Coast Air Basin

The project site is located in the western portion of Riverside County, which is part of the South Coast Air Basin (Air Basin) that includes the non-desert portions of Riverside, San Bernardino, and Los Angeles Counties and all of Orange County. The Air Basin is located on a coastal plain with connecting broad valleys and low hills to the east. Regionally, the Air Basin is bounded by the Pacific Ocean to the southwest and high mountains to the east forming the inland perimeter.

7.2 Local Climate

The climate of western Riverside County, technically called an interior valley subclimate of the Southern California's Mediterranean-type climate, is characterized by hot dry summers, mild moist winters with infrequent rainfall, moderate afternoon breezes, and generally fair weather. Occasional periods of strong Santa Ana winds and winter storms interrupt the otherwise mild weather pattern. The clouds and fog that form along the area's coastline rarely extend as far inland as western Riverside County. When morning clouds and fog form, they typically burn off quickly after sunrise. The most important weather pattern from an air quality perspective is associated with the warm season airflow across the densely populated areas located west of the project site. This airflow brings polluted air into western Riverside County late in the afternoon. This transport pattern creates unhealthful air quality that may extend to the project site particularly during the summer months.

Winds are an important parameter in characterizing the air quality environment of a project site because they both determine the regional pattern of air pollution transport and control the rate of dispersion near a source. Daytime winds in western Riverside County are usually light breezes from off the coast as air moves regionally onshore from the cool Pacific Ocean to the warm Mojave Desert interior of Southern California. These winds allow for good local mixing, but as discussed above, these coastal winds carry significant amounts of industrial and automobile air pollutants from the densely urbanized western portion of the Air Basin into the interior valleys which become trapped by the mountains that border the eastern and northern edges of the Air Basin.

In the summer, strong temperature inversions may occur that limit the vertical depth through which air pollution can be dispersed. Air pollutants concentrate because they cannot rise through the inversion layer and disperse. These inversions are more common and persistent during the summer months. Over time, sunlight produces photochemical reactions within this inversion layer that creates ozone, a particularly harmful air pollutant. Occasionally, strong thermal convections occur which allows the air pollutants to rise high enough to pass over the mountains and ultimately dilute the smog cloud.

In the winter, light nocturnal winds result mainly from the drainage of cool air off of the mountains toward the valley floor while the air aloft over the valley remains warm. This forms a type of inversion known as a radiation inversion. Such winds are characterized by stagnation and poor local mixing and trap pollutants such as automobile exhaust near their source. While these inversions may lead to air pollution "hot spots" in heavily developed coastal areas of the Air Basin, there is not enough traffic in inland valleys to cause any winter air pollution problems. Despite light wind conditions, especially at night and in the early morning, winter is generally a period of good air quality in the project vicinity.

The temperature and precipitation levels for the Sun City Monitoring Station, which is the nearest weather station to the project site with historical data are shown below in Table E. Table E shows that July is typically the warmest month and January is typically the coolest month. Rainfall in the project area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers being almost completely dry.

Table E – Monthly Climate Data

Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Total Precipitation (inches)
January	66.1	36.3	2.66
February	68.4	38.7	3.25
March	69.6	41.1	1.96
April	76.7	44.4	0.66
May	82.1	49.6	0.31
June	91.9	54.0	0.05
July	97.4	58.9	0.03
August	98.0	59.4	0.24
September	92.6	57.5	0.15
October	84.2	49.2	0.25
November	73.8	39.8	0.66
December	67.6	34.5	1.02
Annual	**80.7**	**46.9**	**11.22**

Source: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca8655

7.3 Monitored Local Air Quality

The air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the Air Basin. Improvements in cleaner technology and strict regulations have reduced ozone levels since its peak in the mid-twentieth century. However, ozone levels have remained unacceptably high over the past decade despite significant reductions. This trend is due to the changes in climate and other weather conditions such as the increase in hot, stagnant days that can lead to the formation of ozone that we have experienced in recent years. (SCAQMD, 2022).

SCAQMD has divided the Air Basin into 38 air-monitoring areas with a designated ambient air monitoring station representative of each area. The project site is located in Air Monitoring Area 24, Perris Valley. The nearest air monitoring station to the project site is the is the Lake Elsinore-West Flint Street Monitoring Station (Lake Elsinore Station), which is located approximately 6.3 miles west of the project site at 506 West Flint Street, Lake Elsinore. However, it should be noted that due to the air monitoring station's distance from the project site, recorded air pollution levels at the Lake Elsinore Station reflect with varying degrees of accuracy, local air quality conditions at the project site. It should also be noted that CO measurements have not been provided, since CO is currently in attainment in the Air Basin and monitoring of CO within the Air Basin ended on March 31, 2013.

The monitoring data from the Lake Elsinore Station is presented in Table F and shows the most recent three years of monitoring data from CARB. Table F shows that ozone and particulate matter (PM10 and PM2.5) are the air pollutants of primary concern in the project area, which are detailed below.

Table F – Local Area Air Quality Monitoring Summary

Pollutant (Standard)	Year[1]		
	2020	2021	2022
Ozone:			
Maximum 1-Hour Concentration (ppm)	0.130	0.118	0.121
Days > CAAQS (0.09 ppm)	**18**	**18**	**17**
Maximum 8-Hour Concentration (ppm)	0.100	0.097	0.091
Days > NAAQS (0.070 ppm)	**54**	**44**	**37**
Days > CAAQs (0.070 ppm)	**55**	**46**	**37**
Nitrogen Dioxide:			
Maximum 1-Hour Concentration (ppb)	43.6	43.7	37.2
Days > NAAQS (100 ppb)	0	0	0
Days > CAAQS (180 ppb)	0	0	0
Inhalable Particulates (PM10):			
Maximum 24-Hour National Measurement (ug/m^3)	192.4	90.0	91.8
Days > NAAQS (150 ug/m^3)	**1**	0	0
Days > CAAQS (50 ug/m^3)	ND	ND	ND
Annual Arithmetic Mean (AAM) (ug/m^3)	23.7	22.4	20.3
Annual > NAAQS (50 ug/m^3)	No	No	No
Annual > CAAQS (20 ug/m^3)	**Yes**	**Yes**	**Yes**
Ultra-Fine Particulates (PM2.5):			
Maximum 24-Hour State Measurement (ug/m^3)	41.6	28.8	16.2
Days > NAAQS (35 ug/m^3)	**3**	0	0
Annual Arithmetic Mean (AAM) (ug/m^3)	7.2	6.9	5.8
Annual > NAAQS and CAAQS (12 ug/m^3)	No	No	No

Notes: Exceedances are listed in **bold.** CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million; ppb = parts per billion; ND = no data available.

[1] Data obtained from the Lake Elsinore Station.

Source: http://www.arb.ca.gov/adam/

Ozone

During the last three years, the State 1-hour concentration standard for ozone has been exceeded between 17 and 18 days each year at the Lake Elsinore Station. The State 8-hour ozone standard has been exceeded between 37 and 55 days each year over the last three years at the Lake Elsinore Station. The Federal 8-hour ozone standard has been exceeded between 37 and 54 days each year over the last three years at the Lake Elsinore Station.

Ozone is a secondary pollutant as it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO_2, which occur only in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in the area. Many areas of Southern California contribute to the ozone levels experienced at this monitoring station, with the more significant areas being those directly upwind.

Nitrogen Dioxide

The Lake Elsinore Station did not record an exceedance of either the Federal or State 1-hour NO_2 standards for the last three years.

Particulate Matter

There is no data available at the Lake Elsinore Station State 24-hour concentration standards. Over the past three years the Federal 24-hour standard for PM10 has only been exceeded for one day in 2020 for the past three years at the Lake Elsinore Station. The annual PM10 concentration at the Lake Elsinore Station has exceeded the State standard for the past three years and has not exceeded the Federal standard for the past three years.

Over the past three years the federal 24-hour concentration standard for PM2.5 has been exceeded between 0 and 3 days each year over the past three years at the Lake Elsinore Station. The annual PM2.5 concentrations at the Lake Elsinore Station has not exceeded either the State or Federal standards for the past three years. There does not appear to be a noticeable trend for PM10 or PM2.5 in either maximum particulate concentrations or days of exceedances in the area. Particulate levels in the area are due to natural sources, grading operations, and motor vehicles.

According to the EPA, some people are much more sensitive than others to breathing fine particles (PM10 and PM2.5). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive, because many breathe through their mouths during exercise.

7.4 Toxic Air Contaminant Levels

In order to determine the Air Basin-wide risks associated with major airborne carcinogens, the SCAQMD conducted the Multiple Air Toxics Exposure Study (MATES) studies. According to the MATES V study (SCAQMD, 2021), the project site has an estimated cancer risk of 285 per million persons chance of cancer. In comparison, the average cancer risk for the Air Basin is 455 per million persons. The MATES V study monitored air toxins between May 1, 2018 to April 30, 2019, found that cancer risk from air toxics has declined significantly in the Air Basin with a 40 percent decrease in cancer risk since the monitoring for the MATES IV study that occurred between July 1, 2012 and June 30, 2013 and an 84 percent decrease in cancer risk since the monitoring for the MATES II study that occurred between April 1, 1998 and March 31, 1999.

The MATES V study also analyzed impacts specific to the communities experiencing environmental injustices (EJ communities) that were evaluated using the Senate Bill 535 definition of disadvantaged communities, which found that between MATES IV and MATES V, the cancer risk from air toxics decreased by 57 percent in EJ communities overall, compared to a 53 percent reduction in non-EJ communities.

In order to provide a perspective of risk, it is often estimated that the incidence in cancer over a lifetime for the U.S. population ranges between 1 in 3 to 4 and 1 in 3, or a risk of about 300,000 per million persons.

The MATES-III study referenced a Harvard Report on Cancer Prevention, which estimated that of cancers associated with known risk factors, about 30 percent were related to tobacco, about 30 percent were related to diet and obesity, and about 2 percent were associated with environmental pollution related exposures that includes hazardous air pollutants.

8.0 MODELING PARAMETERS AND ASSUMPTIONS

8.1 CalEEMod Model Input Parameters

The criteria air pollution and GHG emissions impacts created by the proposed project have been analyzed through use of the California Emissions Estimator Model (CalEEMod) Version 2022.1.1.22 CalEEMod is a computer model published by the California Air Pollution Control Officers Association (CAPCOA) for estimating air pollutant and GHG emissions. The CalEEMod program uses the EMFAC2021 computer program to calculate the emission rates specific for the South Coast Air Basin portion of Riverside County for employee, vendor and haul truck vehicle trips and the OFFROAD2011 computer program to calculate emission rates for heavy equipment operations. EMFAC2021 and OFFROAD2011 are computer programs generated by CARB that calculates composite emission rates for vehicles. Emission rates are reported by the program in grams per trip and grams per mile or grams per running hour.

The project characteristics in the CalEEMod model were set to a project location of the South Coast Air Basin portion of Riverside County, utility companies of Southern California Edison and Southern California Gas (with 2026 forecast factors) and a project opening year of 2026.

Land Use Parameters

The proposed project would consist of development of 74 duplex residential units and an associated onsite road system and water detention facilities on approximately 14.4 acres. The proposed project's land use parameters that were entered into the CalEEMod model are shown in Table G.

Table G – CalEEMod Land Use Parameters

Proposed Land Use	Land Use Subtype in CalEEMod	Land Use Size[1]	Lot Acreage[2]	Building[3] (sq ft)	Landscaped Area[4] (sq ft)
Duplexes	Single Family Housing	74 DU	10.8	78,440	94,090
Onsite Roads and Driveways	Other Asphalt Surfaces	3.6 AC	3.6	--	31,363

Notes:
[1] DU = Dwelling unit; AC = Acre.
[2] Lot acreage calculated based on the total area disturbed of 14.4 acres.
[3] Building square feet represent area where architectural coatings will be applied
[4] Landscaped area based on 20 percent of lot acreage for each land use.

Construction Parameters

Construction of the proposed project is anticipated to start in spring 2025. The project site consists of hilly terrain and the Grading Plan shows that grading will require 108,500 cubic yards of cut and 45,700 cubic yards of fill, which will require the export of 62,800 cubic yards of dirt from the project site. Due to the hilly terrain and large amount of earthwork that will be required for the proposed project, it was estimated that earthmoving would take three times longer than a typical flat project site, which resulted in the site preparation phase being extended from the default value of 10 workdays to 30 workdays and the grading phase was extended from the default value of 30 workdays to 70 workdays. All other phases were based on the CalEEMod default timing, which found that construction would be completed in approximately 21 months. In addition, the export of 62,800 cubic yards was split proportionally (based on phase duration) between the Site Preparation and Grading phases, which resulted in 15,700 cubic yards being exported during the Site Preparation phase and 47,100 cubic yards being exported during the Grading phase.

The construction-related GHG emissions were based on a 30-year amortization rate as recommended in the SCAQMD GHG Working Group meeting on November 19, 2009. The phases of construction activities that have been analyzed are detailed below and include: 1) Site Preparation, 2) Grading, 3) Building construction, 4) Paving, and 5) Application of architectural coatings.

CalEEMod provides the selection of reduction measures to account for project conditions that would result in less emissions than a project without these conditions. This includes the required to adherence to SCAQMD Rule 403, which requires that the Best Available Control Measures be utilized to reduce fugitive dust emissions and was modeled in CalEEMod by selection of water all exposed areas three times per day, water unpaved roads twice daily, reduce vehicle speeds on dirt roads and sweep paved roads once per month.

Site Preparation

The site preparation phase would consist of removing any vegetation, tree stumps, and stones onsite prior to grading. The site preparation was modeled as starting spring 2025 and occurring over 30 workdays. During the site preparation phase it is anticipated that 15,700 cubic yards of dirt will be exported from the project site. The export of dirt would generate an average of 65.4 haul truck trips per day over the duration of the site preparation phase.

The site preparation activities would generate an average of 17.5 worker trips per day. In order to account for water truck emissions, three onsite truck trips per day with a quarter-mile length was added to the site preparation phase. The onsite equipment would consist of three rubber-tired dozers, and four crawler tractors, which replaced the CalEEMod default value of four of either tractors, loaders, or backhoes, in order to provide a more conservative analysis.

Grading

The grading phase was modeled as starting after completion of the site preparation phase and was modeled as occurring over 90 workdays. During the grading phase it is anticipated that 47,100 cubic yards of dirt will be imported to the project site. The import of dirt would generate an average of 65.4 haul truck trips per day over the duration of the grading phase.

The onsite equipment would consist of two excavators, one grader, one rubber-tired dozer, two scrapers, and two crawler tractors, which replaced the CalEEMod default value of two of either tractors, loaders, or backhoes, in order to provide a more conservative analysis. The grading activities would generate an average of 20 automobile trips per day for the workers. In order to account for water truck emissions, three onsite truck trips per day with a quarter-mile length was added to the grading phase.

Building Construction

The building construction would occur after the completion of the grading phase and was modeled as occurring over 300 workdays (14 months), which is based on the CalEEMod default timing. The building construction phase would generate an average of 53.3 worker trips and 7.91 vendor trips per day. The onsite equipment would consist of the simultaneous operation of one crane, three forklifts, one generator, one welder, and three of either tractors, loaders, or backhoes, which is based on the CalEEMod default equipment mix.

Paving

The paving phase would consist of paving the onsite roads and driveways. The paving phase was modeled as occurring after completion of the building construction phase and occurring over 20 workdays, which is based on the CalEEMod default timing. The paving phase would generate 15 worker trips per day. The onsite equipment would consist of the simultaneous operation of two pavers, two paving equipment, and two rollers, which is based on the CalEEMod default equipment mix.

Architectural Coating

The application of architectural coatings was modeled as occurring after completion of the paving phase and occurring over 20 workdays, which is based on the CalEEMod default timing. The architectural coating phase was modeled based on covering 158,841 square feet of residential interior area, 52,947 square feet of residential exterior area, and 9,409 square feet of parking and roadway area. The architectural coating phase would generate an average of 10.7 worker trips per day. The onsite equipment would consist of one air compressor, which is based on the CalEEMod default equipment mix.

Operational Emissions Modeling

The operations-related criteria air pollutant emissions and GHG emissions created by the proposed project have been analyzed through use of the CalEEMod model. The proposed project was analyzed in the CalEEMod model based on the land use parameters provided above and the parameters entered for each operational source is described below.

Mobile Sources

Mobile sources include emissions the additional vehicle miles generated from the proposed project. The weekday daily trips was adjusted in CalEEMod to match the daily rate provided in the *Trip Generation and Scoping – Oak Hills West Tract 38652* (Trip Generation Memo), prepared by General Technologies and Solutions (GTS), April 10, 2024, of 7.2 daily trips per dwelling unit. Since the Trip Generation Memo does not provide Saturday or Sunday daily trip rates, the CalEEMod default values of 8.14 daily trips per unit for Saturdays and 6.28 daily trips per unit for Sundays were utilized.

Area Sources

Area sources include emissions from consumer products, landscape equipment, hearths and architectural coatings. The area source emissions were based on the on-going use of the proposed project in the CalEEMod model. According to the project applicant, a natural gas fireplace may be an optional item in each home. Since SCAQMD Rule 445 restricts the installation of wood-burning fireplaces into new developments, 74 natural gas only fireplaces were modeled in the CalEEMod model. No other changes were made to the default area source parameters in the CalEEMod model.

Energy Usage

Energy usage includes emissions from electricity and natural gas used onsite. The energy usage was based on the ongoing use of the proposed project in the CalEEMod Model. No changes were made to the default energy usage parameters in the CalEEMod model.

The 2022 Title 24, Part 6 building energy efficiency standards have been developed so that the average new home built in California will have zero-net-energy use. The 2022 Title 24 Part 6 standards also require all new homes to install rooftop photovoltaic systems based on Section 150.1-C from: https://www.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf

It should be noted that the Title 24 Report for the proposed project has not yet been prepared so the exact number of solar panels to be installed on the project site has not yet been calculated. However, Exception 3 to Section 150.1-c states that all two-story homes shall provide a minimum of 1.0 Watt DC of solar panels per square foot of conditioned floor area. According to the default building square footage from CalEEMod, the 74 proposed homes would total 78,440 square feet of building space, which based on the above formula would require the installation of 78.4 kilowatts of photovoltaic solar panels. Based on operating 8 hours per day and then dividing by 1.2 to account for the loss associated with converting the direct current (DC) power to alternating current (AC) power on the electrical grid, the proposed solar panels would generate 190,871 kilowatt-hours per year, which was entered into the CalEEMod model.

Solid Waste

Waste includes the GHG emissions associated with the processing of waste from the proposed project as well as the GHG emissions from the waste once it is interred into a landfill. The analysis was based on the default CalEEMod waste generation rate of 54.7 tons of solid waste per year from the proposed project. No changes were made to the default solid waste parameters or mitigation measures in the CalEEMod model.

Water and Wastewater

Water includes the water used for the interior of the buildings as well as for landscaping and is based on the GHG emissions associated with the energy used to transport and filter the water. The analysis was based on the default CalEEMod water usage rate of 3,009,859 gallons per year of indoor water use and 2,320,672 gallons per year of outdoor water use. No changes were made to the default water and wastewater parameters in the CalEEMod model.

8.2 Energy Use Calculations

The proposed project is anticipated to consume energy during both construction and operation of the proposed project and the parameters utilized to calculate energy use from construction and operation of the proposed project are detailed separately below.

Construction-Related Energy Use

Construction of the proposed project is anticipated to use energy in the forms of petroleum fuel for both off-road equipment as well as from the transport of workers and materials to and from the project site and the calculations for each source are described below.

Off-Road Construction Equipment

The off-road construction equipment fuel usage was calculated through use of the CalEEMod model's default off-road equipment assumptions detailed above in Section 8.1. For each piece of off-road equipment, the fuel usage was calculated through use of the *2017 Off-road Diesel Emission Factors* spreadsheet, prepared by CARB (https://ww3.arb.ca.gov/msei/ordiesel.htm). The Spreadsheet provides the following formula to calculate fuel usage from off-road equipment:

Fuel Used = Load Factor x Horsepower x Total Operational Hours x BSFC / Unit Conversion

Where:

Load Factor - Obtained from CalEEMod default values

Horsepower – Obtained from CalEEMod default values

Total Operational Hours – Calculated by multiplying CalEEMod default daily hours by CalEEMod default number of working days for each phase of construction

BSFC – Brake Specific Fuel Consumption (pounds per horsepower-hour) – If less than 100 Horsepower = 0.408, if greater than 100 Horsepower = 0.367

Unit Conversion – Converts pounds to gallons = 7.109

Table H shows the off-road construction equipment fuel calculations based on the above formula. Table H shows that the off-road equipment utilized during construction of the proposed project would consume 69,964 gallons of diesel fuel.

Table H – Off-Road Equipment and Fuel Consumption from Construction of the Proposed Project

Equipment Type	Equipment Quantity	Horse-power	Load Factor	Operating Hours per Day	Total Operational Hours[1]	Fuel Used (gallons)
Site Preparation						
Rubber Tired Dozers	3	367	0.40	8	720	5,457
Crawler Tractors	4	87	0.43	8	960	2,061
Grading						
Excavators	2	36	0.38	8	1,440	1,131
Grader	1	148	0.41	8	720	2,255
Rubber Tired Dozer	1	367	0.40	8	720	5,457
Scrapers	2	423	0.48	8	1,440	15,094
Crawler Tractors	2	87	0.43	8	1,440	3,092
Building Construction						
Crane	1	367	0.29	7	2,100	11,538
Forklifts	3	82	0.20	8	7,200	6,777
Generator Set	1	14	0.74	8	2,400	1,427
Tractors/Loaders/Backhoes	3	84	0.37	7	6,300	11,238
Welder	1	46	0.45	8	2,400	2,851
Paving						
Pavers	2	81	0.42	8	320	625
Paving Equipment	2	89	0.36	8	320	588
Rollers	2	36	0.38	8	320	251
Architectural Coating						
Air Compressor	1	37	0.48	6	120	122
Total Off-Road Equipment Diesel Fuel Used during Construction (gallons)						**69,964**

Notes:

[1] Based on: 30 days for Site Preparation, 90 days for Grading; 300 days for Building Construction; 20 days for Paving; and 20 days for Architectural Coating.

Source: CalEEMod Version 2022.1 (see Appendix A); CARB, 2017.

On-Road Construction-Related Vehicle Trips

The on-road construction-related vehicle trips fuel usage was calculated through use of the construction vehicle trip assumptions from the CalEEMod model run as detailed above in Section 8.1. The calculated total construction miles was then divided by the fleet average for the South Coast Air Basin portion of

Riverside County miles per gallon rates for the year 2025 calculated through use of the EMFAC2021 model and the EMFAC2021 model printouts are shown in Appendix B. The worker trips were based on the combined fleet average miles per gallon rates for gasoline powered automobiles, SUVs and pickup trucks and the vendor and haul truck trips were based on the combined T6 and T7 diesel trucks fleet average miles per gallon rate. Table I shows the on-road construction vehicle trips modeled in CalEEMod and the fuel usage calculations.

Table I – On-Road Vehicle Trips and Fuel Consumption from Construction of the Proposed Project

Vehicle Trip Types/ Fuel Type	Daily Trips	Trip Length (miles)	Total Miles per Day	Total Miles per Phase[1]	Fleet Average Miles per Gallon[2]	Fuel Used (gallons)
Site Preparation						
Worker (Gasoline)	17.5	18.5	324	9,713	26.4	368
Haul Trucks (Diesel)	65.4	20	1,308	39,240	7.3	5,347
Water Trucks (Diesel)	3	0.25	0.75	23	7.3	3
Grading						
Worker (Gasoline)	20	18.5	370	33,300	26.4	1,263
Haul Trucks (Diesel)	65.4	20	1,308	117,720	7.3	16,040
Water Trucks (Diesel)	3	0.25	0.75	68	7.3	9
Building Construction						
Worker (Gasoline)	53.3	18.5	986	295,815	26.4	11,222
Vendor Truck (Diesel)	7.91	10.2	81	24,205	7.3	3,298
Paving						
Worker (Gasoline)	15	18.5	278	5,550	26.4	211
Architectural Coatings						
Worker (Gasoline)	10.7	18.5	198	3,959	26.4	150
Total Gasoline Fuel Used from On-Road Construction Vehicles (gallons)						**13,214**
Total Diesel Fuel Used from On-Road Construction Vehicles (gallons)						**24,697**

Notes:
[1] Based on: 30 days for Site Preparation, 90 days for Grading; 300 days for Building Construction; 20 days for Paving; and 20 days for Architectural Coating.
[2] From EMFAC 2021 model (see Appendix B). Worker Trips based on gasoline powered automobiles, SUVs and pickup trucks and Vendor Trips based on applicable diesel powered truck fleet.
Source: CalEEMod Version 2022.1; EMFAC2021.

Table I shows that the on-road construction-related vehicle trips would consume 13,214 gallons of gasoline and 24,697 gallons of diesel fuel. As detailed above, Table H shows that the off-road construction equipment would consume 69,964 gallons of diesel fuel. This would result in the total consumption of 13,214 gallons of gasoline and 94,661 gallons of diesel fuel from construction of the proposed project.

Operations-Related Energy Use

The operation of the proposed project is anticipated to use energy in the forms of petroleum fuel, electricity, and natural gas, and the calculations for each source are described below.

Operational Petroleum Fuel

The on-road operations-related vehicle trips fuel usage was calculated through use of the total annual vehicle miles traveled assumptions from the CalEEMod model run as detailed above in Section 8.1, which found that operation of the proposed project would generate 1,911,296 vehicle miles traveled per year. The calculated total operational miles were then divided by 26.4 miles per gallon, which was calculated through use of the EMFAC2021 model and based on the South Coast Air Basin portion of Riverside County miles per gallon rates for the year 2025. The EMFAC2021 model printouts are shown in Appendix B. Based on the above calculation methodology, operational vehicle trips generated from the proposed project would consume 72,504 gallons of gasoline per year.

Operational Electricity Use

The operations-related electricity usage was calculated in the CalEEMod model run that is detailed above in Section 8.1 that found the operation of the proposed project will use 351,485 kilowatt hours (kWh) per year with implementation of Title 24 Part 6 requirements that require the implementation of building energy efficiency standards that include the installation of photovoltaic systems on the rooftops of the proposed homes.

Operational Natural Gas Use

The operations-related natural gas usage was calculated in the CalEEMod model run that is detailed above in Section 8.1 that found the operation of the proposed project will use 1,542,950 kilo British Thermal Units (kBTU) per year, which is equivalent to 1,543 mega-British Thermal units (MBTU) per year of natural gas.

9.0 THRESHOLDS OF SIGNIFICANCE

9.1 Regional Air Quality

Many air quality impacts that derive from dispersed mobile sources, which are the dominant pollution generators in the Air Basin, often occurs hours later and miles away after photochemical processes have converted primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual project is generally very small and difficult to measure. Therefore, SCAQMD has developed significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. The SCAQMD CEQA Handbook states that any project in the Air Basin with daily emissions that exceed any of the identified significance thresholds should be considered as having an individually and cumulatively significant air quality impact. For the purposes to this air quality impact analysis, a regional air quality impact would be considered significant if emissions exceed the SCAQMD significance thresholds identified in Table J.

Table J – SCAQMD Regional Criteria Pollutant Emission Thresholds of Significance

	Pollutant Emissions (pounds/day)						
	VOC	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**	**Lead**
Construction	75	100	550	150	150	55	3
Operation	55	55	550	150	150	55	3

Source: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2

9.2 Local Air Quality

Project-related construction air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin. In order to assess local air quality impacts the SCAQMD has developed Localized Significant Thresholds (LSTs) to assess the project-related air emissions in the project vicinity. SCAQMD has also provided *Final Localized Significance Threshold Methodology* (LST Methodology), July 2008, which details the methodology to analyze local air emission impacts. The LST Methodology found that the primary emissions of concern are NO_2, CO, PM10, and PM2.5.

The LST Methodology provides Look-Up Tables with different thresholds based on the location and size of the project site and distance to the nearest sensitive receptors. As detailed above in Section 7.3, the project site is located in Monitoring Area 24, which covers Perris Valley.

The Look-Up Tables include site acreage sizes of 1-acre, 2-acres and 5-acres. The *Fact Sheet for Applying CalEEMod to Localized Significance Thresholds*, prepared by SCAQMD, 2015, provides guidance on how to determine the appropriate site acreage size to utilize for a project. The Fact Sheet details the site acreage should be based on the maximum number of acres disturbed on the peak day of construction that is calculated on the construction equipment list utilized in the CalEEMod model, where crawler tractors, graders, and rubber-tired dozers are all assumed to disturb 0.5-acre in an 8-hour day and scrapers are assumed to disturb 1.0-acre in an 8-hour day. It should be noted that the methodology in the Fact Sheet was developed from the CalEEMod User Guide Appendix A, page 9, where the same acres disturbed per equipment type is detailed and is utilized in the CalEEMod model in order to determine the acres per day disturbed during site preparation and grading phases.

Table K lists all of the construction equipment modeled in CalEEMod and utilizes the methodology in the Fact Sheet to calculate the acres disturbed per day. As shown in Table K, the maximum disturbed per day would occur during the grading phase when 4.0-acres would be disturbed. As such, the 2-acre and 5-acre project sites shown in the Look-Up Tables were interpolated in order to calculate the 4.0-acre threshold that has been utilized in this analysis.

Table K – Construction Equipment Modeled in CalEEMod and Acres Disturbed per Day

Construction Activity	Equipment Type	Equipment Quantity	Acres Disturbed per piece of Equipment per Day[1]	Operating Hours per Day	Acres Disturbed per Day
Site Preparation	Rubber Tired Dozers	3	0.5	8	1.5
	Crawler Tractors	4	0.5	8	2.0
	Total Acres Disturbed per Day During Site Preparation				3.5
Grading	Excavators	2	0	8	0
	Grader	1	0.5	8	0.5
	Rubber Tired Dozers	1	0.5	8	0.5
	Scrapers	2	1.0	8	2.0
	Crawler Tractors	2	0.5	8	1.0
	Total Acres Disturbed per Day During Grading				4.0
Building Construction	Cranes	1	0	7	0
	Forklifts	3	0	8	0
	Generator Sets	1	0	8	0
	Tractors/Loaders/Backhoes	3	0	7	0
	Welders	1	0	8	0
	Total Acres Disturbed per Day During Building Construction				0
Paving	Pavers	2	0	8	0
	Paving Equipment	2	0	8	0
	Rollers	2	0	8	0
	Total Acres Disturbed per Day During Paving				0
Architectural Coating	Air Compressor	1	0	6	0
	Total Acres Disturbed per Day During Architectural Coating				0
	Maximum Acres Disturbed during All Construction Activities				**4.0**

Notes:
[1] Based on the Fact Sheet for Applying CalEEMod to Localized Significance Thresholds where crawler tractors, graders, and rubber-tired dozers disturb 0.5-acre in an 8-hour day and scrapers disturb 1.0-acre in an 8-hour day. All other equipment disturbs 0 acres per 8-hour day.
Source: CalEEMod Version 2022.1; SCAQMD, 2015.

The nearest sensitive receptors to the project site are single-family homes located on Boulder Crest Way and as near as four feet (1.2 meters) to the south of the project site. According to LST Methodology, any receptor located closer than 25 meters (82 feet) shall be based on the 25-meter thresholds. Table L below shows the LSTs for NO_2, PM10 and PM2.5 for both construction and operational activities.

Table L – SCAQMD Local Air Quality Thresholds of Significance

Activity	Allowable Emissions (pounds/day)[1]			
	NOx	CO	PM10	PM2.5
Construction	237	1,346	11	7
Operation	237	1,346	3	2

Notes:
[1] The nearest sensitive receptors to the project site are single-family homes located as near as 4 feet (1.2 meters) from the project site. According to SCAQMD methodology, all receptors closer than 25 meters are based on the 25-meter threshold.
Source: Calculated from SCAQMD's Mass Rate Look-up Tables for 4 acres interpolated from two and five acres in Air Monitoring Area 24, Perris Valley.

9.3 Toxic Air Contaminants

According to the SCAQMD CEQA Handbook, any project that has the potential to expose the public to toxic air contaminants in excess of the following thresholds would be considered to have a significant air quality impact:

- If the Maximum Incremental Cancer Risk is 10 in one million or greater; or
- Toxic air contaminants from the proposed project would result in a Hazard Index increase of 1 or greater.

In order to determine if the proposed project may have a significant impact related to TACs, the *Health Risk Assessment Guidance for analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*, (Diesel Analysis) prepared by SCAQMD, August 2003, recommends that if the proposed project is anticipated to create TACs through stationary sources or regular operations of diesel trucks on the project site, then the proximity of the nearest receptors to the source of the TAC and the toxicity of the HAP should be analyzed through a comprehensive facility-wide health risk assessment (HRA).

9.4 Odor Impacts

The SCAQMD CEQA Handbook states that an odor impact would occur if the proposed project creates an odor nuisance pursuant to SCAQMD Rule 402, which states:

> "A person shall not 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 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.
>
> The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals."

If the proposed project results in a violation of Rule 402 with regards to odor impacts, then the proposed project would create a significant odor impact.

9.5 Energy Conservation

The *2022 CEQA California Environmental Quality Act Statutes & Guidelines* (2022 CEQA Guidelines) include an Energy Section that analyzes the proposed project's energy consumption in order to avoid or reduce inefficient, wasteful or unnecessary consumption of energy. Appendix F of the 2022 CEQA Statute and Guidelines, states the following:

> The goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include:
>
> (1) Decreasing overall per capita energy consumption,
>
> (2) Decreasing reliance on fossil fuels such as coal, natural gas and oil, and
>
> (3) Increasing reliance on renewable energy sources.

Since the Energy Section was recently added, no state or local agencies have adopted specific criteria or thresholds to be utilized in an energy impact analysis. However, Appendix F, Subsection II.C of the 2022 CEQA Guidelines provides the following criteria for determining significance.

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project life cycle including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
2. The effects of the project on local and regional energy supplies and on requirement for additional capacity.
3. The effects of the project on peak and base period demands for electricity and other forms of energy.
4. The degree to which the project complies with existing energy standards.
5. The effects of the project on energy resources.
6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

If the proposed project creates inefficient, wasteful or unnecessary consumption of energy during construction or operation activities or conflicts with a state or local plan for renewable energy or energy efficiency, then the proposed project would create a significant energy impact.

9.6 Greenhouse Gas Emissions

The *Menifee General Plan Draft Environmental Impact Report* (General Plan EIR), adopted September 2013, utilized the SCAQMD Working Group Thresholds (see Section 6.4, above) for the determination of significance of GHG emissions from implementation of the General Plan. It should be noted that SCAQMD's Working Group's thresholds were prepared prior to the issuance of Executive Order B-30-15 on April 29, 2015 that provided a reduction goal of 40 percent below 1990 levels by 2030. This target was codified into statute through passage of AB 197 and SB 32 in September 2016. However, the California Supreme Court's ruling on *Cleveland National Forest Foundation v. San Diego Association of Governments* (Cleveland v. SANDAG), Filed July 13, 2017 stated:

> SANDAG did not abuse its discretion in declining to adopt the 2050 goal as a measure of significance in light of the fact that the Executive Order does not specify any plan or implementation measures to achieve its goal. In its response to comments, the EIR said: "It is uncertain what role regional land use and transportation strategies can or should play in achieving the EO's 2050 emissions reduction target. A recent California Energy Commission report concludes, however, that the primary strategies to achieve this target should be major 'decarbonization' of electricity supplies and fuels, and major improvements in energy efficiency [citation].

Although, the above court case was referencing California's GHG emission targets for the year 2050, at this time it is also unclear what role land use strategies can or should play in achieving the AB 197 and SB 32 reduction goal of 40 percent below 1990 levels by 2030. As such this analysis has relied on the SCAQMD Working Group's recommended thresholds, which were utilized as the applicable thresholds in the General Plan EIR.

As shown above in Section 6.2, the Working Group thresholds includes four tiers of thresholds that may be utilized to determine if a project would create a significant cumulative GHG impact. This analysis has utilized the Tier 3 Quantitative Screening Value of 3,000 $MTCO_2e$ per year for all land use types to determine if the proposed project would create a significant cumulative increase in GHG emissions.

The GHG emissions analysis for both construction and operation of the proposed project can be found below in Sections 10.8 and 10.9.

10.0 IMPACT ANALYSIS

10.1 CEQA Thresholds of Significance

Consistent with CEQA and the State CEQA Guidelines, a significant impact related to air quality, energy, and GHG emissions would occur if the proposed project is determined to:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations;
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people;
- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation;
- Conflict with or obstruct a state or local plan for renewable energy;
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

10.2 Air Quality Compliance

The proposed project would not conflict with or obstruct implementation of the SCAQMD Air Quality Management Plan (AQMP). The following section discusses the proposed project's consistency with the SCAQMD AQMP.

SCAQMD Air Quality Management Plan

The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and regional plans (CEQA Guidelines Section 15125). The regional plan that applies to the proposed project includes the SCAQMD AQMP. Therefore, this section discusses any potential inconsistencies of the proposed project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed project would interfere with the region's ability to comply with Federal and State air quality standards. If the decision-makers determine that the proposed project is inconsistent, the lead agency may consider project modifications or inclusion of mitigation to eliminate the inconsistency.

The SCAQMD CEQA Handbook states that "New or amended GP Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP." Strict consistency with all aspects of the plan is usually not required. A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

(1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

(2) Whether the project will exceed the assumptions in the AQMP or increments based on the year of project buildout and phase.

Both of these criteria are evaluated in the following sections.

Criterion 1 - Increase in the Frequency or Severity of Violations?

Based on the air quality modeling analysis contained in this report, short-term regional construction air emissions would not result in significant impacts based on SCAQMD regional thresholds of significance discussed above in Section 9.1 or local thresholds of significance discussed above in Section 9.2. The ongoing operation of the proposed project would generate air pollutant emissions that are inconsequential on a regional basis and would not result in significant impacts based on SCAQMD thresholds of significance discussed above in Section 9.1. The analysis for long-term local air quality impacts showed that local pollutant concentrations would not be projected to exceed the air quality standards. Therefore, a less than significant long-term impact would occur and no mitigation would be required.

Therefore, based on the information provided above, the proposed project would be consistent with the first criterion.

Criterion 2 - Exceed Assumptions in the AQMP?

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed project with the assumptions in the AQMP. The emphasis of this criterion is to insure that the analyses conducted for the proposed project are based on the same forecasts as the AQMP. The AQMP is developed through use of the planning forecasts provided in the RTP/SCS (Connect SoCal) and FTIP (2019 FTIP). The RTP/SCS is a major planning document for the regional transportation and land use network within Southern California. The RTP/SCS is a long-range plan that is required by federal and state requirements placed on SCAG and is updated every four years. The FTIP provides long-range planning for future transportation improvement projects that are constructed with state and/or federal funds within Southern California. Local governments are required to use these plans as the basis of their plans for the purpose of consistency with applicable regional plans under CEQA. For this project, the City of Menifee General Plan's Land Use Plan Land Use Plan defines the assumptions that are represented in AQMP.

The project site is currently designated as 2.1-5 dwelling unit per acre Residential (2.1-5R). The proposed project would consist of development of 37 lots on 14.4 acres, which results in a density of approximately 2.7 lots per acre, which is within the land use designation of 2.1 to 5 dwelling units per acre. The proposed project would be consistent with the current land use designation and would not require a General Plan Amendment. As such, the proposed project is not anticipated to exceed the AQMP assumptions for the project site and is found to be consistent with the AQMP for the second criterion.

Based on the above, the proposed project will not result in an inconsistency with the SCAQMD AQMP. Therefore, a less than significant impact will occur in relation to implementation of the AQMP.

Level of Significance

Less than significant impact.

10.3 Cumulative Net Increase in Non-Attainment Pollution

The proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard. The SCAQMD has published a report on how to address cumulative impacts from air pollution: White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution (http://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/cumulative-impacts-working-group/cumulative-impacts-white-paper.pdf). In this report the AQMD clearly states (Page D-3):

> "*…the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or Environmental Impact Report (EIR). The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for TAC emissions. The project specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility- wide) is HI > 3.0. It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts. Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."*

Therefore, this analysis assumes that individual projects that do not generate operational or construction emissions that exceed the SCAQMD's recommended daily thresholds for project-specific impacts would also not cause a cumulatively considerable increase in emissions for those pollutants for which the Basin is in nonattainment, and, therefore, would not be considered to have a significant, adverse air quality impact. Alternatively, individual project-related construction and operational emissions that exceed SCAQMD thresholds for project-specific impacts would be considered cumulatively considerable. The following section calculates the potential air emissions associated with the construction and operations of the proposed project and compares the emissions to the SCAQMD standards.

Construction Emissions

The construction activities for the proposed project are anticipated to include site preparation and grading of the project site, building construction of the homes, paving of the onsite roads and parking areas, sidewalks and hardscapes, and application of architectural coatings. The CalEEMod model has been utilized to calculate the construction-related emissions from the proposed project and the input parameters utilized in this analysis have been detailed in Section 8.1. The maximum daily construction-related criteria pollutant emissions from the proposed project are shown below in Table M.

Table M – Construction-Related Criteria Pollutant Emissions

Season and Year of Construction	Maximum Daily Pollutant Emissions (pounds/day)					
	VOC	NOx	CO	SO_2	PM10	PM2.5
Daily Summer Maximum						
2025	4.20	42.6	35.0	0.09	9.38	4.96
2026	1.30	10.3	16.9	0.03	1.15	0.53
Daily Winter Maximum						
2025	4.19	42.8	34.7	0.08	9.38	4.96
2026	26.9	10.4	15.9	0.03	1.15	0.53
Maximum Daily Construction Emissions	**26.9**	**42.6**	**35.0**	**0.09**	**9.38**	**4.96**
SCQAMD Regional Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
SCAQMD Local Thresholds[1]	**--**	**237**	**1,346**	**--**	**11**	**7**
Exceeds Thresholds?	No	No	No	No	No	No

Notes:
[1] The nearest offsite sensitive receptors to the project site are single-family homes located as near as 4 feet (1.2 meters) from the project site. According to SCAQMD methodology, all receptors closer than 25 meters are based on the 25-meter threshold. Calculated from SCAQMD's Mass Rate Look-up Tables for 4 acres interpolated from two and five acres in Air Monitoring Area 24, Perris Valley.
Source: CalEEMod Version 2022.1.

Table M shows that none of the analyzed criteria pollutants would exceed either the regional or local emissions thresholds during construction of the proposed project. Therefore, a less than significant regional or local air quality impact would occur from construction of the proposed project.

Operational Emissions

The on-going operation of the proposed project would result in a long-term increase in air quality emissions. This increase would be due to emissions from the project-generated vehicle trips, emissions from energy usage, onsite area source emissions created from the on-going use of the proposed project. The following section provides an analysis of potential long-term air quality impacts due to regional air quality and local air quality impacts with the on-going operations of the proposed project.

<u>Operations-Related Regional Criteria Pollutant Analysis</u>

The operations-related regional criteria air quality impacts created by the proposed project have been analyzed through use of the CalEEMod model and the input parameters utilized in this analysis have been detailed in Section 8.1. The worst-case summer or winter VOC, NOx, CO, SO_2, PM10, and PM2.5 daily emissions created from the proposed project's long-term operations have been calculated and are summarized below in Table N and the CalEEMod daily emissions printouts are shown in Appendix A.

Table N – Operational Regional Criteria Pollutant Emissions

Activity	Pollutant Emissions (pounds/day)					
	VOC	NOx	CO	SO_2	PM10	PM2.5
Mobile Sources	2.42	2.28	19.6	0.05	4.23	1.10
Area Sources	2.28	1.27	4.72	0.01	0.10	0.10
Energy Usage	0.02	0.39	0.17	<0.01	0.03	0.03
Total Emissions	**4.72**	**3.94**	**24.49**	**0.06**	**4.36**	**1.23**
SCQAMD Regional Operational Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold?	No	No	No	No	No	No

Notes:
[1] Mobile sources consist of emissions from vehicles and road dust.

[2] Area sources consist of emissions from consumer products, architectural coatings, and landscaping equipment.
[3] Energy usage consists of emissions from natural gas usage.
Source: Calculated from CalEEMod Version 2022.1.

The data provided in Table N shows that none of the analyzed criteria pollutants would exceed the regional emissions thresholds. Therefore, a less than significant regional air quality impact would occur from operation of the proposed project.

In *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502 (also referred to as "*Friant Ranch*"), the California Supreme Court held that when an EIR concluded that when a project would have significant impacts to air quality impacts, an EIR should "make a reasonable effort to substantively connect a project's air quality impacts to likely health consequences." In order to determine compliance with this Case, the Court developed a multi-part test that includes the following:

1) The air quality discussion shall describe the specific health risks created from each criteria pollutant, including diesel particulate matter.

This Analysis details the specific health risks created from each criteria pollutant above in Section 4.1 and specifically in Table B. In addition, the specific health risks created from diesel particulate matter is detailed above in Section 2.2 of this analysis. As such, this analysis meets the part 1 requirements of the Friant Ranch Case.

2) The analysis shall identify the magnitude of the health risks created from the Project. The Ruling details how to identify the magnitude of the health risks. Specifically, on page 24 of the ruling it states "The Court of Appeal identified several ways in which the EIR could have framed the analysis so as to adequately inform the public and decision makers of possible adverse health effects. The County could have, for example, identified the Project's impact on the days of nonattainment per year."

The Friant Ranch Case found that an EIR's air quality analysis must meaningfully connect the identified air quality impacts to the human health consequences of those impacts, or meaningfully explain why that analysis cannot be provided. As noted in the Brief of Amicus Curiae by the SCAQMD in the Friant Ranch case (https://www.courts.ca.gov/documents/9-s219783-ac-south-coast-air-quality-mgt-dist-041315.pdf) (Brief), SCAQMD has among the most sophisticated air quality modeling and health impact evaluation capability of any of the air districts in the State, and thus it is uniquely situated to express an opinion on how lead agencies should correlate air quality impacts with specific health outcomes. The SCAQMD discusses that it may be infeasible to quantify health risks caused by projects similar to the proposed Project, due to many factors. It is necessary to have data regarding the sources and types of air toxic contaminants, location of emission points, velocity of emissions, the meteorology and topography of the area, and the location of receptors (worker and residence). The Brief states that it may not be feasible to perform a health risk assessment for airborne toxics that will be emitted by a generic industrial building that was built on "speculation" (i.e., without knowing the future tenant(s)). Even where a health risk assessment can be prepared, however, the resulting maximum health risk value is only a calculation of risk, it does not necessarily mean anyone will contract cancer as a result of the Project. The Brief also cites the author of the CARB methodology, which reported that a PM2.5 methodology is not suited for small projects and may yield unreliable results. Similarly, SCAQMD staff does not currently know of a way to accurately quantify ozone-related health impacts caused by NOX or VOC emissions from relatively small projects, due to photochemistry and regional model limitations. The Brief concludes, with respect to the

Friant Ranch EIR, that although it may have been technically possible to plug the data into a methodology, the results would not have been reliable or meaningful.

On the other hand, for extremely large regional projects (unlike the proposed project), the SCAQMD states that it has been able to correlate potential health outcomes for very large emissions sources – as part of their rulemaking activity, specifically 6,620 pounds per day of NOx and 89,180 pounds per day of VOC were expected to result in approximately 20 premature deaths per year and 89,947 school absences due to ozone. As shown above in Table M, project-related construction activities would generate a maximum of 26.9 pounds per day of VOC and 42.8 pounds per day of NOx and as shown above in Table N, operation of the proposed project would generate 4.72 pounds per day of VOC and 3.94 pounds per day NOx. The proposed project would not generate anywhere near these levels of 6,620 pounds per day of NOx or 89,190 pounds per day of VOC emissions. Therefore, the proposed project's emissions are not sufficiently high enough to use a regional modeling program to correlate health effects on a basin-wide level.

Notwithstanding, this analysis does evaluate the proposed project's localized impact to air quality for emissions of CO, NOx, PM10, and PM2.5 by comparing the proposed project's onsite emissions to the SCAQMD's applicable LST thresholds. As evaluated in this analysis, the proposed project would not result in emissions that exceeded the SCAQMD's LSTs. Therefore, the proposed project would not be expected to exceed the most stringent applicable federal or state ambient air quality standards for emissions of CO, NOx, PM10, and PM2.5.

<u>Operations-Related Local Air Quality Impacts</u>

Project-related air emissions may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin. The proposed project has been analyzed for the potential local CO emission impacts from the project-generated vehicular trips and from the potential local air quality impacts from on-site operations. The following analyzes the vehicular CO emissions and local impacts from on-site operations.

Local CO Hotspot Impacts from Project-Generated Vehicular Trips

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential local air quality impacts. Local air quality impacts can be assessed by comparing future without and with project CO levels to the State and Federal CO standards of 20 ppm over one hour or 9 ppm over eight hours.

At the time of the 1993 Handbook, the Air Basin was designated nonattainment under the CAAQS and NAAQS for CO. With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the Air Basin and in the state have steadily declined. In 2007, the Air Basin was designated in attainment for CO under both the CAAQS and NAAQS. SCAQMD conducted a CO hot spot analysis for attainment at the busiest intersections in Los Angeles during the peak morning and afternoon periods and did not predict a violation of CO standards[3]. Since

[3] The four intersections analyzed by the SCAQMD were: Long Beach Boulevard and Imperial Highway; Wilshire Boulevard and Veteran Avenue; Sunset Boulevard and Highland Avenue; and La Cienega Boulevard and Century Boulevard. The busiest intersection evaluated (Wilshire and Veteran) had a daily traffic volume of approximately 100,000 vehicles per day with LOS E in the morning and LOS F in the evening peak hour.

the nearby intersections to the proposed project are much smaller with less traffic than what was analyzed by the SCAQMD, no local CO Hotspot are anticipated to be created from the proposed project and no CO Hotspot modeling was performed. Therefore, a less than significant long-term air quality impact is anticipated to local air quality with the on-going use of the proposed project.

Local Criteria Pollutant Impacts from Onsite Operations

Project-related air emissions from onsite sources such as architectural coatings, landscaping equipment, and onsite usage of natural gas appliances may have the potential to create emissions areas that exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin.

The local air quality emissions from onsite operations were analyzed using the SCAQMD's Mass Rate LST Look-up Tables and the methodology described in LST Methodology. The Look-up Tables were developed by the SCAQMD in order to readily determine if the daily emissions of CO, NOx, PM10, and PM2.5 from the proposed project could result in a significant impact to the local air quality. Table O shows the onsite emissions from the CalEEMod model that includes area sources, energy usage, and vehicles operating in the immediate vicinity of the project site and the calculated emissions thresholds.

Table O – Operations-Related Local Criteria Pollutant Emissions

	Pollutant Emissions (pounds/day)			
Onsite Emission Source	**NOx**	**CO**	**PM10**	**PM2.5**
Mobile Sources	0.29	2.45	0.53	0.14
Area Sources	1.27	4.72	0.10	0.10
Energy Usage	0.39	0.17	0.03	0.03
Total Emissions	**1.95**	**7.34**	**0.66**	**0.27**
SCAQMD Local Operational Thresholds[1]	**237**	**1,346**	**3**	**2**
Exceeds Threshold?	No	No	No	No

Notes:

[1] Mobile sources consist of emissions from vehicles and road dust and were calculated based on 1/8 of the mobile source emissions, which is the estimated portion of vehicle emissions occurring within a quarter mile of the project site.

[2] Area sources consist of emissions from consumer products, architectural coatings, hearths and landscaping equipment.

[3] Energy usage consist of emissions from onsite natural gas usage.

[4] The nearest offsite sensitive receptors to the project site are single-family homes located as near as 4 feet (1.2 meters) from the project site. According to SCAQMD methodology, all receptors closer than 25 meters are based on the 25-meter threshold.

Source: Calculated from SCAQMD's Mass Rate Look-up Tables for 4 acres interpolated from two and five acres in Air Monitoring Area 24, Perris Valley.

The data provided in Table O shows that the on-going operations of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 9.2. Therefore, the on-going operations of the proposed project would create a less than significant operations-related impact to local air quality due to onsite emissions and no mitigation would be required.

Therefore, the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant.

Level of Significance

Less than significant impact.

10.4 Sensitive Receptors

The proposed project would not expose sensitive receptors to substantial pollutant concentrations. The local concentrations of criteria pollutant emissions produced in the nearby vicinity of the proposed project, which may expose sensitive receptors to substantial concentrations have been calculated above in Section 10.3 for both construction and operations, which are discussed separately below. The discussion below also includes an analysis of the potential impacts from toxic air contaminant emissions. The nearest sensitive receptors to the project site are single-family homes located on Boulder Crest Way and as near as four feet to the south of the project site. There are also single-family homes located as near as 28 feet east of the project site.

Construction-Related Sensitive Receptor Impacts

The construction activities for the proposed project are anticipated to include site preparation and grading of the project site, building construction of the homes, paving of the onsite roads driveways, sidewalks and hardscapes, and application of architectural coatings. Construction activities may expose sensitive receptors to substantial pollutant concentrations of localized criteria pollutant concentrations and from toxic air contaminant emissions created from onsite construction equipment, which are described below.

Local Criteria Pollutant Impacts from Construction

The local air quality impacts from construction of the proposed project have been analyzed above in Section 10.3 and found that the construction of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 9.2. Therefore, construction of the proposed project would create a less than significant construction-related impact to local air quality and no mitigation would be required.

Toxic Air Contaminants Impacts from Construction

The greatest potential for toxic air contaminant emissions would be related to diesel particulate matter (DPM) emissions associated with heavy equipment operations during construction of the proposed project. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of “individual cancer risk”. “Individual Cancer Risk” is the likelihood that a person exposed to concentrations of toxic air contaminants over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. It should be noted that the most current cancer risk assessment methodology recommends analyzing a 30 year exposure period for the nearby sensitive receptors (OEHHA, 2015).

Given the relatively limited number of heavy-duty construction equipment, the varying distances that construction equipment would operate to the nearby sensitive receptors, and the short-term construction schedule, the proposed project would not result in a long-term (i.e., 30 or 70 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk. In addition, California Code of Regulations Title 13, Article 4.8, Chapter 9, Section 2449 regulates emissions from off-road diesel equipment in California. This regulation limits idling of equipment to no more than five minutes, requires equipment operators to label each piece of equipment and provide annual reports to CARB of their fleet’s usage and emissions. This regulation also requires systematic upgrading of the emission Tier level of each fleet, and currently no commercial operator is allowed to purchase Tier 0, Tier 1 or Tier 2 equipment. In addition to the purchase restrictions, equipment operators need to meet fleet average emissions targets that become more stringent each year between years 2014 and 2023. By January, 2026, 75 percent or more of all contractors’ equipment fleets must be Tier 2 or higher and by January, 2029 100 percent of all equipment fleets must be Tier 2 or higher. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project. As such, construction of the proposed project would result in a less than significant exposure of sensitive receptors to substantial pollutant concentrations.

Operations-Related Sensitive Receptor Impacts

The on-going operations of the proposed project may expose sensitive receptors to substantial pollutant concentrations of local CO emission impacts from the project-generated vehicular trips and from the potential local air quality impacts from onsite operations. The following analyzes the vehicular CO emissions. Local criteria pollutant impacts from onsite operations, and toxic air contaminant impacts.

Local CO Hotspot Impacts from Project-Generated Vehicle Trips

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential impacts to sensitive receptors. The analysis provided above in Section 10.3 shows that no local CO Hotspots are anticipated to be created at any nearby intersections from the vehicle traffic generated by the proposed project. Therefore, operation of the proposed project would result in a less than significant exposure of offsite sensitive receptors to substantial pollutant concentrations.

Local Criteria Pollutant Impacts from Onsite Operations

The local air quality impacts from the operation of the proposed project would occur from onsite sources such as architectural coatings, landscaping equipment, and onsite usage of natural gas appliances. The analysis provided above in Section 10.3 found that the operation of the proposed project would not exceed the local NOx, CO, PM10 and PM2.5 thresholds of significance discussed above in Section 9.2. Therefore, the on-going operations of the proposed project would create a less than significant operations-related impact to local air quality due to on-site emissions and no mitigation would be required.

Operations-Related Toxic Air Contaminant Impacts

Particulate matter (PM) from diesel exhaust is the predominant TAC in most areas and according to *The California Almanac of Emissions and Air Quality 2013 Edition*, prepared by CARB, about 80 percent of the outdoor TAC cancer risk is from diesel exhaust. Some chemicals in diesel exhaust, such as benzene and formaldehyde have been listed as carcinogens by State Proposition 65 and the Federal Hazardous Air Pollutants program. Due to the nominal number of diesel truck trips that are anticipated to be generated by the on-going operation of the proposed single-family homes, a less than significant TAC impact would be created from the on-going operations of the proposed project and no mitigation would be required.

Level of Significance

Less than significant impact.

10.5 Odor Emissions

The proposed project would not create objectionable odors affecting a substantial number of people. Individual responses to odors are highly variable and can result in a variety of effects. Generally, the impact of an odor results from a variety of factors such as frequency, duration, offensiveness, location, and sensory perception. The frequency is a measure of how often an individual is exposed to an odor in the ambient environment. The intensity refers to an individual's or group's perception of the odor strength or concentration. The duration of an odor refers to the elapsed time over which an odor is experienced. The offensiveness of the odor is the subjective rating of the pleasantness or unpleasantness of an odor. The location accounts for the type of area in which a potentially affected person lives, works, or visits; the type of activity in which he or she is engaged; and the sensitivity of the impacted receptor.

Sensory perception has four major components: detectability, intensity, character, and hedonic tone. The detection (or threshold) of an odor is based on a panel of responses to the odor. There are two types of thresholds: the odor detection threshold and the recognition threshold. The detection threshold is the lowest concentration of an odor that will elicit a response in a percentage of the people that live and work in the immediate vicinity of the project site and is typically presented as the mean (or 50 percent of the population). The recognition threshold is the minimum concentration that is recognized as having a characteristic odor quality, this is typically represented by recognition by 50 percent of the population. The intensity refers to the perceived strength of the odor. The odor character is what the substance smells like. The hedonic tone is a judgment of the pleasantness or unpleasantness of the odor. The hedonic tone varies in subjective experience, frequency, odor character, odor intensity, and duration. Potential odor impacts have been analyzed separately for construction and operations below.

Construction-Related Odor Impacts

Potential sources that may emit odors during construction activities include the application of coatings such as asphalt pavement, paints and solvents and from emissions from diesel equipment. Standard construction requirements that limit the time of day when construction may occur as well as SCAQMD Rule 1108 that limits VOC content in asphalt and Rule 1113 that limits the VOC content in paints and solvents would minimize odor impacts from construction. As such, the objectionable odors that may be produced during the construction process would be temporary and would not likely be noticeable for extended periods of time beyond the project site's boundaries. Through compliance with the applicable regulations that reduce odors and due to the transitory nature of construction odors, a less than significant odor impact would occur and no mitigation would be required.

Operations-Related Odor Impacts

The proposed project would consist of a single-family residential development. The proposed project would not contain any known sources of odors. Therefore, no significant impact related to odors would occur during the on-going operations of the proposed project.

Level of Significance

Less than significant impact.

10.6 Energy Consumption

The proposed project would impact energy resources during construction and operation. Energy resources that would be potentially impacted include electricity, natural gas, and petroleum based fuel supplies and distribution systems. This analysis includes a discussion of the potential energy impacts of the proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. A general definition of each of these energy resources are provided below.

Electricity, a consumptive utility, is a man-made resource. The production of electricity requires the consumption or conversion of energy resources, including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources, into energy. The delivery of electricity involves a number of system components, including substations and transformers that lower transmission line power (voltage) to a level appropriate for on-site distribution and use. The electricity generated is distributed through a network of transmission and distribution lines commonly called a power grid. Conveyance of electricity through transmission lines is typically responsive to market demands. In 2022, Riverside County consumed 17,781 Gigawatt-hours per year of electricity[4].

Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas consumed in California is obtained from naturally occurring reservoirs, mainly located outside the State, and delivered through high-pressure transmission pipelines. The natural gas transportation system is a nationwide network and, therefore, resource availability is typically not an issue. Natural gas satisfies almost one-third of the State's total energy requirements and is used in electricity generation, space heating, cooking, water heating, industrial processes, and as a transportation fuel. Natural gas is measured in terms of cubic feet. In 2022, Riverside County consumed 431.05 Million Therms of natural gas[5].

Petroleum-based fuels currently account for a majority of the California's transportation energy sources and primarily consist of diesel and gasoline types of fuels. However, the state has been working on developing strategies to reduce petroleum use. Over the last decade California has implemented several policies, rules, and regulations to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and GHG emissions from the transportation sector, and reduce vehicle miles traveled (VMT). Accordingly, petroleum-based fuel consumption in California has declined. In 2022, 981 million gallons of gasoline and 173 million gallons of diesel was sold in Riverside County[6].

The following section calculates the potential energy consumption associated with the construction and operations of the proposed project and provides a determination if any energy utilized by the proposed project is wasteful, inefficient, or unnecessary consumption of energy resources.

Construction Energy

The construction activities for the proposed project are anticipated to include site preparation and grading of the project site, building construction of the homes, paving of the onsite roads driveways, sidewalks and hardscapes, and application of architectural coatings. The proposed project would consume energy resources during construction in three (3) general forms:

1. Petroleum-based fuels used to power off-road construction vehicles and equipment on the Project Site, construction worker travel to and from the Project Site, as well as delivery and haul truck trips (e.g. hauling of demolition material to off-site reuse and disposal facilities);
2. Electricity associated with the conveyance of water that would be used during Project construction for dust control (supply and conveyance) and electricity to power any necessary lighting during construction, electronic equipment, or other construction activities necessitating electrical power; and,

4 Obtained from: http://www.ecdms.energy.ca.gov/elecbycounty.aspx
5 Obtained from: http://www.ecdms.energy.ca.gov/gasbycounty.aspx
6 Obtained from: https://www.energy.ca.gov/media/3874

3. Energy used in the production of construction materials, such as asphalt, steel, concrete, pipes, and manufactured or processed materials such as lumber and glass.

Construction-Related Electricity

During construction the proposed project would consume electricity to construct the proposed warehouse and infrastructure. Electricity would be supplied to the project site by Southern California Edison and would be obtained from the existing electrical lines in the vicinity of the project site. The use of electricity from existing power lines rather than temporary diesel or gasoline powered generators would minimize impacts on fuel consumption. Electricity consumed during project construction would vary throughout the construction period based on the construction activities being performed. Various construction activities include electricity associated with the conveyance of water that would be used during project construction for dust control (supply and conveyance) and electricity to power any necessary lighting during construction, electronic equipment, or other construction activities necessitating electrical power. Such electricity demand would be temporary, nominal, and would cease upon the completion of construction. Overall, construction activities associated with the proposed project would require limited electricity consumption that would not be expected to have an adverse impact on available electricity supplies and infrastructure. Therefore, the use of electricity during project construction would not be wasteful, inefficient, or unnecessary.

Since there are currently power lines in the vicinity of the project site, it is anticipated that only nominal improvements would be required to Southern California Edison Utility distribution lines and equipment with development of the proposed project. Compliance with City's guidelines and requirements would ensure that the proposed project fulfills its responsibilities relative to infrastructure installation, coordinates any electrical infrastructure removals or relocations, and limits any impacts associated with construction of the project. Construction of the project's electrical infrastructure is not anticipated to adversely affect the electrical infrastructure serving the surrounding uses or utility system capacity.

Construction-Related Natural Gas

Construction of the proposed project typically would not involve the consumption of natural gas. Natural gas would not be supplied to support construction activities, thus there would be no demand generated by construction. Since the project site is adjacent to roads that currently have natural gas lines, construction of the proposed project would be limited to installation of new natural gas connections within the project site. Development of the proposed project would likely not require extensive infrastructure improvements to serve the project site. Construction-related energy usage impacts associated with the installation of natural gas connections are expected to be confined to trenching in order to place the lines below surface. In addition, prior to ground disturbance, the proposed project would notify and coordinate with SoCalGas to identify the locations and depth of all existing gas lines and avoid disruption of gas service. Therefore, construction-related impacts to natural gas supply and infrastructure would be less than significant.

Construction-Related Petroleum Fuel Use

Petroleum-based fuel usage represents the highest amount of transportation energy potentially consumed during construction, which would be utilized by both off-road equipment operating on the project site and on-road automobiles transporting workers to and from the project site and on-road trucks transporting equipment and supplies to the project site.

The off-road construction equipment fuel usage was calculated through use of the off-road equipment assumptions and fuel use assumptions shown above in Section 8.2, which found that construction of the proposed project would consume 13,214 gallons of gasoline and 94,661 gallons of diesel fuel. This equates to 0.001 percent of the gasoline and 0.05 percent of the diesel used annually in Riverside County. As such, the construction-related petroleum use would be nominal, when compared to current county-wide petroleum usage rates.

Construction activities associated with the proposed project would be required to adhere to all State and SCAQMD regulations for off-road equipment and on-road trucks, which provide minimum fuel efficiency standards. As such, construction activities for the proposed project would not result in the wasteful, inefficient, and unnecessary consumption of energy resources. Impacts regarding transportation energy would be less than significant. Development of the project would not result in the need to manufacture construction materials or create new building material facilities specifically to supply the proposed project. It is difficult to measure the energy used in the production of construction materials such as asphalt, steel, and concrete, it is reasonable to assume that the production of building materials such as concrete, steel, etc., would employ all reasonable energy conservation practices in the interest of minimizing the cost of doing business.

Operational Energy

The on-going operation of the proposed project would require the use of energy resources for multiple purposes including, but not limited to, heating/ventilating/air conditioning (HVAC), refrigeration, lighting, appliances, and electronics. Energy would also be consumed during operations related to water usage, solid waste disposal, landscape equipment and vehicle trips.

Operations-Related Electricity

Operation of the proposed project would result in consumption of electricity at the project site. As detailed above in Section 8.2 the proposed project would consume 351,485 kilowatt-hours per year of electricity. This equates to 0.002 percent of the electricity consumed annually in Riverside County. As such, the operations-related electricity use would be nominal, when compared to current electricity usage rates in the County.

It should be noted that the proposed project will be required to meet the 2022 Title 24, Part 6 building energy efficiency standards that have been developed to meet the State's goal of zero-net-energy use for new homes. The zero net energy use will be achieved through a variety of measures to make new homes more energy efficient and by also requiring installation of photovoltaic systems of adequate size to generate enough electricity to meet the zero-net energy use standard. The size of the PV system required for the project pursuant to the 2022 Title 24 standards was calculated above in Section 8.1, which found that the proposed project would need to install at least 78.4 Kilowatts of photovoltaic panels within the proposed project. Although, the CalEEMod model found that with implementation of the 2022 Title 24 Part 6 standards, that the proposed project would continue to utilize a nominal amount of power, it should be noted that the electricity usage and emission rates utilized by the CalEEMod model are based on regional average usage rates for existing homes, which were not all built to the most current Title 24 Part 6, standards, so the CalEEMod model provides a conservative or worst-case analysis of electricity use from the proposed project. Therefore, it is anticipated the proposed project will be designed and built to minimize electricity use and that existing and planned electricity capacity and electricity supplies would be sufficient to support the proposed project's electricity demand. Thus, impacts with regard to electrical supply and infrastructure capacity would be less than significant and no mitigation measures would be required.

Operations-Related Natural Gas

Operation of the proposed project would result in increased consumption of natural gas at the project site. As detailed above in Section 8.2 the proposed project would consume 1,543 MBTU per year of natural gas. This equates to 0.004 percent of the natural gas consumed annually in Riverside County. As such, the operations-related natural gas use would be nominal, when compared to current natural gas usage rates in the County.

It should be noted that, the proposed project would comply with all Federal, State, and County requirements related to the consumption of natural gas, that includes CCR Title 24, Part 6 *Building Energy Efficiency Standards* and CCR Title 24, Part 11: *California Green Building Standards.* The CCR Title 24, Part 6 and Part 11 standards require numerous energy efficiency measures to be incorporated into the proposed structures, including enhanced insulation as well as use of efficient natural gas appliances and HVAC units. Therefore, it is anticipated the proposed project will be designed and built to minimize natural gas use and that existing and planned natural gas capacity and natural gas supplies would be sufficient to support the proposed project's natural gas demand. Thus, impacts with regard to natural gas supply and infrastructure capacity would be less than significant and no mitigation measures would be required.

Operations-Related Vehicular Petroleum Fuel Usage

Operation of the proposed project would result in increased consumption of petroleum-based fuels related to vehicular travel to and from the project site. As detailed above in Section 8.2 the proposed project would consume 72,504 gallons of gasoline per year from vehicle travel. This equates to 0.007 percent of the gasoline consumed annually in Riverside County. As such, the operations-related petroleum use would be nominal, when compared to current petroleum usage rates

It should be noted that, the proposed project would comply with all Federal, State, and City requirements related to the consumption of transportation energy that includes California Code of Regulations Title 24, Part 10 California Green Building Standards that require that all new garages to install electrical panels of adequate size to support the installation of electric vehicle charging systems. Therefore, it is anticipated the proposed project will be designed and built to minimize transportation energy through the promotion of the use of electric-powered vehicles and it is anticipated that existing and planned capacity and supplies of transportation fuels would be sufficient to support the proposed project's demand. Thus, impacts with regard transportation energy supply and infrastructure capacity would be less than significant and no mitigation measures would be required.

In conclusion, the proposed project would comply with regulatory compliance measures outlined by the State and City related to air quality (see section 4.0 above), energy (see section 5.0 above), and GHGs (see section 6.0 above). Additionally, the proposed project would be constructed in accordance with all applicable City Building and Fire Codes. Therefore, the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation. Impacts would be less than significant.

Level of Significance

Less than significant impact.

10.7 Energy Plan Consistency

The proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. The applicable energy plan for the proposed project is the *City of Menifee General Plan Open Space and Conservation Element,* adopted 2013. The proposed project's consistency with the energy conservation policies from the General Plan are shown in Table P.

Table P – Proposed Project Compliance with the General Plan Energy Conservation Policies

General Plan Policy	Proposed Project Implementation Actions
Goal OSC-4: Efficient and environmentally use and management of energy and mineral resources to ensure their availability for future generations	
Policy OCS-4.1: Apply energy efficiency and conservation practices in land use, transportation demand management, and subdivision and building design.	**Consistent.** The proposed homes will be designed to meet or exceed the 2022 Title 24 Part 6 building standards that require all single-family homes built in California to have rooftop solar PV systems, enhanced insulation, and to install energy efficient appliances.
Policy OCS-4.2: Evaluate public and private efforts to develop and operate alternative systems of energy production, including solar, wind, and fuel cell.	**Not Applicable.** The policy is for the City to implement, however the proposed project will be required to install a solar PV rooftop system onto each home.
Policy OCS-4.3: Advocate for cost-effective and reliable production and delivery of electrical power to residents and businesses throughout the community.	**Not Applicable.** This policy is directed to Southern California Edison.
Policy OCS-4.4: Require that any future mining activities be in compliance with the State Mining Reclamation Act, federal and state environmental regulations, and local ordinances.	**Not Applicable.** The policy is related to mining, which is not a part of the proposed project.
Policy OCS-4.5: Limit the impacts of mining operations on the city's natural open space, biological and scenic resources, cultural resources and landscapes, and any adjacent land uses.	**Not Applicable.** The policy is related to mining, which is not a part of the proposed project.

Source: City of Menifee, 2013.

As shown in Table P, the proposed project would be consistent with all applicable energy conservation policies from the General Plan Conservation Element. Therefore, the proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Impacts would be less than significant.

Level of Significance

Less than significant impact.

10.8 Generation of Greenhouse Gas Emissions

The proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The proposed project would consist of development and operation of a residential community. The proposed project is anticipated to generate GHG emissions from area sources, energy usage, mobile sources, waste disposal, water usage, and construction equipment. The project's GHG emissions have been calculated with the CalEEMod model based on the construction and operational parameters detailed above in Section 8.1. A summary of the results is shown below in Table Q and the CalEEMod model run is provided in Appendix A.

Table Q – Project Related Greenhouse Gas Annual Emissions

	Greenhouse Gas Emissions (Metric Tons per Year)			
Category	**CO_2**	**CH_4**	**N_2O**	**CO_2e**
Mobile Sources[1]	686	0.03	0.03	698
Area Sources[2]	18.9	<0.01	<0.01	19.0
Energy Usage[3]	137	0.01	<0.01	138
Water and Wastewater[4]	6.11	0.10	<0.01	9.28
Solid Waste[5]	4.88	0.49	0.00	17.1
Refrigeration[6]	--	--	--	0.09
Construction[7]	36.0	<0.01	<0.01	36.5
Total GHG Emissions	**889**	**0.63**	**0.04**	**918**
SCAQMD Draft Threshold of Significance				**3,000**
Exceed Thresholds?				**No**

Notes:
[1] Mobile sources consist of GHG emissions from vehicles.
[2] Area sources consist of GHG emissions from consumer products, architectural coatings, and landscaping equipment.
[3] Energy usage consists of GHG emissions from electricity and natural gas usage.
[4] Water includes GHG emissions from electricity used for transport of water and processing of wastewater.
[5] Waste includes the CO_2 and CH_4 emissions created from the solid waste placed in landfills.
[6] Refrigeration includes GHG emissions from refrigerants in air conditioning units.
[7] Construction emissions amortized over 30 years as recommended in the SCAQMD GHG Working Group on November 19, 2009.
Source: CalEEMod Version 2022.1 (see Appendix A)

The data provided in Table Q shows that the proposed project would create 918 $MTCO_2e$ per year. According to the SCAQMD draft threshold of significance detailed above in Section 9.6, a cumulative global climate change impact would occur if the GHG emissions created from the on-going operations would exceed 3,000 $MTCO_2e$ per year. Therefore, a less than significant generation of greenhouse gas emissions would occur from development of the proposed project. Impacts would be less than significant.

Level of Significance

Less than significant impact.

10.9 Greenhouse Gas Plan Consistency

The proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions. The applicable plan for the proposed project is the *ty of Menifee General Plan Open Space and Conservation Element,* adopted 2013, that requires the City to consider impacts to climate change as a factor in evaluating projects within the City. The proposed project would be designed to exceed the current Title 24 Part 6 building standards that require all new homes to be designed to use net zero energy, through a combination of energy efficiency measures as well as requiring all new homes to install rooftop photovoltaic systems that are of adequate size to generate enough electricity to meet the net-zero energy requirements. Also, the California Green Building Code requires that the all new developments to institute additional energy efficiency and water conservation measures. Through adherence to the current Title 24 Part 6 building standards and the California Green Building Code, the proposed project would meet the reduction goals provided in the General Plan.

In addition to the City's GHG reduction plan, the SCAQMD initiated a Working Group to develop a GHG emissions policy and provided detailed methodology for evaluating significance under CEQA and the

SCAQMD's thresholds were utilized in the analysis of the General Plan EIR (City of Menifee, 2013). As detailed above in Section 10.8, the GHG emissions created from the proposed project were found to be within the SCAQMD's the SCAQMD's Tier 3, quantitative screening value of 3,000 $MTCO_2e$ per year. Therefore, the proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Level of Significance

Less than significant impact.

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APPENDIX A

CalEEMod Model Printouts

Oak Hills West TTM No. 38652 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Oak Hills West TTM No. 38652
Construction Start Date	3/3/2025
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	9.20
Location	33.70371927672623, -117.22494159635932
County	Riverside-South Coast
City	Menifee
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5505
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.22

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

Condo/Townhouse	74.0	Dwelling Unit	10.8	78,440	94,090	—	239	—
Other Asphalt Surfaces	3.60	Acre	3.60	0.00	31,363	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Energy	E-10-B	Establish Onsite Renewable Energy Systems: Solar Power

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.	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.20	42.6	35.0	0.09	9.38	4.96	11,513	0.37	0.78	10.7	11,764
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Unmit.	26.9	42.8	34.7	0.08	9.38	4.96	10,274	0.32	0.76	0.27	10,510
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.32	15.3	14.3	0.03	2.51	1.24	4,404	0.15	0.27	1.82	4,491
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.42	2.79	2.61	0.01	0.46	0.23	729	0.02	0.05	0.30	743
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	150	55.0	—	—	—	—	—
Unmit.	No	No	No	No	No	No	—	—	—	—	—

Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—
Threshold	75.0	100	550	150	150	55.0	—	—	—	—	—
Unmit.	No	No	No	No	No	No	—	—	—	—	—

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
2025	4.20	42.6	35.0	0.09	9.38	4.96	11,513	0.37	0.78	10.7	11,764
2026	1.30	10.3	16.9	0.03	1.15	0.53	3,370	0.13	0.08	3.14	3,401
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
2025	4.19	42.8	34.7	0.08	9.38	4.96	10,274	0.32	0.76	0.27	10,510
2026	26.9	10.4	15.9	0.03	1.15	0.53	3,311	0.11	0.08	0.08	3,339
Average Daily	—	—	—	—	—	—	—	—	—	—	—
2025	1.56	15.3	14.3	0.03	2.51	1.24	4,404	0.15	0.27	1.82	4,491
2026	2.32	6.72	10.4	0.02	0.73	0.34	2,116	0.07	0.05	0.85	2,134
Annual	—	—	—	—	—	—	—	—	—	—	—
2025	0.28	2.79	2.61	0.01	0.46	0.23	729	0.02	0.05	0.30	743
2026	0.42	1.23	1.90	< 0.005	0.13	0.06	350	0.01	0.01	0.14	353

2.3. Construction Emissions by Year, Mitigated

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

Year	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—

2025	4.20	42.6	35.0	0.09	9.38	4.96	11,513	0.37	0.78	10.7	11,764
2026	1.30	10.3	16.9	0.03	1.15	0.53	3,370	0.13	0.08	3.14	3,401
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
2025	4.19	42.8	34.7	0.08	9.38	4.96	10,274	0.32	0.76	0.27	10,510
2026	26.9	10.4	15.9	0.03	1.15	0.53	3,311	0.11	0.08	0.08	3,339
Average Daily	—	—	—	—	—	—	—	—	—	—	—
2025	1.56	15.3	14.3	0.03	2.51	1.24	4,404	0.15	0.27	1.82	4,491
2026	2.32	6.72	10.4	0.02	0.73	0.34	2,116	0.07	0.05	0.85	2,134
Annual	—	—	—	—	—	—	—	—	—	—	—
2025	0.28	2.79	2.61	0.01	0.46	0.23	729	0.02	0.05	0.30	743
2026	0.42	1.23	1.90	< 0.005	0.13	0.06	350	0.01	0.01	0.14	353

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.	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.72	3.78	24.5	0.06	4.36	1.23	7,581	3.86	0.24	17.7	7,768
Mit.	4.72	3.78	24.5	0.06	4.36	1.23	7,399	3.85	0.24	17.7	7,586
% Reduced	—	—	—	—	—	—	2%	< 0.5%	1%	—	2%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.19	3.89	17.3	0.06	4.36	1.23	7,271	3.87	0.25	1.01	7,444
Mit.	4.19	3.89	17.3	0.06	4.36	1.23	7,090	3.85	0.25	1.01	7,261
% Reduced	—	—	—	—	—	—	2%	< 0.5%	1%	—	2%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.10	2.55	18.3	0.04	3.76	1.01	5,331	3.82	0.22	7.10	5,501

Mit.	4.10	2.55	18.3	0.04	3.76	1.01	5,150	3.80	0.22	7.10	5,319
% Reduced	—	—	—	—	—	—	3%	< 0.5%	1%	—	3%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.75	0.47	3.33	0.01	0.69	0.18	883	0.63	0.04	1.18	911
Mit.	0.75	0.47	3.33	0.01	0.69	0.18	853	0.63	0.04	1.18	881
% Reduced	—	—	—	—	—	—	3%	< 0.5%	1%	—	3%
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	150	55.0	—	—	—	—	—
Unmit.	No	No	No	No	No	No	—	—	—	—	—
Mit.	No	No	No	No	No	No	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—
Threshold	55.0	55.0	550	150	150	55.0	—	—	—	—	—
Unmit.	No	No	No	No	No	No	—	—	—	—	—
Mit.	No	No	No	No	No	No	—	—	—	—	—
Exceeds (Annual)	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	—	—	—	—	—	—	—	—	—	3,000
Unmit.	—	—	—	—	—	—	—	—	—	—	No
Mit.	—	—	—	—	—	—	—	—	—	—	No

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.42	2.13	19.6	0.05	4.23	1.10	4,936	0.20	0.22	17.1	5,024
Area	2.28	1.27	4.72	0.01	0.10	0.10	1,569	0.03	< 0.005	—	1,571

Energy	0.02	0.39	0.17	< 0.005	0.03	0.03	1,009	0.09	0.01	—	1,013
Water	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Waste	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Refrig.	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	4.72	3.78	24.5	0.06	4.36	1.23	7,581	3.86	0.24	17.7	7,768
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.26	2.28	16.6	0.05	4.23	1.10	4,637	0.21	0.23	0.44	4,711
Area	1.91	1.23	0.52	0.01	0.10	0.10	1,558	0.03	< 0.005	—	1,560
Energy	0.02	0.39	0.17	< 0.005	0.03	0.03	1,009	0.09	0.01	—	1,013
Water	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Waste	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Refrig.	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	4.19	3.89	17.3	0.06	4.36	1.23	7,271	3.87	0.25	1.01	7,444
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.98	2.05	15.2	0.04	3.72	0.97	4,142	0.18	0.20	6.54	4,213
Area	2.10	0.11	2.91	< 0.005	0.01	0.01	114	< 0.005	< 0.005	—	115
Energy	0.02	0.39	0.17	< 0.005	0.03	0.03	1,009	0.09	0.01	—	1,013
Water	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Waste	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Refrig.	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	4.10	2.55	18.3	0.04	3.76	1.01	5,331	3.82	0.22	7.10	5,501
Annual	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.36	0.37	2.77	0.01	0.68	0.18	686	0.03	0.03	1.08	698
Area	0.38	0.02	0.53	< 0.005	< 0.005	< 0.005	18.9	< 0.005	< 0.005	—	19.0
Energy	< 0.005	0.07	0.03	< 0.005	0.01	0.01	167	0.02	< 0.005	—	168
Water	—	—	—	—	—	—	6.11	0.10	< 0.005	—	9.28
Waste	—	—	—	—	—	—	4.88	0.49	0.00	—	17.1

Refrig.	—	—	—	—	—	—	—	—	—	0.09	0.09
Total	0.75	0.47	3.33	0.01	0.69	0.18	883	0.63	0.04	1.18	911

2.6. Operations Emissions by Sector, Mitigated

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

Sector	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.42	2.13	19.6	0.05	4.23	1.10	4,936	0.20	0.22	17.1	5,024
Area	2.28	1.27	4.72	0.01	0.10	0.10	1,569	0.03	< 0.005	—	1,571
Energy	0.02	0.39	0.17	< 0.005	0.03	0.03	828	0.08	< 0.005	—	831
Water	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Waste	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Refrig.	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	4.72	3.78	24.5	0.06	4.36	1.23	7,399	3.85	0.24	17.7	7,586
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.26	2.28	16.6	0.05	4.23	1.10	4,637	0.21	0.23	0.44	4,711
Area	1.91	1.23	0.52	0.01	0.10	0.10	1,558	0.03	< 0.005	—	1,560
Energy	0.02	0.39	0.17	< 0.005	0.03	0.03	828	0.08	< 0.005	—	831
Water	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Waste	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Refrig.	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	4.19	3.89	17.3	0.06	4.36	1.23	7,090	3.85	0.25	1.01	7,261
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.98	2.05	15.2	0.04	3.72	0.97	4,142	0.18	0.20	6.54	4,213
Area	2.10	0.11	2.91	< 0.005	0.01	0.01	114	< 0.005	< 0.005	—	115
Energy	0.02	0.39	0.17	< 0.005	0.03	0.03	828	0.08	< 0.005	—	831

Water	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Waste	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Refrig.	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	4.10	2.55	18.3	0.04	3.76	1.01	5,150	3.80	0.22	7.10	5,319
Annual	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.36	0.37	2.77	0.01	0.68	0.18	686	0.03	0.03	1.08	698
Area	0.38	0.02	0.53	< 0.005	< 0.005	< 0.005	18.9	< 0.005	< 0.005	—	19.0
Energy	< 0.005	0.07	0.03	< 0.005	0.01	0.01	137	0.01	< 0.005	—	138
Water	—	—	—	—	—	—	6.11	0.10	< 0.005	—	9.28
Waste	—	—	—	—	—	—	4.88	0.49	0.00	—	17.1
Refrig.	—	—	—	—	—	—	—	—	—	0.09	0.09
Total	0.75	0.47	3.33	0.01	0.69	0.18	853	0.63	0.04	1.18	881

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.05	37.5	32.4	0.05	1.93	1.78	5,528	0.22	0.04	—	5,547
Dust From Material Movement	—	—	—	—	5.67	2.69	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.03	< 0.005	0.28	0.03	7.27	< 0.005	< 0.005	0.01	7.66
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	4.05	37.5	32.4	0.05	1.93	1.78	5,528	0.22	0.04	—	5,547
Dust From Material Movement	—	—	—	—	5.67	2.69	—	—	—	—	—
Onsite truck	< 0.005	0.05	0.03	< 0.005	0.28	0.03	7.38	< 0.005	< 0.005	< 0.005	7.76
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.33	3.08	2.67	< 0.005	0.16	0.15	454	0.02	< 0.005	—	456
Dust From Material Movement	—	—	—	—	0.47	0.22	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	0.02	< 0.005	0.60	< 0.005	< 0.005	< 0.005	0.63
Annual	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.56	0.49	< 0.005	0.03	0.03	75.2	< 0.005	< 0.005	—	75.5
Dust From Material Movement	—	—	—	—	0.09	0.04	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.10	< 0.005	< 0.005	< 0.005	0.10
Offsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.35	0.00	0.23	0.05	247	0.01	0.01	0.91	250
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.07	5.00	1.22	0.03	1.27	0.42	4,509	0.08	0.71	9.61	4,732
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.08	1.02	0.00	0.23	0.05	227	0.01	0.01	0.02	230
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.07	5.23	1.24	0.03	1.27	0.42	4,512	0.08	0.71	0.25	4,725
Average Daily	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	0.01	0.09	0.00	0.02	< 0.005	18.9	< 0.005	< 0.005	0.03	19.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.43	0.10	< 0.005	0.10	0.03	371	0.01	0.06	0.34	389
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	< 0.005	< 0.005	3.12	< 0.005	< 0.005	0.01	3.17
Vendor	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	0.08	0.02	< 0.005	0.02	0.01	61.4	< 0.005	0.01	0.06	64.3

3.2. Site Preparation (2025) - Mitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.05	37.5	32.4	0.05	1.93	1.78	5,528	0.22	0.04	—	5,547
Dust From Material Movement	—	—	—	—	5.67	2.69	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.03	< 0.005	0.28	0.03	7.27	< 0.005	< 0.005	0.01	7.66
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.05	37.5	32.4	0.05	1.93	1.78	5,528	0.22	0.04	—	5,547
Dust From Material Movement	—	—	—	—	5.67	2.69	—	—	—	—	—
Onsite truck	< 0.005	0.05	0.03	< 0.005	0.28	0.03	7.38	< 0.005	< 0.005	< 0.005	7.76
Average Daily	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.33	3.08	2.67	< 0.005	0.16	0.15	454	0.02	< 0.005	—	456
Dust From Material Movement	—	—	—	—	0.47	0.22	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	0.02	< 0.005	0.60	< 0.005	< 0.005	< 0.005	0.63
Annual	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.56	0.49	< 0.005	0.03	0.03	75.2	< 0.005	< 0.005	—	75.5
Dust From Material Movement	—	—	—	—	0.09	0.04	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.10	< 0.005	< 0.005	< 0.005	0.10
Offsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.35	0.00	0.23	0.05	247	0.01	0.01	0.91	250
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.07	5.00	1.22	0.03	1.27	0.42	4,509	0.08	0.71	9.61	4,732
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.08	1.02	0.00	0.23	0.05	227	0.01	0.01	0.02	230
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.07	5.23	1.24	0.03	1.27	0.42	4,512	0.08	0.71	0.25	4,725
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.09	0.00	0.02	< 0.005	18.9	< 0.005	< 0.005	0.03	19.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.43	0.10	< 0.005	0.10	0.03	371	0.01	0.06	0.34	389
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	< 0.005	< 0.005	3.12	< 0.005	< 0.005	0.01	3.17

Vendor	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	0.08	0.02	< 0.005	0.02	0.01	61.4	< 0.005	0.01	0.06	64.3

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.57	32.6	29.4	0.06	1.52	1.40	6,715	0.27	0.05	—	6,738
Dust From Material Movement	—	—	—	—	2.68	0.98	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.03	< 0.005	0.28	0.03	7.27	< 0.005	< 0.005	0.01	7.66
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.88	8.04	7.26	0.02	0.37	0.34	1,656	0.07	0.01	—	1,662
Dust From Material Movement	—	—	—	—	0.66	0.24	—	—	—	—	—
Onsite truck	< 0.005	0.01	0.01	< 0.005	0.07	0.01	1.80	< 0.005	< 0.005	< 0.005	1.90
Annual	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.47	1.32	< 0.005	0.07	0.06	274	0.01	< 0.005	—	275
Dust From Material Movement	—	—	—	—	0.12	0.04	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	0.01	< 0.005	0.30	< 0.005	< 0.005	< 0.005	0.31

Offsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.26	0.06	282	0.01	0.01	1.04	286
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.07	5.00	1.22	0.03	1.27	0.42	4,508	0.08	0.71	9.61	4,732
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.30	0.00	0.06	0.02	64.7	< 0.005	< 0.005	0.11	65.6
Vendor	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	1.30	0.30	0.01	0.31	0.10	1,112	0.02	0.17	1.02	1,166
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.01	< 0.005	10.7	< 0.005	< 0.005	0.02	10.9
Vendor	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	0.24	0.06	< 0.005	0.06	0.02	184	< 0.005	0.03	0.17	193

3.4. Grading (2025) - Mitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.57	32.6	29.4	0.06	1.52	1.40	6,715	0.27	0.05	—	6,738
Dust From Material Movement	—	—	—	—	2.68	0.98	—	—	—	—	—
Onsite truck	< 0.005	0.04	0.03	< 0.005	0.28	0.03	7.27	< 0.005	< 0.005	0.01	7.66

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.88	8.04	7.26	0.02	0.37	0.34	1,656	0.07	0.01	—	1,662
Dust From Material Movement	—	—	—	—	0.66	0.24	—	—	—	—	—
Onsite truck	< 0.005	0.01	0.01	< 0.005	0.07	0.01	1.80	< 0.005	< 0.005	< 0.005	1.90
Annual	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.47	1.32	< 0.005	0.07	0.06	274	0.01	< 0.005	—	275
Dust From Material Movement	—	—	—	—	0.12	0.04	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	0.01	< 0.005	0.30	< 0.005	< 0.005	< 0.005	0.31
Offsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	1.54	0.00	0.26	0.06	282	0.01	0.01	1.04	286
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.07	5.00	1.22	0.03	1.27	0.42	4,508	0.08	0.71	9.61	4,732
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.30	0.00	0.06	0.02	64.7	< 0.005	< 0.005	0.11	65.6
Vendor	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	1.30	0.30	0.01	0.31	0.10	1,112	0.02	0.17	1.02	1,166
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.01	< 0.005	10.7	< 0.005	< 0.005	0.02	10.9
Vendor	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	0.24	0.06	< 0.005	0.06	0.02	184	< 0.005	0.03	0.17	193

3.5. Building Construction (2025) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	0.40	2,398	0.10	0.02	—	2,406
Onsite truck	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	1.13	10.4	13.0	0.02	0.43	0.40	2,398	0.10	0.02	—	2,406
Onsite truck	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	0.24	2.27	2.83	0.01	0.09	0.09	521	0.02	< 0.005	—	523
Onsite truck	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	0.04	0.41	0.52	< 0.005	0.02	0.02	86.2	< 0.005	< 0.005	—	86.5
Onsite truck	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	0.24	0.23	4.11	0.00	0.70	0.16	751	0.03	0.03	2.76	762
Vendor	0.01	0.27	0.08	< 0.005	0.07	0.02	242	0.01	0.04	0.69	254
Hauling	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	0.22	0.26	3.11	0.00	0.70	0.16	690	0.03	0.03	0.07	699
Vendor	< 0.005	0.28	0.08	< 0.005	0.07	0.02	242	0.01	0.04	0.02	253
Hauling	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	0.05	0.06	0.71	0.00	0.15	0.04	152	0.01	0.01	0.26	154
Vendor	< 0.005	0.06	0.02	< 0.005	0.02	< 0.005	52.6	< 0.005	0.01	0.06	55.1
Hauling	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	0.01	0.13	0.00	0.03	0.01	25.1	< 0.005	< 0.005	0.04	25.5
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	8.71	< 0.005	< 0.005	0.01	9.12
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Building Construction (2025) - Mitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	0.40	2,398	0.10	0.02	—	2,406
Onsite truck	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	1.13	10.4	13.0	0.02	0.43	0.40	2,398	0.10	0.02	—	2,406
Onsite truck	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	0.24	2.27	2.83	0.01	0.09	0.09	521	0.02	< 0.005	—	523
Onsite truck	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	0.04	0.41	0.52	< 0.005	0.02	0.02	86.2	< 0.005	< 0.005	—	86.5
Onsite truck	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	0.24	0.23	4.11	0.00	0.70	0.16	751	0.03	0.03	2.76	762
Vendor	0.01	0.27	0.08	< 0.005	0.07	0.02	242	0.01	0.04	0.69	254
Hauling	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	0.22	0.26	3.11	0.00	0.70	0.16	690	0.03	0.03	0.07	699
Vendor	< 0.005	0.28	0.08	< 0.005	0.07	0.02	242	0.01	0.04	0.02	253
Hauling	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	0.05	0.06	0.71	0.00	0.15	0.04	152	0.01	0.01	0.26	154
Vendor	< 0.005	0.06	0.02	< 0.005	0.02	< 0.005	52.6	< 0.005	0.01	0.06	55.1
Hauling	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	0.01	0.13	0.00	0.03	0.01	25.1	< 0.005	< 0.005	0.04	25.5
Vendor	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	8.71	< 0.005	< 0.005	0.01	9.12
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.7. 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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	0.35	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	0.35	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	5.96	7.84	0.01	0.23	0.21	1,450	0.06	0.01	—	1,455
Onsite truck	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	0.12	1.09	1.43	< 0.005	0.04	0.04	240	0.01	< 0.005	—	241
Onsite truck	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	0.23	0.21	3.83	0.00	0.70	0.16	735	0.03	0.03	2.49	746
Vendor	0.01	0.25	0.08	< 0.005	0.07	0.02	238	0.01	0.04	0.65	250
Hauling	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	0.21	0.23	2.90	0.00	0.70	0.16	676	0.01	0.03	0.06	684
Vendor	< 0.005	0.27	0.08	< 0.005	0.07	0.02	238	0.01	0.04	0.02	249

Hauling	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	0.13	0.15	1.84	0.00	0.42	0.10	414	0.01	0.02	0.65	419
Vendor	< 0.005	0.16	0.05	< 0.005	0.04	0.01	144	< 0.005	0.02	0.17	151
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.33	0.00	0.08	0.02	68.5	< 0.005	< 0.005	0.11	69.4
Vendor	< 0.005	0.03	0.01	< 0.005	0.01	< 0.005	23.8	< 0.005	< 0.005	0.03	25.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2026) - Mitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	0.35	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	0.35	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	5.96	7.84	0.01	0.23	0.21	1,450	0.06	0.01	—	1,455
Onsite truck	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	0.12	1.09	1.43	< 0.005	0.04	0.04	240	0.01	< 0.005	—	241
Onsite truck	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	0.23	0.21	3.83	0.00	0.70	0.16	735	0.03	0.03	2.49	746
Vendor	0.01	0.25	0.08	< 0.005	0.07	0.02	238	0.01	0.04	0.65	250
Hauling	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	0.21	0.23	2.90	0.00	0.70	0.16	676	0.01	0.03	0.06	684
Vendor	< 0.005	0.27	0.08	< 0.005	0.07	0.02	238	0.01	0.04	0.02	249
Hauling	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	0.13	0.15	1.84	0.00	0.42	0.10	414	0.01	0.02	0.65	419
Vendor	< 0.005	0.16	0.05	< 0.005	0.04	0.01	144	< 0.005	0.02	0.17	151
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.33	0.00	0.08	0.02	68.5	< 0.005	< 0.005	0.11	69.4
Vendor	< 0.005	0.03	0.01	< 0.005	0.01	< 0.005	23.8	< 0.005	< 0.005	0.03	25.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Paving (2026) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	7.12	9.94	0.01	0.32	0.29	1,511	0.06	0.01	—	1,516
Paving	0.47	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.04	0.39	0.54	< 0.005	0.02	0.02	82.8	< 0.005	< 0.005	—	83.1
Paving	0.03	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.07	0.10	< 0.005	< 0.005	< 0.005	13.7	< 0.005	< 0.005	—	13.8
Paving	< 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
Offsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.07	0.82	0.00	0.20	0.05	190	< 0.005	0.01	0.02	193
Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.01	< 0.005	10.6	< 0.005	< 0.005	0.02	10.7
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	< 0.005	< 0.005	1.75	< 0.005	< 0.005	< 0.005	1.77

Vendor	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

3.10. Paving (2026) - Mitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	7.12	9.94	0.01	0.32	0.29	1,511	0.06	0.01	—	1,516
Paving	0.47	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.04	0.39	0.54	< 0.005	0.02	0.02	82.8	< 0.005	< 0.005	—	83.1
Paving	0.03	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.07	0.10	< 0.005	< 0.005	< 0.005	13.7	< 0.005	< 0.005	—	13.8
Paving	< 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
Offsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—

Worker	0.06	0.07	0.82	0.00	0.20	0.05	190	< 0.005	0.01	0.02	193
Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.01	< 0.005	10.6	< 0.005	< 0.005	0.02	10.7
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	< 0.005	< 0.005	1.75	< 0.005	< 0.005	< 0.005	1.77
Vendor	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

3.11. 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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	0.02	134	0.01	< 0.005	—	134
Architectural Coatings	26.7	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.05	0.06	< 0.005	< 0.005	< 0.005	7.32	< 0.005	< 0.005	—	7.34

Architectural Coatings	1.46	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.01	< 0.005	< 0.005	< 0.005	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	0.27	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.04	0.05	0.58	0.00	0.14	0.03	135	< 0.005	0.01	0.01	137
Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.01	< 0.005	7.50	< 0.005	< 0.005	0.01	7.60
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	< 0.005	< 0.005	1.24	< 0.005	< 0.005	< 0.005	1.26
Vendor	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

3.12. Architectural Coating (2026) - Mitigated

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

Location	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.86	1.13	< 0.005	0.02	0.02	134	0.01	< 0.005	—	134
Architectural Coatings	26.7	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.05	0.06	< 0.005	< 0.005	< 0.005	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	1.46	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.01	< 0.005	< 0.005	< 0.005	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	0.27	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.04	0.05	0.58	0.00	0.14	0.03	135	< 0.005	0.01	0.01	137
Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	0.03	0.00	0.01	< 0.005	7.50	< 0.005	< 0.005	0.01	7.60
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	< 0.005	< 0.005	1.24	< 0.005	< 0.005	< 0.005	1.26
Vendor	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

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	2.42	2.13	19.6	0.05	4.23	1.10	4,936	0.20	0.22	17.1	5,024
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.42	2.13	19.6	0.05	4.23	1.10	4,936	0.20	0.22	17.1	5,024
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	2.26	2.28	16.6	0.05	4.23	1.10	4,637	0.21	0.23	0.44	4,711
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.26	2.28	16.6	0.05	4.23	1.10	4,637	0.21	0.23	0.44	4,711
Annual	—	—	—	—	—	—	—	—	—	—	—

Condo/Townho	0.36	0.37	2.77	0.01	0.68	0.18	686	0.03	0.03	1.08	698
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.36	0.37	2.77	0.01	0.68	0.18	686	0.03	0.03	1.08	698

4.1.2. Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	2.42	2.13	19.6	0.05	4.23	1.10	4,936	0.20	0.22	17.1	5,024
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.42	2.13	19.6	0.05	4.23	1.10	4,936	0.20	0.22	17.1	5,024
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	2.26	2.28	16.6	0.05	4.23	1.10	4,637	0.21	0.23	0.44	4,711
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.26	2.28	16.6	0.05	4.23	1.10	4,637	0.21	0.23	0.44	4,711
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	0.36	0.37	2.77	0.01	0.68	0.18	686	0.03	0.03	1.08	698
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.36	0.37	2.77	0.01	0.68	0.18	686	0.03	0.03	1.08	698

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	514	0.05	0.01	—	517
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	514	0.05	0.01	—	517
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	514	0.05	0.01	—	517
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	514	0.05	0.01	—	517
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	85.2	0.01	< 0.005	—	85.7
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	85.2	0.01	< 0.005	—	85.7

4.2.2. Electricity Emissions By Land Use - Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—

Condo/Townho use	—	—	—	—	—	—	333	0.03	< 0.005	—	335
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	333	0.03	< 0.005	—	335
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	333	0.03	< 0.005	—	335
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	333	0.03	< 0.005	—	335
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	55.2	0.01	< 0.005	—	55.5
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	55.2	0.01	< 0.005	—	55.5

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	0.02	0.39	0.17	< 0.005	0.03	0.03	494	0.04	< 0.005	—	496
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.39	0.17	< 0.005	0.03	0.03	494	0.04	< 0.005	—	496
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—

Condo/Townho	0.02	0.39	0.17	< 0.005	0.03	0.03	494	0.04	< 0.005	—	496
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.39	0.17	< 0.005	0.03	0.03	494	0.04	< 0.005	—	496
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	< 0.005	0.07	0.03	< 0.005	0.01	0.01	81.9	0.01	< 0.005	—	82.1
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	0.07	0.03	< 0.005	0.01	0.01	81.9	0.01	< 0.005	—	82.1

4.2.4. Natural Gas Emissions By Land Use - Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	0.02	0.39	0.17	< 0.005	0.03	0.03	494	0.04	< 0.005	—	496
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.39	0.17	< 0.005	0.03	0.03	494	0.04	< 0.005	—	496
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	0.02	0.39	0.17	< 0.005	0.03	0.03	494	0.04	< 0.005	—	496
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.39	0.17	< 0.005	0.03	0.03	494	0.04	< 0.005	—	496
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	< 0.005	0.07	0.03	< 0.005	0.01	0.01	81.9	0.01	< 0.005	—	82.1

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	0.07	0.03	< 0.005	0.01	0.01	81.9	0.01	< 0.005	—	82.1

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.07	1.23	0.52	0.01	0.10	0.10	1,558	0.03	< 0.005	—	1,560
Consumer Products	1.69	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.15	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.37	0.04	4.20	< 0.005	< 0.005	< 0.005	11.2	< 0.005	< 0.005	—	11.3
Total	2.28	1.27	4.72	0.01	0.10	0.10	1,569	0.03	< 0.005	—	1,571
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.07	1.23	0.52	0.01	0.10	0.10	1,558	0.03	< 0.005	—	1,560
Consumer Products	1.69	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.15	—	—	—	—	—	—	—	—	—	—
Total	1.91	1.23	0.52	0.01	0.10	0.10	1,558	0.03	< 0.005	—	1,560
Annual	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	17.7	< 0.005	< 0.005	—	17.7
Consumer Products	0.31	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	0.03	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.05	0.01	0.52	< 0.005	< 0.005	< 0.005	1.27	< 0.005	< 0.005	—	1.28
Total	0.38	0.02	0.53	< 0.005	< 0.005	< 0.005	18.9	< 0.005	< 0.005	—	19.0

4.3.2. Mitigated

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

Source	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.07	1.23	0.52	0.01	0.10	0.10	1,558	0.03	< 0.005	—	1,560
Consumer Products	1.69	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.15	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.37	0.04	4.20	< 0.005	< 0.005	< 0.005	11.2	< 0.005	< 0.005	—	11.3
Total	2.28	1.27	4.72	0.01	0.10	0.10	1,569	0.03	< 0.005	—	1,571
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.07	1.23	0.52	0.01	0.10	0.10	1,558	0.03	< 0.005	—	1,560
Consumer Products	1.69	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.15	—	—	—	—	—	—	—	—	—	—
Total	1.91	1.23	0.52	0.01	0.10	0.10	1,558	0.03	< 0.005	—	1,560
Annual	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	17.7	< 0.005	< 0.005	—	17.7
Consumer Products	0.31	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	0.03	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.05	0.01	0.52	< 0.005	< 0.005	< 0.005	1.27	< 0.005	< 0.005	—	1.28
Total	0.38	0.02	0.53	< 0.005	< 0.005	< 0.005	18.9	< 0.005	< 0.005	—	19.0

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	34.4	0.59	0.01	—	53.5
Other Asphalt Surfaces	—	—	—	—	—	—	2.50	< 0.005	< 0.005	—	2.52
Total	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	34.4	0.59	0.01	—	53.5
Other Asphalt Surfaces	—	—	—	—	—	—	2.50	< 0.005	< 0.005	—	2.52
Total	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	5.69	0.10	< 0.005	—	8.86
Other Asphalt Surfaces	—	—	—	—	—	—	0.41	< 0.005	< 0.005	—	0.42
Total	—	—	—	—	—	—	6.11	0.10	< 0.005	—	9.28

4.4.2. Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	34.4	0.59	0.01	—	53.5
Other Asphalt Surfaces	—	—	—	—	—	—	2.50	< 0.005	< 0.005	—	2.52
Total	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	34.4	0.59	0.01	—	53.5
Other Asphalt Surfaces	—	—	—	—	—	—	2.50	< 0.005	< 0.005	—	2.52
Total	—	—	—	—	—	—	36.9	0.59	0.01	—	56.0
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	5.69	0.10	< 0.005	—	8.86
Other Asphalt Surfaces	—	—	—	—	—	—	0.41	< 0.005	< 0.005	—	0.42
Total	—	—	—	—	—	—	6.11	0.10	< 0.005	—	9.28

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	4.88	0.49	0.00	—	17.1
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	4.88	0.49	0.00	—	17.1

4.5.2. Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townhouse	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	29.5	2.95	0.00	—	103

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	29.5	2.95	0.00	—	103
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	4.88	0.49	0.00	—	17.1
Other Asphalt Surfaces	—	—	—	—	—	—	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	4.88	0.49	0.00	—	17.1

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	—	—	—	—	—	—	—	—	—	0.56	0.56
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	—	—	—	—	—	—	—	—	—	0.56	0.56
Annual	—	—	—	—	—	—	—	—	—	—	—

Condo/Townho use	—	—	—	—	—	—	—	—	—	0.09	0.09
Total	—	—	—	—	—	—	—	—	—	0.09	0.09

4.6.2. Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	—	—	—	—	—	—	—	—	—	0.56	0.56
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	—	—	—	0.56	0.56
Total	—	—	—	—	—	—	—	—	—	0.56	0.56
Annual	—	—	—	—	—	—	—	—	—	—	—
Condo/Townho use	—	—	—	—	—	—	—	—	—	0.09	0.09
Total	—	—	—	—	—	—	—	—	—	0.09	0.09

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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—

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

4.7.2. Mitigated

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

Equipment Type	ROG	NOx	CO	SO2	PM10T	PM2.5T	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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—

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

4.8.2. Mitigated

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

Equipment Type	ROG	NOx	CO	SO2	PM10T	PM2.5T	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	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

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

Equipment Type	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

Vegetation	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

Species	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

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

Vegetation	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

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

Species	ROG	NOx	CO	SO2	PM10T	PM2.5T	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—

Sequestered	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	3/28/2025	5/8/2025	5.00	30.0	—
Grading	Grading	5/9/2025	9/11/2025	5.00	90.0	—
Building Construction	Building Construction	9/12/2025	11/5/2026	5.00	300	—
Paving	Paving	11/6/2026	12/3/2026	5.00	20.0	—
Architectural Coating	Architectural Coating	12/4/2026	12/31/2026	5.00	20.0	—

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
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Crawler Tractors	Diesel	Average	4.00	8.00	87.0	0.43
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
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	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
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

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Crawler Tractors	Diesel	Average	4.00	8.00	87.0	0.43
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48

Grading	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
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	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
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
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	65.4	20.0	HHDT
Site Preparation	Onsite truck	3.00	0.25	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	65.4	20.0	HHDT
Grading	Onsite truck	3.00	0.25	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	53.3	18.5	LDA,LDT1,LDT2

Building Construction	Vendor	7.91	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	10.7	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

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	65.4	20.0	HHDT
Site Preparation	Onsite truck	3.00	0.25	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	65.4	20.0	HHDT
Grading	Onsite truck	3.00	0.25	HHDT
Building Construction	—	—	—	—

Building Construction	Worker	53.3	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	7.91	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	10.7	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

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

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	158,841	52,947	0.00	0.00	9,409

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	15,700	35.0	0.00	—
Grading	—	47,100	120	0.00	—
Paving	0.00	0.00	0.00	0.00	3.60

5.6.2. Construction Earthmoving Control Strategies

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

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Condo/Townhouse	—	0%
Other Asphalt Surfaces	3.60	100%

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
Condo/Townhouse	533	602	465	194,549	5,234	5,918	4,566	1,911,296
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Condo/Townhouse	533	602	465	194,549	5,234	5,918	4,566	1,911,296
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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	74
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

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Condo/Townhouse	—
Wood Fireplaces	0
Gas Fireplaces	74
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)
158841	52,947	0.00	0.00	9,409

5.10.3. Landscape Equipment

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

5.10.4. Landscape Equipment - Mitigated

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)
Condo/Townhouse	542,356	346	0.0330	0.0040	1,542,950
Other Asphalt Surfaces	0.00	346	0.0330	0.0040	0.00

5.11.2. Mitigated

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)
Condo/Townhouse	351,485	346	0.0330	0.0040	1,542,950
Other Asphalt Surfaces	0.00	346	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Condo/Townhouse	3,009,859	1,823,389
Other Asphalt Surfaces	0.00	497,283

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Condo/Townhouse	3,009,859	1,823,389
Other Asphalt Surfaces	0.00	497,283

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Condo/Townhouse	54.7	—
Other Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Condo/Townhouse	54.7	—
Other Asphalt Surfaces	0.00	—

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
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

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
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

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

5.15.2. Mitigated

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

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	27.9	annual days of extreme heat
Extreme Precipitation	2.60	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	7.84	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	91.1
AQ-PM	50.4
AQ-DPM	11.9
Drinking Water	10.2
Lead Risk Housing	9.75

Pesticides	5.66
Toxic Releases	22.5
Traffic	7.29
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	7.35
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	37.3
Cardio-vascular	59.5
Low Birth Weights	48.0
Socioeconomic Factor Indicators	—
Education	50.7
Housing	35.8
Linguistic	17.3
Poverty	43.1
Unemployment	35.0

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	48.73604517
Employed	29.51366611
Median HI	18.86308225

Education	—
Bachelor's or higher	21.98126524
High school enrollment	100
Preschool enrollment	95.7141024
Transportation	—
Auto Access	45.25856538
Active commuting	13.29398178
Social	—
2-parent households	56.01180547
Voting	63.23623765
Neighborhood	—
Alcohol availability	97.0101373
Park access	10.04747851
Retail density	13.93558322
Supermarket access	2.399589375
Tree canopy	2.194276915
Housing	—
Homeownership	88.31002181
Housing habitability	59.65610163
Low-inc homeowner severe housing cost burden	42.07622225
Low-inc renter severe housing cost burden	9.303220839
Uncrowded housing	89.4649044
Health Outcomes	—
Insured adults	49.96791993
Arthritis	0.8
Asthma ER Admissions	83.9
High Blood Pressure	1.2

Cancer (excluding skin)	1.0
Asthma	37.3
Coronary Heart Disease	0.9
Chronic Obstructive Pulmonary Disease	2.1
Diagnosed Diabetes	8.1
Life Expectancy at Birth	13.9
Cognitively Disabled	6.7
Physically Disabled	1.6
Heart Attack ER Admissions	59.9
Mental Health Not Good	54.9
Chronic Kidney Disease	0.9
Obesity	34.9
Pedestrian Injuries	47.3
Physical Health Not Good	21.1
Stroke	1.7
Health Risk Behaviors	—
Binge Drinking	95.9
Current Smoker	58.7
No Leisure Time for Physical Activity	26.0
Climate Change Exposures	—
Wildfire Risk	31.9
SLR Inundation Area	0.0
Children	92.8
Elderly	1.5
English Speaking	59.6
Foreign-born	26.0
Outdoor Workers	46.6

Climate Change Adaptive Capacity	—
Impervious Surface Cover	76.7
Traffic Density	7.5
Traffic Access	23.0
Other Indices	—
Hardship	62.2
Other Decision Support	—
2016 Voting	59.7

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	12.0
Healthy Places Index Score for Project Location (b)	44.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Total area disturbed 14.4 acres. 20% of area landscaped
Construction: Construction Phases	No Demolition phase. Site Prep extended from 10 to 25 workdays and Grading extended from 30 to 70 workdays to account for the large earthwork quantities.
Construction: Off-Road Equipment	Tractor/Loader/Backhoe changed to Crawler Tractors in Site Prep and Grading phases to account for hilly terrain
Operations: Vehicle Data	Weekday Trip Rate set to 7.2 daily trips per Dwelling Unit to match Traffic Memo
Operations: Hearths	74 natural gas only fireplaces and no woodstoves
Construction: Dust From Material Movement	62,800 cu yds export, split proportionally between Site Preparation and Grading Phases

APPENDIX B

EMFAC2021 Model Printouts

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Riverside (SC)
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Y	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	Trips	Fuel Consumption
Riverside (SC)	2025	LDA	Aggregate	Aggregate	Gasoline	469318.5	20373766	2183259.5	673.3
Riverside (SC)	2025	LDT1	Aggregate	Aggregate	Gasoline	39844.4	1499610	172787.8	59.9
Riverside (SC)	2025	LDT2	Aggregate	Aggregate	Gasoline	201900.8	8973974	947238.8	360.0
Riverside (SC)	2025	MCY	Aggregate	Aggregate	Gasoline	24005.5	138550	48010.9	3.3
Riverside (SC)	2025	MDV	Aggregate	Aggregate	Gasoline	157992.6	6448293	723018.6	323.5
Riverside (SC)	2025	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	461.1	15575	6579.6	1.7
Riverside (SC)	2025	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	438.3	14929	6254.8	1.7
Riverside (SC)	2025	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	1272.8	43120	18162.6	4.8
Riverside (SC)	2025	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	182.4	9852	2603.5	1.1
Riverside (SC)	2025	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1564.4	65866	18084.7	7.4
Riverside (SC)	2025	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	3832.9	166778	44308.4	18.9
Riverside (SC)	2025	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	2725.5	116482	31506.4	13.0
Riverside (SC)	2025	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	1319.9	60644	15258.2	6.6
Riverside (SC)	2025	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	17.6	872	203.9	0.1
Riverside (SC)	2025	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	453.3	26565	5239.7	2.7
Riverside (SC)	2025	T6 Public Class 4	Aggregate	Aggregate	Diesel	76.5	2629	392.3	0.3
Riverside (SC)	2025	T7 Single Concrete/Transit Mi›	Aggregate	Aggregate	Diesel	1266.6	87445	11931.8	14.3
Riverside (SC)	2025	T7 Single Dump Class 8	Aggregate	Aggregate	Diesel	1179.0	68603	11106.4	11.5
Riverside (SC)	2025	T7 SWCV Class 8	Aggregate	Aggregate	Diesel	47.9	3107	220.2	1.2
Riverside (SC)	2025	T7 Tractor Class 8	Aggregate	Aggregate	Diesel	4101.0	312988	59587.4	50.3

Worker (Autos) vehicle miles per day	37,434,192	1,420	1,000 gall per day
Workers (Autos) Avg Miles per gallon	**26.4**	1,420,055	gallons per day
Diesel Truck vehicle miles per day	995,456	136	1,000 gall per day
Diesel Truck Fleet Avg Miles per gallon	**7.3**	135,639	gallons per day

BIOLOGICAL TECHNICAL REPORT

Menifee Tract 28920

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October 2023

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ACRONYMS, ABBREVIATIONS, AND GLOSSARY OF TERMS

BMPs	Best Management Practices
CDFW	California Department of Fish and Wildlife
City	City of Menifee
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
USACE	United States Army Corps of Engineers
CRPR	California Rare Plant Rank
CWA	federal Clean Water Act
ESA	federal Endangered Species Act
FGC	Fish and Game Code
GIS	Geographic Information System
MBTA	Migratory Bird Treaty Act
MSHCP	Multiple Species Habitat Conservation Plan
MSL	mean sea level
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High Water Mark
RWQCB	Regional Water Quality Control Board
sf	square feet
TNW	Traditional Navigable Water
U.S.	United States
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCS	VCS Environmental
WDR	Water Discharge Requirement
WQC	Section 401 Water Quality Certification

1.0 INTRODUCTION

On behalf of Oak Hills West, LLC, VCS Environmental (VCS) prepared this Biological Technical Report as a biological resource update to the MSHCP Consistency and Biological Constraints Analysis prepared by Michael Brandman Associates dated August 12, 2005, and revised on January 25, 2006; attached as Appendix A, for the Menifee Tract 28920 (Project). VCS prepared this report to support California Environmental Quality Act (CEQA) documentation for the Oak Hills West Residential Project [herein after referred to as the "Project Site"] with the City of Menifee as the lead agency.

The Project's MSHCP Consistency and Biological Constraints Analysis documents consistency with the Multiple Species Habitat Conservation Plan (MSHCP). Furthermore, a Formal Section 7 Consultation Letter from the United States Fish and Wildlife Service (USFWS) dated July 27, 2006, attached as Appendix B, discusses additional measures required to address MSHCP requirements not otherwise addressed in the 2005/2006 report. The Project boundary and site conditions have not changed significantly since this determination. Therefore, no further MSHCP review was conducted.

In summary, general biological surveys conducted by VCS in 2022 and 2023 were done to verify no significant changes have occurred since the results of the 2005/2006 MSHCP Consistency and Biological Constraints Analysis and the 2006 USFWS Formal Section 7 Letter which concluded the following:

- The 2005 MSHCP Consistency Analysis concluded no riparian/riverine areas or vernal pools onsite, and the drainages onsite do not contribute any function or value to riparian habitat downstream; therefore, a Determination of Biologically Equivalent or Superior Preservation (DBESP) analysis will not be required. The 2006 USFWS Formal Section 7 Letter stated that while a DBESP was not required, Riverine areas were present onsite and payment to the Riverside County Parks and Open Space District's Arundo removal program for treatment of 0.25 acres was adequate to address the requirements of the MSHCP Riparian/Riverine policy.
- The 2005 MSHCP Consistency Analysis concluded the Project was not located with an existing or proposed linkage and an Urban/Wildlands Interface analysis is not required. The USFWS Formal Section 7 Consultation Letter included measures to address MSHCP guidelines pertaining to Urban/Wildlands Interface.
- Both the 2005 MSHCP Consistency Analysis and the 2006 USFWS Formal Section 7 Consultation Letter state that a pre-construction nesting bird survey shall be conducted prior to vegetation clearing during the nesting season.
- The 2005 MSHCP Consistency Analysis concluded that although no BUOW were observed onsite, the Project Site contains suitable habitat for this species and presence/absence focused surveys are recommended. The USFWS Formal Section 7 Consultation Letter confirmed that focused surveys were complete in April 2006 and determined BUOW were not present. Additionally, a pre-construction survey will be conducted within 30 days prior to disturbance in accordance with the MSHCP species specific objectives for the burrowing owl.

No major changes to the Project Site conditions were documented; therefore, further MSHCP analysis was not done.

1.1 Purpose and Approach

This report provides a summary of the conditions present during the biological survey conducted on November 4, 2022 and September 22, 2023, which included an assessment of the potential presence of sensitive biological resources, and an analysis of the potential impacts to those resources with implementation of the Project. This report identifies the current biological resources present within the Project Footprint including habitat communities, and the potential for occurrence of special status plant and wildlife species. The potential biological impacts in view of federal, state, and local laws and regulations are also identified in this report. While general biological resources are discussed, the focus of this assessment is on those resources considered to be sensitive. The report also recommends, as appropriate, Best Management Practices (BMPs), avoidance, minimization, and mitigation measures to reduce or avoid potential impacts. This report was prepared based upon the results of a literature review and field survey.

1.2 Terms

The following terms will be used throughout this document and are defined as follows:

- Property Boundary: The Property Boundary which includes the Project Site, is approximately 77.81 acres and is comprised of Assessor Parcel Numbers (APNs) 341-160-012 and APN 341-160-010.
- Project Site: The Project Site is the approximately 15.50-acre area assessed during the biological survey. The Project Site includes the eastern portion of the Property Boundary plus immediate adjacent roadside improvements.

1.3 Project Site Location

The approximately 15.50-acre Project Site is in the City of Menifee, Riverside County, California directly north of Boulder Crest Way and Ridgemoor Road. The Project Site is regionally accessible from Interstate 15 (I-15), via east on Railroad Canyon Road, to Murrieta Road heading north, then to Ridgemoor Road heading west (refer to Figures 1 and 2, *Regional and Aerial Maps*). The site is bordered by residential development to the south and east and open space area to the north and west. The Project Site is located within Section 30, Township 5 South and Range 2 West of the United States Geological Survey (USGS) San Bernardino 7.5-minute quadrangle map (Figure 3, *USGS Topographic Map*). The site consists of Assessor Parcel Numbers (APNs) 341-160-012 and 341-160-010.

2.0 PROJECT DESCRIPTION

Implementation of the Project would result in the development of 37 dwelling units clustered on the eastern portion of the 77.81-acre property with streets and utilities, and open undisturbed land on the remaining land. Storm drains and BMP's (i.e., water quality basins) will also be constructed in the eastern portion of the property.

2.1 Current Conditions

The Project Site is open, undeveloped land. There is evidence of offroad vehicle use throughout the site. There is one main dirt road bisecting the site from southeast to northwest. Suburban residential neighborhoods border the Project Site to the east and south. Open, undeveloped land is found north and west of the Project Site. The elevations on the Project Site range from approximately 1,392 feet above mean sea level (MSL) to 1,413 feet above MSL.

The Project Site supports four vegetation communities/land cover types including brittle bush scrub, California buckwheat scrub, tamarisk thickets, and disturbed/developed as shown in Figure 5, *Vegetation Map*. Site photographs are attached as Appendix C.

The topography throughout the Project Site is slightly sloped to the east gradually increasing in elevation going west. Elevations on the Project Site range from approximately 1,520– 1,615 feet (~463– 492 meters) above mean sea level (MSL) (Google Earth 2023).

3.0 REGULATORY CONTEXT

The following is a list of the relevant federal, state, and local laws and regulations that apply to protecting plant communities, plants, wildlife, and water quality from impacts within the Project Site.

Agency/ Organization	Laws/Regulations	Notes
Federal	Nationwide Permit (NWP) Section 404	Jurisdictional Waters of the U.S. are absent from the Project Footprint; therefore, a Section 404 permit from the United States Army Corps of Engineers (USACE) will not be required.
	CWA Section 401/Waste Discharge Requirement (WDR)	Jurisdictional Waters of the U.S. are absent from the Project Site; therefore, a Section 401 permit from the Regional Water Quality Control Board (RWQCB) will not be required. Jurisdictional Waters of the State (WOS) are present within the Project Site and will be impacted during Project activities; therefore, a Waste Discharge Requirement (WDR) permit from the Regional Water Quality Control Board (RWQCB) will be required.
	CWA Section 408	No facilities subject to Section 408 occur within the Project.
	Migratory Bird Treaty Act (MBTA)	Compliance with the MBTA will be achieved with pre-construction surveys for nesting birds within three days prior to initiation of work.
	Endangered Species Act (ESA)	Coastal California gnatcatcher (*Polioptila californica californica*; CAGN) a federally listed threatened bird was observed on the Project Site during the September 22, 2023 biological survey. Since this Project is within the MSHCP and the CAGN is an MSHCP covered species, no compensatory mitigation is proposed. A pre-construction nesting bird survey will be conducted prior to initiation of Project activities to avoid direct impacts to CAGN.
State	Section 1600 of the Fish and Game Code (FGC)	Jurisdictional Waters of the State are present; therefore, a Section 1600 permit from the California Department of Fish and Wildlife (CDFW) will be required.
	Sections 3503, 3503.5, and 3513 of the FGC	These FGC sections offer protection of nesting birds, birds-of-prey, and migratory birds. Compliance will be maintained with a pre-construction survey for nesting birds (including birds-of-prey and migratory birds) within three (3) days prior to initiation of work.
	Section 4150 of the FGC	Prohibits incidental or deliberate "take" of non-game mammals, including bats. Compliance will be maintained through pre-construction surveys for bats during the identified maternity season.
	Porter-Cologne Water Quality Control Act and Water Discharge Requirements (WDR)	WOS are present within the Project Site and will be impacted during Project activities; therefore, a WDR may be required.

Agency/ Organization	Laws/Regulations	Notes
County of Riverside	Western Riverside Multiple Species Habitat Conservation Plan (MSHCP)	The Project is located within the MSHCP and will therefore need to comply with provisions and regulations set forth by the MSHCP. MSHCP Consistency was determined in 2005/2006, and the Project impact boundary has not changed since this determination; therefore, no further MSHCP review was conducted.
City of Menifee	MSHCP Mitigation Fee	The Project proponent shall be required to pay City of Menifee's local development mitigation fee prior to issuance of a building permit.
Local Plans	Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan (HCP)	The Project is located within the SKR HCP; therefore, the Project will be required to comply with applicable provisions of the SKR HCP (which includes payment of a mitigation fee). During the biological assessment, no SKR individuals were observed, and the site provides low potential habitat for the species.
City of Menifee	City of Menifee Development Code Title 9, Article 4, Chapter 9.200	The purpose of this code is to protect trees, considered to be a valuable community resource, from indiscriminate cutting or removal, to ensure and enhance public health, safety and welfare through proper care, maintenance, and preservation of trees (City of Menifee n.d.), such as landscaping, irrigation systems and tree preservation represent a substantial investment in and potential benefit to the community. Heritage trees such as those with certain characteristics (age, size, species, location, historical influence, aesthetic quality, or ecological value) are subject to special attention and preservation efforts. The Project will be impacting trees planted in existing landscaping that may require a permit for removal.

3.1 Impacts Terminology

Potential impacts to biological resources that could result from implementation of the proposed Project are discussed in each of the Vegetation, Wildlife, and Jurisdictional Waters sections presented in this report.

Biological resources may be either directly or indirectly impacted by a project. Furthermore, direct and indirect impacts may be either permanent or temporary in nature. These impact categories are defined below. These terms will be used throughout the document.

- Direct Impact: Any loss, alteration, disturbance, or destruction of biological resources that would result from Project-related activities is a direct impact. Examples include vegetation clearing, encroaching into wetlands, diverting natural surface water flows, and the loss of individual species and/or their habitats. Direct impacts are long-term.
- Indirect Impact: As a result of Project-related activities, biological resources may also be affected in a manner that is not direct. Examples of indirect impacts include elevated noise, light, and dust levels, increased human activity, decreased water quality, erosion created by the removal of

vegetation, and the introduction of invasive plants and unnatural predators (e.g., domestic cats and dogs). These indirect impacts may be both short-term and long-term in their extent.

- Permanent Impacts: All impacts that result in the long-term or irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources.
- Temporary Impacts: Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include the generation of fugitive dust during construction, removing vegetation, and either allowing the natural vegetation to recolonize or actively revegetating the Project Site.

Under each section, potential impacts are discussed.

4.0 VEGETATION

4.1 Literature Review

4.1.1 Sensitive Plant Communities

Sensitive plant communities (sensitive habitats) as defined below, are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. Sensitive habitats are often threatened with local extirpation and are therefore considered as valuable biological resources. Plant communities are considered "sensitive" by the California Native Plant Society (CNPS) and CDFW if they meet any of the following criteria listed below.

- The habitat is recognized and considered sensitive by CDFW, United States Fish and Wildlife Service (USFWS), and/or special interest groups such as CNPS.
- The habitat is under the jurisdiction of the USACE pursuant to Section 404 of the CWA.
- The habitat is under the jurisdiction of the CDFW pursuant to Sections 1600 through 1612 of the FGC.
- The habitat is known or believed to be of high priority for inventory in the California Natural Diversity Database (CNDDB).
- The habitat is considered regionally rare.
- The habitat has undergone a large-scale reduction due to increased encroachment and development.
- The habitat supports special status plant and/or wildlife species (defined below).
- The habitat functions as an important corridor for wildlife movement.

The most current version of CDFW's List of California Sensitive Natural Communities indicates which natural communities are sensitive given the current state of the California classification (CDFW 2023b).

4.1.2 Special Status Plants

Species of plants are afforded "special status" by federal agencies, state agencies, and/or non-governmental organizations (e.g., USFWS, CDFW, CNPS, and United States Forest Service [USFS]) because of their recognized rarity, potential vulnerability to extinction, and local importance. These species typically have a limited geographic range and/or limited habitat and are referred to collectively as "special status" species. Plant species were considered "special status" species if they meet any of the following criteria:

- Taxa with official status under ESA, California Endangered Species Act (CESA), and/or the Native Plant Protection Act (NPPA).
- Taxa proposed for listing under ESA and/or CESA.
- Taxa identified as sensitive, unique, or rare, by the USFWS, CDFW, USFS, and/or the Bureau of Land Management (BLM).
- Plants that meet the definition of rare or endangered under the CEQA §15380(b) and (d). Species that may meet the definition of rare or endangered include the following:

   - Species considered by CNPS and CDFW to be “rare, threatened or endangered in California” (California Rare Plant Rank [CRPR] 1A, 1B and 2; CNPS 2019). A majority of the CRPR 3 and CRPR 4 plant species generally do not qualify for protection under CESA and NPPA.
   - Species that may warrant consideration on the basis of local significance or recent biological information.
   - Some species included on the CNDDB Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2023c).
- Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances. Examples include a species at the outer limits of its known range or a species occurring on an uncommon soil type.

Available literature and databases were reviewed regarding sensitive habitats and special status plant species. Special status plant species that have the potential to occur within the immediate region of the Property Boundary were identified. Several agencies, including the USFWS, CDFW, and CNPS publish lists of particular taxa (species and subspecies) and the associated level of protection or concern associated with each. Reviewed and consulted literature and databases focused on the Property Boundary and included the following sources listed below:

- The CNDDB, a CDFW species account database that inventories status and locations of rare plants and wildlife in California, was used to identify any sensitive plant communities and special status plants that may exist within a two-mile radius of the Property Boundary (CDFW 2023a).
- Online CNPS Inventory of Rare and Endangered Plants of California (CNPS 2023). A search for the United States Geological Survey (USGS) 7.5-Minute Topographic Map San Bernardino Quadrangle within a range of 150 - 700 meters elevation provided information regarding the distribution and habitats of special status vascular plants in the vicinity of the Project.
- A map of USFWS critical habitat to determine species with critical habitat mapped in the general vicinity of the Project (USFWS 2023a).
- The USFWS’s Information for Planning and Consultation online tool, which identifies species and critical habitat under USFWS jurisdiction that are known or expected to be on or near the Project area (USFWS 2023b).
- Pertinent maps, scientific literature, websites, and regional flora and fauna field guides.

As noted previously, species occurrence and distribution information are often based on documented occurrences where opportunistic surveys have taken place; therefore, a lack of records does not necessarily indicate that a given species is absent from the Property Boundary.

4.2 Field Methodology

The field survey was conducted within the Project Site on November 4, 2022 and September 22, 2023 by VCS biologists Sierra Valladares, Nathalie Munoz, and Wade Caffrey. During the survey, biologists walked the entirety of the Project Site paying special attention to those areas that could host sensitive vegetation communities or had the potential to provide suitable habitat for special status plant species. Plant species were identified using plant field and taxonomical guides, such as The Jepson Manual: Vascular Plants of California, second edition (Baldwin et al. 2012). All plant species encountered during the field survey were identified and recorded in field notes.

The vegetation communities and habitat conditions were inspected to confirm the presence and habitat quality of the vegetation found onsite. Where appropriate, descriptions of vegetation communities from the Manual of California Vegetation (Sawyer et al. 2008) were also utilized. Any deviations from standard vegetation classifications were made on best professional judgment when areas did not fit into a specific habitat description provided by the Manual. Vegetation communities were mapped using field observations and utilizing aerial imagery.

4.3 Results/Impacts

4.3.1 Vegetation Communities

Vegetation/land cover mapping and acreages for each vegetation community and land type within the Project Site can be found in Table 1 and Figure 5, *Vegetation Map*. Representative photographs of the Project Site are included as Appendix C.

Table 1. Vegetation Communities/Land Cover Observed within the Project Site

Vegetation Community/Land Cover Type	Acres
Brittle Bush Scrub	5.18
California Buckwheat Scrub	3.65
Tamarisk Thickets	0.07
Disturbed Developed	6.60
TOTAL	**15.50**

4.3.1.1 Brittle Bush Scrub (*Encelia farinosa* Shrubland Alliance)

Approximately 5.18 acres of the Project Site consists of brittle bush scrub. This vegetation community is dominated by brittle bush (*Encelia californica*) with other native species in lower cover such as California buckwheat (*Eriogonum fasciculatum*), doveweed (*Croton setiger*) and vinegar weed (*Trichostema lanceolatum*). Non-native species observed in this community include stinknet (*Oncosiphon piluliferum*), brome grasses (*Bromus* sp.), and shortpod mustard (*Hirschfeldia incana*).

4.3.1.2 California Buckwheat Scrub (*Eriogonum fasciculatum* Shrubland Alliance)

Approximately 3.65 acres of the Project Site consists of California buckwheat scrub. This vegetation community is dominated by California buckwheat. Other native species observed in low cover include brittle bush, doveweed, and vinegar weed. Non-native species observed in this community include stinknet, brome grasses (*Bromus* sp.), and shortpod mustard.

4.3.1.3 Tamarisk Thickets

Approximately 0.07 acres of the Project Site consists of tamarisk trees thickets (*Tamarix ramosissima*). This community is found along a small portion of one of the onsite drainages. Other species found in this community at low cover include stinknet and shortpod mustard.

4.3.1.4 Disturbed/Developed

Approximately 6.60 acres of disturbed/developed land was observed in the Project Site. This land cover type consists of dirt roads throughout the site and areas that have been previously disturbed with little to no vegetation cover. It also includes some ornamental landscaping along the southern boundary. The ornamental landscaping includes a few western sycamore trees (*Platanus racemosa*) and Peruvian pepper trees (*Schinus molle*).

4.3.1.5 Special Status Vegetation Communities

No special status vegetation communities occur within the site.

4.3.2 Plants

A total of 17 plant species were observed within the Project Site during the November 2022 and September 2023 surveys and are listed in Appendix D.

4.3.2.1 Sensitive Plant Species Occurring Onsite

One sensitive plant species, San Diego tarweed (*Deinandra paniculata*), was observed on the Project Site during the September 25, 2023 biological survey. San Diego tarweed has a CNPS rating of 4.2. This species was observed in various areas of the southern portion and eastern portion of the Project Site. This plant is not state or federally listed. The biologists noted the disturbed nature of the Project Site which appeared to be used frequently by offroad vehicles. San Diego tarweed’s rating of 4.2 indicates it is a lower ranking for risk and can be common where it does occur. Therefore, no mitigation is warranted for the limited impacts that may occur as a result of the Project.

4.3.2.2 Sensitive Plant Species with Potential to Occur

Sensitive plant species include federally or state listed threatened or endangered species and those species listed on CNPS’s rare and endangered plant inventory. Species with the potential to occur onsite were analyzed based on distribution, habitat requirements, and existing site conditions, and are listed in Appendix D. In total, only one sensitive plant species was deemed to have at least “low-moderate” or higher potential of occurring on the Project Site, the San Diego tarweed (discussed above) which was “present" within the Project Site. No significant direct and/or indirect impacts to these other special status plants are anticipated with Project implementation and no mitigation is warranted.

San Diego tarweed has a limited distribution in California but is known to be fairly common where it does occur. It does not have a federal or state listing as a threatened or endangered species. Additionally, it has a low ranking for risk on both the CNDDB’s Heritage Rankings and the CNPS Rare Plant Rankings. No mitigation will be required.

ROBINSON’S PEPPERGRASS (LEPIDIUM VIRGINICUM VAR. ROBINSONII)

Robinson’s peppergrass is an annual herb found in coastal sage scrub and chaparral communities. This species has a CRPR rating of 4.3 meaning it is of limited distribution but not very threatened in California (CNPS) and would not warrant mitigation if found. Due to the presence of coastal sage scrub vegetation on site, there is a moderate to high chance this species will occur onsite.

4.3.3 Potential Impacts to Vegetation Communities

A total of 15.5 acres of permanent impacts to four vegetation communities/land cover types will occur as a result of Project activities as shown in Table 2. The vegetation communities onsite are not considered sensitive; therefore, impacts to vegetation communities are considered less than significant.

Table 2. Potential Impacts to Vegetation Communities

Vegetation Community/Land Cover Type	Acres
Brittle Bush Scrub	5.18
California Buckwheat Scrub	3.65
Tamarisk Thickets	0.07
Disturbed Developed	6.60
TOTAL	**15.50**

4.3.4 Potential Impacts to Special Status Plants

SAN DIEGO TARWEED

San Diego tarweed was observed within the Project Site. San Diego tarweed's rating of 4.2 indicates it is a lower ranking for risk and can be common where it does occur. San Diego tarweed has a limited distribution in California but is known to be fairly common where it does occur. It does not have a federal or state listing as a threatened or endangered species. Additionally, it has a low ranking for risk on both the CNDDB's Heritage Rankings and the CNPS Rare Plant Rankings. Therefore, no mitigation is warranted for the limited impacts that may occur as a result of Project activities. Impacts are anticipated to be less than significant.

ROBINSON'S PEPPERGRASS

The biological surveys conducted for the Project were not conducted during the blooming period for this species therefore it is not known if this species occurs onsite. However, due to the 4.3 rating, this species is known to be fairly common in California. It does not have a federal or state listing as a threatened or endangered species. Therefore, no mitigation is warranted for the limited impacts that may occur as a result of Project activities. Impacts are anticipated to be less than significant.

4.3.5 Potential Impacts to Critical Habitat

The Project Site does not fall within or near critical habitat for any sensitive plant species; therefore, no impacts to critical habitat will occur.

5.0 WILDLIFE

5.1 Literature Review

Species of wildlife are afforded "special status" by federal agencies, state agencies, and/or non-governmental organizations because of their recognized rarity, potential vulnerability to extinction, and local importance. These species typically have a limited geographic range and/or limited habitat and are referred to collectively as "special status" species. Wildlife species were considered "special status" species if they meet any of the following criteria:

- Taxa with official status under ESA or California Endangered Species Act (CESA).
- Taxa proposed for listing under ESA and/or CESA.
- Taxa designated a species of special concern by CDFW.
- Taxa designated a state fully protected species by CDFW.
- Taxa identified as sensitive, unique or rare, by the United States Fish and Wildlife Service (USFWS), CDFW, USFS, and/or BLM.
- Taxa that meet the definition of rare or endangered under the CEQA §15380(b) and (d).
- Species considered locally significant; that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances. Examples include a species at the outer limits of its known range.

Special status wildlife species that have the potential to occur within the immediate region of the Project Site were identified. Several agencies, including the USFWS and CDFW publish lists of particular taxa (species and subspecies) and the associated level of protection or concern associated with each. Reviewed and consulted literature and databases focused on the Project Site and included the following sources listed below:

- The CNDDB was used to identify any special status wildlife that may exist within a two-mile radius of the Project Site (Figure 6, *CNDDB Animal Occurrences Map*; CDFW 2023a). CNDDB records are generally used as a starting point when determining what special status species, if any, may occur in a particular area. However, these records may be old, lack data not yet entered, and do not represent all the special status species that could be in that particular area.
- A map of USFWS critical habitat to determine species with critical habitat mapped in the general vicinity of the Project (USFWS 2023a).
- The USFWS's Information for Planning and Consultation online tool, which identifies species and critical habitat under USFWS jurisdiction that are known or expected to be on or near the Project area (USFWS 2023b).
- Pertinent maps, scientific literature, websites, and regional flora and fauna field guides.

The literature review provided a baseline from which to inventory the biological resources potentially occurring within the Project Site as well as the surrounding area. Although the inventory list of special status wildlife species was not exhaustive of all species that might be of concern for the property, it provided a wide range of species that are representative of the wildland habitats in the area. Species occurrence and distribution information is often based on documented occurrences where opportunistic surveys have taken place; therefore, a lack of records does not necessarily indicate that a given species is absent from the Project Site.

5.2 Field Methodology

The location of the Project is within the general distributional range of several special status wildlife species. The purpose of the November 2022 and September 2023 biological surveys was to verify the findings of previous surveys conducted in 2005 and 2006, and note those species observed, ascertain general site conditions, and identify habitat areas that could be suitable for special status wildlife species.

All wildlife species encountered visually or audibly during the field survey were identified and recorded in field notes. Signs of wildlife species including wildlife tracks, burrows, nests, scat and remains, were also recorded. Binoculars were used to aid in the identification of observed wildlife and in areas not accessible on foot. Wildlife field guides and photographs were used to assist with identification of wildlife species during the field survey, as necessary. A one-day survey cannot be used to conclusively determine presence or absence of a species; therefore, assessments of presence/absence and potential for occurrence were made based on presence of suitable habitat to support the species, diagnostic signs (burrows, scat, tracks, vocalizations, and nests), known records or occurrence within the area, known distribution and elevation range, and habitat utilization from the relevant literature.

5.2.1 Burrowing Owl

Focus burrowing owl surveys were conducted in April 2006. The results were negative, and it was determined that no burrowing owl occurred on the Project Site. The general biological survey conducted by VCS in November 2022 by Wade Caffrey and Sierra Valladares, was conducted to verify the accuracy of the prior findings in 2006. Literature review of pertinent databases such as CNDDB was conducted prior to the 2022 site visit. During the site visit, no suitable burrows or burrow surrogates were identified on the Project Site. Additional focus surveys are not recommended; however, as documented in the 2006 USFWS letter, a 30-day pre-construction survey will be conducted prior to implantation of the Project; therefore, MM BIO-2 will be implemented to ensure no impacts occur to burrowing owl.

5.3 Results

Representative photographs of the Project Site are included as Appendix C. The wildlife species or signs thereof observed within the Project Site during the field survey are listed in Appendix D.

5.3.1 Sensitive Wildlife Species with Potential to Occur

Sensitive wildlife species include the following classifications: federally or state listed threatened or endangered species, California species of special concern, and fully protected and protected species (as designated by CDFW). Species with the potential to occur onsite were analyzed based on distribution, habitat requirements, and existing site conditions.

A complete list of sensitive wildlife species analyzed with potential to occur within the Project Site is included in Appendix E.

Coastal California gnatcatcher was observed within the Project Site during the September 2023 survey. This is a covered species under the MSHCP.

Five special status species were determined to have at least a "low-moderate" potential or higher of occurring within the Project Site during the database review or were observed within the Project Site during surveys. All other species in Appendix E were deemed to have "low" potential of occurring onsite.

5.3.1.1 Coastal California Gnatcatcher

The coastal California gnatcatcher (CAGN) is found on the coastal slopes of southern California, from southern Ventura southward through Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties into Baja California, Mexico. This gnatcatcher typically occurs in or near coastal sage scrub, a habitat characterized by relatively low growing, dry-season deciduous, and succulent plants. Characteristic plants of these communities include California sagebrush, California buckwheat, laurel sumac, lemonade berry, bush penstemon, and various species of sage (*Salvia* spp.). They are particularly known for their "meowing" calls. This species was observed onsite during the September 2023 biological survey and suitable habitat including the brittle bush scrub and buckwheat scrub are present onsite. Focus surveys are not required in the MSHCP, since this is a covered species under the MSHCP. Pre-construction nesting surveys for CAGN are required only if work begins during the nesting season as described in MM BIO-1.

5.3.1.2 Burrowing Owl

Focus burrowing owl surveys were conducted in April 2006. The results were negative, and it was determined that no burrowing owl occurred on the Project Site. A burrowing owl habitat assessment was performed by VCS in November 2022 by Wade Caffrey and Sierra Valladares. Literature review of pertinent databases such as CNDDB was conducted prior to the 2022 burrowing owl habitat assessment of the Project Site. During the habitat assessment, no suitable habitat including suitable burrows or burrow surrogates were identified on the Project Site. Additional focus surveys are not recommended. A 30-day pre-construction survey should be conducted prior to the start of Project activities as required by the 2006 USFWS letter. MM BIO-2 will be implemented to ensure no impacts occur to burrowing owl.

5.3.1.3 Southern California rufous-crowned sparrow *(Aimophila ruficeps canescens)*

The southern California rufous-crowned sparrow is a CDFW Watch List species and is within the MSCHP Group 2. This species is known to inhabit coastal sage scrub and chaparral dominated areas. The Project Site contains marginal suitable habitat, therefore there is moderate to high potential for the species to occur onsite. MM BIO-1 will be implemented to prevent impacts to this species.

5.3.1.4 *Bell's Sparrow (Artemisiospiza belli belli)*

Bell's sparrow is a CDFW Watch List species. This species inhabits coastal sage scrub and chaparral dominated areas. Suitable habitat is present within the Project Site, therefore there is moderate to high potential for this species to occur. MM BIO-1 will be implemented to prevent impacts to this species.

5.3.1.5 Crotch's Bumble Bee (*Bombus crotchii*)

The Crotch's bumble bee is a CESA state listed as a candidate endangered species. This species lives in grassland and scrub habitats in coastal California and Baja California, Mexico. It was most commonly found in the Central Coast, but urbanization and agriculture activities contributed to its decline. Crotch's bumble bee nest in the ground, and prefer undisturbed habitat with native vegetation, which is plentiful within the Project Site and Property Boundary. Additionally, the general survey identified suitable pollen and nectar species for the bee, allowing for moderate to high potential for this species to occur. This species has been listed and unlisted several times, however, if the species is listed when construction is to begin, then a pre-construction survey will be required. If the species is observed onsite and will be impacted, an Incidental Take Permit (ITP) through CDFW will be required as described in MM BIO-6.

5.3.1.6 Orange-throated Whiptail (*Aspidoscelis hyperythra*)

The orange-throated whiptail is classified as a CDFW Watch List species, a USFS Forestry Service Sensitive species, and an IUCN species of Least Concern. The Project Site contains coastal sage scrub allowing for moderate to high potential to occur.

5.3.1.7 Coastal Whiptail (*Aspidoscelis tigris stejnegeri*)

The coastal whiptail is a CDFW Species of Special Concern. This species generally occurs within sparse scrub-type habitats such as open-canopy coastal sage scrub and chaparral, in addition to woodland and riparian habitats. The sage scrub habitat found throughout the Project Site provides suitable habitat for this reptile species allowing for high potential to occur.

5.3.1.8 San Diego Black-tailed Jackrabbit (*Lepus californicus bennettii*)

The San Diego black-tailed jackrabbit is restricted to the cismontane areas of southern California, extending from the coast to the Santa Monica, San Gabriel, San Bernardino, and Santa Rosa mountain ranges. Typical habitat includes sage scrub and chaparral in western Riverside County. The sage scrub habitat onsite provides suitable habitat for this species; however, the species typically occurs closer to the coast and mountain ranges, therefore, there is low to moderate potential for this species to occur onsite.

5.3.2 Critical Habitat

The USFWS's online service for information regarding Threatened and Endangered Species Final Critical Habitat designation within California was reviewed to determine if the Project occurs within any species designated Critical Habitat. A two-mile radius was analyzed for the presence of Critical Habitat and no Critical Habitat occurs on the Project Site; however, CAGN critical habitat occurs directly adjacent to the northern boundary of the Project Site and Property Boundary.

5.3.3 Wildlife Movement

Wildlife corridors link together areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. Corridors effectively act as links between different populations of a species. An increase in a population's genetic variability is generally associated with an increase in a population's health.

Corridors mitigate the effects of habitat fragmentation by:

- Allowing wildlife to move between remaining habitats, which allows depleted populations to be replenished and promotes genetic diversity;
- Providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events (such as fires or disease) will result in population or local species extinction; and
- Serving as travel routes for individual wildlife species as they move within their home ranges in search of food, water, mates, and other needs (Fahrig and Merriam, 1985; Simberloff and Cox, 1987; Harris and Gallagher, 1989).

Wildlife movement activities usually fall into one of three movement categories:

- Dispersal (e.g., juvenile animals from natal areas, individuals extending range distributions);
- Seasonal migration; and
- Movements related to home range activities (foraging for food or water, defending territories, searching for mates, breeding areas, or cover).

The Project Site is bordered by roads and urban development to the east and south which will not be impacted. The remaining area of the Property Boundary west of the Project Site consists of open land which connects to additional open land north and south and will not be impacted. The Project Site may function as a local wildlife dispersal, migration, and foraging area. The majority of the Property Boundary lies outside of the Project Site, where much of Property Boundary, which includes foothills and undeveloped land, will remain undisturbed and remain connected to undeveloped land to the north and south.

5.3.4 Avian Nesting and Bat Roosts

A few ornamental trees are present on the Project Site. Additionally, the shrub dominated areas provide suitable nesting habitat for shrub and ground-nesting avian species. There is potential for avian nesting and bat roosting in the Project Site within the landscape planted trees in the southern portion of the Project Site and within the Peruvian pepper trees in the middle portion of the Project Site. Biologists did not observe signs of nesting or roosting activity within the Project Site during the 2022 and 2023 biological surveys.

As stated previously, birds and bats are protected by the Migratory Bird Treaty Act (MBTA) and Section 4150 of the California Fish and Game Code respectively. The Project Site is in compliance with both due to MM BIO-1.

5.4 Project Impacts

5.4.1 Potential Impacts to Special Status Wildlife

As described above, one sensitive wildlife species (CAGN) was observed onsite, and four sensitive wildlife species were determined to have moderate or high potential to occur on the Project Site but were not observed. Direct impacts from Project activities could include injury to or mortality of individuals and destruction of active nests during vegetation removal and loss of foraging habitat, while indirect impacts could include general harassment or nest failure from noise and other disturbance in the vicinity of a nest. MM BIO-1 will be implemented to prevent the destruction of active nests. Impacts to special status wildlife are considered less than significant.

5.4.2 Potential Impacts to Critical Habitat

There is critical habitat for the CAGN that occurs directly adjacent to the northern boundary of the Project Site as shown in Figure 7, *USFWS Critical Habitat Map*. No impacts will occur to the critical habitat and MM BIO-1 and MM BIO-3 will be implemented. Impacts are considered less than significant.

5.4.3 Potential Impacts to Wildlife Movement/Nesting/Bat Roosts

As described above, the Project Site may serve as a function of local wildlife dispersal and foraging; however, due to the fact that the majority of the Property Boundary will remain undeveloped as open space, movement of wildlife will remain the same. This conservation of habitat within the Property

Boundary will help prevent habitat fragmentation and help maintain any role the Property Boundary plays in local wildlife dispersal and foraging. Therefore, no long-term or significant effects to wildlife movement are anticipated due to Project implementation.

6.0 JURISDICTIONAL WATERS

6.1 Delineation Statement

6.1.1 Waters of the United States

The Project Site was assessed for jurisdictional wetland and non-wetland Waters of the U.S. To determine the presence of a wetland, three indicators are required: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. The methodology published in the USACE 1987 Wetland Delineation Manual, and the Arid West Supplement sets the standards for meeting each of the three indicators, which normally require that 50% or more dominant plant species typical of a wetland, soils exhibiting characteristics of saturation, and hydrological indicators be present.

Jurisdictional non-wetland Waters of the U.S. are typically determined through the observation of an Ordinary High Water Mark (OHWM), which is defined as the "line on the shore established by the fluctuation of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." The following guidance documents were utilized in making this determination:

- Field Guide to OHWM Determinations in the Arid West (August 2008);
- Updated OHWM Datasheet for the Field Guide to OHWM Determinations in the Arid West (July 2010); and
- Ordinary High Flows and the Stage-Discharge Relationship in the Arid West Region (2011).

Projects with impacts to Waters of the U.S. are regulated under Sections 401 and 404 of the Clean Water Act and by connectivity with adjacent watersheds. Note, the RWQCB has updated their definition of a wetland to include areas that have hydric soils and wetland hydrology but lack hydric vegetation (e.g., vernal pools). This update took effect May 28, 2020.

Additionally, on May 25, 2023, the United States Supreme Court issued its decision in *Sackett v. Environmental Protection Agency*, narrowing the scope of federal jurisdiction over wetlands under the Clean Water Act to "relatively permanent bod[ies] of water connected to traditional interstate navigable waters); and second, that … have a continuous surface connection with that water" (*Sackett v. EPA*, No. 21–454 (2023)). On August 29, 2023, the USACE and EPA issued a final rule to amend the final "Revised Definition of 'Waters of the United States' rule, published in the Federal Register on January 18, 2023. This final rule conforms the definition of "waters of the United States" to the U.S. Supreme Court's May 25, 2023, decision in the case of *Sackett v. Environmental Protection Agency*. The conforming rule, "Revised Definition of 'Waters of the United States'; Conforming," published in the Federal Register and became effective on September 8, 2023 (EPA, 2023). Therefore, it is anticipated that the waters onsite, all of which are ephemeral and do not have a continuous surface connection, will no longer be considered Waters of the U.S.

6.1.2 Waters of the State

The Project Site was also assessed for jurisdictional streambed and riparian Waters of the State. The CDFW and the RWQCB take jurisdiction over Waters of the State and Riparian/Riverine resources (California Fish and Game Code §§1600 et seq.; California Code of Regulations, Title 14, §720). Section 1602 of the California Fish and Game Code applies to natural rivers, streams, and lakes:

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

CDFW defines a stream as "a body of water that flows perennially or episodically and that is defined by the area in which water currently flows, or has flowed, over a given course during the historic hydrologic course regime, and where the width of its course can reasonably be identified by physical or biological indicators". CDFW regulates wetland areas only to the extent that those wetlands are part of a stream, river, or lake as defined by the CDFW.

CDFW jurisdiction includes ephemeral, intermittent and perennial watercourses and extends to the top of the bank of a stream or lake if unvegetated, or to the limit of the adjacent riparian habitat located contiguous to the watercourse if the stream or lake is vegetated.

6.2 Literature Review

The following sources were reviewed to determine the potential presence or absence of jurisdictional streams/drainages, wetlands, lakes, and their location within the watersheds associated with the Project Site and other features that might contribute to federal or state jurisdictional authority located within watersheds associated with the Project Site.

- National Wetlands Inventory (NWI) maps (USFWS 2023c). The NWI database indicates potential wetland areas based on changes in vegetation patterns as observed from satellite imagery. This database is used as a preliminary indicator of wetland habitats because the satellite data are not precise;
- USGS National Hydrography Dataset. Provides the locations of "blue-line" streams as mapped on 7.5-Minute Topographic Map coverage;
- Aerial Imagery;
- USGS 7.5-Minute Topographic Maps; and
- Natural Resource Conservation Service (NRCS) Soil Survey.

6.3 Field Methodology

During the November 2022 and September 2023 general biological surveys, VCS biologists assessed the presence or absence of potential jurisdictional streams/drainages on the Project Site. Accessible areas of the Project Site were walked and jurisdictional features, including their approximate location, length, width, and associated vegetation, were recorded using ESRI ArcCollector on an iPhone.

Prior to the field surveys, Google Earth, and the National Wetlands Inventory (NWI) Online Mapper were used to review aerials of the Survey Area and identify any potential jurisdictional Waters of the U.S. features. Following the field surveys, ESRI ArcMap and Google Earth were used in combination with the field survey results to delineate and map relevant habitats and jurisdictional waters. The resulting Geographic Information System (GIS) data was then used to quantify the extent of each feature.

6.4 Results

6.4.1 Jurisdictional Waters

Waters of the State were mapped in the Project Site totaling 0.39 acres of ephemeral streambed which has increased from the previously documented 0.11 acres. The entirety of the 0.39 acres deemed Waters of the State is expected to be impacted (Figure 10; *Jurisdictional Waters Map*). The majority of streambeds documented in the Project Site flow from the hills in the west to the east eventually connecting to an existing concrete v-ditch which flows south to an existing culvert leading offsite to the south/southeast. These drainages are deemed Waters of the State. Therefore, CDFW 1600 permits, and Waste Discharge Requirements (WDR) will be necessary. Drainage features 1F and 1G were included in the 2005/2006 MSHCP Consistency and Biological Constraints Analysis by Michael Brandman Associates for the Project, but our newly reported drainage features start their numbering at 1A. The new features detailed below were present at the time of the initial biological review in 2005, however, interpretations by the State have expanded since then and the additional minor tributaries to the large drainages are anticipated to be jurisdictional under today's regulatory environment.

- Feature 1A: is a single small, concrete v-ditch which flows southward along the eastern boundary of the Project Site. This feature has a width of 1 meter (approximately 3 feet) and length of 958.5 feet and contains streambed Waters of the State. This feature would not be considered Waters of the State and it was not mapped previously.
- Feature 1B: is a single, earthen ephemeral feature in the hills on a downhill slope and leads to Feature 1A which leads to the existing culvert in the southeastern corner of the site. This drainage has a width of 2.3 feet and length of 220.6 feet and contains streambed Waters of the State.
- Feature 1C: is a single, earthen ephemeral feature in the hills on a downhill slope and leads to Feature 1A which leads to the existing culvert in the southeastern corner of the site. This drainage has an average width of 4.15 feet and length of 246.2 feet and contains streambed Waters of the State.
- Feature 1D: is a single, earthen ephemeral feature in the hills on a downhill slope and leads to Feature 1A which leads to the existing culvert in the southeastern corner of the site. This drainage has an average width of 3.77 feet and length of 594.7 feet and contains streambed Waters of the State.
- Feature 1E: is a single, earthen ephemeral feature. It flows southeast into Feature 1F. This drainage has a width of 3.3 feet and length of 270.9 feet and contains streambed Waters of the State.
- Feature 1F: is an earthen ephemeral feature bisecting the Project west to east connecting to Feature 1A. It also contains one smaller drainage that branches off the main drainage but does not connect to any other drainages. This drainage has an average width of 5.91 and length of 946.9 feet and contains Waters of the State.
- Feature 1G: is an earthen ephemeral drainage crossing the site west to east in the southern portion of the Project Site. This drainage has an average width of 4.75 feet and length of 706.1 feet and contains Waters of the State.

Table 3. Jurisdictional Features on the Project Site and Impacts

Jurisdictional Feature	Waters Impacts (acres)	Waters Impacts (linear feet)
Streambed WOS/MSHCP Riverine	0.39	3,944
Total	**0.39**	**3,944**

6.4.2 National Wetland Inventory

The USFWS is the principal Federal agency that provides information to the public on the extent and status of the Nation's wetlands. The USFWS has developed a series of maps, known as the National Wetland Inventory (NWI) to show wetlands and deepwater habitat. This geospatial information is used by federal, state, and local agencies, academic institutions, and private industry for management, research, policy development, education, and planning activities. The NWI program was neither designed nor intended to produce legal or regulatory products; therefore, wetlands identified by the NWI program are not the same as wetlands defined by the USACE. Multiple aquatic features are mapped within the Project Site according to the USFWS's National Wetland Inventory (NWI) (USFWS [2023c]) (Figure 8, *National Wetlands Inventory Map*).

The NWI is used as a reference and any features from the NWI were confirmed via field surveys. The NWI can be based on historical aerials and information. One NWI feature was mapped within the Project Site and confirmed in the field. This feature is mapped as Feature 1F on Figure 10, *Jurisdictional Waters Map*,.

6.4.3 Hydrology

Multiple drainages were observed within the Project Site. The Project Site is generally sloped with elevation increasing as you move west and decreasing as you move east. Water would generally drain east/southeast/south from the hills in the western portion of the Property Boundary. All drainage courses observed within the Project Site consists of ephemeral streambed and are considered streambed Waters of the State; no wetlands or riparian drainage courses were observed. Additionally, one culvert is located in the southeastern corner of the Project Site.

6.4.4 Soils

The United States Department of Agriculture NRCS (NRCS 2020) identifies three soil types present within the Project Site (Figure 9, *Soil Map*):

- Lodo rocky loam, 8-25% percent slopes, eroded (LpE2): This soil type consists of somewhat excessively drained soils with parent material of metamorphosed residuum weather from sandstone. This soil type is typically found on hills with a typical profile consisting of gravelly loam and unweathered bedrock.
- Lodo rocky loam, 25-50% slopes, eroded (LpF2): The soil type consists of shallow, somewhat excessively drained soils that formed in material weathered from hard shale and fine-grained sandstone. Lodo soils are on uplands with a typical profile consisting of gravelly loam and unweathered bedrock.
- Ysidora gravelly very fine sandy loam, 8-25% slopes, severely eroded (YsE3): This soil type consists of moderately well drained soils with parent material of alluvium derived from metasedimentary

rock. Typically found on alluvial fans, the typical profile consists of gravelly very fine sandy loam, gravelly clay loam, and cemented soils.

7.0 CUMULATIVE IMPACTS

Cumulative impacts are defined as the direct and indirect effects of a proposed Project which, when considered alone, would not be deemed a substantial impact, but when considered in addition to the impacts of related projects in the area, would be considered significant. "Related projects" refers to past, present, and reasonably foreseeable probable future projects, which would have similar impacts to the proposed Project. CEQA deems a cumulative impact analysis to be adequate if a list of "related projects" is included in the EIR or the proposed Project is consistent with an adopted general, specific, master, or comparable programmatic plan [Section 15130(b)(1)(B)]. CEQA also states that no further cumulative impact analysis is necessary for impacts of a proposed Project consistent with an adopted general, specific, master, or comparable programmatic plan [Section 15130(d)].

The MSHCP was developed to address the comprehensive regional planning effort and anticipated growth in the County of Riverside. Additionally, the MSHCP has set aside areas for conservation in order to address the cumulative impact of development within Riverside County. The Project remains consistent with the MSHCP, SKR HCP, and the City's General Plan; therefore, the Project's cumulative impacts would not be considered significant.

8.0 BMPS AND MITIGATION MEASURE RECOMMENDATIONS

8.1 BMPs and Avoidance Measures

Implementation of general Best Management Practices (BMPs) are recommended to the extent practical. Key aspects of the BMPs are to clearly delineate the limits of disturbance, use properly maintained equipment, develop procedures for minimizing the likelihood of spills and to control sediment, ensure worker safety, and minimize impacts to biological resources on and adjacent to the Project Site. The following Project design features are recommended:

- Work area limits will be clearly defined and visible. All construction boundaries will be marked with flagging, staking, or fencing.
- All vehicles and equipment will be in proper working condition and will be checked regularly for leaks prior to use to ensure that there is no potential for fugitive emissions of motor oil, fuel, antifreeze, hydraulic fluid, grease, or other hazardous materials.
- Any litter or rubbish will be collected and disposed of in appropriate containers with lids to avoid attracting wildlife species to the Project Site.
- Dust control measures, such as watering trucks, shall be implemented during construction to reduce the impact of fugitive dust on the adjacent habitats.

The MSHCP Volume 1, Appendix C, outlines standard BMPs which are intended in part to reduce impacts to plant communities, special status plant and wildlife species, and jurisdictional waters. Since the Project Site is located within the MSHCP boundary, the Project will be required to comply with the standard BMPs found in Appendix C of the MSHCP. The Project will comply with the following, as applicable, which are based on the standard MSHCP BMPs:

- A condition shall be placed on grading permits requiring a qualified biologist to conduct a training session for Project personnel prior to grading. The training shall include a description of the species of concern and its habitats, the general provisions of the ESA and the MSHCP, the need to adhere to the provisions of the ESA and the MSHCP, the penalties associated with violating the provisions of the ESA, the general measures that are being implemented to conserve the species of concern as they relate to the Project, and the access routes to and Project Site boundaries within which the Project activities must be accomplished.
- Water pollution and erosion control plans shall be developed and implemented in accordance with RWQCB requirements.
- The Site of disturbance shall be minimized to the maximum extent feasible. Access to sites shall be via pre-existing access routes to the greatest extent possible.
- The upstream and downstream limits of Project disturbance plus lateral limits of disturbance on either side of the stream shall be clearly defined and marked in the field, in a manner appropriate to the field conditions, and reviewed by the biologist prior to initiation of work. [Note: the limits are meant to protect onsite and offsite avoided drainages and habitats].
- Projects should be designed to avoid the placement of equipment and personnel within the stream channel or on sand and gravel bars, banks, and adjacent upland habitats used by target species of concern.

- Projects that cannot be conducted without placing equipment or personnel in sensitive habitats should be timed to avoid the breeding season of riparian species identified in MSHCP Global Species Objective No. 7.
- When stream flows must be diverted, the diversions shall be conducted using sandbags or other methods requiring minimal instream impacts. Silt fencing of other sediment trapping materials shall be installed at the downstream end of construction activity to minimize the transport of sediments offsite. Settling ponds where sediment is collected shall be cleaned out in a manner that prevents the sediment from re-entering the stream. Care shall be exercised when removing silt fences, as feasible, to prevent debris or sediment from returning to the stream.
- Equipment storage, fueling, and staging areas shall be located on upland sites with minimal risks of direct drainage into riparian areas or other sensitive habitats. These designated areas shall be located in such a manner as to prevent any runoff from entering sensitive habitat. Necessary precautions shall be taken to prevent the release of cement or other toxic substances into surface waters. Project related spills of hazardous materials shall be reported to appropriate entities including but not limited to applicable jurisdictional city, USFWS, CDFW, and RWQCB, and shall be cleaned up immediately and contaminated soils removed to approved disposal areas.
- Erodible fill material shall not be deposited into water courses. Brush, loose soils, or other similar debris material shall not be stockpiled within the stream channel or on its banks.
- The qualified Project biologist shall monitor vegetation clearing to ensure that practicable measures are being employed to avoid incidental disturbance of habitat and species of concern outside the Project Site.
- The removal of native vegetation shall be avoided and minimized to the maximum extent practicable. Temporary impacts shall be returned to pre-existing contours and revegetated with appropriate native species.
- Exotic species that prey upon or displace target species of concern should be permanently removed from the site to the extent feasible.
- To avoid attracting predators of the species of concern, the Project Site shall be kept as clean of debris as possible. All food related trash items shall be enclosed in sealed containers and regularly removed from the site(s).
- Construction employees shall strictly limit their activities, vehicles, equipment, and construction materials to the proposed Project Site and designated staging areas and routes of travel. The construction area(s) shall be the minimal area necessary to complete the Project and shall be specified in the construction plans. Construction limits will be fenced with orange snow screens or other appropriate material. Exclusion fencing should be maintained until the completion of all construction activities. Employees shall be instructed that their activities are restricted to the construction areas.
- The Permittee shall have the right to access and inspect any sites of approved projects including any restoration/enhancement area for compliance with Project approval conditions including these BMPs.

8.2 Mitigation Measures

The following mitigation measures are taken from the 2005/2006 MSHCP Consistency and Biological Constraints Analysis by Michael Brandman Associates and the 2006 USFWS Formal Section 7 Consultation Letter. Note, BIO-5 has been modified and BIO-6 was added to be consistent with current site conditions.

BIO-1 **Nesting Birds.** There is suitable avian nesting habitat on the Project Site. If the clearance of vegetation occurs during the avian nesting season (February to August), it is recommended that a pre-construction nesting bird survey be conducted prior to any vegetation disturbance activities. If passerine birds are found to be nesting or there is evidence of nesting behavior inside or within 250-feet of the impact area, a 250-foot buffer will be required around the nest where no vegetation disturbance would be permitted. For raptor species (birds of prey, such as hawks and owls), this buffer is expanded to 500-feet. A qualified biologist would be required to monitor the nest closely until it is determined that the nest is no longer active, at which time vegetation removal could continue. All construction activity within the vicinity of active nests must be conducted in the presence of a qualified biological monitor. Construction activity may encroach into the buffer area at the discretion of the biological monitor.

BIO-2 **Burrowing Owl.** A qualified biologist will conduct a pre-construction presence/absence survey for burrowing owls within 30 days prior to site disturbance. If burrowing owls are documented on site, the owls will be relocated/excluded from the site outside of the breeding season following accepted protocols, as specified in the MSHCP.

BIO-3 **Urban/Wildlands Interface.** To address MSHCP guidelines pertaining to the Urban/Wildlands Interface, the Project should incorporate the following:

1. Untreated surface runoff from developed and paved areas into the PQP lands will be avoided;
2. Manufactured slopes will not extend into the PQP lands;
3. A stone wall barrier will be erected adjacent to development on the Project's northern border;
4. Landscaping will avoid the use of invasive species listed on Table 6-2 of the MSHCP
5. No night lighting will be used; and
6. Pre-and post-construction best management practices will be implemented.

BIO-4 **Stephen's Kangaroo Rat**. The Project Site contains marginally suitable habitat for SKR and is located within the boundaries of the Habitat Conservation Plan (HCP) for Stephens' Kangaroo Rat in Western Riverside County. With adherence to the HCP's IA and payment of the County's per-acre mitigation fee for this species, no further action is required.

BIO-5: **Jurisdictional Features**. The Project Site contains drainage features totaling 0.39-acre of CDFW and RWQCB jurisdiction. Due to impacts that will occur to the jurisdictional features, regulatory permits will be required from CDFW and RWQCB.

BIO-6 **Crotch's Bumble Bee**. Crotch's bumble bee is a CDFW candidate endangered species, and it will be surveyed for prior to construction. An Incidental Take Permit (ITP) would be processed prior to grading with CDFW should the species be present if the Fish and Game Commission (FGC) continues to list the species.

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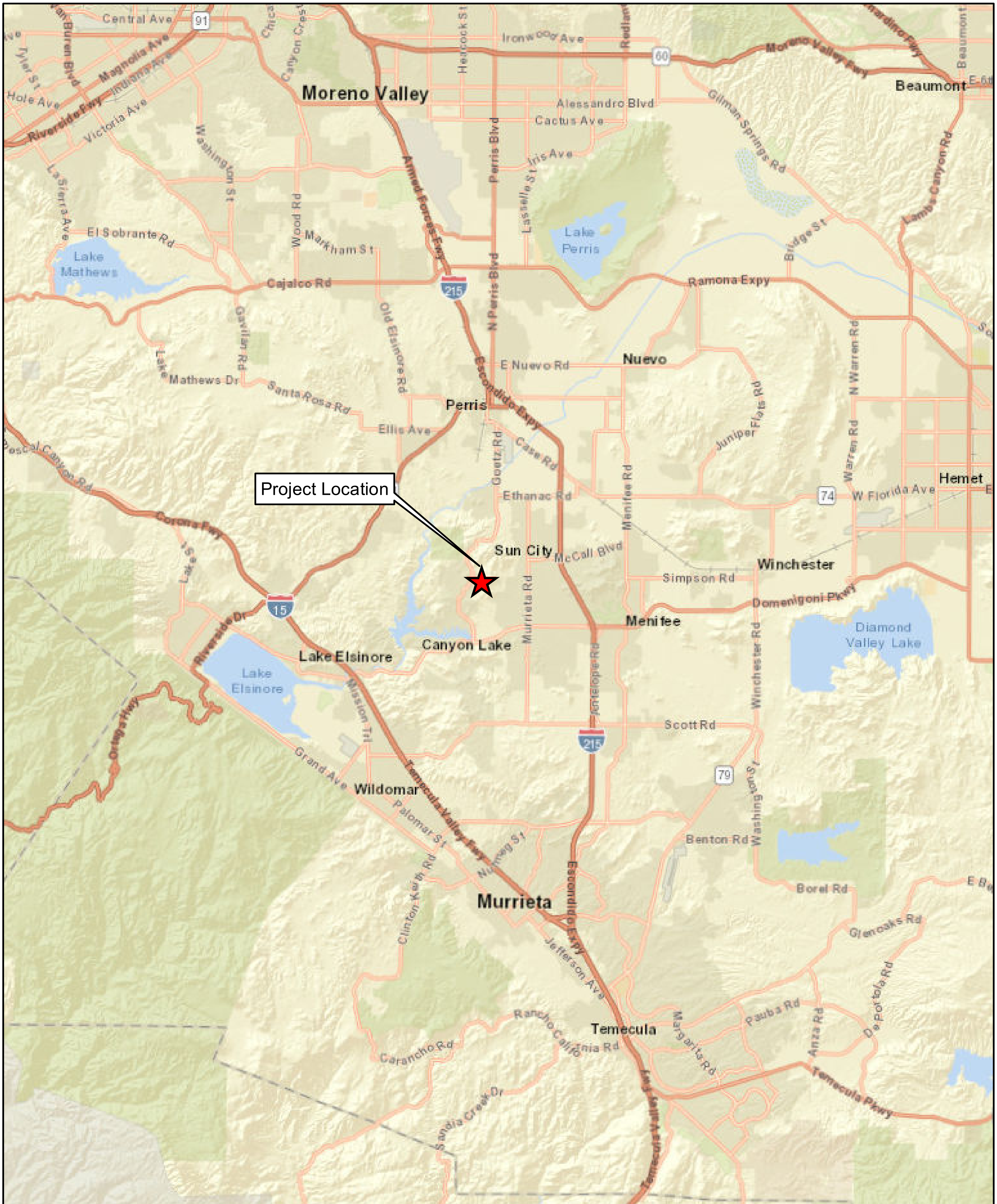
Figures



Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

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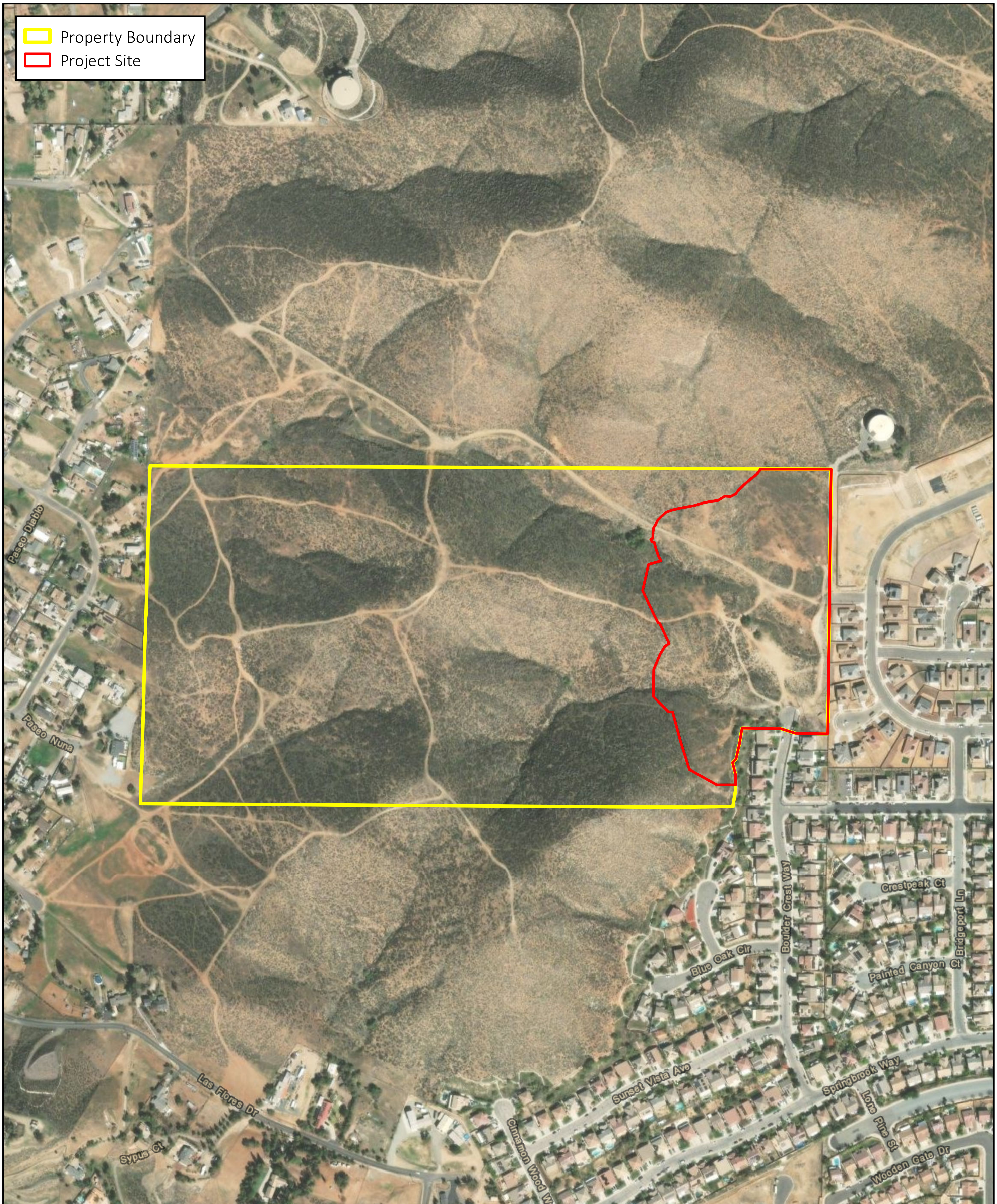
Oak Hills

Figure 1

Regional Map



Prepared By:

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Map Created: August 2023
Data Sources: ESRI

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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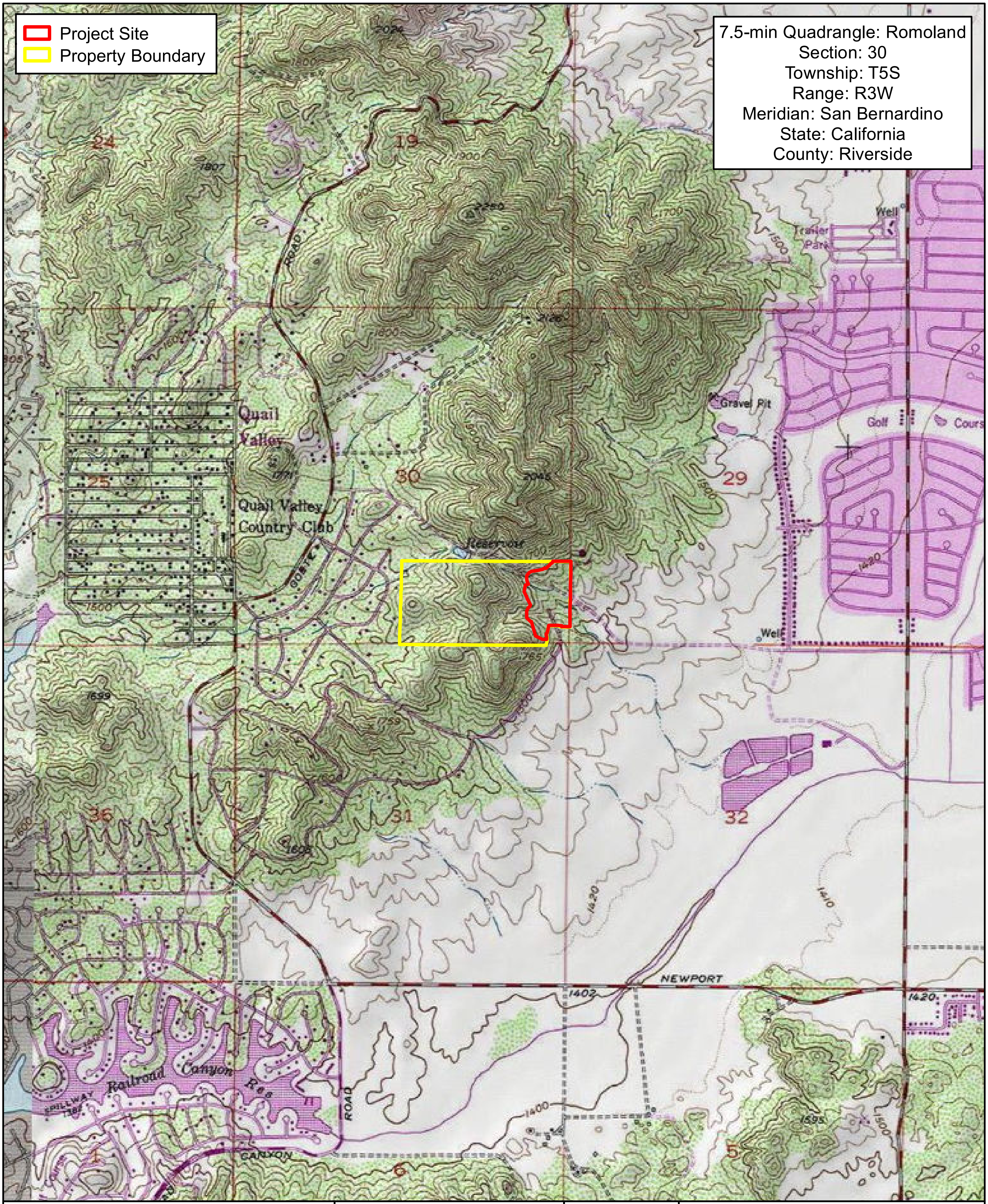
Oak Hills

Figure 2

Aerial Map



Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI, USGS

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

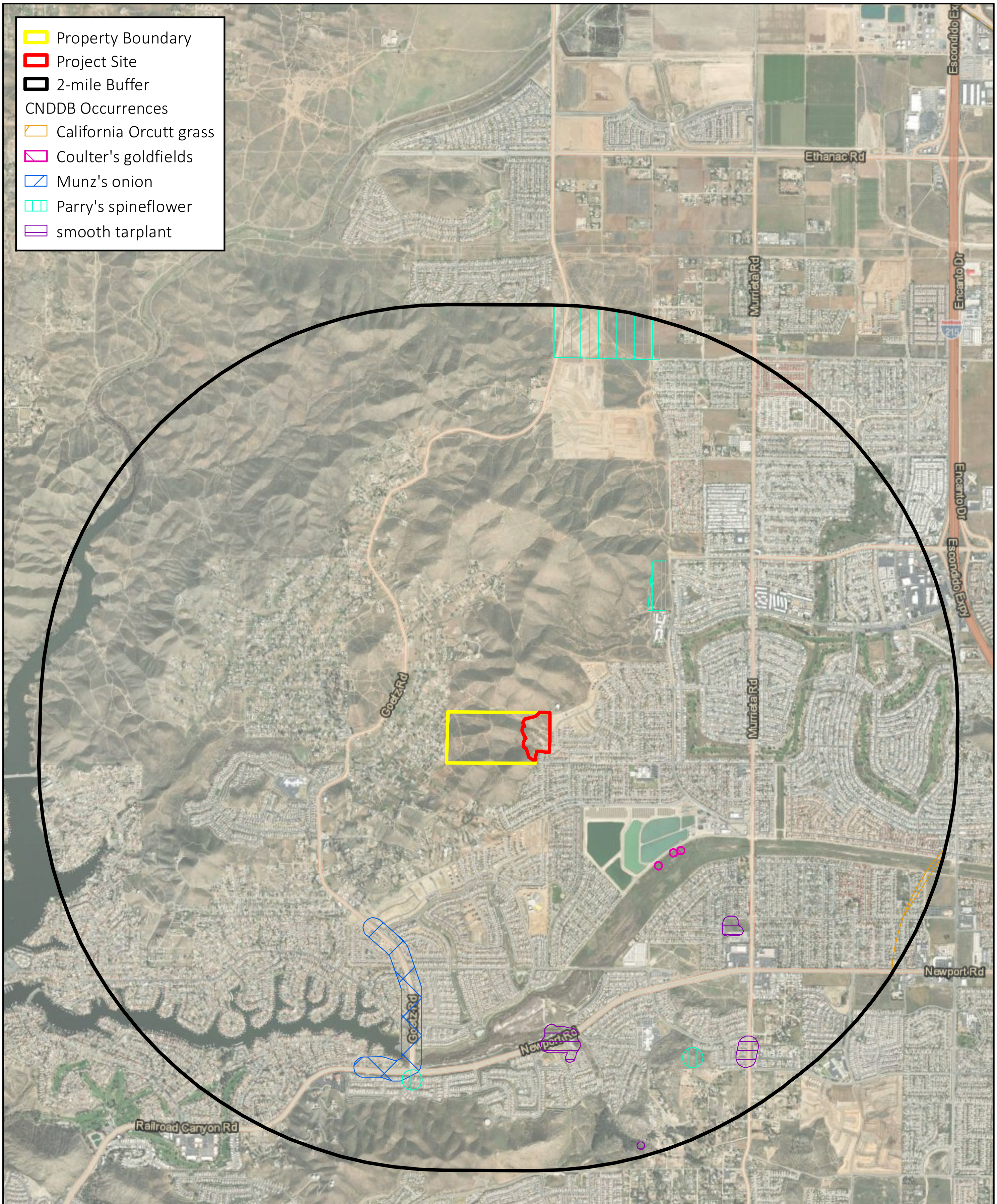
0 1,200 2,400
Feet
1:24,000

N
W E
S

Oak Hills

Figure 3

USGS Topographic Map



Prepared By:

VCS Environmental

Map Created: October 2023
Data Sources: ESRI, CNDDB

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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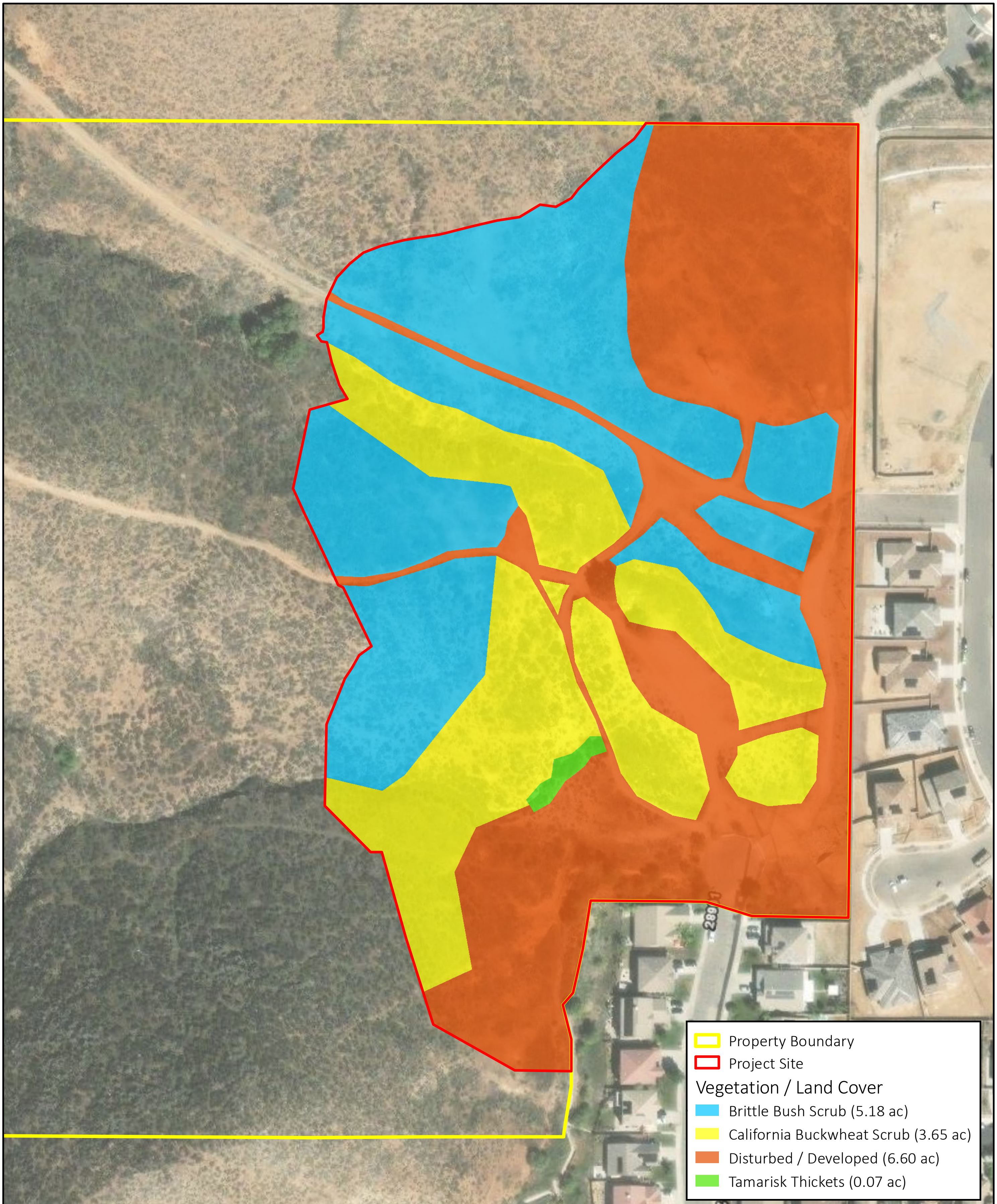
Feet
1:40,000

N W E S

Oak Hills

Figure 4

CNDDB Plant Occurrences Map



Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

0 100 200
Feet
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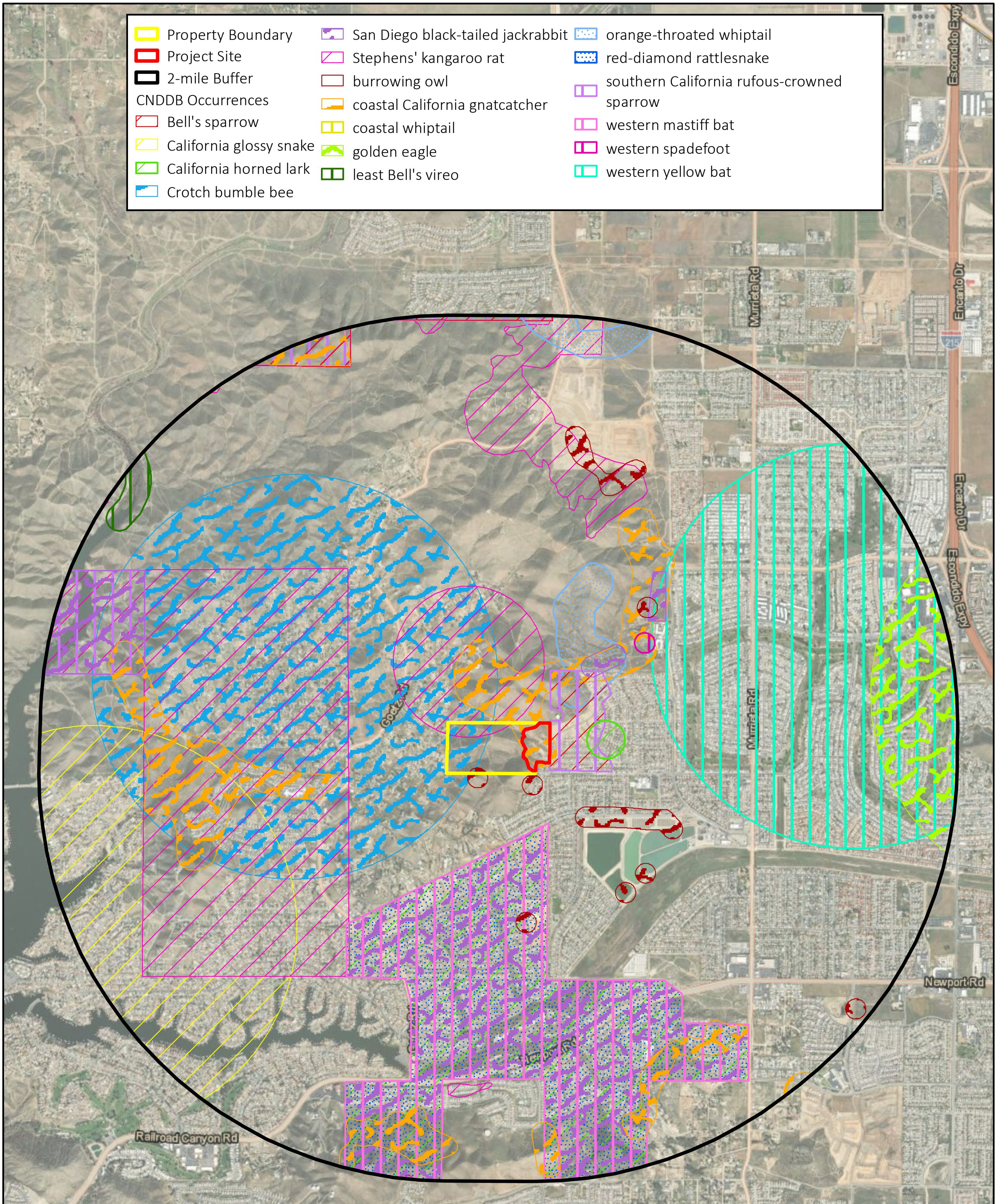
N W E S

Oak Hills

Figure 5

Vegetation Map



Prepared By:

VCS Environmental

Map Created: October 2023
Data Sources: ESRI, CNDDB

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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Feet
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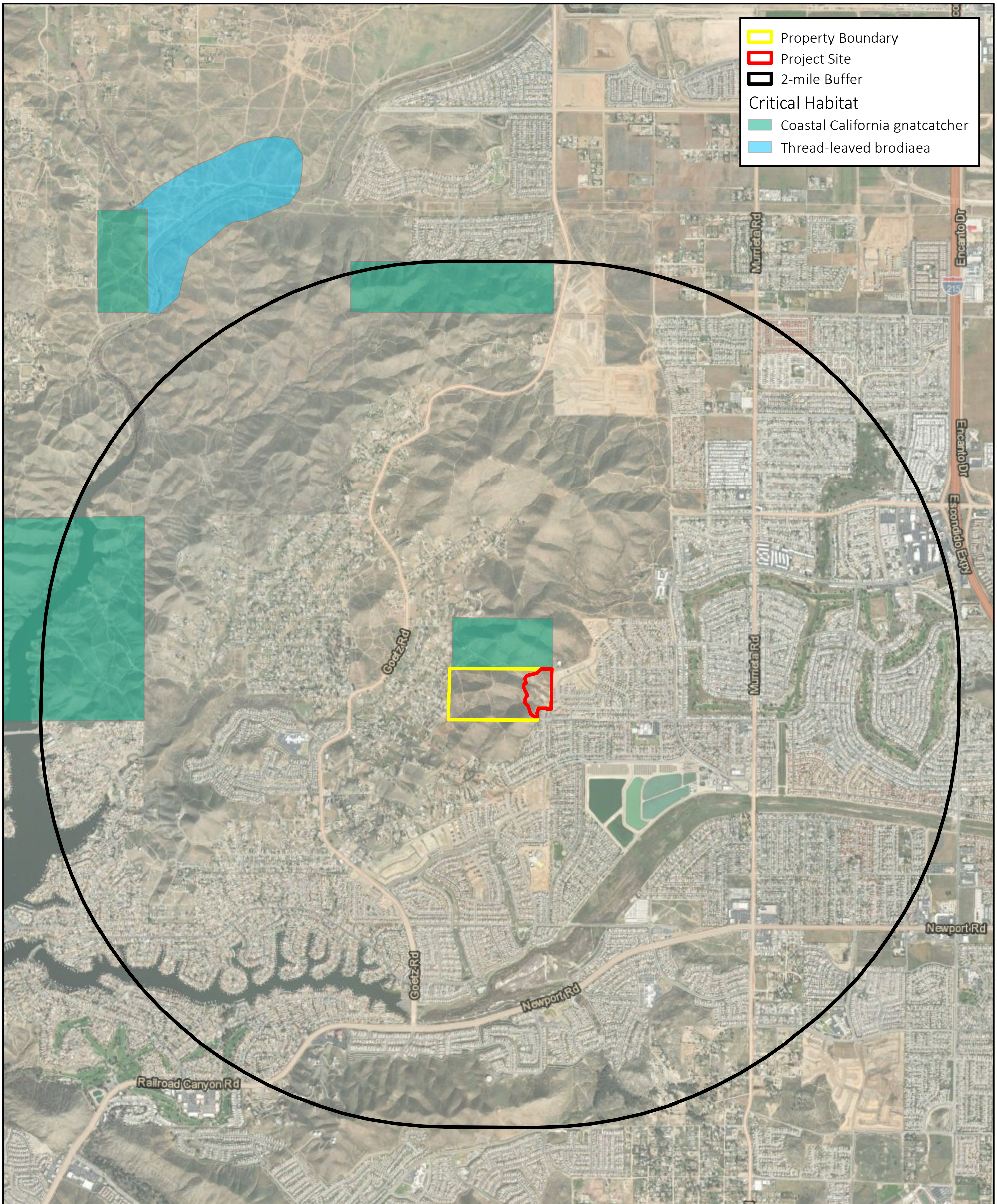
N W E S

Oak Hills

Figure 6

CNDDB Animal Occurrences Map



Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI, USFWS

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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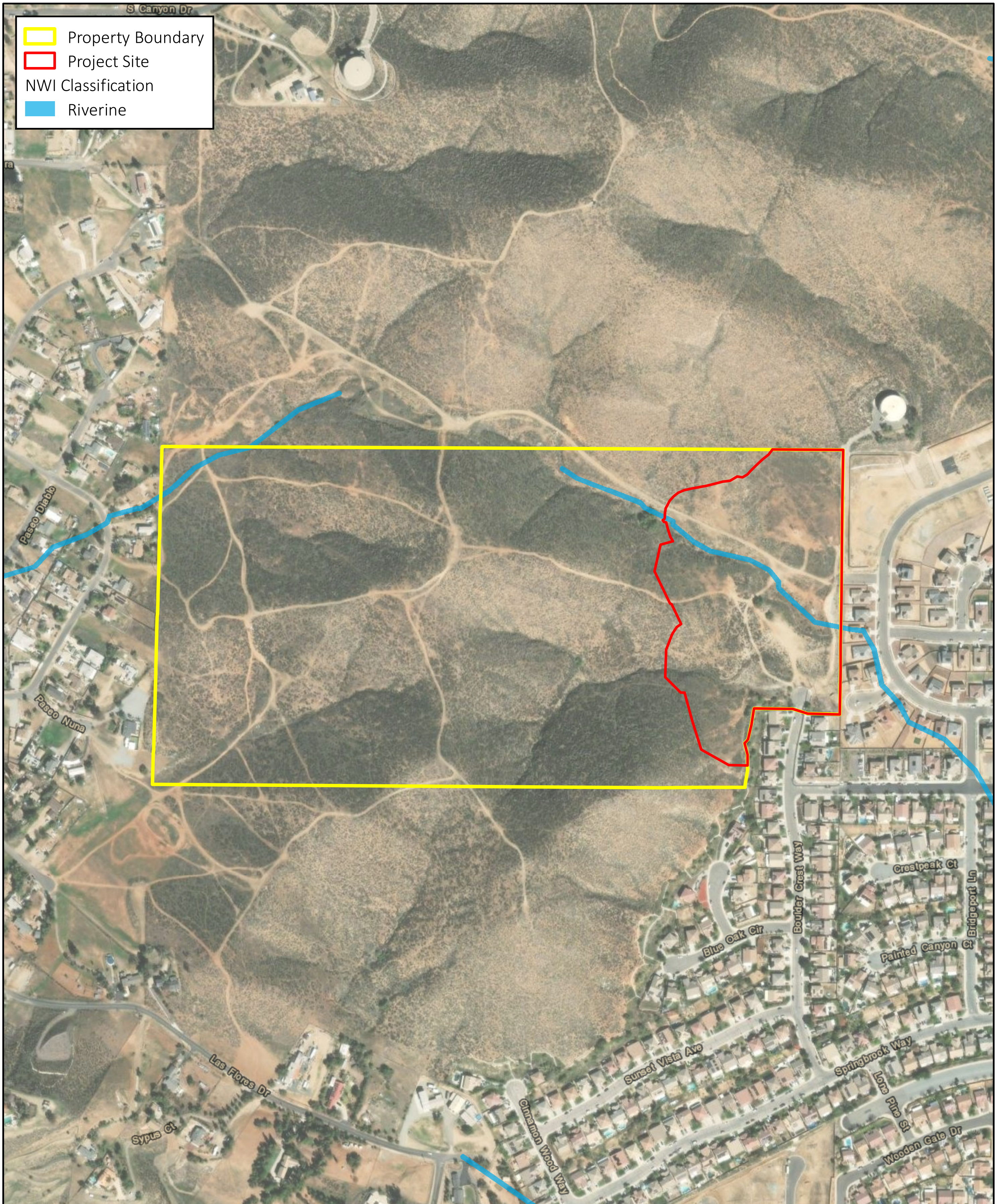
Oak Hills

Figure 7 USFWS Critical Habitat Map



Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI, NWI

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

0 300 600

Feet

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N
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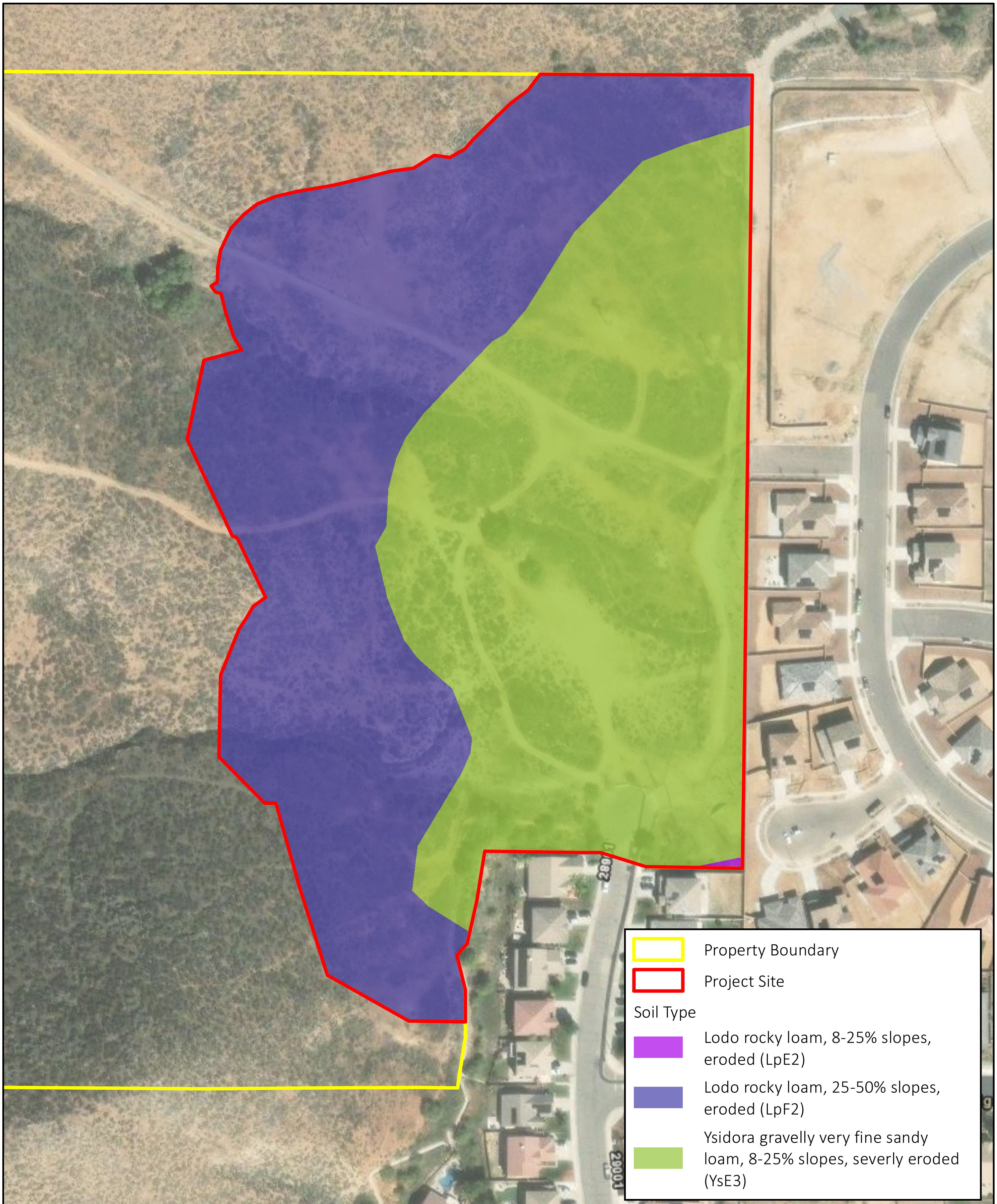
Figure 8

Oak Hills

National Wetland Inventory Map



Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI, NRCS

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

0 100 200
Feet
1:2,000

N
W E
S

Oak Hills

Figure 9

Soil Map

Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

0 100 200
Feet
1:2,000

N
W E
S

Oak Hills

Figure 10 Jurisdictional Waters Map

APPENDIX A

MSHCP Consistency and Biological Constraints Analysis

Habitat Assessment
MSHCP Consistency and Biological Constraints Analysis
121-Acre Tentative Tract 28920
Riverside County, California

APNs 341-160-002 and 341-160-003
Romoland USGS 7.5-minute Topographic Quadrangle
Section 30 and 31 Township 5 South, Range 3 West

Prepared for:

John Laing Homes
255 East Rincon Street, Suite 100
Corona, CA 92879

Contact: Ms. Linda Valia

Prepared by:

Michael Brandman Associates
220 Commerce, Suite 200
Irvine, CA 92602
714.508.4100

Contact: Kelly Rios, Biologist

Survey Conducted By: Kelly Rios,
Survey Conducted On: July 15, 2005

Report Date: August 12, 2005
Revised Report Date: January 25, 2006

Habitat Assessment
MSHCP Consistency and Biological Constraints Analysis
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TABLE OF CONTENTS

LIST OF EXHIBITS

SUMMARY

This report contains the results of a Habitat Assessment and Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Consistency Analysis for a 121-acre property, located in the community of Sun City, unincorporated Riverside County, California. The Project Site is located within Sun City/Menifee Valley Area Plan of the MSHCP but not within a Criteria Cell.

The Site is located within an MSHCP-designated habitat assessment survey area for burrowing owl (*Athene cunicularia*) (BUOW). The Site contains suitable habitat for burrowing owl.

The Site does not contain any riparian/riverine areas and/or vernal pools and does not contribute any function or value to any riparian habitat downstream. The Site is not located within an MSHCP-designated linkage. The closest proposed conservation area (Criteria Cell) occurs approximately two miles northwest of the Site and thus an urban/wildlands interface analysis is not required.

Suitable habitat for Stephens' kangaroo rat (*Dipodomys stephensi*) (SKR) is present onsite and the Site is located within the boundaries of the *Habitat Conservation Plan for Stephen's Kangaroo Rat in Western Riverside County* (1996) (HCP).

In addition to the MSHCP, additional biological constraints were identified. The Project Site contains two drainage features that fall under the jurisdiction of the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and/or California Department of Fish and Game (CDFG). A formal jurisdictional delineation was conducted by Vandermost Consulting Services, Inc. in 2002 in which 0.11-acre of ephemeral "waters of the U.S" were identified on-site. Likewise, "waters of the state" totals 0.11-acre of non-riparian streambed.

The Project Site also contains suitable avian nesting habitat for a variety of species. If construction activities for the proposed project occur during the avian breeding season (February to August), a pre-construction clearance survey for nesting birds will be required as part of the Migratory Bird Treaty Act.

SECTION 1: INTRODUCTION

At the request of the John Laing Homes, MBA conducted a Habitat Assessment and MSHCP Consistency Analysis to comply with the Western Riverside County MSHCP. This report contains the results of a habitat assessment for burrowing owl, and an analysis of all applicable MSHCP requirements and additional biological constraints for the 121-acre property located in unincorporated Riverside County, California. This property is hereinafter referred to as Project Site or Site.

1.1 - PROJECT LOCATION

The Project Site is generally located west of Interstate 215 and southeast of State Highway 74, north of Ridgemoor Road, and south of the McCall Boulevard, in the city of Sun City, Riverside County, California (Exhibit 1).

The Project Site consists of Assessor's Parcel Numbers (APNs):

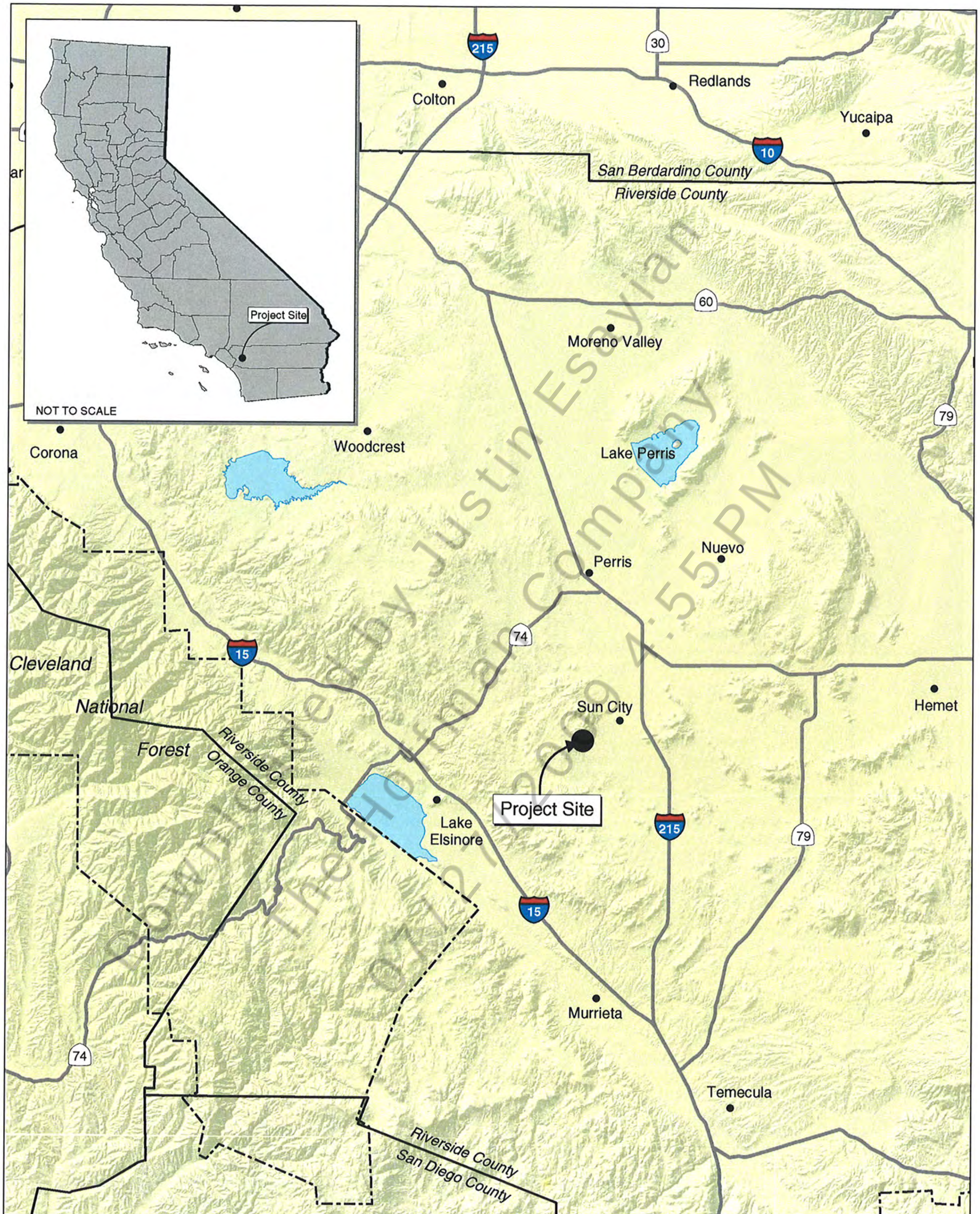
- 341-160-002
- 341-160-003

These APNs are in Sections 29, 30, 31, and 32 within Township 5 South, Range 3 West on the Romoland, CA U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Exhibit 2).

The Project Site is specifically located within the rolling hills east of Goetz Road and west of Murrieta Road. The Site is bordered to the east, west, and south by residential development, and to the north by open space containing Riversidean sage scrub (Exhibit 3).

1.2 - PROJECT DESCRIPTION

The proposed project consists of subdividing the 121-acre property into acres of residential lots with single-family homes, supporting infrastructure, and acres of open space. Preliminary plans for the project design include two community entryways and associated surface streets to connect the northern and southern portions of the Project Site. The plans incorporate the avoidance of some of the existing natural drainage courses, trails, and stands of trees that occupy the Site.



Source: Census 2000 Data, The CaSIL, MBA GIS 2005.

Michael Brandman Associates

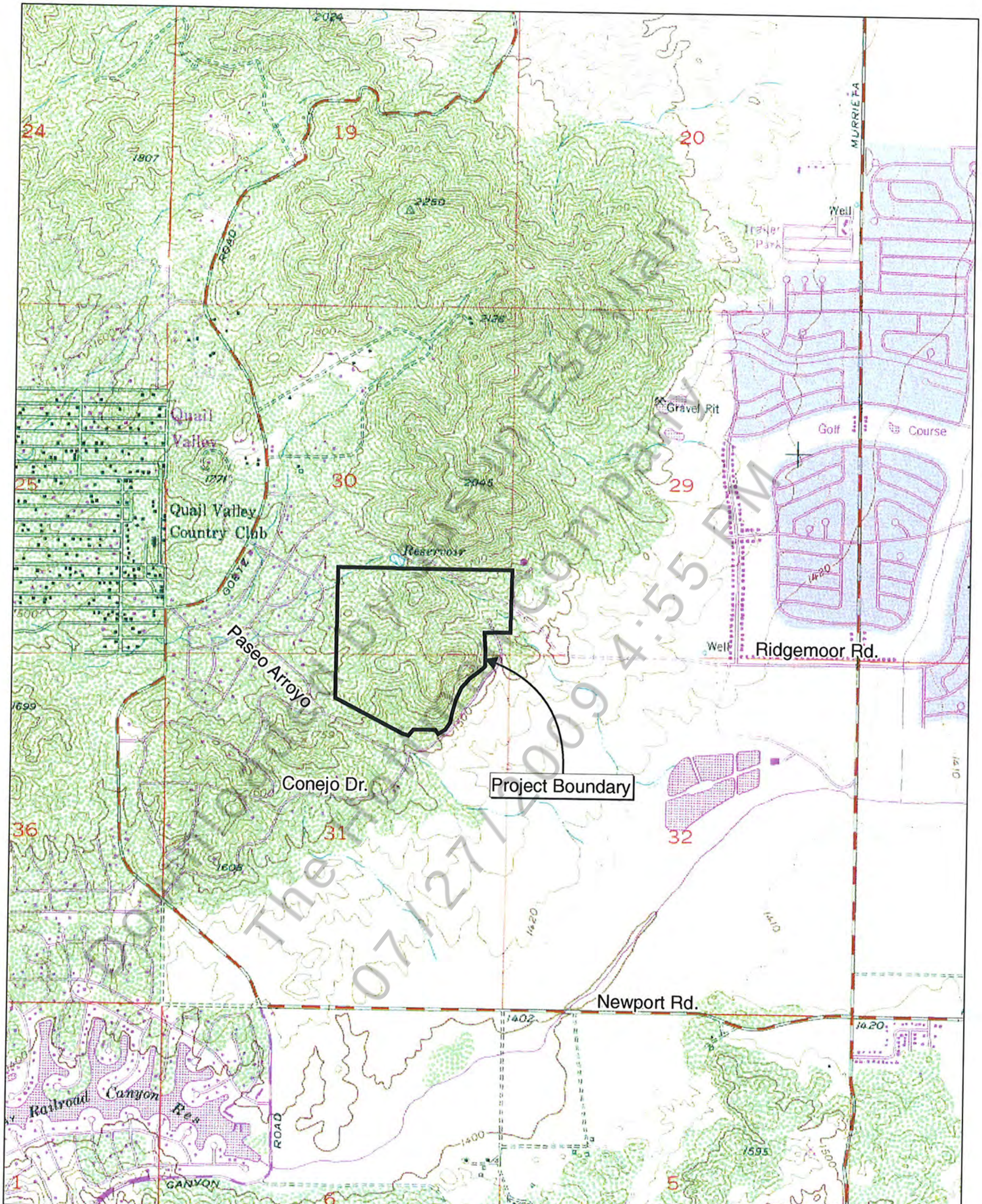
NORTH

5 2.5 0 5
Miles

Exhibit 1
Regional Location Map

03150023 • 11/2005 | 1_regional.mxd

JOHN LAING HOMES • SUN CITY, CA
MSHCP CONSISTENCY ANALYSIS REPORT



Source: USGS Romoland (1979) 7.5' DRG.

Michael Brandman Associates

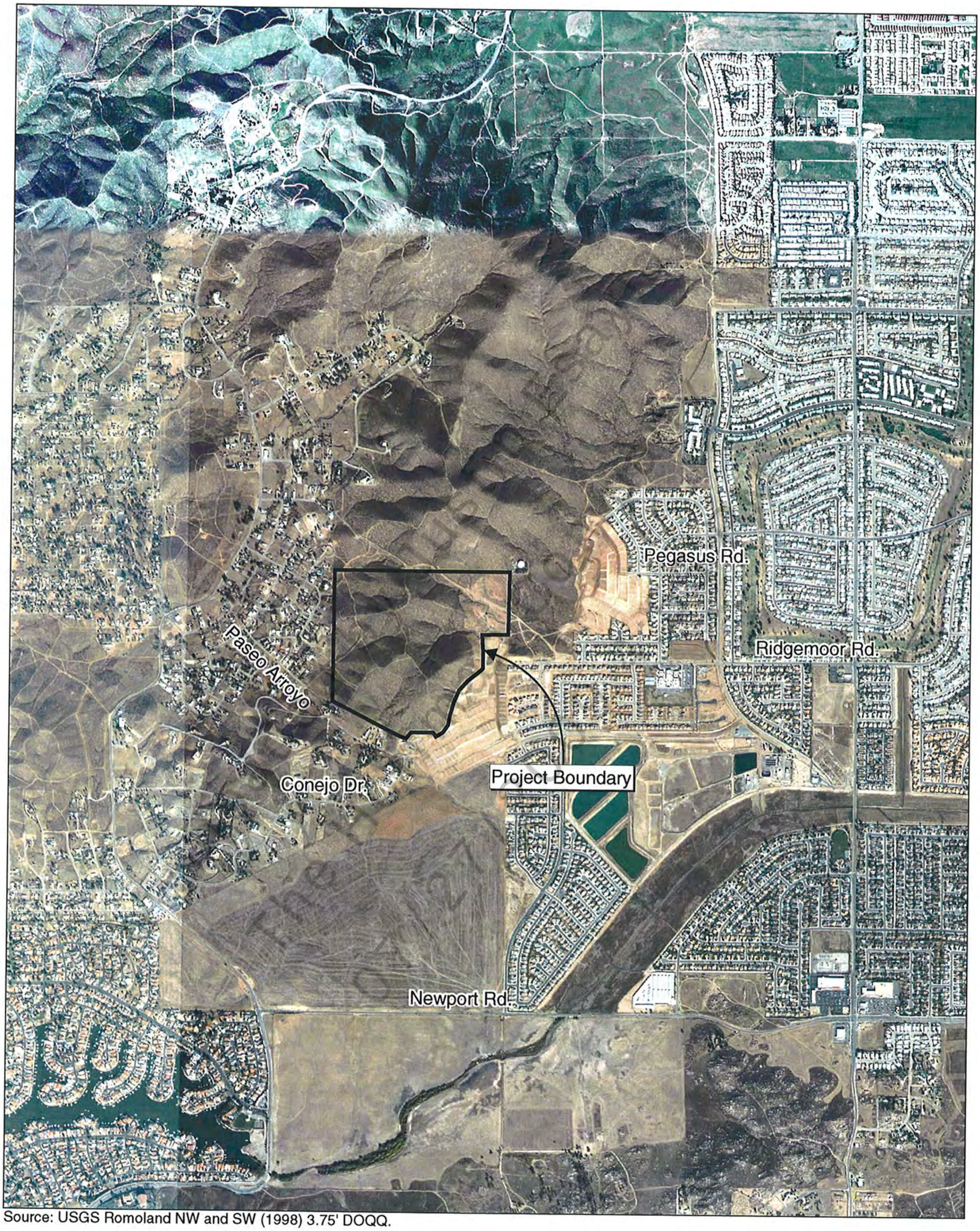
NORTH

2,000 1,000 0 2,000 Feet

03150023 • 11/2005 | 2_local_usgs.mxd

Exhibit 2
Local Vicinity USGS Map

JOHN LAING HOMES • SUN CITY, CA
MSHCP CONSISTENCY ANALYSIS REPORT



Source: USGS Romoland NW and SW (1998) 3.75' DOQQ.

Michael Brandman Associates

NORTH

2,000 1,000 0 2,000

Feet

03150023 • 11/2005 | 3_local_aerial.mxd

Exhibit 3
Local Vicinity Aerial Map

JOHN LAING HOMES • SUN CITY, CA
MSHCP CONSISTENCY ANALYSIS REPORT

1.3 - REGULATORY BACKGROUND

Special status species are native species that have been afforded special legal or management protection because of concern for their continued existence. There are several categories of protection at both federal and state levels, depending on the magnitude of threat to their continued existence and knowledge of population levels.

1.3.1 - Federal Endangered Species Act

The U.S. Fish and Wildlife Service (USFWS) administers the federal Endangered Species Act (FESA) that provides a process for listing species as either threatened or endangered, and methods of protecting them. The FESA defines as "endangered" any plant or animal species that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is a species that is likely to become endangered in the near future. A "proposed" species is one that has been officially proposed by USFWS for addition to the federal threatened and endangered species list.

Section 9 of the FESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The presence of any federally threatened or endangered species that are in a project area generally imposes severe constraints on development, particularly if development would result in "take" of the species or its habitat. Under the regulations of the FESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act.

1.3.2 - California Endangered Species Act

The CDFG administers the California Endangered Species Act (CESA). The State of California considers an endangered species as one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is considered as one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management. A rare species is one that is considered present in such small numbers throughout its range that it may become endangered if its present environment worsens. State threatened and endangered species are fully protected against take, as defined above.

1.3.3 - Section 3503 and 3511 of California Fish and Game Code

The CDFG administers the California Fish and Game Code. There are particular sections of the Code that are applicable to natural resource management. For example, § 3503 of the Code states it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3511 of the

Code lists fully protected bird species, where the CDFG is unable to authorize the issuance of permits or licenses to take these species.

1.3.4 - Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union.

1.3.5 - Section 404 of the Federal Clean Water Act

Section 404 of the federal Clean Water Act, which is administered by USACE, regulates the discharge of dredge and fill material into waters of the United States (U.S.). USACE has established a series of nationwide permits that authorize certain activities in waters of the U.S., if a proposed activity can demonstrate compliance with standard conditions. Normally, USACE requires an individual permit for an activity that will affect an area in excess of 0.5 acre of waters of the U.S. or 300 linear feet of impacts to a perennial or intermittent drainage. Projects that result in impacts to less than 0.5 acre can normally be conducted pursuant to one of the nationwide permits, if consistent with the standard permit conditions. USACE also has discretionary authority to require an Environmental Impact Statement for projects that result in impacts to an area between 0.1 and 0.3 acre. Use of any nationwide permit is contingent on the activities having no impacts to endangered species.

1.3.6 - Section 1600 through 1603 of the California Fish and Game Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFG pursuant to Sections 1600 through 1603 of the Code, requiring preparation of a Streambed Alteration Agreement. Under the Code, a stream is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Included are watercourses with surface or subsurface flows that support or have supported riparian vegetation. Additionally, CDFG has jurisdiction over altered or artificial waterways as well as dry washes that carry water ephemerally during storm events based on the biological value of these drainages to fish and wildlife.

1.3.7 - Section 401 of the Clean Water Act

Section 401 of the Clean Water Act requires that "any applicant for a federal permit for activities that involve a discharge to waters of the State shall provide the federal permitting agency with a certification from the State, in which the discharge is proposed, that states the discharge will comply with the applicable provisions under the federal Clean Water Act." Therefore, before the USACE will issue a Section 404 permit, applicants must apply for and receive a Section 401 water quality certification from the RWQCB.

1.3.8 - Porter-Cologne Act

The RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, with any region that could affect the waters of the state" (California Water Code §13260(a)), pursuant to provisions of the State Porter-Cologne Water Quality Act. "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code §13050 (e)).

1.3.9 - Western Riverside County MSHCP

The MSHCP is a comprehensive, multi-jurisdictional habitat conservation plan (HCP) focusing on conservation of species and their associated habitats in western Riverside County. Of the 146 Covered Species within the MSHCP, 118 are considered to be "adequately conserved." The remaining 28 Covered Species will be considered to be adequately conserved when certain landmark conservation requirements are met during the course of future development. The general goal of the MSHCP is to maintain biological and ecological diversity within a rapidly urbanizing region.

The approval of the MSHCP and execution of the Implementing Agreement (IA) by the wildlife agencies allows signatories of the IA to issue "take" authorizations for all species covered by the MSHCP, including state- and federal-listed species as well as other identified sensitive species and/or their habitats. Each city or local jurisdiction will impose a Development Mitigation Fee for projects within their jurisdiction. With payment of the mitigation fee to the County and compliance with the survey requirements of the MSHCP where required, full mitigation in compliance with the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), CESA, and FESA will be granted. The Development Mitigation Fee varies according to project size and project description. The fee for residential development ranges from $800 per unit to $1,600 per unit depending on development density (Riverside County Ordinance No. 810.2). Payment of the mitigation fee and compliance with the requirements of Section 6.0 of the MSHCP are intended to provide full mitigation under CEQA, NEPA, CESA, and FESA for impacts to the species and habitats covered by the MSHCP pursuant to agreements with the USFWS, the CDFG, and/or any other appropriate participating regulatory agencies and as set forth in the IA for the MSHCP.

SECTION 2: METHODS

2.1 - WESTERN RIVERSIDE COUNTY MSHCP CONSISTENCY ANALYSIS

The Project Site was reviewed to determine consistency with the MSHCP. GIS software was used to map the Project Site in relation to MSHCP areas, including Criteria Cells, conservation areas, and linkages. The Riverside County Integrated Project (RCIP) Conservation Summary Report Generator was queried to determine habitat assessment and potential survey requirements for the Project Site, to determine if there are any additional species requirements.

The MSHCP also requires that an assessment be completed of the potentially significant effects of the project on riparian/riverine areas and vernal pools, if applicable. According to the MSHCP, the documentation for the assessment shall include mapping and a description of the functions and values of the mapped areas with respect to the species listed in Section 6.1.2, Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools. The assessment considers the functions and values of these features, including hydrologic regime, flood storage and flood flow modification, nutrient retention and transformation, sediment trapping and transport, toxicant trapping, public use, wildlife habitat, and aquatic habitat.

Also as part of the MSHCP requirements, an Urban/Wildlands Interface analysis is required to address the indirect effects associated with locating proposed development in proximity to MSHCP conservation areas. According to the MSHCP, the analysis should include an assessment of the potential indirect project impacts that may result from drainage, toxics, noise, invasive species, barriers, access, and grading/development, as listed and described in Section 6.1.4, Guidelines Pertaining to Urban/Wildlands Interface. However, the proposed development of the Project Site will not conflict with the Section 6.1.4 of the MSHCP, Guidelines Pertaining to the Urban Wildlands Interface because the site is not located in proximity to MSHCP conservation areas. Therefore, an Urban/Wildlands Interface analysis is not required.

2.1.1 - Literature Review

Prior to the field visit, a literature review was conducted of the environmental setting of the Project Site. Literature review for the subject report included the USDA Soil Survey for the Western Riverside Area (1971), Romoland USGS 7.5-minute topographic quadrangle, and literature detailing the habitat requirements of burrowing owl.

The MSHCP was also reviewed for habitat assessment requirements as well as habitat suitability elements specifically for burrowing owl. The primary objective of the assessment was to evaluate the potential for suitable habitat for burrowing owl, as well as to determine the applicability of other MSHCP and CEQA requirements as they pertain to the proposed project.

A compilation of sensitive plant and wildlife species recorded in the vicinity of the Project Site was derived from the CDFG's California Natural Diversity Database (CNDDB), a sensitive species and plant community account database. Additional recorded occurrences of plant species found on or near the Project Site were derived from the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California database. The CNDDB and CNPS search was based on the Romoland, CA USGS 7.5-minute topographic quadrangle.

Previously recorded occurrences of special status plant and wildlife species and their proximity to the Project Site were determined through a query of the CNDDB. Additional recorded occurrences of these species found on or near the Project Site were derived from biota studies conducted for the MSHCP. The CNDDB ArcGIS database was used, together with ArcGIS software, to locate the nearest occurrence and determine the distance from the Project Site.

2.1.2 - Plant Communities

Plant communities were mapped using 7.5-minute USGS topographic base maps and aerial photography. The plant communities within the Project Site were classified according to Holland's *Preliminary Descriptions of the Terrestrial Natural Communities of California* (1986). The CDFG does not currently have a narrative description of the vegetation communities; therefore, the descriptions provided are according to Holland.

2.1.3 - Jurisdictional Areas

Aerial photography was reviewed prior to conducting general surveys. The photographs were used to identify any potential natural drainage features and water bodies that may be considered under the jurisdiction of either USACE and/or CDFG. In general, surface drainage features indicated as blue-line streams on USGS maps that are observed or expected to exhibit evidence of flow are considered potentially subject to state and federal regulatory authority as "waters." Vandermost Consulting Services, Inc. conducted a jurisdictional delineation of the Site in March 2002, identifying approximately 0.11-acre of ephemeral "waters of the U.S." on-site. The limits of jurisdictional waters were confirmed by the USACE in a jurisdictional determination, dated April 8, 2002. CDFG jurisdiction totals 0.11-acre of non-riparian streambed. MBA determined that approximately 0.1-acres of jurisdictional waters will be impacted by project development.

2.1.4 - Habitat Assessment

Environmental conditions and biological resources that were observed or otherwise detected during the habitat assessment of the Project Site were recorded in a field notebook. Special attention was directed to the environmental setting of the Project Site, including those areas potentially supporting sensitive fauna species, specifically, that which provides suitable habitat for burrowing owl. Parameters assessed regarding the habitat requirements for burrowing owl include the presence of suitable physical characteristics in topography, vegetation, and soils, the presence of wildlife signs such as nests, burrows, owl pellets, bones and discarded prey items, scat and white-wash, and plumage, as well as the presence of suitable prey items such as small mammals.

2.1.5 - Plants

Common plant species observed during the field survey were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less familiar plants were identified offsite using taxonomical guides. A list of all species observed on the Project Site was compiled from the survey data. Taxonomic nomenclature used in this study follows Hickman (1993). Common plant names, when not available from Hickman, were taken from Munz (1974). In this report, scientific names are provided immediately following common names of plant species (first reference only).

2.1.6 - Wildlife

Wildlife species detected during field surveys by sight, calls, tracks, scat, or other sign were recorded during surveys in a field notebook. Field guides were used to assist with identification of species during surveys, which included *Western Reptiles and Amphibians* (Stebbins 1996), *A Field Guide to Western Birds* (Peterson 1990), and *Mammals of the Pacific States, California, Oregon, Washington* (Ingles 1965). Although common names of wildlife species are fairly well standardized, scientific names are used in this report and are provided in Appendix A for reference.

SECTION 3:
EXISTING CONDITIONS

3.1 - ENVIRONMENTAL SETTING

MBA biologist Kelly Rios conducted the habitat assessment of the 121-acre Project Site on June 15, 2005 between the hours of 0700 and 1000. Weather conditions included a temperature of approximately 71 degrees Fahrenheit, winds ranging from 1 to 2 miles per hour.

The Project Site is located northeast of Canyon Lake and east of Quail Valley. The Project Site has an elevation range of approximately 1,300 to 1,765 feet above mean sea level, and consists of steep and shallow slopes that contribute to a number of ridge top and small canyon and valley-like features. Two jurisdictional drainage features traverse the Site from the northwest to the southeast.

The Project Site contains two different soil series. A soil series is a group of soils with similar profiles. These profiles include major horizons with similar thickness, arrangement, and other important characteristics. The soils that occur on the Project Site include Lodo rocky loam and Ysidora very fine sandy loam (United States Department of Agriculture Soil Survey, Western Riverside Area, California 1971) (Exhibit 4).

The Project Site has previously been impacted by human-related disturbances including off-highway vehicular use and trash dumping. Numerous, frequently trafficked dirt access roads traverse the ridge tops and transect the Project Site at various locations. The majority of the Project Site is relatively undisturbed and undeveloped.

3.1.1 - Plant Communities

Two plant communities occur within the 121-acre Project Site: Riversidean sage scrub (RSS) and non-native grassland (NNG). The dominant plant community identified within the Project Site is RSS, which occurs throughout the Site and is further classified into two categories, low quality RSS (48.4 acres) and moderate quality RSS (67.7 acres).

The plant communities described below are based on the Holland Classification system and the classification codes and acreages are included for each plant community as part of the discussion's heading.

Source: USGS Romoland NW and SW (1998) 3.75' DOQQ
and US Dept. of Agriculture Soils Data.

Michael Brandman Associates

NORTH

800 400 0 800
Feet

03150023 • 11/2005 | 4_soils.mxd

Exhibit 4
USDA Soils Map

Non-native grassland is the next most prevalent plant community within the Project Site (3.5 acres). In addition to the scrub and NNG communities, several previously disturbed areas occur along the western portion of the Project Site. Although not considered a plant community, the Project Site contains approximately 2.3 acres of disturbed areas. These areas lack vegetation and have been routinely impacted by off-road vehicle usage and other human-related activities. Disturbed habitat exists in limited areas within the Project Site (Exhibit 5). Existing land use on the Project Site is characterized as undeveloped open land. The names and definitions of plant communities are discussed below based upon descriptions provided by Holland (1986) and MBA. A complete list of all plant and wildlife species observed during the habitat assessment for the Project Site is included in Appendix A.

Riversidean Sage Scrub (32720) (116.1 Acres)

RSS is a natural plant community that is widespread throughout parts of southern California. RSS vegetation typically consists of low-growing, drought deciduous, and evergreen shrubs that occur on steep and/or gentle sloping topography. This community may be found on xeric sites with severely drained soils, or clays that release stored soil moisture slowly. Stands of RSS range from fairly open to dense, and are typically dominated by California sage brush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*), and are often found integrated with chaparral, scrub, grassland and ruderal type plant communities (Holland 1986).

Riversidean sage scrub (RSS) occupies 116.1 acres within scattered isolated patches on the Project Site (Exhibit 5). The RSS observed on Site consists primarily of moderate quality RSS containing mature shrubs with an understory of non-native annual herbs, forbs and grasses. The Site also contains low quality RSS, which contains scattered native shrubs with a dense understory of non-native herbs and grasses.

The native species observed within the RSS community include shrubs dominated by California buckwheat (*Eriogonum fasciculatum*). Additional species include California sage brush (*Artemisia californica*), deerweed (*Lotus scoparius*) and California brittlebush (*Encelia farinosa*). Other native plant species observed within this community include fiddleneck (*Amsinckia menziesii*), fascicled tarweed (*Hemizonia fasciculata*), and turkey mullein (*Eremocarpus setigerus*).

Source: USGS Romoland NW and SW (1998) 3.75' DOQQ and MBA.

Michael Brandman Associates

NORTH

800 400 0
Feet

03150023 • 11/2005 | 5_veg.mxd

Exhibit 5
Plant Communities Map

JOHN LAING HOMES • SUN CITY, CA
MSHCP CONSISTENCY ANALYSIS REPORT

Common wildlife species observed within RSS include California towhee, California quail, house finch, and northern mockingbird. Additionally, two coastal California gnatcatchers (CAGN) (*Polioptila californica californica*), a federally-listed threatened species, was observed on the Project Site. One CAGN was observed in the moderate quality RSS located northeastern portion of the Project Site. The other CAGN was observed in the western portion of the Site in low quality RSS (Exhibit 5). Focused surveys for the CAGN were not conducted because the CAGN is a covered species under the MSHCP. However, the presence of CAGN is consistent with protocol surveys conducted during the 2002 breeding season by Tom Dodson and Associates. The 2002 surveys identified the presence of one pair of CAGN in the northeastern portion of the Site.

Non-Native Grassland (3.5 Acres)

Non-native grassland is characterized by a dense to sparse cover of annual grasses often associated with numerous species of annual forbs (wildflowers), especially in years with plentiful rain. Seed germination occurs with the onset of winter rains. Some plant growth occurs in winter, but most growth and flowering occurs in the spring. Plants then die in the summer, and persist as seeds in the uppermost layers of soil until the next rainy season. Characteristics associated with this community include fine-textured soils (usually clay) that are moist or evenly waterlogged during the winter rains and very dry during summer and fall. Dominant plant genera typically found within non-native grasslands include brome chess (*Bromus* sp.), wild oats (*Avena* sp.), fescue (*Vulpia* sp.), and barley (*Hordeum* sp.).

Much of the non-native grassland within the Project Site can be found along the southwestern portion of the Project Site. The grasslands on Site are intermixed with a number of non-native ruderal herbs and forbs, as well as a few native scrub species.

Dominant plant species observed within the non-native grassland plant community include black mustard (*Brassica nigra*), ripgut grass (*Bromus diandrus*), and slender oats (*Avena fatua*). Other non-native species observed include vinegar weed (*Trichostema lanceolatum*), short-podded mustard (*Hirschfeldia incana*), and yellow-star thistle (*Centaurea solstitialis*). Native species observed within the ecotone between the NNG and RSS habitats include California aster (*Lessingia filaginifolia* var. *filaginifolia*), western ragweed (*Ambrosia psilostachya*), and fiddleneck (*Amsinckia menziesii*). Common wildlife species found within NNG include house finch and mourning dove.

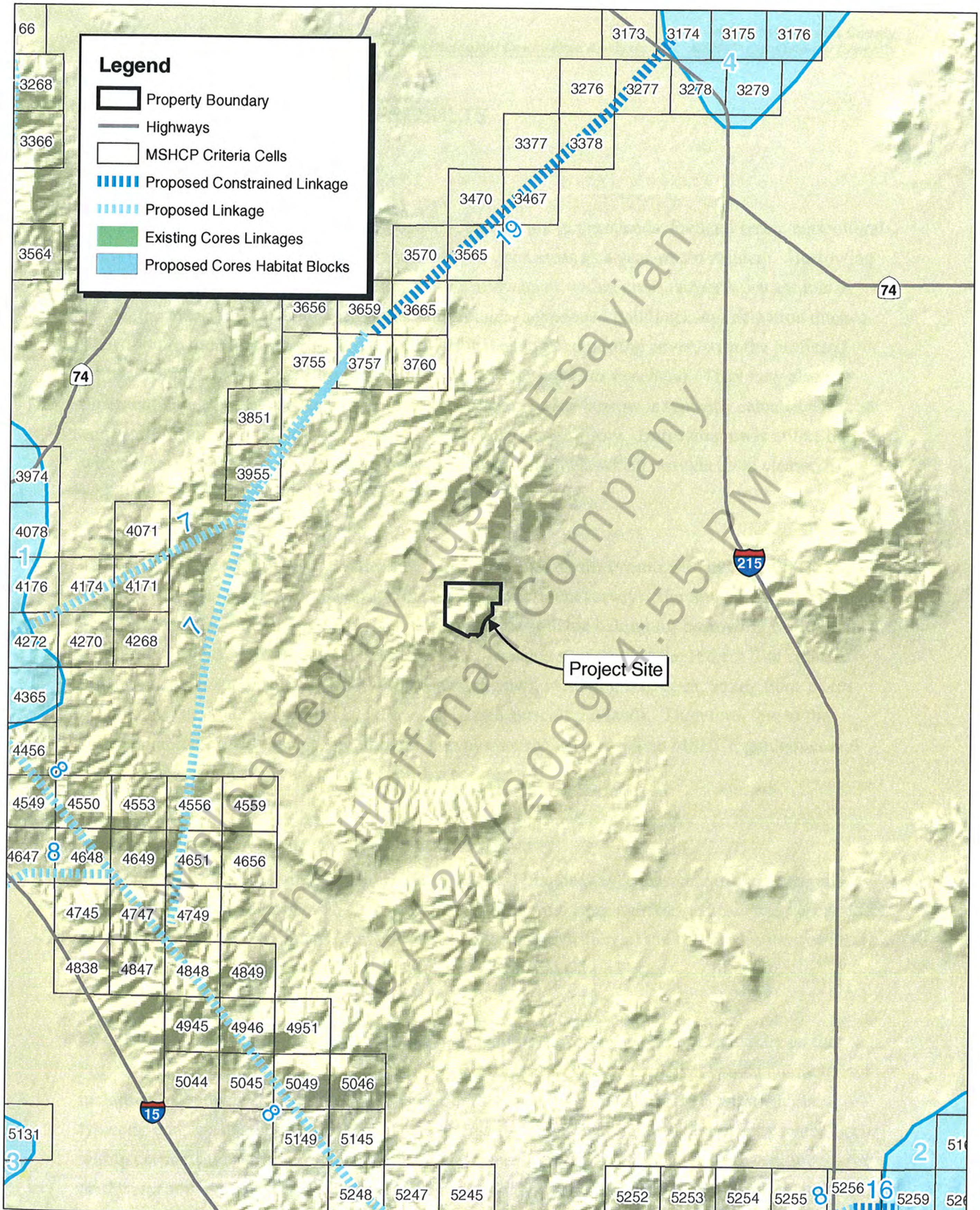
SECTION 4: WESTERN RIVERSIDE COUNTY MSHCP CONSISTENCY ANALYSIS

4.1 - OVERVIEW

The proposed Project Site is located within the Sun City/Menifee Valley Plan, and is not located within any Criteria Area Cells (Exhibit 6). The Project Site is not located in the vicinity of any Existing Cores. The closest linkages or constrained linkages are approximately two miles west, northwest of the Site (Proposed Linkage 7 and Proposed Constrained Linkages 19).

This habitat assessment addresses the potential for sensitive biological resources as indicated by the Riverside County Integrated Plan Conservation Summary Report (RCIP) to occur within the Project Site. Based on the report, a habitat assessment is required for a single wildlife species, burrowing owl. Due to the lack of adequate information for burrowing owl within Riverside County, the MSHCP has assigned specific conservation objectives, including a required habitat assessment, for burrowing owl.

The proposed project is within the required habitat assessment survey area for burrowing owl. Although the APN numbers for the Project Site are reported to be invalid by the Riverside County Integrated Project website, the adjacent open space parcels, APNs 341-160-001 to the north of the Site and 339-020-035 to the east of the Site (Appendix B, Riverside County Integrated Plan (RCIP) Conservation Summary Report) are required to conduct a habitat assessment for burrowing owl. The MSHCP also has specific survey requirements for certain sensitive plant, invertebrate, bird, mammal, and amphibian species (Appendix C, Riverside County Attachments). The habitat assessment also addresses the presence/absence of riparian/riverine areas and vernal pools on the Project Site, identifies any migratory corridors and linkages on or in the vicinity of the Project Site, and includes an Urban/Wildlands Interface analysis.



Source: USGS NED, Riverside County MSHCP, Census 2000 data.

Michael Brandman Associates

NORTH

1.2 0.6 0 1.2 Miles

03150023 • 11/2005 | 6_mshcp.mxd

Exhibit 6
MSHCP Criteria Areas Map

JOHN LAING HOMES • SUN CITY, CA
MSHCP CONSISTENCY ANALYSIS REPORT

4.2 - HABITAT ASSESSMENT RESULTS

4.2.1 - Wildlife Species

Burrowing Owl

The burrowing owl is a state species of concern that occurs in grasslands, lowland scrub, agricultural lands (particularly rangelands), and some artificial, open areas as a year-round resident. Burrowing owls may also use golf courses, cemeteries, road allowances within cities, airports, vacant lots in residential areas and university campuses, fairgrounds, abandoned buildings, and irrigation ditches. They require rodent or other fossorial burrows for roosting and nesting cover, with the preferred burrow being that of the California ground squirrel (*Spermophilus beecheyi*). They may also use pipes, culverts, and nest boxes where burrows are scarce. One burrow is typically selected as a nest, and satellite burrows are usually found within the defended territory. Burrowing owls utilize habitat with sparse vegetation and open areas as well as rocky outcrops, which provide them clearer visibility.

The CNDDB has recorded observations of burrowing owls on the Project Site in 1998-2003. No owls or owl signs were observed during the habitat assessment survey. The Site contains some flat, open space areas of non-native grassland that constitute suitable habitat for burrowing owl, but no California ground squirrels were observed onsite. The area surrounding the Project Site contains numerous locations of suitable habitat for burrowing owl, including flat, open, valley floor plains occupied by non-native grasslands, fallow fields, and agricultural lands. Therefore, due to the suitable habitat on the Project Site, focused surveys are required based on MSHCP guidelines and presence/absence surveys are required for this species.

4.2.2 - Riparian/Riverine Areas and Vernal Pools

Section 6.1.2 of the Western Riverside County MSHCP requires an assessment of the potentially significant effects of a project on Covered Species occupying riparian/riverine areas and vernal pools. This assessment is independent from considerations given to waters of the U.S. and waters of the State under the Clean Water Act and the California Fish and Game Code.

MBA conducted a riparian/riverine habitat assessment of the drainage features that exist on the Project Site. The drainage features were inspected for the presence of riparian habitat characteristics, including a dominance of hydrophytic vegetation. Hydrophytic vegetation in riparian habitats typically consists of trees, shrubs, persistent emergents or emergent mosses and lichens which occur within permanent or near permanent watersheds, or occupy areas with moist soils that occur nearby a freshwater source (as defined by the MSHCP on p. 6-21). The vegetation within the drainage feature is dominated by RSS as well but also contains native Mexican elderberry (*Sambucas mexicanus*) and giant creek nettle (*Urtica dioica*). Non-native species include fuzzy rabbit's foot (*Polypogon monspeliensis*), tree tobacco (*Nicotiana glauca*), and Peruvian pepper tree (*Schinus molle*); see Appendix D, Site Photographs. Based on the onsite conditions observed during the recent site visit, it was determined that the Project Site does not provide the necessary vegetative structure to be considered riparian/riverine habitat nor were there any vernal pools identified within the Project Site. Further, no MSHCP species associated with either riparian/riverine area or vernal pool are present. According to the site development plan, 0.1-acres of the drainage features will be impacted by the development (Exhibit 7). The drainages run southeast for approximately 1500 feet and then most likely goes into a storm drain near the residential development at Ridgemoor Road. The 1500 feet has little function or value before it moves to the storm drain system. Since the drainages do not contribute any function or value to riparian habitat downstream, a Determination of Biologically Equivalent or Superior Preservation (DBESP) analysis will be not be required.

4.2.3 - Migratory Corridors/Linkage

Based on Figure 3-2 of the MSCHP, the Project Site is not within a designated linkage or constrained linkage (see Exhibit 6). The Project Site is located east of constrained linkage 7 and southeast of proposed constrained linkage 19. Therefore, the development of the Project Site is not likely to affect any migratory proposed linkages or constrained linkages.

4.2.4 - Urban/Wildlands Interface Analysis

The Project Site is located within Sun City/Menifee Valley Area Plan and is not located within any Criteria Cells or potential Conservation Area. The area west, southwest, and northeast of the Project Site contains residential development. Open foothills and undeveloped land occurs north, southeast of the Project Site. Therefore, the proposed development of the Project Site will not conflict with the Section 6.1.4 of the MSHCP, Guidelines Pertaining to the Urban Wildlands Interface, and an Urban/Wildlands Interface analysis is not required.

4.3 - BIOLOGICAL COMPLIANCE ISSUES NOT COVERED BY THE MSHCP

The MSHCP does not address potential impacts to Stephen's kangaroo rat within the boundaries of the *Habitat Conservation Plan for Stephens' Kangaroo Rat in Western Riverside County*. In addition, the MSHCP does not address potential impacts to nesting birds (regulated by USFWS and CDFG) or jurisdictional waters and wetlands (regulated by USACE, CDFG, and RWQCB).

4.3.1 - Stephens' Kangaroo Rat

Stephens' kangaroo rat is a small burrowing rodent that is federally-listed as endangered and state-listed as threatened. It occurs within open grasslands and sparse shrublands in Riverside County and

Source: USGS Romoland NW 3.75' DOQQ.

Michael Brandman Associates

NORTH

450 225 0 450 Feet

Exhibit 7
Jurisdictional Impacts

northern San Diego County. The Project Site contains marginally suitable habitat for SKR and is located within the boundaries of the County's HCP for this species.

4.3.2 - Nesting Birds

No previously occupied or active nests were observed on the Project Site during the habitat assessment survey. However, the Site contains suitable habitat for several ground and shrub-nesting avian species, including burrowing owl. In addition, large non-native trees on the northern portion of the Site provide suitable nesting habitat for several raptor species.

4.3.3 - Jurisdictional Waters and Wetlands

Two drainage features occur within the northeastern portion of the Project Site totaling 0.11-acre of jurisdictional "waters of the state" and "waters of the U.S.", all of which will be impacted by project implementation. The drainage features on the Project Site flow southeast and go into a storm drain near Ridgemoor Road. The drainage features are under the jurisdiction of the United States Army Corps of Engineers (USACE), California Department of Fish and Game (CDFG), and the Regional Water Quality Control Board (RWQCB) and impacts will require the appropriate permits pursuant to Section 404 of the federal Clean Water Act, Section 1600 of the Fish and Game Code, and Section 401 of the federal Clean Water Act and the State Porter-Cologne Act.

4.3.4 - USFWS Critical Habitat

Approximately 108.5-acres of the 121-acre Site is within an area designated Critical Habitat for the federally threatened coastal California gnatcatcher (*Polioptila californica californica).* Impacts will be determined during the Section 7 process. According to Section 6.9 of the MSHCP, the MSCHP and the MSHCP IA are consistent with USFWS regulation concerning the designation of Critical Habitat and provide for the protection of "those physical and biological features essential to the conservation" of the Covered Species Adequately Conserved. For Critical Habitat designations within the MSHCP boundaries "*…no subsequent evaluation of the Covered Species Adequately Conserved, nor any mitigation, compensation, conservation enhancement or other protective measures other than those set forth in the MSHCP shall be required.*"

SECTION 5: RECOMMENDATIONS

5.1 - BURROWING OWL

Although no burrowing owls were observed on the Project Site during the habitat assessment survey, the Site contains suitable habitat for this species and, according to the CNDDB, two recorded observations occur on the Project Site. Focused burrowing owl surveys should be conducted from two hours before sunset to one hour after, or from one hour before to two hours after sunrise. If focused surveys are positive, additional actions/mitigation may be required pursuant to the MSHCP. Pursuant to the MSHCP, if less than 35 acres of suitable habitat or fewer than 3 pairs occur onsite, take of active nests must be avoided during the breeding season (February-August). Outside the breeding season, the owls would need to be relocated prior to project impacts. In the unlikely event that 3 or more pairs of BUOW occur onsite, the MSHCP requires that at least 90 percent of the area with long-term conservation value and BUOW pairs will be conserved or a biologically equivalent or superior alternative shall be proposed. The area to be conserved would be determined in coordination with the County of Riverside through the HANS process.

5.2 - STEPHENS' KANGAROO RAT

The Project Site contains marginally suitable habitat for SKR and is located within the boundaries of the *Habitat Conservation Plan for Stephens' Kangaroo Rat in Western Riverside County.* With adherence to the HCP's IA and payment of the County's per-acre mitigation fee for this species, no further action is required.

5.3 - NESTING BIRDS

The Project Site contains suitable habitat for nesting birds. Therefore, pursuant to the MBTA and CDFG Code, the removal of any trees, shrubs, or any other potential nesting habitat should be conducted outside the avian nesting season. The nesting season generally extends from early February through August, but can vary slightly from year to year based upon seasonal weather conditions.

If suitable nesting habitat must be removed during the nesting season, a qualified biologist should conduct a breeding bird survey to identify any potential nesting activity. If active nests are observed, construction activity must be prohibited within a 250-foot buffer around the nest or a 500-foot buffer for nesting raptors until the nestlings have fledged. All construction activity within the vicinity of active nests must be conducted in the presence of a qualified biological monitor. Construction activity may encroach into the buffer area at the discretion of the biological monitor.

5.4 - URBAN/WILDLANDS INTERFACE GUIDELINES

The Project Site is located within Sun City/Menifee Valley and is not located within any Criteria Cells or potential Conservation Area. The nearest Conservation Area or proposed Conservation Area is over 2 miles from the Project Site. Therefore, an Urban/Wildlands Interface analysis is not required.

5.5 - RIPARIAN/RIVERINE AREAS AND VERNAL POOLS

Two drainage features will be impacted within the Project Site by the proposed development. Approximately 0.1 acres will be lost (Exhibit 7). According to the site development plan, the drainage features will be impacted by the development. However, since the drainages do not contribute any function or value to riparian habitat downstream, a DBESP analysis will be not be required.

5.6 - JURISDICTIONAL WATERS AND WETLANDS

The Project Site contains two drainage features totaling 0.11-acre of USACE or CDFG jurisdiction. Due to impacts that will occur to the jurisdictional features, regulatory permits will be required from the USACE, CDFG, and RWQCB.

5.7 - NESTING BIRDS

There is suitable avian nesting habitat on the Project Site. If the clearance of vegetation occurs during the avian nesting season (February to August), it is recommended that a pre-construction nesting bird survey be conducted prior to any vegetation disturbance activities. If passerine birds are found to be nesting or there is evidence of nesting behavior inside or within 250 feet of the impact area, a 250-foot buffer will be required around the nest where no vegetation disturbance would be permitted. For raptor species (birds of prey, such as hawks and owls), this buffer is expanded to 500 feet. A qualified biologist would be required to monitor the nest closely until it is determined that the nest is no longer active, at which time vegetation removal could continue.

5.8 - CRITICAL HABITAT

If a federal nexus exists, impacts to CAGN critical habitat will require evaluation by the USFWS pursuant to the Endangered Species Act through a Section 7 consultation. However, as stated in

Section 6.9 of the MSHCP, no additional mitigation shall be required and consistency with the MSHCP will be the basis of the consultation process under Section 7 of the ESA.

SECTION 6: CONCLUSIONS

A habitat assessment and MSHCP consistency and constraints analysis, was conducted for the 121-acre Project Site located in the unincorporated area of Riverside, California. The Project Site is located within the Sun City/Menifee Valley Area Plan of the MSHCP but is not located within a Criteria Cell. The habitat assessment addresses the MSHCP survey requirements for the sensitive wildlife specie, BUOW. Although no BUOW were observed onsite during the habitat assessment survey, the Site contains suitable habitat for this species and presence/absence focused surveys are recommended for this species. No riparian/riverine areas or vernal pools were identified onsite. The drainages do not contribute any function or value to riparian habitat downstream, and a DBESP analysis will be not be required.

The Project Site is not located within an existing or proposed linkage. The closest potential conservation area (Criteria Cell) occurs approximately two miles northwest of the Site and an Urban/Wildlands Interface analysis is not required.

Two drainage features occur within the Project Site that fall under the jurisdiction of USACE, the RWQCB, and the CDFG. Suitable avian nesting habitat occurs throughout the Project Site. The removal of vegetation should occur outside the avian breeding season (February 1 to August 31) to avoid impacts to nesting birds. If construction is to occur within the avian breeding season, a pre-construction nesting bird clearance survey is recommended.

Adherence with the above recommendations concerning BUOW, nesting birds, and jurisdictional areas (and resulting additional actions, where required including a Section 7 consultation) will fulfill requirements for biological and jurisdictional resources pursuant to the regulations outlined in Section 3. With subsequent payment of the MSHCP and SKR mitigation fees, the proposed development of the Project Site will be fully consistent with the Western Riverside County MSHCP.

SECTION 7: CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: January 25, 2006 Signed: Kelly Rios
Kelly Rios, Biologist

SECTION 8: REFERENCES

California Department of Fish and Game (CDFG), 2003 (July). *State and Federally Listed Endangered, Threatened, and Rare Plants of California.* The Resources Agency State of California, Department of Fish and Game, Natural Heritage Division, Natural Diversity Data Base. Sacramento, California.

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U.S. Department of the Interior, Geological Survey. 1988. Romoland, Calif. 7.5-minute USGS Quadrangle Map.

Appendix A: Floral and Faunal Compendia

Floral Compendium

Angiosperms (Dicotyledons)

Asteraceae		**Sunflower Family**
	Artemisia dracunculus	tarragon
	Chrysothamnus sp.	rabbitbrush
	Conyza canadensis	horseweed
	Encelia farinosa	brittlebush
	Helianthus annuus	common sunflower
	Hemizonia fasciculata	tarweed
	Lessingia filanginifolia	cudweed aster
	Stephanomeria pauciflora	wire-lettuce
Brassicaceae		**Mustard Family**
*	*Brassica nigra*	black mustard
*	*Hirshfeldia incana*	short-podded mustard
Caprifoliaceae		**Honeysuckle Family**
	Sambucus mexicana	mexican elderberry
Curcubitaceae		**Gourd Family**
	Curcubita palmata	coyote gourd
Euphorbiaceae		**Spurge Family**
	Eremocarpus setigerus	dove weed
Fabaceae		**Legume Family**
	Lotus scoparius	deerweed
Lamiaceae		**Mint Family**
	Salvia apiana	white sage
	Trichostema lanceolatum	vinegar weed
Polygonaceae		**Buckwheat Family**
	Eriogonum fasciculatum	California buckwheat
Solanaceae		**Nightshade Family**
*	*Nicotiana glauca*	tree tobacco
Urticaceae		**Nettle Family**
	Urtica dioica	giant creek nettle

Angiosperms (Dicotyledons)

Anacardiaceae		**Sumac or Cashew Family**
*	*Schinus molle*	Peruvian pepper tree

Angiosperms (Monocotyledons)

Poaceae	**Grass Family**
* *Avena barbata*	slender oats
* *Bromus diandrus*	ripgut grass
* *Bromus rubens*	red brome
* *Hordeum vulgare*	barley

**non-native species*

Faunal Compendium

Birds	
Phasianidae	**Pheasants and Quails**
Callipepla californica	California quail
Tyrannidae	**Tyrant Flycatchers**
Tyrannus verticalis	western kingbird
Columbidae	**Pigeons and Doves**
Zenaida macroura	mourning dove
Trochilidae	**Hummingbirds**
Calypte anna	Anna's hummingbird
Muscicapidae	**Kinglets, Gnatcatchers, Thrushes, and Babblers**
Polioptila californica californica	California gnatcatcher
Mimidae	**Thrashers**
Mimus polyglottos	northern mockingbird
Laniidae	**Shrikes**
Lanius ludovicianus	loggerhead shrike
Emberizidae	**Wood Warblers, Tanagers, Buntings, and Blackbirds**
Pipilo crissalis	California towhee
Fringillidae	**Finches**
Carpodacus mexicanus	house finch
Mammals	
Leporidae	**Hares and Rabbits**
Lepus californicus	black-tailed jackrabbit
Sylvilagus audubonii	desert cottontail

* non-native species

Appendix B: Riverside County Integrated Plan (RCIP) Conservation Summary Report

Riverside County Integrated Project (RCIP)
Proposed Multiple Species Habitat Conservation Plan (MSHCP)

APN	Cell	Cell Group	Acres	Area Plan	Sub Unit
341160006	Not A Part	Independent	77.85	Sun City / Menifee Valley	Not a Part
341160008	Not A Part	Independent	43.08	Sun City / Menifee Valley	Not a Part

HABITAT ASSESSMENTS

Habitat assessment shall be required and should address at a minimum potential habitat for the following species:

APN	Amphibia Species	Burrowing Owl	Criteria Area Species	Mammalian Species	Narrow Endemic Plant Species	Special Linkage Area
341160006		Yes				
341160008		Yes				

Burrowing Owl

Burrowing owl.

If potential habitat for these species is determined to be located on the property, focused surveys may be required during the appropriate season.

Project Status

Riverside County is nearing the end of a comprehensive planning effort called the Riverside County Integrated Project (RCIP). RCIP integrates three regional planning efforts; a County General Plan, a Community and Environmental Transportation Acceptability Process to determine present and future road-way infrastructure; and a Multiple Species Habitat Conservation Plan (MSHCP) to conserve listed and sensitive species and their habitats. The final MSHCP was approved by the County Board of Supervisors on June 17, 2003.

The MSHCP is a comprehensive, multi-jurisdictional effort that includes portions of Western Riverside County and fourteen cities. Rather than deal with endangered species on a one-by-one basis, this Plan focuses on the conservation of 146 species. The MSHCP proposes a reserve system of approximately 500,000 acres of which approximately 347,000 acres is currently within public ownership and 153,000 acres are currently in private ownership. An approved MSHCP will contribute to the economic viability of the region by providing landowners, developers, and those who build public infrastructure with certainty, a streamlined regulatory process, and identified project mitigation.

Although the MSHCP has been adopted by the County, federal and state permits have not yet been issued. Once the permits are granted, the MSHCP, will require no further surveys for 75% of the 146 species covered by the MSHCP. Habitat assessments and/or surveys may be undertaken within suitable habitat areas in specific locations identified on survey maps in the MSHCP.

More information concerning RCIP, the MSHCP, and processing schedules may be obtained from www.rcip.org or by contacting the following:

County contact: Jamie Thompson, 951-955-6892

Appendix C: Riverside County Attachments

Attachment E-3

BIOLOGICAL REPORT SUMMARY SHEET

(Submit two copies to the County)

Applicant Name: John Laing Homes - TTN 28920
Assessor's Parcel Number (APN): 341-160-002 ; 341-160-003
APN cont. :
Site Location: Section: 30+31 **Township:** 5S **Range:** 3W
Site Address:
Related Case Number(s): **PDB Number:**

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
	Arroyo Southwestern Toad	Yes	No	N/A
✓	Blueline Stream(s)	Yes	No	N/A
	Coachella Valley Fringed-Toed Lizard	Yes	No	N/A
	Coastal California Gnatcatcher	Yes	No	N/A
✓	Coastal Sage Scrub RSS	Yes	No	N/A
	Delhi Sands Flower-Loving Fly	Yes	No	N/A
	Desert Pupfish	Yes	No	N/A
	Desert Slender Salamander	Yes	No	N/A
	Desert Tortoise	Yes	No	N/A
	Flat-Tailed Horned Lizard	Yes	No	N/A
	Least Bell's Vireo	Yes	No	N/A
	Oak Woodlands	Yes	No	N/A
	Quino Checkerspot Butterfly	Yes	No	N/A
	Riverside Fairy Shrimp	Yes	No	N/A
	Santa Ana River Woolystar	Yes	No	N/A
	San Bernardino Kangaroo Rat	Yes	No	N/A
	Slender Horned Spineflower	Yes	No	N/A
	Stephen's Kangaroo Rat	Yes	No	N/A
	Vernal Pools	Yes	No	N/A
✓	Wetlands	Yes	No	N/A

CHECK SPECIES SURVEYED FOR	SPECIES or ENVIRONMENTAL ISSUE OF CONCERN	(Circle Yes, No or N/A regarding species findings on the referenced site)		
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A
	Other	Yes	No	N/A

Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any hosts, perching, or food plants used by any animals listed as rare, endangered, threatened or candidate species by either State, or Federal regulations, or for Riverside County as listed by the California Department of Fish and Game Natural Diversity Data Base (NDDB).

I declare under penalty of perjury that the information provided on this summary sheet is in accordance with the information provided in the biological report.

Kelly Rios Michael Brandman Ass. 1/24/06

Signature and Company Name Report Date

10(a) Permit Number (if applicable) Permit Expiration Date

County Use Only

Received by: Date:

PD-B#

Attachment E-4

LEVEL OF SIGNIFICANCE CHECKLIST
For Biological Resources
(Submit Two Copies)

Case Number: __________ **Lot/Parcel No:** 341-160-002 341-160-003 **EA Number**__________

Wildlife & Vegetation

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

(Check the level of impact the applies to the following questions)

Less than Sign. w/ Mit. Incorp. a) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state conservation plan?

Less than Sign. w/ Mit. Incorp. b) Have a substantial adverse effect, either directly or through habitat modifications, on any endangered, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12)?

Less than Sign. w/ Mit. Incorp. c) 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. Wildlife Service?

No impact d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

No impact e) 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 U. S. Fish and Wildlife Service?

No impact f) 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?

No impact g) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Source: CGP Fig. VI.36-VI.40

Findings of Fact: Three of the seven had findings of "less than significant w/ mitigation incorporated." The remaining four had findings of "no impact."

Proposed Mitigation: Mitigation will be paid in accordance to the Riverside Co. MSHCP + fees associated w/ permits required by the agencies.

Monitoring Recommended:
TO be determined.

Attachment D

NOTIFICATION TO COUNTY OF RIVERSIDE OF CONSULTANT TO PREPARE ARCHAEOLOGICAL OR BIOLOGICAL REPORT

Notification to the County of Riverside is hereby made that John Laing Homes, TTN 28920, project sponsor, has entered into a contract with Michael Brandman Associates for the preparation of an X ( ) biological, ___ ( ) archaeological to be submitted to the County of Riverside in satisfaction of a request made by the County for additional environmental information prior to completion of an environmental assessment for the property and development proposal, if any, described below:

Assessor's Parcel Number(s) (APN) :
341-160-002 + 341-160-003

Development Proposal Case Number(s): ______

In accordance with the notice of additional environmental information provided by the County, the scope of work for the report will be as follows:

*For Archaeological Reports (Standardized - Check those that apply):
_____ Phase 1 _____ Phase 2 _____ Phase 3 _____ Phase 4

*For Biological Reports (Please describe Scope): MSHCP Consistency + Biological Constraints Analysis

Both the Consultant and the project sponsor acknowledge that the consultant may not submit reports to the County for use in completing initial environmental assessments or EIR's for development proposals unless the consultant has been previously qualified by the County to submit such reports and unless the consultant has entered into a Memorandum of Understanding (MOU) with the County governing the preparation and handling of such reports. The project sponsor hereby acknowledges that they have been furnished a copy of the MOU, have read it, and understand the responsibilities of both the county and the consultant as set forth therein.

Project sponsor acknowledges that the report for which notification is hereby made is the:

_______ 1st, _______ 2nd or _______ (specify number) archaeological, or biological report for which contractual arrangements have been made under the direction of the project sponsor for the property described above.

PROJECT SPONSOR AND CONSULTANT are to execute the following:
I hereby affirm that all information provided above, is, to the best of my knowledge, true, correct, and complete.

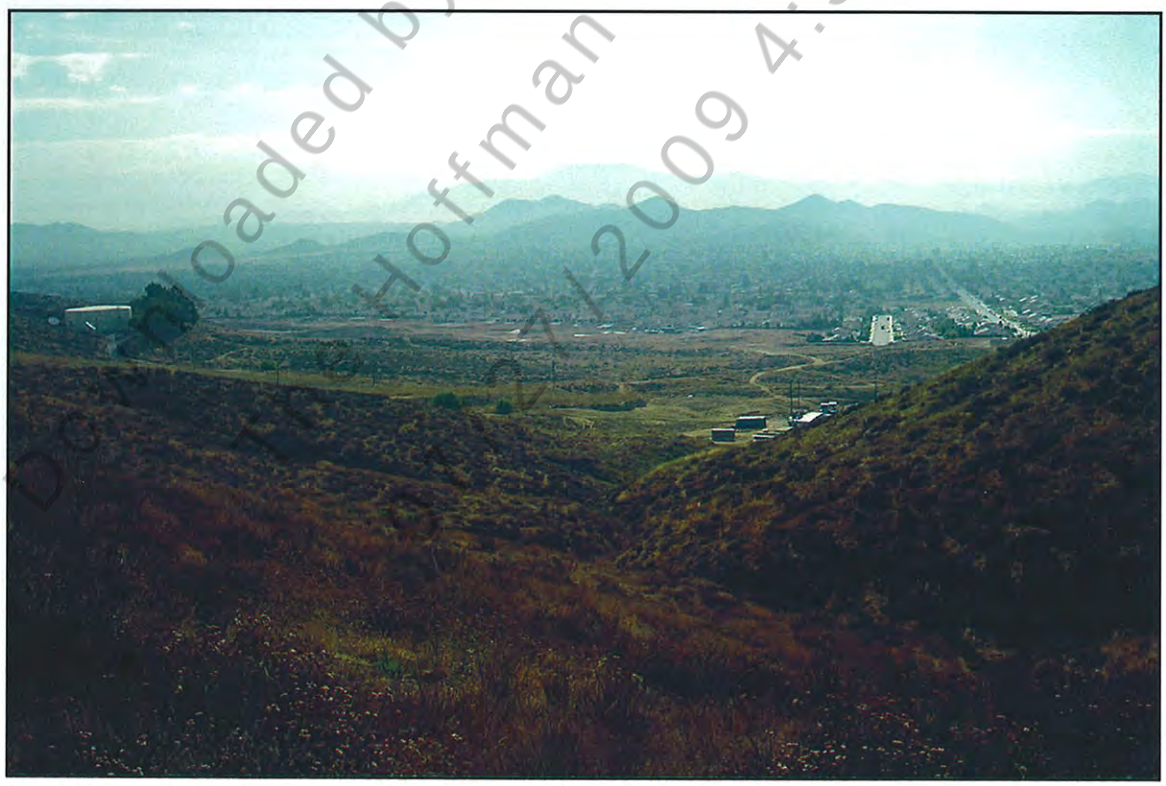
Project sponsor: ______ Dated: ______

Consultant: Kelly Rios Dated: 1/24/06

A Riverside County Planning Department "Date Received" stamp hereon shall acknowledge receipt of this Notice by the County.

Appendix D: Site Photographs

Photograph 1: Low Quality RSS - Facing West.



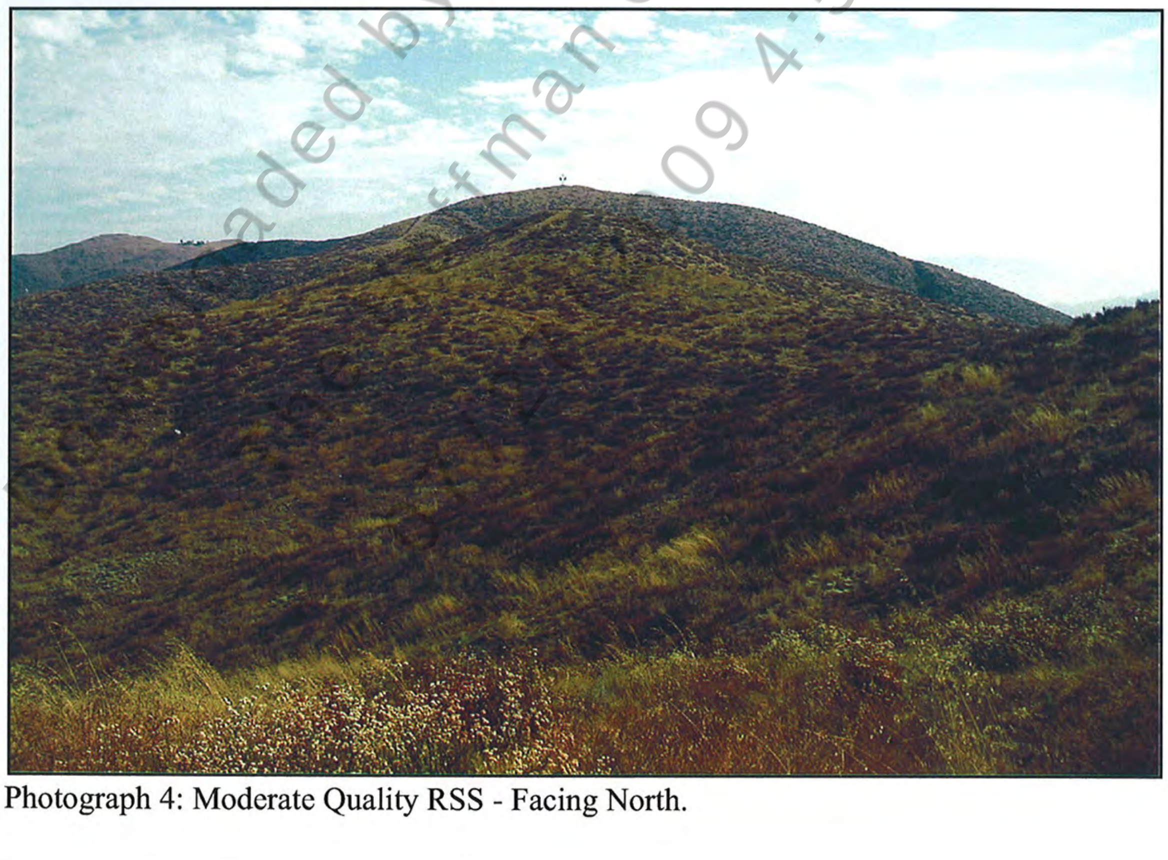
Photograph 2: Moderate Quality RSS - Facing Northeast.

Source: Michael Brandman Associates, 2005.

Michael Brandman Associates

Appendix D
Site Photographs

Photograph 3: Low Quality RSS - Facing West.



Photograph 4: Moderate Quality RSS - Facing North.

Source: Michael Brandman Associates, 2005.

APPENDIX B

USFWS Formal Section 7 Consultation Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92011

RECEIVED
AUG 04 2006
REGULATC .ANCH
LOS ANGEL OFFICE

In Reply Refer To:
FWS-WRIV-4940.1

JUL 27 2006

Colonel Alex Dornstauder
District Engineer
U.S. Army Corps of Engineers
Los Angeles District
P.O. Box 532711
Los Angeles, California 90053-2325

Attn: Stephanie J. Hall, Regulatory Branch (File No. 200600825-SJH)

Subj: Formal Section 7 Consultation for Residential Development of Tract 28920, Riverside County, California (1-6-06-F-4940.1)

Dear Colonel Dornstauder:

This document transmits our biological opinion based on our review of the proposed construction of residential housing Tract 28920 located within unincorporated Riverside County, California, and its potential effects on the federally threatened coastal California gnatcatcher (*Polioptila californica californica*; "gnatcatcher") and its designated critical habitat, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*). We initiated formal consultation on May 8, 2006, the date we received your request.

On June 22, 2004, we issued a section 10(a)(1)(B) permit for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP established a multiple species conservation program to minimize and mitigate habitat loss and the incidental take of covered species in association with activities covered under the permit. The applicant, WL Homes, LLC, seeks incidental take authorization through participation in the MSHCP. Although the proposed project is located outside of the MSHCP Criteria Area, other MSHCP policies and procedures such as the Protection of Species Associated with Riparian/ Riverine Areas and Vernal Pools policy (MSHCP section 6.1.2) (Riparian/Riverine Policy), Guidelines Pertaining to the Urban/Wildlands Interface (MSHCP section 6.1.4), and the Additional Survey Needs and Procedures (MSHCP section 6.3.2, figure 6-2) apply to the proposed project.

ENCL 2

This biological opinion is based on information provided in the following documents: 1) *Preconstruction Notification for the Proposed Development of Tract 28920, in an Unincorporated Area of Riverside County, California* (Vandermost Consulting 2006); 2) *Burrowing Owl Focused Survey Report, 121–Acre Tentative Tract 28920, Riverside County, California* (Michael Brandman Associates 2006); 3) *Intra-Service Formal Section 7 Consultation/Conference for Issuance of Endangered Species Act Section 10(a)(1)(B) Permit TE-088609-0 for the Western Riverside County Multiple Species Habitat Conservation Plan* dated June 22, 2004 (FWS-WRIV-870.19); and 4) other information available in our files. A complete project file addressing this consultation is located at the Carlsbad Fish and Wildlife Office.

The 121.7-acre proposed project site is located at the western terminus of Ridgemoore Road in the Sun City/Menifee Area Plan of the MSHCP. The property is bordered by open space on the north and west, and proposed and current development on the south and east. Approximately 116 acres of the proposed project site supports Riversidean sage scrub, of which 65 acres is designated gnatcatcher critical habitat. The remainder of the proposed project site is non-native grassland. One pair of gnatcatchers was observed onsite during the 2002 breeding season. A total of 0.11 acres (3100 linear feet) of waters of the United States are located onsite.

Your agency, the Army Corps of Engineers, proposes to authorize the proposed action that will impact 0.05 acres (1370 linear feet) of waters of the United States. Implementation of the proposed project will result in the development of 40 residential lots on a total of 16.5 acres. Almost the entirety of the 16.5 acre impact area supports Riversidean sage scrub habitat, 15.4 acres of which are designated as gnatcatcher critical habitat. The remaining 105.2 acres of the proposed project site would be designated as open space.

Although the MSHCP Riparian/Riverine Policy calls for submittal of a "Determination of Biologically Equivalent or Superior Preservation" (DBESP) to the U. S. Fish and Wildlife Service and the California Department of Fish and Game for a 60-day review period, information received through the consultation process was sufficient for us to evaluate the proposed action for consistency with the Riparian/Riverine Policy. Measures to offset impacts to riverine areas have been incorporated into the proposed action; namely, payment to the Riverside County Parks and Open Space District's *Arundo* removal program for treatment of 0.25 acres. We consider this measure adequate to address the requirements of the MSHCP Riparian/Riverine Policy.

The proposed project is bordered to the north by Public/Quasi-public (PQP) land. Therefore, measures to address MSHCP Guidelines Pertaining to the Urban/Wildlands Interface have been incorporated into the proposed project including the following: 1) untreated surface runoff from developed and paved areas into the PQP lands will be avoided; 2) manufactured slopes will not extend into the PQP lands; 3) a stone wall barrier will be erected adjacent to development on the project's northern border; 4) landscaping will avoid the use of invasive species listed on Table 6-2 of the MSHCP; 5) no night lighting will be used; and 6) pre- and post-construction best management practices will be implemented.

In accordance with the Additional Survey Needs and Procedures of the MSHCP, a focused survey consisting of four days in April 2006 were conducted for burrowing owls (*Athene cunicularia hypungaea*). Burrowing owls were not observed on the proposed project area. However, pre-construction surveys will be conducted within 30 days prior to disturbance in accordance with the MSHCP species-specific objectives for the burrowing owl.

To address Condition 5 of the section 10(a)(1)(B) MSHCP permit, a qualified biologist shall conduct a nesting bird survey prior to vegetation clearing during the nesting season (February through August). A 250-foot buffer will be avoided around any active nests found. A 500-foot buffer will be avoided around nest for raptors. The buffers will remain in place until nestlings have fledged.

Based on our review of the information provided to us, we have determined that the proposed project is consistent with the relevant MSHCP policies and procedures. The status of the gnatcatcher and its critical habitat along with the effects of implementing the MSHCP were previously addressed in our biological opinion (FWS-WRIV-870.19) dated June 22, 2004, in which we concluded that the level of anticipated take in the MSHCP plan area was not likely to result in jeopardy to this species or adversely modify gnatcatcher critical habitat. We do not anticipate any adverse effects to this species or its designated critical habitat that were not previously evaluated in the biological opinion for the MSHCP.

This concludes formal consultation on the proposed action. As provided in 50 CFR section 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the proposed action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat is designated that may be affected by the proposed action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact Kathleen Pollett of this office at (760) 431-9440, extension 357.

Sincerely,

Doreen Stadtlander

for Karen A. Goebel
Assistant Field Supervisor

cc:
Sherri Conley, Vandermost Consulting, San Juan Capistrano, CA
Leslie MacNair, CDFG, Ontario, CA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92011

In Reply Refer To:
FWS-WRIV-4940.1

JUL 27 2006

Colonel Alex Dornstauder
District Engineer
U.S. Army Corps of Engineers
Los Angeles District
P.O. Box 532711
Los Angeles, California 90053-2325

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Sincerely,

Doreen Stadtlander

for Karen A. Goebel
Assistant Field Supervisor

cc:
Sherri Conley, Vandermost Consulting, San Juan Capistrano, CA
Leslie MacNair, CDFG, Ontario, CA

APPENDIX C

Site Photographs

Photo 1. View of the middle portion of the Impact Area and Feature 1F, viewing south.

Photo 2. View of the eastern boundary of the Impact Area, including the concrete v-ditch (Feature 1A).

Photo 3. View of the southwestern portion of the Impact Area including typical habitat such as brittle bush scrub, California buckwheat scrub, and tamarisk thickets, and Feature 1G, viewing southwest.

Photo 4. View of the existing culvert in the southeast corner of the Impact Area at the end of Feature 1A, viewing east.

Photo 5. View of the Impact Area, viewing southeast.

Photo 6. View of Feature 1C and typical brittlebush scrub within the Impact Area, viewing northwest.

APPENDIX D

Plant and Wildlife Species Observed
Menifee Tract 28920

Plant Species Observed within the Project Site

Scientific Name	Common Name
Anacardiaceae	Cashew Family
*Schinus molle**	Peruvian pepper tree
Asteraceae (Compositae)	Sunflower Family
Deinandra paniculata†	San Diego tarweed
Encelia farinosa	Brittlebush
Gutierrezia sarothrae	Broom snakeweed
*Oncosiphon piluliferum**	Stinknet
Brassicaceae	Mustard Family
*Hirshfelida incana**	Short-pod mustard
Cactaceae	Cactus Family
Cylindropuntia californica	California cholla
Euphorbiaceae	Spurge Family
Croton setiger	Turkey mullein
Stillingia linearifolia	Narrow-leaved stillingia
Fabaceae	Legume Family
Lotus scoparius	Deerweed
Lamiaceae	Mint Family
*Rosmariunus officinalis**	Creeping rosemary
Trichostema lanceolatum	Vinegarweed
Nyctaginaceae	Four O'Clock Familty
Mirabilis laevis	Wishbone bush
Platanaceae	Plane Tree Family
*Platanus racemose**	Western Sycamore
Poaceae	Grass Family
*Bromus madritensis ssp. rubens**	Red brome
*Hordeum murinum**	Wall barely
Polygonaceae	Knotweed Family

Scientific Name	Common Name
Eriogonum fasciculatum	California buckwheat
Tamaricaceae	Tamarisk Family
*Tamarix ramosissima**	Saltcedar

* non-native species
† Sensitive species

Wildlife Species Observed/Detected within the Impact Area

Scientific Name	**Common Name**
Columbidae	**Dove Family**
Zenaida macroura	Mourning dove
Falconidae	**Falcon family**
Falco sparverius	American kestrel
Fringillidae	**True Finch Family**
Haemorhous mexicanus	House finch
Spinus psaltria	Lesser goldfinch
Polioptillidae	**Gnatcatcher Family**
Polioptila californica californica†	Coastal California gnatcatcher
Passerellidae	**New World Sparrow Family**
Melospiza melodia	Song sparrow
Troglodytidae	**Wren Family**
Salpinctes obsoletus	Rock wren
Tyrannidae	**Tyrant Flycatcher Family**
Sayornis nigricans	Black phoebe

† Sensitive species

Appendix E
Menifee Tract 29820
Special Status Plant Species Potential Occurrence Determination

This table summarizes conclusions from analysis and field surveys regarding the potential occurrence of special status species within the Project Site. During the field surveys, the potential for special status species to occur within the Project Site was assessed based on the following criteria:

- Present: observed on the site during the field surveys, or recorded on-site by other qualified biologists.
- High potential to occur: observed in similar habitat in the region by a qualified biologist, or habitat on the site is a type often utilized by the species and the site is within the known distribution and elevation range of the species.
- Moderate potential to occur: reported sightings in surrounding region, or the site is within the known distribution and elevation range of the species and habitat on the site is a type occasionally used by the species.
- Low potential to occur: the site is within the known distribution and elevation range of the species but habitat on the site is rarely used by the species, or there are no known recorded occurrences of the species within or adjacent to the site.
- Absent: a focused study failed to detect the species or no suitable habitat is present.
- Unknown: the species' distributional/elevation range and habitat are poorly known.

Even with field surveys, biologists assess the *probability* of occurrence rather than make a definitive conclusion about species' presence or absence. Failure to detect the presence of the species is not definitive, and may be due to variable effects associated with fire, rainfall patterns, and/or season.

Special Status Plants: Potential to Occur within the Survey Area

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
PLANTS				
Allium munzii	Munz's onion	FE, ST, CRPR: 1B.1 MSHCP: Group 3	It is endemic to western Riverside County where it grows in the coastal sage scrub, grassland or juniper woodland communities of the local hills and mountains. Occur on clay and cobbly clay soils which include the following series: Altamont, Auld, Bosanko, Claypit, and Porterville. Elevation: 300 - 900 meters Blooming Period: April - May	Low. No clay soils present.
Ambrosia pumila	San Diego ambrosia	FE, CRPR: 1B.1 MSHCP: Group 3	Perennial herb. Range extends from Riverside County through San Diego County into Baja California. It generally occurs in chaparral, coastal scrub and valley and foothill grasslands, usually where exposed to seasonal flooding. This species inhabits sandy loam soils or clay soils and has been known to tolerate alkaline conditions. In valleys, it persists where disturbance has been superficial. Sometimes, this species can be found on margins or near vernal pools. Elevation: 50 - 600 meters Blooming Period: April - July	Low. Although coastal sage scrub vegetation is present, flooding and alkaline conditions are not present.
Atriplex coronata var. notatior	San Jacinto Valley crownscale	FE, CRPR: 1B.1 MSCHP: Group 3	Suitable habitat for the San Jacinto Valley crownscale includes floodplains (seasonal wetlands) dominated by alkali scrub, alkali playas, vernal pools, and alkali grasslands. It is endemic to western Riverside County and is restricted to the San Jacinto, Perris, Menifee, and Elsinore Valleys. Restricted to highly alkaline, silty-clay soils in association with the Traver-Domino-Willows soil association; the majority (approximately 80 percent) of the populations being associated with the Willows soil series. Elevation: 400 - 500 meters Blooming Period: April - August	Low. No floodplains, vernal pools, or alkaline soils.
Brodiaea filifolia	thread-leaved brodiaea	FT, SE, CRPR: 1B.1, MSCHP: Group 3	Perennial bulbiferous herb. Found in floodplains in semi-alkaline mudflats, vernal pools, mesic southern needlegrass grassland, mixed native-nonnative grassland, alkali grassland,	Low. No clay soils and the habitat onsite is not ideal.

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
			and alluvial fan sage scrub plant communities. Requires very heavy clay soils. The range of this species extends from the foothills of the San Gabriel Mountains at Glendora in Los Angeles County, east to Arrowhead Hot Springs in the western foothills of the San Bernardino Mountains in San Bernardino County, and south through eastern Orange and western Riverside Counties to the City of San Diego. Elevation: 25 - 860 meters Blooming Period: March - June	
Caulanthus simulans	Payson's jewelflower	CRPR: 4.2, FSS MSHCP: Group 1	Sandy, granitic habitats in chaparral and coastal scrub, and pinyon/juniper woodland. Elevation: 90 - 2200 meters (CNPS); 400 - 2200 meters (Jepson eFlora) Blooming Period: (Feb)March - May(Jun)	Low. Suitable soil is not present onsite.
Centromadia pungens ssp. laevis	smooth tarplant	CRPR: 1B.1 MSHCP: Group 3	Suitable habitat for the smooth tarplant includes open, poorly drained flats, depressions, waterway banks, margins bristly-ciliate, alkali scrub, alkali playas, and grasslands with alkaline affinities. Elevation: 0 - 640 meters (CNPS); 90 - 500 meters (Jepson eFlora) Blooming Period: April - September	Low. Site is very dry, no depressions, alkali scrub, or alkaline affinities are present onsite.
Chorizanthe leptotheca	peninsular spineflower	CRPR: 4.2 MSHCP: Group 2	Annual herb found in open habitats, typically on granitic-derived or alluvial surfaces. At higher elevations, this species appears to be associated with chaparral, sage scrub and coniferous forest openings and at lower elevations it is typically associated with old formation alluvial benches. Elevation: (300)600 - 1600 meters (Jepson eFlora) Blooming Period: May - August	Low. Coastal sage scrub habitat is present, however alluvial surfaces or benches are not present.
Chorizanthe parryi var. parryi	Parry's spineflower	CRPR: 1B.1, BLMS, FSS MSHCP: Group 2	Parry's spineflower occurs within sandy soils within the alluvial chaparral and scrub of the San Gabriel, San Bernardino and San Jacinto Mountains. Elevation: 90 - 800 meters Blooming Period: April - June (CNPS); May - June (Jepson eFlora)	Low. Alluvial scrub not present and Project location is not near the San Gabriel, San Bernardino, or San Jacinto Mountains.
Chorizanthe	long-spined	CRPR: 1B.2, BLMS	Long-spined spineflower is associated primarily with sand or	Low. No suitable habitat present

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
polygonoides var. longispina	spineflower	MSHCP: Group 2	heavy, often rocky, clay soils in southern needlegrass grassland, and openings in coastal sage scrub, and chaparral. Elevation: 30 - 1530 meters Blooming Period: April - July (CNPS); April - June (Jepson eFlora)	onsite.
Convolvulus simulans	small-flowered morning-glory	CRPR: 4.2 MSHCP: Group 2	Annual herb native to California and Baja California. Found in clay substrates (occasionally serpentine) in chaparral, coastal scrub, and valley and foothill grassland. Rare in southern California. Threatened by development and vehicles. Elevation: 30 - 740 meters (CNPS); 30 – 875 (Jepson eFlora) Blooming Period: March - July; April - June (Jepson eFlora)	Low. No clay soils onsite.
Deinandra paniculata	San Diego tarplant (paniculate tarplant)	CRPR: 4.2	Occurs as a dominant or co-dominant plant in the herbaceous layer of grasslands, forblands, openings of coastal sage scrub and oak woodland. Often in sandy soils. Elevation: < 1320 meters Blooming Period: (Mar)April - November(Dec); May - Nov (Jepson eFlora)	Present. San Diego tarplant was observed in the Impact Area during the September 2023 biological survey.
Dodecahema leptoceras	slender-horned spineflower	FE, SE, CRPR: 1B.1 MSHCP: Group 3	Slender-horned spineflower is endemic to southwestern cismontane California, ranging from central Los Angeles County east to San Bernardino County, and south to southwestern Riverside County in the foothills of the Transverse and Peninsular Ranges. Slender-horned spineflower is found in sandy soil in association with mature alluvial scrub that is maintained by periodic flooding and sediment transport. Elevation: 200 - 760 meters (CNPS); 200 - 700 meters (Jepson eFlora) Blooming Period: April - June (CNPS); May - June (Jepson eFlora)	Low. No suitable habitat onsite.
Harpagonella palmeri	Palmer's grapplinghook	CRPR: 4.2 MSHCP: Group 2	Palmer's grapplinghook is associated with clay and cobbly clay soils in chaparral, coastal sage scrub, valley and foothill grasslands, and scrub oak woodland. Elevation: 20 - 955 meters (CNPS); < 1000 meters (Jepson eFlora) Blooming Period: March to May (CNPS); March - April (Jepson eFlora)	Low. No suitable habitat onsite.

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
Juglans californica var *californica*	California black walnut / Southern California black walnut	CRPR: 4.2 MSHCP: Group 2	Perennial deciduous tree endemic to California. Habitat includes alluvial substrates, chaparral, cismontane woodland, coastal scrub, and riparian woodland. Threatened by urbanization, grazing, non-native plants, and possibly by lack of natural reproduction. Elevation: 30 - 900 meters Blooming Period: March - August (CNPS); Mar - May (Jepson eFlora)	Low. Species not observed onsite during 2022 and 2023 biological surveys.
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	CRPR: 1B.1, BLMS MSHCP: Group 3	Coulter's goldfields is associated with low-lying alkali habitats along the coast and in inland valleys. Most of the populations are associated with coastal salt marsh. In Riverside County, Coulter's goldfields occur primarily in highly alkaline, silty-clay soils in association with Traver, Domino and Willows soils. Most Riverside County populations are associated with the Willows soil series. Coulter's goldfields occur primarily in the alkali vernal plains community. Elevation: 1 - 1200 meters (CNPS); < 1000 meters (Jepson eFlora) Blooming Period: February - June (CNPS); April - May (Jepson eFlora)	Low. No suitable habitat onsite.
Lepidium virginicum var. robinsonii	Robinson's peppergrass	CRPR: 4.3	Annual herb occurring in dry sandy or thin soils in coastal sage scrub and chaparral. Elevation: 1 - 885 meters (CNPS); < 2800 meters (Jepson eFlora) Blooming Period: January - July (CNPS); Mar - Jun (Jepson eFlora)	Moderate. Marginal suitable habitat onsite.
Microseris douglasii var. platycarpha	small-flowered microseris	CRPR:4.2 MSHCP: Group 2	Clay soils in association with native grasslands or vernal pools. Elevation: 15 - 1070 meters Blooming Period: March - May	Low. No suitable habitat onsite.
Myosurus minimus ssp. apus	little mousetail	CRPR: 3.1 MSHCP: Group 3	Little mousetail occurs in association with vernal pools and within the alkali vernal pools and alkali annual grassland components of alkali vernal plains. Elevation: 20 - 640 meters Blooming Period: March - June	Low. No suitable habitat onsite.
Navarretia fossalis	spreading	FT, CRPR: 1B.1	Annual herb native to California and Baja California. Habitat	Low. No suitable habitat onsite.

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
	navarretia	MSHCP: Group 3	includes chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, and vernal pools. Threatened by urbanization, agriculture, road construction, grazing, flood control, non-native plants, illegal dumping, foot traffic, and vehicles. Elevation: 30 - 655 meters (CNPS); 30 - 1300 meters (Jepson eFlora) Blooming Period: April - June	
Orcuttia californica	California Orcutt grass	FE, SE, CRPR: 1B.1 MSHCP: Group 3	All known California Orcutt grass localities are associated with vernal pools. Elevation: < 700 meters Blooming Period: April - August	Low. No suitable habitat onsite.
ANIMALS				
Invertebrates / Crustaceans				
Branchinecta lynchi	vernal pool fairy shrimp	FT, IUCN: VU MSHCP: Group 3	This species is usually associated with vernal pools (79%) but can also be found in association with other ephemeral habitats including alkali pools, seasonal drainages, stock ponds, vernal swales and rock outcrops.	Low. No suitable habitat onsite.
Streptocephalus woottoni	Riverside fairy shrimp	FE, IUCN: EN MSHCP: Group 3	*S. wootoni* is restricted to deep (greater than 12” in depth) seasonal vernal pools, vernal pool like ephemeral ponds, and stock ponds and other human modified depressions.	Low. No suitable habitat onsite.
Invertebrates / Insects				
Bombus crotchii	Crotch bumble bee	SCE, IUCN: EN	Uncommon species of coastal California east towards the Sierras; select food plan genera include *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, Eriogonum.* Also, like lotus, *Encelia* sp., milk weed, and non-native grassland. Don’t prefer dense non-native vegetation. Nest in the ground but are not limited by compact soils unless no rodent burrows or crevices are present. Highly impacted by urbanization; unlikely to be found in fragmented habitats and more likely to be found in large undisturbed areas or sites with direct connections to large undisturbed areas.	Moderate. High. Suitable habitat onsite. An occurrence on the western portion of the Project Site is reported on CNDDB.
Danaus plexippus pop. 1	monarch – CA overwintering population	FSS, FCE, IUCN: EN	Winter migrant along California coast. Known to roost in eucalyptus trees. Usually encountered in lowland areas. Obligate milkweed host plant (primarily *Asclepias* spp.) during	Low. No suitable habitat onsite.

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
			larval stage. Nectar and milkweed resources are often associated with riparian corridors. Overwinter in groves along the coast of California and Baja California, typically close to the coast, populated by a variety of tree species, including blue gum eucalyptus (*Eucalyptus globulus*), Monterey pine (*Pinus radiata*), and Monterey cypress (*Hesperocyparis macrocarpa*).	
Euphydryas editha quino	quino checkerspot butterfly	FE MSHCP: Group 3	Each phase has distinct habitat requirements. Habitat associations seem to be tied to both host plant species and topography. Larvae feed immediately upon *Plantago erecta*, *Plantago patagonia, Antirrhinum coulterianum*, *Cordylanthus rigidus* and possibly other *Plantago* species and *Collinsia concolor*, and *Castilleja exserta*. After diapause, the larvae feed again on *Plantago erecta* before metamorphosing. After metamorphose, the adults nectar mostly on small annuals. The Quino checkerspot butterfly is found in association with topographically diverse open woody canopy landscapes that contain low to moderate levels of non-native vegetation compared to disturbed habitat. Vegetation types that support the Quino checkerspot are coastal sage scrub, open chaparral, juniper woodland, forblands, and native grassland. Soil and climatic conditions, as well as ecological and physical factors, affect the suitability of habitat within the species' range.	Low. Habitat onsite is rarely used by the species.
Amphibians				
*Spea hammondii (*also *Scaphiopus hammondii)*	western spadefoot toad	SSC, BLMS, IUCN: NT MSHCP: Group 2	Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools lasting a significant amount of time, and which do not contain bullfrogs, fish, or crayfish are necessary for breeding. Typically found in areas with good native vegetative cover and low levels of disturbance.	Low. No suitable habitat onsite.
Reptiles				
Arizona elegans occidentalis	California glossy snake	SSC	Inhabits arid scrub, rocky washes, grasslands, chaparral. Appears to prefer microhabitats of open areas and areas with soil loose enough for easy burrowing.	Low. Habitat onsite is rarely used by the species.

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
Aspidoscelis hyperythra	orange-throated whiptail	WL, FSS, IUCN:LC MSHCP: Group 1	Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats. Prefers washes and other sandy areas with patches of brush and rocks. Perennial plants necessary for its major food-termites.	Moderate. Marginal habitat onsite.
Aspidoscelis tigris stejnegeri	Coastal whiptail	SSC	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas. Generally, avoids areas of dense grass and thick shrubby growth. Requires warm and sunny areas for basking, friable soil for burrow construction and foraging, open areas for running, and cover of bushes, rocks, or both.	Low-Moderate. Marginal habitat onsite.
Crotalus ruber	red-diamond rattlesnake	FSS, SSC MSHCP: Group 2	Chaparral, woodland, grassland, and desert areas from coastal San Diego County to the eastern slopes of the mountains and north through western Riverside County into southernmost San Bernardino County. Occurs from Sea level to 900 meters in chaparral, woodland, and arid desert habitats in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	Low. No rodent burrows onsite, and habitat is not ideal.
Birds				
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	WL MSHCP: Group 2	Found on moderate to steep, dry, grass-covered hillsides, coastal sage scrub, and chaparral and often occur near the edges of the denser scrub and chaparral associations. Preference is shown for tracts of California sagebrush.	Moderate - High. Suitable habitat is present onsite.
Artemisiospiza belli belli	Bell's sparrow	WL	In cismontane California, frequents chaparral dominated by chamise and coastal sage scrub. Seeks cover in fairly dense stands in chaparral and scrub habitats in breeding season.	Moderate - High. Suitable habitat is present onsite.
Aquila chrysaetos	golden eagle	WL, FP, BCC, BLMS, IUCN:LC MSHCP: Group 2	Range-wide, golden eagles occur locally in open country (*e.g.,* tundra, open coniferous forest, desert, barren areas), especially in hills and mountainous regions.	Low. No suitable nesting habitat onsite.
Athene cunicularia	burrowing owl	SSC, BCC, BLMS, IUCN:LC MSHCP: Group 3	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.	Low. No suitable burrows or burrow surrogates were observed during the 2022 and 2023 biological surveys.
Empidonax traillii	southwestern	FE, SE,	The southwestern willow flycatcher is present in breeding	Low. No suitable habitat present

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
extimus	willow flycatcher	MSHCP: Group 3	territories by mid-May. It builds nests and lays eggs in late May and early June and fledges young in early to mid-July. Between August and September, the southwestern willow flycatcher migrates to wintering grounds in Mexico, Central America, and possibly northern South America. This species is an insectivore and forages within and above dense riparian vegetation. The breeding range of the species includes southern California. The southwestern willow flycatcher breeds in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands including lakes and reservoirs. Habitat patches must be at least 0.25 acres in size and at least 30 feet wide. Following modern changes to riparian communities, this subspecies still nests in native vegetation, but also uses thickets dominated by non-native tamarisk and Russian olive, or in mixed native non-native stands.	onsite.
Eremophila alpestris actia	California horned lark	WL MSHCP: Group 2	The California horned lark is a common to abundant resident in a variety of open habitats, usually where trees and large shrubs are absent. In the Midwest, the species has been characterized as the most abundant species in row-crop fields. Range-wide, California horned larks breed in level or gently sloping shortgrass prairie, montane meadows, "bald" hills, open coastal plains, fallow grain fields, and alkali flats	Low. Grasslands are not present onsite. The shrub communities may provide marginal habitat.
Haliaeetus leucocephalus	bald eagle (nesting and wintering)	SE, FD, BLMS, BCC, FSS, FP, IUCN:LC MSHCP: Group 1	Open areas, forest edges, and mountains near large lakes and rivers. Requires tall trees for nesting.	Low. Ony one large sycamore tree is present onsite and is not significant suitable habitat for this species.
Polioptila californica californica	coastal California gnatcatcher	FT, SSC MSHCP: Group 2	Obligate, permanent resident of coastal sage scrub below 835 meters in southern California. Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	Present. Species was observed onsite during the September 2023 biological survey.
Vireo bellii pusillus	least Bell's vireo	FE, SE, IUCN:NT MSHCP: Group 2	Summer resident of southern California in low riparian, in vicinity of water or in dry river bottoms; below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, baccharis or, mesquite.	Low. No suitable habitat onsite.
Mammals				

Scientific Name	*Common Name*	*Status*	*General Habitat Description* *Blooming period: months in parenthesis are uncommon*	*Potential for Occurrence within the Survey Area*
Dipodomys merriami parvus	San Bernardino kangaroo rat	FE, SSC MSHCP: Group 3	This species is typically found in Riversidean alluvial fan sage scrub and sandy loam soils, alluvial fans and flood plains, and along washes with nearby sage scrub, chaparral and even disturbed areas that are associated with alluvial processes. Soil texture is a primary factor in this subspecies' occurrence. Sandy loam substrates allow for the digging of simple, shallow burrows. The species is found in open grassland habitats where the sparse vegetation is mainly composed of shrubs, sagebrush, grasses and forbs.	Low. Habitat onsite is rarely used by the species.
Dipodomys stephensi	Stephens' kangaroo rat	FE, ST, IUCN: EN MSHCP: Group 2	The species is found in open grassland habitats where the sparse vegetation is mainly composed of shrubs, sagebrush, grasses and forbs. Species avoid dense grasses (for example, non-native bromes) and are more likely to inhabit areas where the annual forbs disarticulate in the summer and leave more open areas. As a fossorial (burrowing) animal, the Stephens' kangaroo rat typically is found in sandy and sandy loam soils with a low clay to gravel content, although there are exceptions where they can utilize the burrows of Botta's pocket gopher and California ground squirrel.	Low. Habitat onsite is rarely used by the species.
Eumops perotis californicus	western mastiff bat	SSC, BLMS, WBWG (H)	Open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban. Suitable habitat consists of extensive open areas with abundant roost locations provided by crevices in rock outcrops and buildings.	Low. Suitable foraging habitat exists; however, no roost locations are present within the Project site.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	SSC MSHCP: Group 1	This species is found in a variety of habitats including herbaceous and desert scrub areas, early stages of open forest and chaparral, and in western Riverside County in suitable grassland, sage scrub and chaparral (openings) habitat. It is also found in substantial numbers in agricultural and rural residential settings. It is restricted to the cismontane areas of Southern California, extending from the coast to the Santa Monica, San Gabriel, San Bernardino and Santa Rosa mountain ranges.	Low-Moderate. Suitable habitat onsite but the Project is outside of the typical distribution.

Legend
Federal Endangered Species Act (ESA) Listing Codes: federal listing is pursuant to the Federal Endangered Species Act of 1973, as amended (ESA). FE = federally listed as endangered: any species, subspecies, or variety of plant or animal that is in danger of extinction throughout all or a significant portion of their range. FT = federally listed as threatened: any species, subspecies, or variety of plant or animal that is considered likely to become endangered throughout all or a significant portion of its range within the foreseeable future. FCE = federal candidate endangered. FD = federally delisted species. *California Endangered Species Act (CESA) Listing Codes:* state listing is pursuant to § 1904 (Native Plant Protection Act of 1977) and §2074.2 and §2075.5 (California Endangered Species Act of 1984) of the Fish and Game Code, relating to listing of Endangered, Threatened and Rare species of plants and animals. SE = state listed as endangered: any species, subspecies, or variety of plant or animal that are in serious danger of becoming extinct throughout all, or a significant portion, of their range. ST = state listed as threatened: any species, subspecies, or variety of plant or animal that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future. SCE = state listed as candidate endangered. SD = state delisted species *California Department of Fish and Wildlife (CDFW):* SSC = species of special concern: status applies to animals which 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist. The CDFW has designated certain vertebrate species as "species of special concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. FP = Fully protected: animal species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. WL = watch list: these birds have been designated as "Taxa to Watch" in the *California Bird Species of Special Concern report* (Shuford and Gardali 2008). The report defines "Taxa to Watch" as those that are not on the current special concern list that (1) formerly were on the 1978 (Remsen 1978) or 1992 (CDFG 1992) special concern lists and are not currently listed as state threatened and endangered; (2) have been removed (delisted) from either the state or federal threatened and endangered lists (and remain on neither), or (3) are currently designated as "fully protected" in California. *United States Fish and Wildlife Service (USFWS):* BCC = USFWS bird of conservation concern: listed in the USFWS'S 2008 *Birds of Conservation Concern* report. The report identifies species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the ESA. While all of the bird species included in the report are priorities for conservation action, the list makes no finding with regard to whether they warrant consideration for ESA listing. *United States Forest Service (USFS):* FSS = Forest Service sensitive: those plant and animal species identified by a Regional Forester that are not listed or proposed for listing under the ESA and for which population viability is a concern, as evidenced by: (a) significant current or predicted downward trends in population numbers or density or (b) significant current or

predicted downward trends in habitat capability that would reduce a species' existing distribution."

United States Bureau of Land Management (BLM):
BLMS = BLM sensitive: those plant and animal species on BLM administered lands and that are (1) under status review by the USFWS/NMFS; or (2) whose numbers are declining so rapidly that federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) those inhabiting ecological refugia or other specialized or unique habitats. BLM policy is to provide the same level of protection as USFWS candidate species.

California Rare Plant Ranks (Formerly known as CNPS Lists): the CNPS is a statewide, non-profit organization that maintains, with CDFG, an Inventory of Rare and Endangered Plants of California. In the spring of 2011, CNPS and CDFG officially changed the name "CNPS List" or "CNPS Ranks" to "California Rare Plant Rank" (or CRPR). This was done to reduce confusion over the fact that CNPS and CDFG jointly manage the Rare Plant Status Review Groups and the rank assignments are the product of a collaborative effort and not solely a CNPS assignment.

CRPR: 1A - California Rare Plant Rank of 1A: Plants presumed extirpated in California and either rare or extinct elsewhere. Plants with a California Rare Plant Rank of 1A are presumed extirpated or extinct because they have not been seen or collected in the wild in California for many years. All of the plants constituting California Rare Plant Rank 1A meet the definitions of the California Endangered Species Act of the California Fish and Game Code, and are eligible for state listing. Should these taxa be rediscovered, and impacts proposed to individuals or their habitat, they must be analyzed during preparation of environmental documents relating to CEQA, or those considered to be functionally equivalent to CEQA, as they meet the definition of Rare or Endangered under CEQA Guidelines §15125 (c) and/or §15380.

CRPR: 1B - California Rare Plant Rank 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere. All of the plants constituting California Rare Plant Rank 1B meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to CEQA.

CRPR: 2A - California Rare Plant Rank 2A: Plants presumed extirpated in California but common elsewhere. Plants with a California Rare Plant Rank of 2A are presumed extirpated because they have not been observed or documented in California for many years. This list only includes plants that are presumed extirpated in California, but more common elsewhere in their range. All of the plants constituting California Rare Plant Rank 2A meet the definitions of the California Endangered Species Act of the California Fish and Game Code, and are eligible for state listing. Should these species be rediscovered, any impacts proposed to individuals or their habitat must be analyzed during preparation of environmental documents relating to CEQA, or those considered to be functionally equivalent to CEQA, as they meet the definition of Rare or Endangered under CEQA Guidelines §15125 (c) and/or §15380.

CRPR: 2B - California Rare Plant Rank 2B: Plants rare, threatened, or endangered in California but more common elsewhere. All of the plants constituting California Rare Plant Rank 2 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to CEQA.

CRPR: 3 – California Rare Plant Rank 3: Review List: Plants about which more information is needed. Plants with a California Rare Plant Rank of 3 are united by one common theme – there is a lack of necessary information to assign them to one of the other ranks or to reject them. Nearly all of the plants constituting California Rare Plant Rank 3 are taxonomically problematic. Many of the plants constituting California Rare Plant Rank 3 meet the definitions of the California Endangered Species Act of the California Fish and Game Code, and are eligible for state listing. Impacts to these species or their habitat should be analyzed during preparation of environmental documents relating to CEQA, or those considered to be functionally equivalent to CEQA, as they may meet the definition of Rare or Endangered under CEQA Guidelines §15125 (c) and/or §15380.

CRPR: 4 - California Rare Plant Rank 4: Plants of Limited Distribution - A Watch List. Very few of the plants constituting California Rare Plant Rank 4 meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and few, if any, are eligible for state listing. Nevertheless, many of them are significant locally, and CNPS and CDFG strongly recommend that California Rare Plant Rank 4 plants be evaluated for consideration during preparation of environmental documents relating to CEQA.

California Native Plant Society (CNPS) Threat Ranks: The CNPS Threat Rank is an extension added onto the California Rare Plant Rank (CRPR) and designates the level of endangerment by a 1 to 3 ranking with 1 being the most endangered and 3 being the least endangered. A Threat Rank is present for all California Rare Plant Rank 1B's, 2's, 4's, and the majority of California Rare Plant Rank 3's. California Rare Plant Rank 4 plants are seldom assigned a Threat Rank of 0.1, as they generally have large enough populations to not have significant threats to their continued existence in California; however, certain conditions exist to make the plant a species of concern and hence be assigned a California Rare Plant Rank. In addition, all California Rare Plant Rank 1A (presumed extinct in California), and some California Rare Plant Rank 3 (need more information) plants, which lack threat information, do not have a Threat Rank extension.

0.1 = seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 = fairly endangered in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3 = not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Western Riverside Multiple Species Habitat Conservation Plan (MSHCP): Planning species covered by the MSHCP. Additional surveys for Narrow Endemic Plant Species and Criteria Area Species to determine presence/absence may be required.
PS = planning species
NEPSSA # = Narrow Endemic Plant Species Survey Area (with survey area number noted).
CASSA # = Criteria Area Species Survey Area (with survey area number noted).

Group 1 = Species that have wide distribution throughout the Plan Area within suitable habitat. Take coverage is warranted based upon regional or landscape level considerations, such as healthy population levels, widespread distribution throughout the MSHCP Plan Area, and life history characteristics that respond to habitat-scale conservation and management actions.
Group 2 = Species that are relatively well-distributed throughout the MSCHP Plan Area. Take coverage is warranted based on regional or landscape level considerations with the addition of site-specific conservation and management requirements that are clearly identified in the MSHCP for species that are generally well-distributed, but that have Core Areas that require Conservation.
Group 3 = Species that have narrow habitat requirements and limited distribution within the Plan Area. Take coverage is warranted based upon site specific considerations and the identification of specific conservation and management conditions for species within a narrowly defined Habitat or limited geographic area within the MSHCP Plan Area.

Western Bat Working Group (WBWG): The WBWG is composed of agencies, organizations, and individuals interested in bat research, management, and conservation from the 13 western states and provinces. The goals are (1) to facilitate communication among interested parties and reduce risks of species decline or extinction; (2) to provide a mechanism by which current information on bat ecology, distribution, and research techniques can be readily accessed; and (3) to develop a forum to discuss conservation strategies, provide technical assistance, and encourage education programs. Species are ranked as High, Medium, or Low Priority in each of 10 regions in western North America. Because California includes multiple regions where a species may have different WBWG Priority ranks, the CNNDB includes categories for Medium-High, and Low-Medium Priority.

WBWG-H= Hight Priority
WBWG-M= Medium Priority
WBWG-L= Low Priority

American Fisheries Society: Listing of imperiled freshwater and diadromous fishes of North America prepared by the American Fisheries Society's Endangered Species Committee.

AFS-E= Endangered
AFS-TH= Threatened
AFS-V= Vulnerable

The International Union for Conservation of Nature (IUCN): The IUCN assesses, on a global scale, the conservation status of species, subspecies, varieties and even selected subpopulations in order to highlight taxa threatened with extinction, and therefore promote their conservation. Detailed information on the IUCN and the Red List is available at: http://www.iucnredlist.org

IUCN-CR = Critically endangered
IUCN-EN = Endangered
IUCN-NT = Near threatened
IUCN-VU = Vulnerable
IUCN-LC = Least concern
IUCN-DD = Data deficient
IUCN-CD = Conservation dependent

NatureServe Element Ranking: This ranking system's units of conservation may include non-taxonomic biological entities such as populations or ecological communities, thus, NatureServe refers to the targets of biological conservation as "elements" rather than taxa. The three main categories that are taken into consideration when assigning an element rank are rarity, threats, and trends.

The global rank (G-rank) is a reflection of the overall status of an element throughout its global range:

GX: Presumed Extinct – Not located despite intensive searches and virtually no likelihood of rediscovery.
GH: Possibly Extinct – Known from only historical occurrences but still some hope of rediscovery. Examples of evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species has been searched for unsuccessfully, but not thoroughly enough to presume that it is extinct throughout its range.
G1: Critically Imperiled – At very high risk of extinction due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
G2: Imperiled – At high risk of extinction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
G3: Vulnerable – At moderate risk of extinction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or

other factors. G4: Apparently Secure – At fairly low risk of extinction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors. G5: Secure – At very low risk of extinction due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats. GNR: Unranked – Global rank not yet assessed. The state rank (S-rank) refers to the imperilment status only within California's state boundaries: SX: Presumed Extirpated – Species is believed to be extirpated from the state. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered SH: Possibly Extirpated – Known from only historical records but still some hope of rediscovery. There is evidence that the species may no longer be present in the state, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction. S1: Critically Imperiled – At very high risk of extirpation in the state due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors. S2: Imperiled – At high risk of extirpation in the state due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors. S3: Vulnerable – At moderate risk of extirpation in the state due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors. S4: Apparently Secure – At a fairly low risk of extirpation in the state due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

Sources:

- Calflora website - search for plants (Calflora 2016 - 2023).
- CNPS Inventory of Rare and Endangered Plants (CNPS 2023).
- The Jepson Manual: *Vascular Plants of California,* second edition (Baldwin *et al.* 2012).
- RareFind, CDFW, California Natural Diversity Database (CNDDB) (CDFW 2020).
- State and Federally Listed Endangered, Threatened, and Rare Plants of California (CDFW 2023).
- State and Federally Listed Endangered and Threatened Animals of California (CDFW, 2023).
- Special Animals List (CDFW 2023)
- Western Riverside County Multiple Species Habitat Conservation Plan (County of Riverside 2003)
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Cultural Resources Assessment

Oak Hills West Residential Project

TTM 38652
Menifee, California

PREPARED FOR:

Oak Hills West, LLC
2922 Daimler Street
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Contact: Sal Provenza

PREPARED BY:

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October 2023

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Cultural Resources Assessment
Oak Hills West Residential Project
TTM 38652
Menifee, California

by

Patrick Maxon, M.A., RPA

October 2023

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USGS *Romoland, CA* 7.5-Minute Quadrangle; Township 5 South; Range 3 West, Section 30 (S.B.B.M).

Project study area: Approximately 14 acres

Investigation: CEQA Phase I: literature review, Tribal scoping; pedestrian field survey, USACE Section 404 Permit

Key Words: Assessment, EIC, WSC, NAHC, SLF Search Negative; Qvof geology

MANAGEMENT SUMMARY

Purpose and Scope

VCS Environmental was retained by Oak Hills West, LLC to complete a Phase I Cultural Resources Assessment (CRA) for the proposed Oak Hills West Residential Project Tract 38652 (Project) in the City of Menifee, Riverside County, California. The Project is a 68-unit Single Family detached housing development. The property is 75.26 acres total. However, development would occur only in an approximately 14-acre area in the eastern portion of the property (i.e., the study area).

This CRA provides a summary of past and current cultural resources investigations in support of the California Environmental Quality Act (CEQA) analysis for the Project. This CRA also was completed in support of securing a permit for the proposed project under Section 404 of the Clean Water Act from the U.S. Army Corps of Engineers, Los Angeles District. Therefore, the Project is a federal action subject to the requirements of Section 106 of the National Historic Preservation Act (NHPA) (16 *United States Code* [USC] 470f) and its implementing regulations at Title 36 *Code of Federal Regulations* [CFR] Part 800 (Protection of Historic Properties). The format of this report follows *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Office of Historic Preservation 1990).

Dates of Investigation

A cultural resources literature review was completed on June 15, 2023 by the Eastern Information Center (EIC) at the University of California, Riverside (Attachment A). A paleontological resources literature review was completed by Collection Manager Brittney Stoneburg at the Western Science Center (WSC) in Hemet on May 5, 2023 (Attachment B). A negative findings Sacred Lands File Search and Tribal contacts list was received from the Native American Heritage Commission (NAHC) on August 16, 2023 (Attachment C). A cultural resources survey of the approximately 14-acre Project study area was conducted by author Patrick Maxon on September 20, 2023. This report was completed in October 2023.

Findings of Investigation

Implementation of the proposed Project would not adversely affect any known significant archaeological or historical resources or fossil localities. The area, however, is known to contain historical resources and mitigation measures are recommended.

- The EIC records search identified seven cultural resources within one mile of the Property. One site (P-33-010944/CA-RIV-6619) is recorded on the Project study area. The field survey failed to relocate the site in the location it was recorded.
- The EIC records search identified 36 cultural resources studies previously completed within one mile of the Property. None have been completed within the Property. A final study (Keller 2000) that resulted in the recording of P-33-010944/CA-RIV-6619 was not provided by the EIC.
- The NAHC Sacred Lands File search was negative.
- There are no known fossil localities recorded within one mile of the Property. The geologic units underlying the Property are mapped as black phyllite, a metamorphic rock. This metamorphic rock unit has low to no paleontological sensitivity. The northwest corner of the property and the eastern third of the study area is covered in very old alluvial fan deposits of Pleistocene age that are highly paleontologically sensitive.

Investigation Constraints

The approximately 14-acre Project study area is undeveloped. Vegetation was intermittent in most areas and dense only in the large drainage on the site and in the more elevated terrain to the west.

Summary and Recommended Mitigation Measures

CULTURAL RESOURCES

Implementation of the proposed Project would not adversely affect any existing known significant archaeological or paleontological resources; however, there is one archaeological site (P-33-010944/CA-RIV-6619) recorded on the Project study area that was not identified or relocated during the survey. It may have been destroyed or eroded downslope into the drainage.

The City of Menifee may have standardized mitigation measures they would prefer to use. The following mitigation measures are recommended:

MM-Cul-1: Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist and Tribal monitor(s) (if requested pending Tribal consultation) to conduct monitoring of all mass grading and trenching activities. The Project Archaeologist shall have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultural Resources Monitoring Plan (CRMP) to address the details, timing and responsibility of all archaeological and cultural activities that will occur on the Project study area. Details in the Plan shall include:

a. Project grading and development scheduling;

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

c. The protocols and stipulations that the contractor, City, Consulting Tribe(s) and Project Archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation.

MM-Cul-2: In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries:

a. One or more of the following treatments, in order of preference, shall be employed with the Tribe(s). Evidence of such shall be provided to the City of Menifee.

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

ii. Onsite reburial of the discovered items. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. A confidential exhibit will be prepared. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments.

MM-Cul-3: If potential historic or cultural resources are uncovered during excavation or construction activities at the Project study area, work in a 100-foot radius around the find must cease immediately and a qualified person meeting the Secretary of the Interior's standards (36 CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City to evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects on the historic, or prehistoric resource. Determinations and recommendations by the consultant shall be immediately submitted for consideration, and implemented as deemed appropriate by the City, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulting Native American Tribes as defined in MM-Cultural-1 before any further work commences in the affected area.

MM-Cul-4: A final monitoring report will be prepared that describes the results of the monitoring program, assesses any discoveries, and makes any additional recommendations. The monitoring report shall be prepared by the Project Archaeologist in conjunction with the Tribe(s) and approved by the City of Menifee.

PALEONTOLOGICAL RESOURCES

The geologic units underlying much of the Project study area are mapped as black phyllite, a metamorphic rock. This metamorphic rock unit has low to no paleontological sensitivity. However, the northwest corner of the property and the eastern third of the study area is underlain by very old alluvial fan deposits of Pleistocene age and are highly paleontologically sensitive. The following mitigation measure is recommended:

MM-Cul-5: Prior to the issuance of grading permits, the Applicant shall retain a qualified paleontologist to observe ground disturbing activities and recover fossil resources as necessary. The Paleontologist will attend the pre-grade conference where he/she will establish procedures for paleontological monitoring and, through the preparation of a mitigation plan, shall establish procedures and protocols to temporarily halt ground disturbing activities to permit sampling, evaluation, and recovery of any discovery. Excavations that impact older Quaternary deposits may encounter fossil vertebrates. Any substantial excavations below the uppermost layers of the surface should be monitored. Sediment samples should also be recovered to determine the small-fossil potential of the site. If a discovery is determined to be significant, additional excavations and salvage of the fossil may be necessary to ensure that any impacts to it are mitigated to a less than significant level. A final monitoring report shall be prepared that describes the results of the monitoring program and evaluates any fossil resources recovered.

HUMAN REMAINS

Project-related earth disturbance nearly always has the potential to unearth previously undiscovered human remains, resulting in a potentially significant impact. If human remains are encountered during excavation activities, all work shall halt and the County Coroner shall be notified (*California Health and Safety Code,* §7050.5). The Coroner will determine whether the remains are of forensic interest. If the Coroner determines that the remains are prehistoric, she/he will contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC is responsible for immediately designating the most likely descendant (MLD), who will be responsible for the ultimate disposition of the remains, as required by Section 5097.98 of the *California Public Resources Code.* The MLD shall make her/his recommendation within 48 hours of being granted access to the site. The MLD's recommendation shall be followed if feasible and may include scientific removal and non-destructive analysis of the human remains and any items associated with Native American burials. If the landowner rejects the MLD's recommendations, the landowner shall rebury the remains with appropriate dignity on the property in a location that will not be subject to further subsurface disturbance.

Disposition of Data

This report will be filed with Oak Hills West, LLC (Applicant), the City of Menifee, VCS, and at the EIC. All field notes and other documentation related to the study are on file at VCS, San Juan Capistrano, California.

1.0 UNDERTAKING INFORMATION/INTRODUCTION

1.1 Contracting Data

VCS Environmental (VCS) was retained by Oak Hills West, LLC to complete a Phase I Cultural Resources Assessment for the proposed Oak Hills Residential Project in the City of Menifee, Riverside County, California.

VCS completed this Phase I Cultural Resources Assessment (CRA), under the California Environmental Quality Act (CEQA), to assist in its environmental study for the Project. The study is also a federal action and was completed under Section 106 of the National Historic Preservation Act (NHPA) in support of a permit under Section 404 of the Clean Water Act from the U.S. Army Corps of Engineers, Los Angeles District. The format of this report follows *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Office of Historic Preservation 1990).

This report details the findings of the investigation and offers management recommendations and mitigation measures to evaluate any discoveries and to reduce the impact of the Project on resources to a less than significant level.

1.2 Undertaking

The proposed Project will result in the development of 37 dwelling units clustered on the 14-acre eastern portion of the 75.26-acre property, with streets, wet and dry utilities, and open undisturbed land on the remaining land. The project also includes construction of storm drains, water quality basins, and implementation of Best Management Practices (BMP's) during construction such as construction phasing, construction entrances, waste management and fugitive dust suppression.

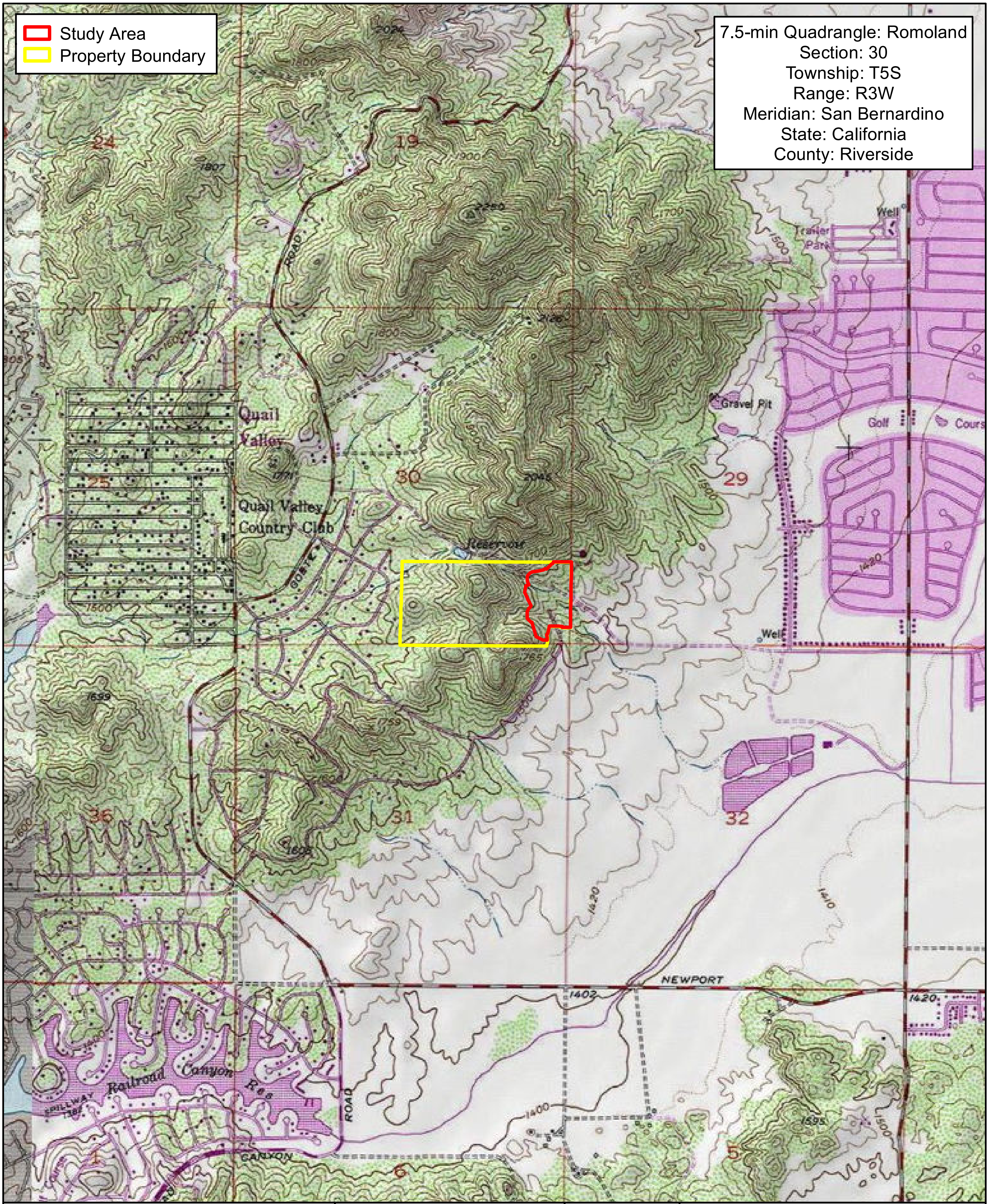
1.3 Project Area

The property is 75.26 acres in size and is located in the City of Menifee, Riverside County, California. The property is situated on the southeastern slopes of Oak Hills, immediately west of Ganymede Way and a new residential neighborhood, and north of the end of the cul-de-sac on Boulder Crest Way.

Figure 1 is an aerial map of the site. Figure 2 depicts the regional location as well as the specific boundary of the smaller, Project study area located in Section 30, Township 5 South; Range 3 West, of the United States Geologic Survey (USGS) 7.5' Quadrangle ***Romoland, CA*** (S.B.B.M).

1.4 Project Personnel

Patrick O. Maxon, M.A., RPA, requested the literature reviews from the EIC and WSC, requested the SLF search from the NAHC, completed the field survey, and authored this report. Refer to Attachment D for qualifications.



Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI, USGS

0 1,200 2,400
Feet
1:24,000

N
W E
S

Oak Hills

Figure 3 USGS Topographic Map

Prepared By:

VCS Environmental

Map Created: August 2023
Data Sources: ESRI

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

0 300 600
Feet
1:6,000

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Oak Hills

Figure 2

Aerial Map

2.0 REGULATORY SETTING

This section contains a discussion of the applicable laws, ordinances, regulations, and standards that govern cultural resources and must be adhered to both prior to and during Project implementation.

2.1 California Environmental Quality Act

CEQA requires a lead agency to determine whether a project would have a significant impact on one or more historical resources. According to Section 15064.5(a) of the State CEQA Guidelines, a "historical resource" is defined as a resource listed in or determined to be eligible for listing in the California Register of Historical Resources (CRHR) (PRC §21084.1); a resource included in a local register of historical resources (14 CCR §15064.5[a][2]); or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (14 CCR §15064.5[a][3]).

Section 5024.1 of the PRC, Section 15064.5 of the State CEQA Guidelines (14 CCR), and Sections 21083.2 and 21084.1 of the CEQA Statutes were used as the basic guidelines for the cultural resources study. PRC 5024.1 requires evaluation of historical resources to determine their eligibility for listing in the CRHR. The purposes of the CRHR are to maintain listings of the State's historical resources and to indicate which properties are to be protected from substantial adverse change. The criteria for listing resources in the CRHR, which were expressly developed to be in accordance with previously established criteria developed for listing in the National Register of Historic Places (NRHP) (per the criteria listed at 36 CFR §60.4), are stated below (PRC §5024.1).

> Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered a historical resource . . . Generally, a resource shall be considered by a lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources including the following:
>
> (a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; or
>
> (b) Is associated with the lives of persons important in our past; or
>
> (c) 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; or
>
> (d) Has yielded, or may be likely to yield, information important in prehistory or history.

Impacts that would materially impair the significance of a resource listed in or eligible for listing in the CRHR are considered to have a significant effect on the environment. Impacts to historical resources from the proposed Project are considered significant if the Project (A) demolishes or materially impairs in an adverse manner those physical characteristics that convey its historical significance and that justify its inclusion in, or eligibility for, the California Register; (B) demolishes or materially impairs in an adverse manner those physical characteristics that account for its inclusion in a local register; or (C) demolishes or materially impairs in an adverse manner those physical characteristics that convey its historical significance and that justify its eligibility for inclusion in the California Register as determined by a lead agency (§15064.5[b][2]).

The purpose of a Phase I Cultural Resources assessment is to evaluate whether any cultural resources remain exposed on the surface of a Project study area or whether any cultural resources can reasonably be expected to exist in the subsurface. If resources are discovered, additional investigations would be required to evaluate the resources for CRHR eligibility and appropriate management of these resources would be required prior to Project implementation.

Broad mitigation guidelines for treating historical resources are codified in Section 15126.4(b) of the CEQA Guidelines. Public agencies should seek to avoid significant impacts to historical resources, with preservation in place being the preferred alternative. If not feasible, a data recovery plan shall be prepared to guide subsequent excavation. Mitigation for historical resources such as buildings, bridges, and other structures that are consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks and Grimmer 1995) will generally be considered mitigated below a level of significance.

2.2 Assembly Bill (AB) 52

This Project is subject to the requirements of Assembly Bill (AB) 52. AB 52 is applicable to projects that have filed a Notice of Preparation (NOP) of an Environmental Impact Report (EIR) or notice of a Mitigated Negative Declaration (MND) or Negative Declaration (ND) on or after July 1, 2015. The law requires lead agencies to initiate consultation with California Native American Tribes that are traditionally and culturally affiliated with the geographic area of the Project and have requested such consultation, prior to determining the type of CEQA documentation that is applicable to the Project (i.e., EIR, MND, ND). Significant impacts to "Tribal Cultural Resources" are considered significant impacts to the environment.

For "Tribal Cultural Resources," PRC §21074, enacted and codified as part of a 2014 amendment to CEQA through Assembly Bill 52, provides the statutory definition as follows:

"Tribal Cultural Resources" are either 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.

To determine if such resources exist, under AB 52 (PRC §21080.3.1) lead agencies must consult with Tribes that request consultation and must make a reasonable and good faith effort to mitigate the impacts of a development on such resources to a less than significant level. AB 52 allows Tribes 30 days after receiving notification to request consultation and the lead agency must then initiate consultation within 30 days of the request by Tribes. The City is undertaking AB 52 consultation with interested Tribes.

2.3 National Historic Preservation Act

Cultural resources are considered during federal undertakings chiefly under Section 106 of National Historic Preservation Act (NHPA) of 1966 (as amended) through one of its implementing regulations (36 CFR 800, Protection of Historic Properties) and NEPA. Properties of traditional religious and cultural importance to

Native Americans are considered under Section 101(d)(6)(A) of NHPA. Other federal laws include the Archaeological Data Preservation Act of 1974, the American Indian Religious Freedom Act (AIRFA) of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1989, among others.

Section 106 of NHPA (16 USC 470f) requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings (36 CFR 800.1). Under Section 106, the significance of any adversely affected cultural resource is assessed, and mitigation measures are proposed to reduce the impacts to an acceptable level. Significant cultural resources are those resources that are listed or are eligible for listing in the NRHP per the criteria listed at 36 CFR 60.4 below:

The quality of significance in American history, architecture, archaeology, engineering and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association and that:

(a) Are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) Are associated with the lives of persons significant in our past; or

(c) Embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) Have yielded, or may be likely to yield, information important in prehistory or history.

2.4 Human Remains

Section 7050.5 of the *California Health and Safety Code* provides for the disposition of accidentally discovered human remains. Section 7050.5 states that, if human remains are found, 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 the appropriate treatment and disposition of the human remains.

Section 5097.98 of the PRC states that, if remains are determined by the Coroner to be of Native American origin, the Coroner must notify the NAHC within 24 hours which, in turn, must identify the person or persons it believes to be the most likely descended from the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

3.0 SETTING

3.1 Natural

The Project lies in the southeast end of the Oak Hills region in the City of Menifee. The Project study area is completely undeveloped aside from the presence of several dirt tracks and consists of rolling hills incised by several drainages. This area is characterized by a growing residential presence with a new development immediately east of the Property.

The Project study area includes approximately 14-acre acres of undeveloped, vacant land located in the Oak Hills foothills. The Property remains undeveloped and is characterized by residential communities to the east and south and undeveloped hillsides to the north and west of the Property.

The Project study area is located between 1,820 feet above mean sea level (msl) in the northcentral portion of the Project study area and 1,520 feet above msl in the southeast.

3.2 Cultural

Chronologies by Warren (1968), Chartkoff and Chartkoff (1984), Moratto (1984) and others are culture histories used to describe the sequence of the prehistoric periods of southern California. William Wallace (1955) developed the first comprehensive California chronologies and defines four periods for the southern coastal and nearshore inland region.

3.2.1 Prehistory

The prehistory of western Riverside County can be understood as the transition area between coastal and desert subsistence patterns. Earlier studies (Kroeber 1925, Moratto 1984, Chartkoff and Chartkoff 1984, et al.) were comprehensive and statewide; however, they were published before and when California contract archaeology was in its infancy and considerable archaeology has been completed in the area since that time. Progress has also been made in addressing the regional research questions posed by earlier researchers. The following chronology, based on that of Erlandson and Colton (1991) is presented in Jones and Klar (2007) - a recent reevaluation and generalized chronology of California prehistory. The following is a summary of Chapter 14 of that book (Byrd and Raab 2007). It describes cultural traits in the southern California Bight (extending from Point Conception to the Mexican border), from ocean to desert.

EARLY HOLOCENE (11,600 – 7,600 BP)

California's first inhabitants have traditionally been thought of as big game hunters who lived at the end of the last ice-age (~11,000 years before present [BP]). As the environment warmed and dried, the large Ice Age fauna vanished, marking the end of the Western Pluvial Lakes Tradition (WPLT) characterized by large pluvial (rainfall-fed) lakes, streams, marshes, and grasslands exploited by native populations whose sites are generally found along their shores (Moratto 1984). Populations responded by exploiting a much wider range of flora and fauna to replace the large mammals.

This traditional model has been tested by the past three decades of archaeological research. Current models suggest a much more complex situation; most dramatically illustrated at coastal sites. The Paleocoastal Tradition (PCT) reflects a coastal adaptation of the WPLT (Davis et al. 1969). PCT sites are also located along bays and estuaries, exploiting mollusks, sea mammals, sea birds, and fish in addition to land plants and animals. Habitation on San Miguel Island has been identified as early as ~11,300 BP at Daisy Cave and ~8,500 BP at Eel Point on San Clemente Island (Byrd and Raab 2007).

MIDDLE HOLOCENE (7,600 – 3,650 BP)

The Middle Holocene has been thought of as a time of cultural change where early Holocene cultures morphed over time into the Late Holocene cultures. This "Millingstone Horizon" (Wallace 1955) in coastal southern California suggests a shift in subsistence strategies - to the gathering and processing of plant seeds, grasses and shellfish as the primary dietary staple, with fishing and the hunting of smaller animals playing a less important role. Large habitation sites are seen in inland areas. Occupation revolved around seasonal and semi-sedentary movements in coastal Orange and San Diego counties. Geographic movement through trade networks are postulated by the presence of Olivella grooved rectangle shell beads as far north as central Oregon dating to 4900 - 3500 BP (Byrd and Raab 2007). Characteristics of the middle Holocene sites include ground stone artifacts (manos and metates) used for processing plant material and shellfish, flexed burial beneath rock or milling stone cairns, flaked core or cobble tools, dart points, cogstones, discoidals, and crescentics.

LATE HOLOCENE (3,650 – 233 BP)

Traditional models of this period maintained that the cultural systems encountered by European explorers in the late 18th century were formed during this time. These cultures were said to have access to rich resources (particularly the acorn), invented the bow and arrow, the mortar and pestle, introduced ceramics, and altered mortuary behaviors from inhumations to cremations. These groups were often elevated to utopian levels by earlier researchers (Raab and Jones 2004).

This period is now also revealed to have been one of more complex local and regional patterns of change that occurred at differing times within the region. Byrd and Raab (2007) suggest that cultures in southern California over-exploited high-ranked food items such as shellfish, fish, terrestrial and marine mammals, and plant remains. This, and climatic fluctuations, led to resource depression, which necessitated a shift to less desirable, more costly resources.

The "Takic Wedge" migration of Takic speakers from the Great Basin into southern California occurred during this period. It should be noted that Tribal origin stories assert that their development occurred in situ, meaning the people were always here and the Shoshonean Wedge hypothesis is, according to them, false.

3.2.2 Ethnography

The Project is located within the ethnographic territory of the Luiseño. The Luiseño are Takic speakers and are also descended from Late Prehistoric populations of the region. Takic is part of the larger Uto-Aztecan language stock which migrated west from the Great Basin (Bean and Shipek 1978, Shipley 1978).

The Luiseño share many similar cultural traits to many other southern California groups, including the Cahuilla. The Luiseño lived in sedentary and independent village groups, each with specific subsistence territories encompassing hunting, food gathering, and fishing areas. Villages were usually located in valley basins, along creeks and streams adjacent to mountain ranges where water was available and where the villages would be protected from environmental conditions and potential enemies. Most inland populations had access to fishing and food gathering sites on the coast (Bean and Shipek 1978).

Luiseño economic and subsistence practices centered upon the seasonal gathering of acorns and seeds; the hunting of deer and small mammals such as rabbits, wood rats, ground squirrels, and birds. Coastal foods included sea mammals, fish and shellfish. Tool technologies were organized around food collection, storage, and preparation strategies, which was reflected in the type, size, and quantity of food items gathered. Stone (lithic) tools included two types: ground stone and flaked stone tools. Ground stone equipment included: mortars, pestles, manos and metate grinding slicks, made from granite, schist, and gneiss. Flaked tools included: bifaces, projectile points, scrapers, and gravers, fabricated from siliceous rock such as chert and jasper, microcrystalline chalcedony, obsidian, fine grain ingenious rocks such as basalt rhyolite, and andesite, and hard silica such as quarts and quartzite. Utilitarian tools were constructed from wood, animal bones, skins, and/or woven from flora materials depending on need (Lovin 1963). Hunting activities were conducted both on an individual basis and/or organized into group activities, depending on seasonal factors and the game hunted. Acorns encompassed as much as 50 percent of the Luiseño diet (White 1963). Acorns provided a reliable and abundant food source that was high in calories and could be easily stored for future use. Acorn collection was a central tenant in the lives of the Luiseños and dominated their economic and social structure (Basgall 1987, Johnson and Earle 1987).

For the Luiseño, nearby Lake Elsinore is an important cosmological center (DuBois 1908). After becoming sick, *Wuyóot* was taken to the hot springs of Lake Elsinore for their healing qualities. The Luiseño consider *Wuyóot* a deity in their creation story as he was the first human and a prophet to the *Káamalam*, the First People (DuBois 1908). The Luiseño also believe that *Wuyóot* died at the hot springs of Lake Elsinore. Lake Elsinore is considered a Traditional Cultural Property to the Luiseño.

The Luiseño name for Lake Elsinore is *Paiakhche*, (Kroeber 1907:144, 147). The village of *Paiahche* is ethnographically documented immediately north of the lake by Kroeber (1925); however, consultation with the Pechanga Tribe shows that the village was located northwest of the Lake and that the correct spelling is *Páayaxchi*. This name also refers to the Lake itself.

3.2.3 History

In California, the historic era is generally divided into three periods: the Spanish or Mission Period (1769 to 1821), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present). The Spanish Period (1769 to 1821) is represented by exploration of the region; establishment of the San Diego Presidio and missions at San Gabriel and San Luis Rey; and the introduction of livestock, agricultural goods, and European architecture and construction techniques. Early exploration of the Riverside County area began in 1772 when Lieutenant Pedro Fages (then Military Governor of San Diego) crossed through the San Jacinto Valley. Permanent settlement began about the turn of the century through the issuance of land grants and grazing permits, and Spanish influence continued to some extent after 1821 due to the continued implementation of the mission system.

The Mexican Period (1821-1848) began with Mexican independence from Spain and continued until the end of the Mexican-American War. The Secularization Act resulted in the transfer, through land grants (called ranchos) of large mission tracts to politically prominent individuals. Sixteen ranchos were granted in Riverside County, the first to Juan Bandini in 1838. The Project is located in what was the *Rancho La Laguna*, also known as *Laguna Grande* and *La Laguna de Temecula*. It was confirmed in 1844 in an official land grant to Julian Manriquez by the Mexican governor of California. The rancho consisted of three leagues that included the lake bed and the shoreline (Hampson 1991). At that time, cattle ranching was a more substantial business than agricultural activities, and trade in hides and tallow increased during the early portion of this period. Until the Gold Rush of 1849, livestock and horticulture dominated California's economy.

The American Period (1848-present) began with the Treaty of Guadalupe Hidalgo, and in 1850, California was accepted into the Union of the United States primarily due to the population increase created by the Gold Rush of 1849. The cattle industry reached its greatest prosperity during the first years of the American Period. Mexican Period land grants had created large pastoral estates in California, and demand for beef during the Gold Rush led to a cattle boom that lasted from 1849–1855. However, beginning about 1855, the demand for beef began to decline due to imports of sheep from New Mexico and cattle from the Mississippi and Missouri Valleys. When the beef market collapsed, many California ranchers lost their ranchos through foreclosure. A series of disastrous floods in 1861–1862, followed by two years of extreme drought, which continued to some extent until 1876, altered ranching forever in the southern California area.

3.3 City of Menifee

The following history of Menifee is adapted from the history discussion on the City of Menifee's website (Menifee n.d.): History | City of Menifee

In the 1940's many of the Menifee roads that you see today were given a "family name". These names could be traced back to an early settler of Menifee who had owned a property in a specific location. The list of Menifee roads has a unique history and is a part of Menifee's culture today.

The area was originally inhabited by the Luiseno and Pechanga Indian tribes, and in the 1700s, the area fell under the rule of the Spanish empire. The area was eventually annexed into the United States from Mexico in 1850 under California's statehood.

Farming activity beginning in the mid-1800s was concentrated in the Menifee area. Mining activity began in the early 1880s with the discovery of a significant quartz lode by miner Luther Menifee Wilson. Menifee derived its name from that mining operation.

Early development of the City of Menifee began with Sun City in the early 1960s as the concept of an active retirement community that was envisioned by Del Webb, a major building contractor from Phoenix, Arizona. Sun City is centrally located within the City of Menifee with a mix of residential and commercial activity.

The Menifee area began to grow further in 1989 with the master-planned community of Menifee Lakes and continues to be one of the fastest growing communities in California. Quail Valley is a semi-rural residential community in the northwestern section of the city, and Romoland is a residential and commercial community located in the northeastern section of the city.

On June 3, 2008, the residents of the communities encompassing the City of Menifee voted to incorporate Menifee into Riverside County's 26th city. The new City of Menifee was officially established on October 1, 2008.

4.0 METHODS

4.1 Cultural Resources Records Search

A literature review of documents on file at the Eastern Information Center (EIC) at the University of California, Riverside was completed by the EIC on June 15, 2023 (Attachment A).

The EIC is the designated branch of the California Historical Resources Information System (CHRIS) and houses records concerning archaeological and historic resources in Riverside, Inyo, and Mono Counties. The records search provided data on known archaeological and built environment resources as well as previous studies within one mile of the Project area. Data sources consulted at the EIC included archaeological records, Archaeological Determinations of Eligibility (DOE), and the Historic Property Data File (HPDF) maintained by the California Office of Historic Preservation (OHP). The HPDF contains listings for the CRHR and/or NRHP, California Historical Landmarks (CHL), and California Points of Historical Interest (CPHI).

The review consisted of an examination of the U.S. Geological Survey's (USGS's) *Romoland, CA* 7.5-minute quadrangle to evaluate the Project study area for any cultural resources recorded on or cultural resources studies conducted on the Property and within a one-mile radius.

4.2 Paleontological Resources Records Search

A paleontological resources records search was received from Brittney Stoneburg at the Western Science Center (WSC) in Hemet on May 5, 2023, via email (Attachment B).

4.3 Historic Aerial Review

An examination was made by Patrick Maxon of the historic aerial photographs at HistoricAerials.com (NETRONLINE n.d.) on September 27, 2023.

4.4 Sacred Lands File Search

An NAHC Sacred Lands File Search and Tribal contacts list was requested via email on July 17, 2023. A response was received from the NAHC on August 16, 2023 (Attachment C).

4.5 Field Survey

A cultural resources survey of the approximately 14-acre Project study area was conducted by Patrick Maxon on September 20, 2023. The Project area was inspected visually, walking north to south transects, spaced approximately 10 meters apart, across the site.

5.0 RESULTS

5.1 Cultural Resources Records Search

5.1.1 Studies

The Eastern Information Center completed a California Historic Resources Information System (CHRIS) records search on June 15, 2023 (Attachment A) which concluded that there have been 36 cultural resources studies completed within one mile of the Project area. None of these studies include the Property. Table 1 lists the studies within one mile of the Property. A final study (Keller 2000), that resulted in the recording of P-33-010944/CA-RIV-6619 on the Project study area, was not provided by the EIC. It may be RI-04516 and RI-04517, for which only maps were provided that include the Project study area as well as the location of P-33-010944/CA-RIV-6619.

Table 1
Cultural Resources Studies Within One Mile of the Property

Report Number	Author/Year	Type of Study
RI-00391	Drover/1978	Survey; 510 acres; 1 resource
RI-02184	McCarthy/1987	Survey; 224 acres; 0 resources
RI-02284	Del Chario/1987	Survey; 97.16 acres; 1 resource
RI-02670	De Munck/1988	Survey; 1.16 acres; 0 resources
RI-02745	Brown/1990	Survey; 275 acres; 0 resources
RI-03691	Keller/1993	Survey; 1 acre; 0 resources
RI-04222	Chandler & Hallett/1999	Survey; 7 acres; 0 resources
RI-04268	Love & Hogan/2000	Survey cell site; .125 acres; 0 resources
RI-04375	White & White/1999	Survey; 12.25 acres; 1 resource
RI-04516	Keller (2000) possible	Map includes current study area
RI-04517	Keller (2000) possible	Map includes study area and location of P-33-010944/CA-RIV-6619
RI-04878	Dice & Irish/2001	Survey; 272.71 acres; 0 resources
RI-05404	Love et al./2001	Survey; 12 acres; 0 resources
RI-06793	McKenna/2005	Lit Review; 0 resources
RI-06988	Glenn/2006	Survey; 12.54 acre; 0 resources
RI-08179	Smith et al./2007	Survey; 1113.4 acres; 7 resources
RI-08396	George & McDougall/2010	Survey; 8km x 11 meters; 0 resources
RI-08569	unknown	Map shows multiple linear segments one of which is just west of the Project study area
RI-08873	Cotterman & Chandler/2011	Survey; 8 acres; 0 resources
RI-09093	Hogan/2014	Survey; 0 resources
RI-09154	Smith & Strope/2013	Survey; 0 resources
RI-09260	Fulton/2014	Survey cell site; 0 resources
RI-09725	Fulton/2015	Survey cell site; 0 resources
RI-09755	Haas et al./2014	Survey; 0 resources
RI-09758	Haas et al./2015	Survey; 0 resources

Report Number	Author/Year	Type of Study
RI-10161	Belcourt/2016	Survey; 0 resources
RI-10190	McDougall et al./2017	Survey; 7.9 miles; 3 resources
RI 10191	McDougall et al./2017	Survey; 180.4 acres; 3 resources
RI-10237	Puckett/2015	Survey cell site; 453.33 sf.; 0 resources
RI-10288	Stropes & Smith/2017	Survey; 13.19 acres; 0 resources
RI-10308	unknown	Map shows Project site immediately to the east of Oak Hills site in Section 29
RI-10536	Smith/2017	Monitoring; 0 resources
RI-10537	Smith/2018	Monitoring; 424.33 acres; 1 resource
RI-10538	Smith/2018	Survey; 1 resource
RI-10608	Bonner & Aislin-Kay/2005	Survey cell site; 0 resources
RI-10648	Wills/2016	Survey cell site; 0 resources

5.1.2 Resources

The records search also concluded that seven cultural resources have been recorded within one mile of the Property. One site (P-33-010944/CA-RIV-6619) is recorded on the Project study area. Native American tribes may have additional historical resource information which could be elucidated during Tribal consultation efforts.

Table 2
Cultural Resources Recorded Within the Project Area

Site Number (P-33-)	Recorder/Year (most recent)	Description
007652	Lege/1982	Quail Valley Country Club
007653	Lege/1982	23790 Clara Place
007679	Lege/1982	23866 Elsinore Lane
010944	Keller/2000	Lithic Scatter, round and flaked stone
011548	Buysse/2002	Lithic Scatter
017369	Hoover & Blevins/2004	Quarry
028062	Goralogia/2018	Chert Biface Isolate
on the Project study area		

P-33-010944/CA-RIV-6619: this prehistoric lithic scatter recorded by Keller (2000), consisted of three metate fragments, one mano, one partially formed scraper blade, and 15 flakes covering an area of about 1000 square meters in the southeastern end of the Project study area. Patrick Maxon, surveying the site, scoured the site area and drainage to the east and south but was not able to relocate it. The site was described in the site record by Keller (2000) as being "in very poor condition due to substantial earthmoving activities pushing the site soil from its original location on top of a flat terrace downslope." Therefore, it may have eroded further downslope to the east and south and into the drainage bottom where it could have been covered by further erosion and soil deposition. The site could potentially remain buried at the location where it was recorded; however, soils are very thin in this area, with bedrock near or at the surface.

5.2 Paleontological Resources Records Search

The Western Science Center (WSC) in Hemet completed a Paleontology collections records search on May 5, 2023 (Attachment B). The geologic units underlying the Property are mapped as black phyllite (Mz q), a fissile (easily split) metamorphic rock. This metamorphic rock unit has low to no paleontological sensitivity. The northwest corner of the property is covered in very old alluvial fan deposits (Qvoa) of Pleistocene age and highly paleontologically sensitive (Stoneburg 2023). The smaller study area does not reach the alluvium to the west; however, there is also a very old Quaternary fan deposit (Qvof) in the eastern one-third of the study area.

Because excavations into the Pleistocene alluvial units in the eastern portion of the Property could uncover scientifically significant fossil resources, the WSC recommends that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from that portion of the site (Stoneburg 2023).

5.3 Historic Aerial Review

Internet research on the Project, and an examination of historical aerial photographs at HistoricAerials.com (NETRONLINE n.d.) on September 27, 2023, revealed that the Property was completely undeveloped in 1967 except for the existing dirt road that enters the site from the northwest, and extends in a southeasterly direction where it now dead ends at the eastern boundary of the site. By 1978 the water tank just off the northeastern corner of the Project study area has been constructed along with a dirt road extending southward along the eastern edge of the Project study area. Aside from the presence of additional dirt roads, perhaps by dirt bikers, the site area remained unchanged until the construction of the residential community and Boulder Crest Way in the southeast corner of the Project study area some time before 2005. No other development is evident on or near the Property until the construction of the residential community immediately east of the Project study area in 2020.

5.4 Sacred Lands File Search

A Sacred Lands File Search and Tribal contacts list was received from the NAHC on August 16, 2023. The results of the Sacred Lands File Search were negative.

The NAHC also provided a Tribal contacts list of local tribes They include the following (refer to Attachment C):

- Agua Caliente Band of Cahuilla Indians; Patricia Garcia-Plotkin, Director
- Augustine Band of Cahuilla Mission Indians; Amanda Vance, Chairperson
- Cabazon Band of Mission Indians; Doug Welmas, Chairperson
- Cahuilla Band of Indians; Anthony Madrigal, THPO
- Cahuilla Band of Indians; Bobby Ray Esparza, Cultural Director
- Cahuilla Band of Indians; Daniel Salgado, Chairperson
- Campo Band of Diegueño Indians; Ralph Goff, Chairperson
- Ewiiaapaayp Band of Kumeyaay Indians; Robert Pinto, Chairperson
- Ewiiaapaayp Band of Kumeyaay Indians; Michael Garcia, Vice Chairperson
- La Posta Band of Diegueño Mission Indians; Gwendolyn Parada, Chairperson
- La Posta Band of Diegueño Mission Indians; Javaughn Miller, Tribal Administrator
- Los Coyotes Band of Cahuilla and Cupeño Indians; Ray Chapparosa, Chairperson

- Manzanita Band of Kumeyaay Nation; Angela Elliot Santos, Chairperson
- Mesa Grande Band of Diegueno Mission Indians; Michael Linton, Chairperson
- Morongo Band of Mission Indians; Ann Brierty, THPO
- Morongo Band of Mission Indians; Robert Martin, Chairperson
- Pala Band of Mission Indians; Alexis Wallick, Assistant THPO
- Pala Band of Mission Indians; Shasta Gaughen, THPO
- Pechanga Band of Luiseño Indians; Mark Macarro, Chairperson
- Pechanga Band of Luiseño Indians; Steve Bodmer, General Counsel
- Quechan Tribe of the Fort Yuma Reservation; Manfred Scott, Acting Chairman – Kw'ts'an Cultural Committee
- Quechan Tribe of the Fort Yuma Reservation; Jordan Joaquin, President, Tribal Council
- Quechan Tribe of the Fort Yuma Reservation; Jill McCormick, Historic Preservation Officer
- Ramona Band of Cahuilla; Joseph Hamilton, Chairperson
- Rincon Band of Luiseño Indians; Joseph Linton, Tribal Council
- Rincon Band of Luiseño Indians; Laurie Gonzalez, Tribal Council
- Rincon Band of Luiseño Indians; Cheryl Madrigal, Cultural Resources Manager/THPO
- Rincon Band of Luiseño Indians; Denise Turner Walsh, Attorney General
- Santa Rosa Band of Cahuilla Indians; Lovina Redner, Tribal Chair
- Soboba Band of Luiseño Indians; Joseph Ontiveros, Cultural Resource Department
- Soboba Band of Luiseño Indians; Jessica Valdez, Cultural Resources Specialist
- Torres-Martinez Desert Cahuilla; Thomas Tortez, Chairperson

Assembly Bill (AB) 52 consultation is being conducted separately by the City of Menifee.

5.5 Field Survey

An archaeological survey of the Project area was conducted by the author, Patrick Maxon, M.A., RPA on September 19, 2023. The Project area was inspected visually, walking north to south transects, spaced approximately 10 meters apart, across the site. The eastern third of the study area, nearest the new residential development, at approximately 1520 feet above msl, is crisscrossed by several dirt roads and exhibits sparse vegetation. The archaeological site P-33-10944/CA-RIV-6619 recorded in the eastern area was not relocated. It may have eroded downslope and into the drainage. No artifacts were seen after intensively scouring the site area and drainage below. The western two-thirds of the Project study area slopes up to as high as 1,620 feet above msl in the northwest portion of the study area. Several episodes of modern trash dumping is evident at the site.

Plate 1: Study Area; view to southeast

Plate 2: Study Area; view to west

Plate 3: Recorded location of P-33-010944/CA-RIV-6619; Eastern end of study area; view to east

Plate 4: Trash dump; northeast end of site; view to north

6.0 FINDINGS AND RECOMMENDATIONS

Implementation of the proposed Project would not adversely affect any known significant archaeological or historical resources or fossil localities. The area, however, is known to contain historical resources, as summarized below, and mitigation measures are recommended.

- The EIC records search identified seven cultural resources within one mile of the Property. One site (P-33-010944/CA-RIV-6619) is recorded on the Project study area. The field survey failed to relocate the site in the location it was recorded.
- The EIC records search identified 36 cultural resources studies previously completed within one mile of the Property. None have been completed within the Property. A final study (Keller 2000) that resulted in the recording of P-33-010944/CA-RIV-6619 was not provided by the EIC.
- The NAHC Sacred Lands File search was negative.
- There are no known fossil localities recorded within one mile of the Property. The geologic units underlying the Property are mapped as black phyllite, a metamorphic rock. This metamorphic rock unit has low to no paleontological sensitivity. The northwest corner of the property and the eastern third of the study area is covered in very old alluvial fan deposits of Pleistocene age that are highly paleontologically sensitive.

Recommended Mitigation Measures

CULTURAL RESOURCES

Implementation of the proposed Project would not adversely affect any existing known significant archaeological or paleontological resources; however, there is one archaeological site (P-33-010944/CA-RIV-6619) recorded on the Project study area that was not relocated during the survey. It may have been destroyed or eroded downslope into the drainage.

The City of Menifee may have standardized mitigation measures they would prefer to use. The following mitigation measures are recommended:

MM-Cul-1: Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist and Tribal monitor(s) (if requested pending Tribal consultation) to conduct monitoring of all mass grading and trenching activities. The Project Archaeologist shall have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultural Resources Monitoring Plan (CRMP) to address the details, timing and responsibility of all archaeological and cultural activities that will occur on the Project study area. Details in the Plan shall include:

a. Project grading and development scheduling;

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

c. The protocols and stipulations that the contractor, City, Consulting Tribe(s) and Project Archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation.

MM-Cul-2: In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries:

a. One or more of the following treatments, in order of preference, shall be employed with the Tribe(s). Evidence of such shall be provided to the City of Menifee.

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

ii. Onsite reburial of the discovered items. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. A confidential exhibit will be prepared. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments.

MM-Cul-3: If potential historic or cultural resources are uncovered during excavation or construction activities at the Project study area, work in a 100-foot radius around the find must cease immediately and a qualified person meeting the Secretary of the Interior's standards (36 CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City to evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects on the historic, or prehistoric resource. Determinations and recommendations by the consultant shall be immediately submitted for consideration, and implemented as deemed appropriate by the City, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulting Native American Tribes as defined in MM-Cultural-1 before any further work commences in the affected area.

MM-Cul-4: A final monitoring report will be prepared that describes the results of the monitoring program, assesses any discoveries, and makes any additional recommendations. The monitoring report shall be prepared by the Project Archaeologist in conjunction with the Tribe(s) and approved by the City of Menifee.

PALEONTOLOGICAL RESOURCES

The geologic units underlying much of the Property are mapped as black phyllite, a metamorphic rock. This metamorphic rock unit has low to no paleontological sensitivity. However, the northwest corner of the site is underlain by very old alluvial fan deposits of Pleistocene age and are highly paleontologically sensitive. The following mitigation measure is recommended:

MM-Cul-5: Prior to the issuance of grading permits, the Applicant shall retain a qualified paleontologist to observe ground disturbing activities and recover fossil resources as necessary. The

Paleontologist will attend the pre-grade conference where he/she will establish procedures for paleontological monitoring and, through the preparation of a mitigation plan, shall establish procedures and protocols to temporarily halt ground disturbing activities to permit sampling, evaluation, and recovery of any discovery. Excavations that impact older Quaternary deposits may encounter fossil vertebrates. Any substantial excavations below the uppermost layers of the surface should be monitored. Sediment samples should also be recovered to determine the small-fossil potential of the site. If a discovery is determined to be significant, additional excavations and salvage of the fossil may be necessary to ensure that any impacts to it are mitigated to a less than significant level. A final monitoring report shall be prepared that describes the results of the monitoring program and evaluates any fossil resources recovered.

HUMAN REMAINS

Project-related earth disturbance nearly always has the potential to unearth previously undiscovered human remains, resulting in a potentially significant impact. If human remains are encountered during excavation activities, all work shall halt and the County Coroner shall be notified (*California Health and Safety Code,* §7050.5). The Coroner will determine whether the remains are of forensic interest. If the Coroner determines that the remains are prehistoric, she/he will contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC is responsible for immediately designating the most likely descendant (MLD), who will be responsible for the ultimate disposition of the remains, as required by Section 5097.98 of the *California Public Resources Code.* The MLD shall make her/his recommendation within 48 hours of being granted access to the site. The MLD's recommendation shall be followed if feasible and may include scientific removal and non-destructive analysis of the human remains and any items associated with Native American burials. If the landowner rejects the MLD's recommendations, the landowner shall rebury the remains with appropriate dignity on the property in a location that will not be subject to further subsurface disturbance.

7.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached figures present the data and information required for this archaeological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: October 2023 SIGNED: ______________________

Patrick Maxon., RPA
Director, Cultural Resources

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CONFIDENTIAL ATTACHMENT A

NOT FOR PUBLIC REVIEW

CULTURAL RESOURCES RECORDS SEARCH (EIC)

California Historical Resources Information System

CHRIS Data Request Form

ACCESS AND USE AGREEMENT NO.: 506 **IC FILE NO.:** ______

To: Eastern Information Center

Print Name: Patrick Maxon Date: 03/30/23

Affiliation: VCS Environmental

Address: 30900 Rancho Viejo Road, Suite 100

City: San Juan Capistrano State: CA Zip: 92675

Phone: (949) 489-2700 Fax: ______ Email: pmaxon@vcsenvironmental.com

Billing Address (if different than above): ______

Project Name / Reference: Oak Hills

Project Street Address: ______

County: Riverside

Township/Range/UTMs: Township 5 South; Range 3 West; Section 30

USGS 7.5' Quad(s): Romoland

PRIORITY RESPONSE (Additional Fee): yes ○ / no ◉

TOTAL FEE NOT TO EXCEED: $ 600.00

Special Instructions:

Information Center Use Only

Date of CHRIS Data Provided for this Request: ______

Confidential Data Included in Response: yes ○ / no ○

Notes: ______

California Historical Resources Information System

CHRIS Data Request Form

Include the following information (mark as necessary) for the records search area(s) shown on the attached map(s) or included in the associated shapefiles. Shapefiles are the current CHRIS standard format for digital spatial data products.

NOTE: All digital data products are subject to availability - check with the appropriate Information Center.

1. **Map Type Desired:** Digital map products will be provided only if they are available at the time of this request. *Regardless of what is requested*, only hard copy hand-drawn maps will be provided for any part of the requested search area for which digital map products are not available at the time of this request**.**
There is an additional charge for shapefiles, whether they are provided with or without Custom GIS Maps.

Mark one map choice only

Custom GIS Maps ○ Shapefiles ○ Custom GIS Maps **and** Shapefiles ◉ Hard Copy Hand-Drawn Maps **only** ○

Any selection below left unmarked will be considered a "no. "

2a.

	Within project area	Within 1 mi radius
ARCHAEOLOGICAL Resource Locations+	yes◉/ no○	yes◉/ no○
NON-ARCHAEOLOGICAL Resource Locations	yes◉/ no○	yes◉/ no○
Report Locations+	yes◉/ no○	yes◉/ no○
Resource Database Printout* (list)	yes◉/ no○	yes○/ no◉
Resource Database Printout* (detail)	yes◉/ no○	yes◉/ no○
Resource Digital Database Records (spreadsheet)+	yes○/ no◉	yes○/ no◉
Report Database Printout* (list)	yes◉/ no○	yes○/ no◉
Report Database Printout* (detail)	yes◉/ no○	yes◉/ no○
Report Digital Database Records (spreadsheet)+	yes○/ no◉	yes○/ no◉
ARCHAEOLOGICAL Resource Record copies+*	yes◉/ no○	yes◉/ no○
PDF○/ Hard Copy○		
NON-ARCHAEOLOGICAL Resource Record copies*	yes◉/ no○	yes◉/ no○
PDF○/ Hard Copy○		
Report copies+*:	yes○/ no◉	yes○/ no◉
PDF○/ Hard Copy○		

	Only directory listing	Associated documentation
OHP Historic Properties Directory**		
within project area	yes◉/ no○	yes○/ no◉
within 1 mi radius	yes◉/ no○	yes○/ no◉
OHP Archaeological Determinations of Eligibility+		
within project area	yes◉/ no○	yes○/ no◉
within 1 mi radius	yes◉/ no○	yes○/ no◉
***California Inventory of Historical Resources* (1976):**		
within project area	yes◉/ no○	yes○/ no◉
within 1 mi radius	yes◉/ no○	yes○/ no◉

+ **In order to receive archaeological information, requestor must meet qualifications as specified in Section III of the current version of the California Historical Resources Information System Information Center Rules of Operation Manual and be identified as an Authorized User under an active CHRIS Access and Use Agreement**.
* These documents may be supplied as PDF files, if available
** Includes, but is not limited to, information regarding National Register of Historic Places, California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and historic building surveys.

CHRIS Data Request Form

2b. Listed below are sources of additional information that may be available at the Information Center. Indicate if a review and documentation of any of the following types of information is requested.

Caltrans Bridge Survey	yes ○/ no ◉
Ethnographic Information	yes ○/ no ◉
Historical Literature	yes ○/ no ◉
Historical Maps	yes ◉/ no ○
Local Inventories	yes ○/ no ◉
GLO and/or Rancho Plat Maps	yes ○/ no ◉
Shipwreck Inventory	yes ○/ no ◉
Soil Survey Maps	yes ○/ no ◉

Report Detail: RI-00391

Identifiers

Report No.:	RI-00391	
Other IDs:	*Type*	*Name*
	NADB-R	1080438
	Voided	MF-0341
Cross-refs:		

Citation information

Author(s):	Christopher E. Dover
Year:	1978
Title:	An Archaeological Survey of the Proposed Subdivision--Tentative Parcel Map 13384, Goetz Road North of Quail Valley, Riverside County, California
Affiliation:	Esgate, Lansing & Associates, San Bernadino, CA
No. pages:	10
No. maps:	
Attributes:	Archaeological, Field study
Inventory size:	ca. 510 Acres surveyed
Disclosure:	Not for publication
Collections:	No

General notes

Needs to be rescanned when original is found!

Associated resources

	Primary No.	*Trinomial*	*Name*
	P-33-001557	CA-RIV-001557	
No. resources:	1		
Has informals:			

Location information

County(ies):	Riverside
USGS quad(s):	ROMOLAND
Address:	
PLSS:	

Database record metadata

	Date	*User*	
Entered:	10/12/1988	EIC	
Last modified:	4/6/2010	Rachel	
IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
	6/23/2009	Jackie	updated.
Record status:			

Report Detail: RI-02184

Identifiers

Report No.: RI-02184

Other IDs:

Type	*Name*
NADB-R	1082611
Voided	MF-2370
Submitter	918

Cross-refs:

Citation information

Author(s): MCCARTHY, DANIEL F.

Year: 1987

Title: AN ARCHAEOLOGICAL ASSESSMENT OF TENTATIVE PARCEL 22745 LOCATED SOUTH OF SUN CITY IN WESTERN RIVERSIDE COUNTY, CALIFORNIA

Affiliation: ARCHAEOLOGICAL RESEARCH UNIT, U.C. RIVERSIDE

No. pages: 7

No. maps:

Attributes: Archaeological, Field study

Inventory size: 224 Acres surveyed

Disclosure:

Collections:

General notes

Associated resources

No. resources: 0

Has informals:

Location information

County(ies): Riverside

USGS quad(s): ROMOLAND

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	6/12/1989	EIC
Last modified:	5/27/2004	EIC

IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.

Record status:

Report Detail: RI-02284

Identifiers

Report No.:	RI-02284	
Other IDs:	*Type*	*Name*
	NADB-R	1082721
	Voided	MF-2477
Cross-refs:		

Citation information

Author(s):	DEL CHARIO, KATHLEEN C.
Year:	1987
Title:	ARCHAEOLOGICAL ASSESSMENT OF TT 22488, NEAR SUN CITY, RIVERSIDE COUNTY, CALIFORNIA
Affliliation:	ARCHAEOLOGICAL RESOURCE MANAGEMENT CORPORATION
No. pages:	15
No. maps:	
Attributes:	Archaeological, Field study
Inventory size:	97.16 Acres surveyed
Disclosure:	
Collections:	

General notes

Associated resources

	Primary No.	*Trinomial*	*Name*
	P-33-004223	CA-RIV-004223	
No. resources:	1		
Has informals:			

Location information

County(ies):	Riverside
USGS quad(s):	ROMOLAND
Address:	
PLSS:	

Database record metadata

	Date	*User*	
Entered:	6/16/1989	EIC	
Last modified:	6/17/2004	EIC	
IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
Record status:			

Report Detail: RI-02670

Identifiers

Report No.: RI-02670

Other IDs:	*Type*	*Name*
	NADB-R	1083139
	Voided	MF-2872

Cross-refs:

Citation information

Author(s): DE MUNCK, VICTOR C.

Year: 1988

Title: AN ARCHAEOLOGICAL ASSESSMENT OF A 1.16 ACRE TRACT OF LAND DESIGNATED LOT 1, TRACT 5410, 8706, LOCATED IN QUAIL VALLEY, RIVERSIDE COUNTY.

Affliliation: ARCHAEOLOGIC AND ETHNOGRAPHIC FIELD ASSOCIATES

No. pages: 11

No. maps:

Attributes: Archaeological, Field study

Inventory size: 1.16 Acres surveyed

Disclosure:

Collections:

General notes

Associated resources

No. resources: 0

Has informals:

Location information

County(ies): Riverside

USGS quad(s): ROMOLAND

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	9/4/1990	EIC
Last modified:	7/1/2004	EIC

IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.

Record status:

Report Detail: RI-02745

Identifiers

Report No.:	RI-02745	
Other IDs:	*Type*	*Name*
	NADB-R	1083353
	Voided	MF-2948
Cross-refs:		

Citation information

Author(s): BROWN, ROBERT

Year: 1990

Title: ARCHAEOLOGICAL SURVEY OF THE CANYON HEIGHTS PROJECT: A 275 ACRE PROPERTY IN THE QUAIL VALLEY AREA OF RIVERSIDE COUNTY, CALIFORNIA

Affliliation: ARCHAEOLOGICAL RESOURCE MANAGEMENT CORPORATION

No. pages: 14

No. maps:

Attributes: Archaeological, Field study

Inventory size: 275 Acres surveyed

Disclosure:

Collections:

General notes

Associated resources

No. resources: 0

Has informals:

Location information

County(ies): Riverside

USGS quad(s): LAKE ELSINORE, ROMOLAND

Address:

PLSS:

Database record metadata

	Date	*User*	
Entered:	9/12/1990	EIC	
Last modified:	8/6/2004	EIC	
IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
Record status:			

Report Detail: RI-03691

Identifiers

Report No.:	RI-03691	
Other IDs:	*Type*	*Name*
	NADB-R	1084463
	Voided	MF-3994
Cross-refs:		

Citation information

Author(s):	KELLER, JEAN
Year:	1993
Title:	A PHASE I ARCHAEOLOGICAL ASSESSMENT OF PUBLIC USE PERMIT 747. 1.0 ACRE OFLAND NEAR SUN CITY,RIVERSIDE COUNTY,CALIFORNIA USGS ROMOLAND,CALIFORNIA QUADRANGLE, 7.5' SERIES
Affiliation:	PRIVATE
No. pages:	20
No. maps:	
Attributes:	Archaeological, Field study
Inventory size:	1 Acres surveyed
Disclosure:	Unrestricted
Collections:	No

General notes

Associated resources

No. resources:	0
Has informals:	

Location information

County(ies):	Riverside
USGS quad(s):	ROMOLAND
Address:	
PLSS:	

Database record metadata

	Date	*User*	
Entered:	4/5/1994	EIC	
Last modified:	3/3/2008	David	
IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
	9/11/2007	eickw	ELB, Report updated
Record status:			

Report Detail: RI-04222

Identifiers

Report No.:	RI-04222	
Other IDs:	*Type*	*Name*
	NADB-R	1085429
	Voided	MF-4694
Cross-refs:		

Citation information

Author(s):	CHANDLER, EVELYN N. and VALERIE M. HALLETT
Year:	1999
Title:	PHASE I ARCHAEOLOGICAL SURVEY OF 7 ACRES IN SUN CITY, RIVERSIDE COUNTY, CALIFORNIA.
Affliliation:	TETRA TECH, INC.
No. pages:	6
No. maps:	
Attributes:	Archaeological, Field study
Inventory size:	7 Acres surveyed
Disclosure:	Not for publication
Collections:	No

General notes

Associated resources

No. resources:	0
Has informals:	

Location information

County(ies):	Riverside
USGS quad(s):	ROMOLAND
Address:	
PLSS:	

Database record metadata

	Date	*User*
Entered:	8/22/2000	EIC
Last modified:	8/3/2007	chris

IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
	8/3/2007	chris	ELB, Report info updated

Record status:

Report Detail: RI-04268

Identifiers

Report No.: RI-04268

Other IDs:

Type	*Name*
NADB-R	1085506
Voided	MF-4747
Submitter	527

Cross-refs:

Citation information

Author(s): LOVE, BRUCE and MICHAEL HOGAN

Year: 2000

Title: IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES: AT&T WIRELESS SITE C908, NEAR THE CITY OF CANYON LAKE, RIVERSIDE COUNTY, CALIFORNIA.

Affliliation: CRM TECH

No. pages: 17

No. maps:

Attributes: Archaeological, Field study

Inventory size: ca. 0.125 Acres surveyed

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals:

Location information

County(ies): Riverside

USGS quad(s): ROMOLAND

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	8/23/2000	EIC
Last modified:	8/3/2007	chris

IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
	8/3/2007	chris	ELB, Report info updated

Record status:

Report Detail: RI-04375

Identifiers

Report No.:	RI-04375	
Other IDs:	*Type*	*Name*
	NADB-R	1085687
	Voided	MF-4872
Cross-refs:		

Citation information

Author(s):	WHITE, ROBERT S. and LAURIE S. WHITE
Year:	1999
Title:	AN ARCHAEOLOGICAL ASSESSMENT OF THE EASTERN MUNICIPAL WATER DISTRICT MENIFEE DESALTER PROJECT, SUN CITY AND MENIFEE, RIVERSIDE COUNTY.
Affliliation:	L & L ENVIRONMENTAL, INC., Corona, CA
No. pages:	18
No. maps:	
Attributes:	Archaeological, Field study
Inventory size:	12.25 Acres surveyed
Disclosure:	Not for publication
Collections:	No

General notes

Associated resources

	Primary No.	*Trinomial*	*Name*
	P-33-001029	CA-RIV-001029	
No. resources:	1		
Has informals:			

Location information

County(ies):	Riverside
USGS quad(s):	ROMOLAND
Address:	
PLSS:	

Database record metadata

	Date	*User*	
Entered:	10/5/2000	EIC	
Last modified:	10/15/2009	eickw	
IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
	8/2/2007	chris	ELB, Report info updated
	10/15/2009	eickw	kw--updated info
Record status:			

Report Detail: RI-04878

Identifiers

Report No.:	RI-04878	
Other IDs:	*Type*	*Name*
	NADB-R	1086240
	Submitter	FHG-01-122
Cross-refs:		

Citation information

Author(s): DICE, MICHAEL and LESLIE NAY IRISH

Year: 2001

Title: A PHASE I ARCHAEOLOGICAL RESOURCES SURVEY OF SPECIFIC PLAN 272, THE CANYON HEIGHTS PROJECT, A 272.71-ACRE RESIDENTIAL PROJECT LOCATED IN THE QUAIL VALLEY, COUNTY OF RIVERSIDE, CALIFORNIA

Affliliation: L&L ENVIRONMENTAL, INC.

No. pages: 54

No. maps:

Attributes: Archaeological, Field study

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals:

Location information

County(ies): Riverside

USGS quad(s): LAKE ELSINORE, ROMOLAND

Address:

PLSS:

Database record metadata

	Date	*User*	
Entered:	7/19/2005	EIC	
Last modified:	7/11/2007	chris	
IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
Record status:			

Report Detail: RI-05404

Identifiers

Report No.: RI-05404

Other IDs:

Type	*Name*
NADB-R	1086767
Submitter	CRM TECH Contract #704

Cross-refs:

Citation information

Author(s): LOVE, BRUCE, BAI TOM TANG, DANIEL BALLESTER, and MELISSA HERNANDEZ

Year: 2001

Title: HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT, SUN CITY ASSISTED LIVING COMMUNITY, VALLEY BOULEVARD, SUN CITY, RIVERSIDE COUNTY, CA

Affliliation: CRM TECH, Riverside, CA

No. pages: 18

No. maps:

Attributes: Archaeological, Field study

Inventory size: 12 Acres surveyed

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals:

Location information

County(ies): Riverside

USGS quad(s): ROMOLAND

Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
		339-030-015	
		339-030-016	

PLSS:

Database record metadata

	Date	*User*
Entered:	3/6/2006	EIC
Last modified:	11/17/2009	eickw

IC actions:

Date	*User*	*Action taken*
3/28/2007	jay	Imported records from NADB.
11/17/2009	eickw	kw--updated info

Record status:

Report Detail: RI-06793

Identifiers

Report No.: RI-06793

Other IDs:

Type	*Name*
Other	CA-7296B

Cross-refs:

Citation information

Author(s): Jeanette A. McKenna

Year: 2005 (Jul)

Title: Letter Report: Goetz Cell Site (CA-7296B)

Affliliation: McKenna et al.

No. pages: 28

No. maps: 1

Attributes: Literature search, Management/planning

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Riverside

USGS quad(s): ROMOLAND

Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
28428 Goetz	Quail Valley	341-040-047	92587

PLSS:

Database record metadata

	Date	*User*
Entered:	4/18/2007	chris
Last modified:	2/6/2018	studenteic

IC actions:

Record status:

Report Detail: RI-06988

Identifiers

Report No.: RI-06988
Other IDs:
Cross-refs:

Citation information

Author(s): Glenn, Brian K.
Year: 2006
Title: Cultural Resources Assessment: 12.54-Acre Jacaranda Park Project Area, Community of Sun City, Riverside County, California
Affliliation: BonTerra Consulting, Costa Mesa, CA
No. pages: 44
No. maps:
Attributes: Archaeological, Field study
Inventory size: ca. 12.54 Acres surveyed
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals:

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS:

Database record metadata

	Date	*User*
Entered:	6/21/2007	chris
Last modified:	11/17/2009	eickw

IC actions:	*Date*	*User*	*Action taken*
	11/17/2009	eickw	kw--updated info

Record status:

Report Detail: RI-08179

Identifiers

Report No.: RI-08179
Other IDs:
Cross-refs:

Citation information

Author(s): Brian F. Smith, Johnna Buysse, James Clifford, Shannon Gilbert, and Larry Pierson
Year: 2007
Title: Archaeological Investigations at Audie Murphy Ranch: A Study of Archaic and Late Prehistoric Occupation Sites Along Salt Creek, Western Riverside County
Affiliation: Brian F. Smith and Associates, Poway, CA
No. pages: 3491
No. maps:
Attributes: Archaeological, Field study
Inventory size: 1113.4 Acres surveyed
Disclosure: Not for publication
Collections: Yes

General notes

Part 1 in 1 of 2 in 8179.

Associated resources

Primary No.	Trinomial	Name
P-33-001031	CA-RIV-001031	
P-33-001034	CA-RIV-001034	
P-33-003937	CA-RIV-003937	
P-33-008823	CA-RIV-006259	
P-33-011505	CA-RIV-006858	
P-33-011546	CA-RIV-006874H	
P-33-011547	CA-RIV-006875	

No. resources: 7
Has informals:

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS:

Database record metadata

	Date	User
Entered:	6/15/2009	Lydia
Last modified:	2/22/2019	aruadmin

IC actions:	*Date*	*User*	*Action taken*
	6/15/2009	Lydia	entered into database
	6/16/2009	Jackie	entered by

Record status:

Report Detail: RI-08396

Identifiers

Report No.:	RI-08396
Other IDs:	
Cross-refs:	

Citation information

Author(s):	Joan George and Dennid McDougall
Year:	2010
Title:	Cultural Resources Report for the Sun City Force Main and Recycled Water Project, Riverside County, California.
Affiliation:	Applied EarthWorks, Inc.
No. pages:	47
No. maps:	
Attributes:	Archaeological, Field study, Literature search
Inventory size:	ca. 8 Kilometers x 11 Meters surveyed
Disclosure:	Unrestricted
Collections:	No

General notes

Associated resources

No. resources:	0
Has informals:	

Location information

County(ies):	Riverside
USGS quad(s):	PERRIS, ROMOLAND
Address:	
PLSS:	

Database record metadata

	Date	*User*	
Entered:	8/13/2010	Karen	
Last modified:	8/13/2010	Karen	
IC actions:	*Date*	*User*	*Action taken*
	8/13/2010	Karen	Entered report into database.
Record status:			

Report Detail: RI-08873

Identifiers

Report No.: RI-08873
Other IDs:
Cross-refs:

Citation information

Author(s): Cary D. Cotterman and Evelyn N. Chandler
Year: 2011
Title: Cultural Resources Inventory of 8 Proposed Pole Replacements In and Near Unincorporated Communities of Nuevo and Sage, In the City of Menifee and Near the City of Perris, Riverside County, California (DWO 6077-4800; 1-4886, 2-4801, 2-4802, 2-4803, 2-480, 2-4813, 2-4814, 2-4815)
Affliliation: ECORP Consulting
No. pages: 56
No. maps:
Attributes: Archaeological, Field study
Inventory size: ca. 8 Acres surveyed
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals:

Location information

County(ies): Riverside
USGS quad(s): AGUANGA, HEMET, PERRIS, ROMOLAND, SAGE, STEELE PEAK
Address:
PLSS:

Database record metadata

	Date	*User*	
Entered:	1/7/2013	Dan	
Last modified:	1/7/2013	Dan	
IC actions:	*Date*	*User*	*Action taken*
	1/7/2013	Dan	Report entered into database
Record status:			

Report Detail: RI-09093

Identifiers

Report No.: RI-09093
Other IDs:
Cross-refs: See also RI-03354
See also RI-02805
See also RI-08887

Citation information

Author(s): Michael Hotgan
Year: 2014 (Apr)
Title: Addendum to Phase I Cultural Resources Assessment: Tentative Tract Map No. 36658 (Off-site Improvements) City of Menifee, Riverside County, California CRM TECH Contract No. 2802
Affiliation: CRM TECH
No. pages: 9
No. maps: 2
Attributes: Archaeological, Field study
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals:

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS: T5S R3W Sec. 17, 18, 19, 20, 29, 30 SBBM

Database record metadata

	Date	*User*	
Entered:	7/14/2014	studenteic	
Last modified:	7/14/2014	studenteic	
IC actions:	*Date*	*User*	*Action taken*
	7/14/2014	studenteic	Entered into database - Mindy
Record status:			

Report Detail: RI-09154

Identifiers

Report No.: RI-09154
Other IDs:
Cross-refs:

Citation information

Author(s): Brian F. Smith and Tracy A. Stropes
Year: 2013 (Aug)
Title: An Updated Phase I Cultural Resources Assessment for Tentative Tract Maps 36484 and 36485, Audie Murphy Ranch City of Menifee, County of Riverside
Affliliation: Brian F. Smith and Associates, Inc.
No. pages: 122
No. maps:
Attributes: Archaeological
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals:

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS:

Database record metadata

	Date	*User*	
Entered:	9/9/2014	studenteic	
Last modified:	9/9/2014	studenteic	
IC actions:	*Date*	*User*	*Action taken*
	9/9/2014	studenteic	Entered into the database by Celia Miranda
Record status:			

Report Detail: RI-09260

Identifiers

Report No.:	RI-09260
Other IDs:	
Cross-refs:	

Citation information

Author(s):	Phil Fulton
Year:	2014 (Oct)
Title:	Cultrural Resource Assessment Class III Inventory, Verizon Wireless Services Texas Facility City of Menifee, County of Riverside, California
Affliliation:	LSA Associates, Inc.
No. pages:	
No. maps:	
Attributes:	Archaeological, Architectural/Historical
Inventory size:	
Disclosure:	Not for publication
Collections:	No

General notes

Associated resources

No. resources:	0
Has informals:	No

Location information

County(ies):	Riverside
USGS quad(s):	ROMOLAND
Address:	
PLSS:	

Database record metadata

	Date	*User*	
Entered:	2/6/2015	studenteic	
Last modified:	2/6/2015	studenteic	
IC actions:	*Date*	*User*	*Action taken*
	2/6/2015	studenteic	entered into data base - Eulices Lopez
Record status:			

Report Detail: RI-09725

Identifiers

Report No.: RI-09725
Other IDs:
Cross-refs:

Citation information

Author(s): Phil Fulton
Year: 2015 (Sep)
Title: Cultural Resource Assessment Class III Inventory, Verizon Wireless Services Texas Facility, City of Menifee, Countyo of Riverside, California
Affliliation: National Archaelogical Data Base
No. pages: 8
No. maps:
Attributes: Archaeological, Field study, Literature search
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:

Address	City	Assessor's parcel no.	Zip code
South Canyon Drive	Menifee	341-040-037-0	

PLSS: T5S R3W Sec. 30 SBBM

Database record metadata

	Date	User
Entered:	1/4/2017	studenteic
Last modified:	1/4/2017	studenteic

IC actions:	Date	User	Action taken
	1/4/2017	studenteic	Leslie Yee

Record status:

Report Detail: RI-09755

Identifiers

Report No.: RI-09755

Other IDs:

Type	*Name*
	Project Number 14-0588

Cross-refs:

Citation information

Author(s): Hannah Haas, Robert Ramirez, and Duane Vander Pluym

Year: 2014 (Jul)

Title: Cultural Resources Survey for the Quail Valley Subarea Nine Project, Quail Valley, Riverside County, California

Affliliation: Rincon Consultants, Inc

No. pages: 6

No. maps: 1

Attributes: Archaeological, Field study

Inventory size: 0

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals: No

Location information

County(ies): Riverside

USGS quad(s): ROMOLAND

Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
	Quail Valley		

PLSS:

Database record metadata

	Date	*User*
Entered:	1/24/2017	studentEIC
Last modified:	11/9/2017	studenteic

IC actions:

Date	*User*	*Action taken*
1/24/2017	studentEIC	Entered in by Michelle

Record status:

Report Detail: RI-09758

Identifiers

Report No.: RI-09758
Other IDs:
Cross-refs:

Citation information

Author(s): Hannah Haas, Robert Ramirez, and Kevin Hunt
Year: 2015 (Jan)
Title: Eastern Municipal Water District Perris II Brackish Groundwater Desalter Project
Affliliation: Rincon Consultants
No. pages: 35
No. maps: 1
Attributes: Field study, Literature search
Inventory size: 0
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
	Menifee		

PLSS:

Database record metadata

	Date	*User*
Entered:	2/9/2017	studentEIC
Last modified:	11/27/2017	studenteic

IC actions:

Date	*User*	*Action taken*
2/9/2017	studentEIC	Entered in by Michelle
11/27/2017	studenteic	citations corrected, Leslie Yee

Record status:

Report Detail: RI-10161

Identifiers

Report No.: RI-10161
Other IDs:
Cross-refs:

Citation information

Author(s): Tria Maria Belcourt
Year: 2016 (Jul)
Title: Phase 1 Cultural Resources Assesment: Tadis Homes 21 Lot Residential Development Project City of Menifee, Riverside County, California
Affliliation: Material Culture Consulting
No. pages: 53
No. maps: 3
Attributes: Archaeological, Field study, Literature search
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS: T5S R6W Sec. 32 SBBM

Database record metadata

	Date	*User*	
Entered:	2/9/2018	studenteic	
Last modified:	2/9/2018	studenteic	
IC actions:	*Date*	*User*	*Action taken*
	2/9/2018	studenteic	Entered into the database by Bo Cheshire.
Record status:			

Report Detail: RI-10190

Identifiers

Report No.:	RI-10190	
Other IDs:	*Type*	*Name*
	Other	CML 5956 (241)
Cross-refs:	See also RI-10191	

Citation information

Author(s):	DENNIS MCDOUGALL, JOAN GEORGE, and VANESSA MIRRO
Year:	2017 (Sep)
Title:	ARCHAEOLOGICAL SURVEY REPORT FOR THE SALT CREEK TRAIL PROJECT RIVERSIDE COUNTY, CALIFORNIA CML 5956 (241)
Affliliation:	APPLIED EARTHWORKS INC
No. pages:	122
No. maps:	6
Attributes:	Archaeological, Architectural/Historical, Literature search
Inventory size:	7.9 MILES
Disclosure:	Not for publication
Collections:	No

General notes

Associated resources

	Primary No.	*Trinomial*	*Name*
	P-33-001162	CA-RIV-001162	
	P-33-008819		
	P-33-011547	CA-RIV-006875	
No. resources:	3		
Has informals:	Yes		

Location information

County(ies):	Riverside
USGS quad(s):	HEMET, LAKE ELSINORE, ROMOLAND, WINCHESTER
Address:	
PLSS:	T6S R3W Sec. 5,6,22,28,32,33,34 SBBM

Database record metadata

	Date	*User*	
Entered:	3/21/2018	studenteic	
Last modified:	3/21/2018	studenteic	
IC actions:	*Date*	*User*	*Action taken*
	3/21/2018	studenteic	SCANNED, ENTERED INTO DATABASE-LARA
Record status:			

Report Detail: RI-10191

Identifiers

Report No.: RI-10191

Other IDs:

Type	*Name*
Other	CML 5956 (241)

Cross-refs: See also RI-10190

Citation information

Author(s): DENNIS MCDOUGALL, JOAN GEORGE, and VANESSA MIRRO

Year: 2017 (Sep)

Title: HISTORIC PROPERTY SURVEY REPORT FOR THE SALT CREEK TRAIL PROJECT RIVERSIDE COUNTY, CALIFORNIA CML 5956 (241)

Affliliation: APPLIED EARTHWORKS INC

No. pages: 47

No. maps: 29

Attributes: Archaeological, Architectural/Historical, Literature search

Inventory size: 180.4 ACRES

Disclosure: Not for publication

Collections: No

General notes

Associated resources

Primary No.	*Trinomial*	*Name*
P-33-001162	CA-RIV-001162	
P-33-008819		
P-33-011547	CA-RIV-006875	

No. resources: 3

Has informals: No

Location information

County(ies): Riverside

USGS quad(s): HEMET, LAKE ELSINORE, ROMOLAND, WINCHESTER

Address:

PLSS: T5S R1W Sec. 22, 27, 28, 29 SBBM
T5S R3W Sec. 33, 32, 34 SBBM

Database record metadata

	Date	*User*
Entered:	3/21/2018	studenteic
Last modified:	3/21/2018	studenteic

IC actions:	*Date*	*User*	*Action taken*
	3/21/2018	studenteic	SCANNED AND ENTERED INTO DATABASE-LARA

Record status:

Report Detail: RI-10237

Identifiers

Report No.: RI-10237
Other IDs:
Cross-refs:

Citation information

Author(s): Heather Puckett
Year: 2015 (May)
Title: Cultural Resources Summary for the Proposed Verizon Wireless, Inc., Property at the Faith Site, 28200 Portsmouth Drive, Sun City, Riverside County, California 92586
Affiliation: Tetra Tech
No. pages:
No. maps:
Attributes: Archaeological, Literature search
Inventory size: 453.33 sf.
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:

Address	City	Assessor's parcel no.	Zip code
		339-072-013	

PLSS: T5S R3W Sec. 29 SBBM

Database record metadata

	Date	User
Entered:	5/18/2018	studenteic
Last modified:	5/18/2018	studenteic

IC actions:	Date	User	Action taken
	5/18/2018	studenteic	Entered by Sabrina Fajardo

Record status:

Report Detail: RI-10288

Identifiers

Report No.: RI-10288
Other IDs:
Cross-refs:

Citation information

Author(s): TRACY A. STROPES and BRIAN F. SMITH
Year: 2017 (May)
Title: A CLASS III ARCHAEOLOGICAL STUDY FOR THE TRACT 28859 PROJECT FOR SECTION 106 COMPLIANCE, RIVERSIDE COUNTY, CALIFORNIA
Affliliation: BRIAN F. SMITH AND ASSOCIATES, INC.
No. pages: 74
No. maps: 4
Attributes: Archaeological, Architectural/Historical
Inventory size: 13.19 ACRE
Disclosure: Restricted
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS: T5S R3W Sec. 29 SBBM

Database record metadata

	Date	*User*
Entered:	8/17/2018	studenteic
Last modified:	8/17/2018	studenteic

IC actions:	*Date*	*User*	*Action taken*
	8/17/2018	studenteic	INPUT BY KIMBERLY LAI

Record status:

Report Detail: RI-10536

Identifiers

Report No.: RI-10536
Other IDs:
Cross-refs:

Citation information

Author(s): Brian F. Smith
Year: 2017 (Feb)
Title: Results of Archaeological Monitoring at Audie Murphy Ranc, TR 36485-1 (Willow Tree Development), City of Menifee, California (Negative Archaeological Monitoring Report)
Affliliation: Brian F. Smith and Associates, Inc.
No. pages: 4
No. maps: 1
Attributes: Monitoring
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS:

Database record metadata

	Date	*User*
Entered:	3/4/2019	studenteic
Last modified:	3/4/2019	studenteic

IC actions:	*Date*	*User*	*Action taken*
	3/4/2019	studenteic	entered by kimberly lai

Record status:

Report Detail: RI-10537

Identifiers

Report No.: RI-10537
Other IDs:
Cross-refs:

Citation information

Author(s): Brian F. Smith
Year: 2018 (Jan)
Title: Results of Archaeological Monitoring at Audie Murphy Ranch, TR 31822-1, -2, and -F; TR 36484; and TR 36485-2 through -11 and -F (GP 14-070; PM32269), City of Menifee, California
Affliliation: Brian F. Smith and Associates, Inc.
No. pages: 5
No. maps: 3
Attributes: Monitoring
Inventory size: 424.33 acres
Disclosure: Not for publication
Collections: No

General notes

Associated resources

Primary No.	Trinomial	Name
P-33-028062		

No. resources: 1
Has informals: No

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS: T5S R3W Sec. 5, 631 SBBM
T6S R3W Sec. 5, 6 SBBM

Database record metadata

	Date	User
Entered:	3/4/2019	studenteic
Last modified:	3/4/2019	studenteic

IC actions:	Date	User	Action taken
	3/4/2019	studenteic	entered by kimberly lai

Record status:

Report Detail: RI-10538

Identifiers

Report No.: RI-10538
Other IDs:
Cross-refs:

Citation information

Author(s): Brian F. Smith
Year: 2018 (Aug)
Title: Archaeological Assessment of the PA-7 School Site at Audie Murphy Ranch
Affiliation: Brain F. Smith and Associates, Inc.
No. pages: 3
No. maps: 1
Attributes: Archaeological, Monitoring
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

	Primary No.	*Trinomial*	*Name*
	P-33-028062		

No. resources: 1
Has informals: Yes

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND
Address:
PLSS:

Database record metadata

	Date	*User*
Entered:	3/4/2019	studenteic
Last modified:	3/4/2019	studenteic

IC actions:	*Date*	*User*	*Action taken*
	3/4/2019	studenteic	entered by Kimberly Lai

Record status:

Report Detail: RI-10608

Identifiers

Report No.:	RI-10608	
Other IDs:	*Type*	*Name*
	Other	RS-0085-01
Cross-refs:		

Citation information

Author(s):	Wayne H. Bonner and Marnie Aislin-Kay
Year:	2005 (Dec)
Title:	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate RS-0085-01 (Anaya), 27772 Goetz Road, Cayon Lake , Riverside County, California
Affliliation:	Michael Brandman Associates
No. pages:	17
No. maps:	2
Attributes:	Archaeological, Literature search, Management/planning
Inventory size:	
Disclosure:	Not for publication
Collections:	No

General notes

Associated resources

No. resources:	0
Has informals:	Yes

Location information

County(ies):	Riverside
USGS quad(s):	ROMOLAND
Address:	
PLSS:	T5S R3W Sec. 19 SBBM

Database record metadata

	Date	*User*	
Entered:	3/19/2019	studenteic	
Last modified:	3/19/2019	studenteic	
IC actions:	*Date*	*User*	*Action taken*
	3/19/2019	studenteic	Entered by Sabrina Fajardo
Record status:			

Report Detail: RI-10648

Identifiers

Report No.: RI-10648
Other IDs:
Cross-refs:

Citation information

Author(s): Carrie D. Wills
Year: 2016 (Aug)
Title: Cultural Resource Records Search and Site Visit Results for Cellco Partnership and their Controlled Affiliates doing buisness as Verizon Wireless Canidate 'Texas', South Canyon Drive, Unadressed Parcel, Menifee, Riverside County, California
Affliliation: Helix Enviornmental Planning
No. pages: 8
No. maps: 1
Attributes: Archaeological, Architectural/Historical, Evaluation, Literature search
Inventory size: NA
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals: No

Location information

County(ies): Riverside
USGS quad(s): ROMOLAND

Address:	*Address*	*City*	*Assessor's parcel no.*	*Zip code*
	NA	NA	3410400370	NA

PLSS: T5S R3W Sec. 30 SBBM

Database record metadata

	Date	*User*
Entered:	4/18/2019	studenteic
Last modified:	4/22/2019	studenteic

IC actions:	*Date*	*User*	*Action taken*
	4/18/2019	studenteic	Added into database - Crystal S.

Record status:

Resource Detail: P-33-007652

Identifying information

Primary No.: P-33-007652
Trinomial:
Name:
Other IDs:

Type	*Name*
Other	Quail Valley Counry Club
Other	Ser. No. 33-2370-54
OTIS Resource Num	463930
OHP Property Numb	061637
National Register	7R

Cross-refs:

Attributes

Resource type: Building
Age: Historic
Information base: Survey
Attribute codes: HP06 (1-3 story commercial building)
Disclosure: Unrestricted
Collections: Unknown
Accession no(s): n/a
Facility: n/a

General notes

Recording events

Date	*Recorder(s)*	*Affiliation*	*Notes*
5/21/1982	Lorna Lege	Riverside County Historical Comm.	none

Associated reports

Location information

County: Riverside
USGS quad(s): ROMOLAND
Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
28702 Anita Dr.	Quail Valley	350-244-037-6	92370

PLSS:
UTMs: Zone 11 477720mE 3729190mN NAD27 (none)

Management status

Database record metadata

	Date	*User*
Entered:	3/28/2007	jay
Last modified:	11/23/2020	eicadmin

IC actions:

Date	*User*	*Action taken*
3/28/2007	jay	Added records from hard-copy list provided by EIC.
4/5/2011	Ramon	Entered and updated record information

Record status:

Resource Detail: P-33-007653

Identifying information

Primary No.: P-33-007653
Trinomial:
Name:
Other IDs:

Type	*Name*
Other	Ser. No. 33-2370-55
OTIS Resource Num	463931
OHP Property Numb	061638
National Register	7N

Cross-refs:

Attributes

Resource type: Building
Age: Historic
Information base: Survey
Attribute codes: HP02 (Single family property)
Disclosure: Unrestricted
Collections: Unknown
Accession no(s): n/a
Facility: n/a

General notes

Recording events

Date	*Recorder(s)*	*Affiliation*	*Notes*
5/12/1982	Lorna Lege	Riverside County Historical Comm.	none

Associated reports

Location information

County: Riverside
USGS quad(s): ROMOLAND
Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
23790 Clara Place	Quail Valley	350-242-020-4	92370

PLSS:
UTMs: Zone 11 477180mE 3729220mN NAD27 (none)

Management status

Database record metadata

	Date	*User*
Entered:	3/28/2007	jay
Last modified:	11/23/2020	eicadmin

IC actions:

Date	*User*	*Action taken*
3/28/2007	jay	Added records from hard-copy list provided by EIC.
4/5/2011	Ramon	Entered and updated record information

Record status:

Resource Detail: P-33-007679

Identifying information

Primary No.: P-33-007679
Trinomial:
Name:
Other IDs:

Type	*Name*
Other	Ser No. 33-2370-0
OTIS Resource Num	463955
OHP Property Numb	061662
National Register	7R

Cross-refs:

Attributes

Resource type: Building
Age: Historic
Information base: Survey
Attribute codes: HP02 (Single family property)
Disclosure: Unrestricted
Collections: Unknown
Accession no(s): n/a
Facility: n/a

General notes

Recording events

Date	*Recorder(s)*	*Affiliation*	*Notes*
7/15/1982	Lorna Lege	Riverside County Historical Comm.	none

Associated reports

Location information

County: Riverside
USGS quad(s): ROMOLAND
Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
23866 Elsinore Ln.	Perris Vic	350-103-038-1	92370

PLSS:
UTMs: Zone 11 477540mE 3729710mN NAD27 (none)

Management status

Database record metadata

	Date	*User*
Entered:	3/28/2007	jay
Last modified:	11/23/2020	eicadmin

IC actions:

Date	*User*	*Action taken*
3/28/2007	jay	Added records from hard-copy list provided by EIC.
4/5/2011	Ramon	Entered and updated record information

Record status:

Resource Detail: P-33-011548

Identifying information

Primary No.:	P-33-011548	
Trinomial:	CA-RIV-006876	
Name:		
Other IDs:	*Type*	*Name*
	Other	AM Temp 16
Cross-refs:		

Attributes

Resource type:	Site
Age:	Prehistoric
Information base:	Survey
Attribute codes:	AP02 (Lithic scatter)
Disclosure:	Not for publication
Collections:	Yes
Accession no(s):	none
Facility:	Brian F. Smith and Associates?

General notes

Recording events

Date	*Recorder(s)*	*Affiliation*	*Notes*
6/24/2002	J. Buysse	Brian F. Smith & Assoc.	none

Associated reports

Location information

County:	Riverside			
USGS quad(s):	ROMOLAND			
Address:	*Address*	*City*	*Assessor's parcel no.*	*Zip code*
	Newport Road	n/a	n/a	n/a

PLSS: T6S R3W NW¼ of NW¼ of Sec. 5 SBBM
T6S R3W NE¼ of NE¼ of Sec. 6 SBBM

UTMs: Zone 11 479385mE 3727020mN NAD83 (N)
Zone 11 479370mE 3726900mN NAD83 (S)
Zone 11 479420mE 3726940mN NAD83 (E)
Zone 11 479325mE 3726925mN NAD83 (W)

Management status

Database record metadata

	Date	*User*	
Entered:	3/28/2007	jay	
Last modified:	6/15/2023	aruadmin	
IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Added records from hard-copy list provided by EIC.
	8/16/2013	rachel	TLR-Entered quad
Record status:			

Resource Detail: P-33-017369

Identifying information

Primary No.: P-33-017369
Trinomial: CA-RIV-009026
Name:
Other IDs:

Type	*Name*
Other	CH-Quarry-1

Cross-refs:

Attributes

Resource type: Site
Age: Prehistoric
Information base: Survey
Attribute codes: AP12 (Quarry)
Disclosure: Not for publication
Collections: Yes
Accession no(s): n/a
Facility: Khov/Forecast Homes

General notes

Recording events

Date	*Recorder(s)*	*Affiliation*	*Notes*
3/1/2004	Anna Hoover and Kris ti Blevins	LL Environmental	none

Associated reports

Location information

County: Riverside
USGS quad(s): ROMOLAND
Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
n/a	n/a	n/a	n/a

PLSS: T5S R4W NW¼ of NE¼ of Sec. 36 SBBM
UTMs: Zone 11 476974mE 3728577mN NAD83 (none)

Management status

Database record metadata

	Date	*User*
Entered:	12/12/2008	Michelle
Last modified:	11/23/2020	eicadmin

IC actions:

Date	*User*	*Action taken*
12/12/2008	Michelle	Record info entered into database

Record status:

Resource Detail: P-33-028062

Identifying information

Primary No.: P-33-028062
Trinomial:
Name:
Other IDs:

Type	*Name*
Other	AMR Isolate 1

Cross-refs:

Attributes

Resource type: Other
Age: Prehistoric
Information base: Other
Attribute codes: AP16 (Other) - Prehistoric Isolate (Chert biface)
Disclosure: Not for publication
Collections: No
Accession no(s): n/a
Facility: n/a

General notes

Recording events

Date	*Recorder(s)*	*Affiliation*	*Notes*
1/9/2018	Elena C. Goralogia	Brian F. Smith and Associates, Inc.	none

Associated reports

Report No.	*Year*	*Title*	*Affiliation*
RI-10537	2018	Results of Archaeological Monitoring at Audie Murphy Ranch, TR 31822-1, -2, and -F; TR 36484; and TR 36485-2 through -11 and -F (GP 14-070; PM32269), City of Menifee, California	Brian F. Smith and Associates, Inc.
RI-10538	2018	Archaeological Assessment of the PA-7 School Site at Audie Murphy Ranch	Brain F. Smith and Associates, Inc.

Location information

County: Riverside
USGS quad(s): ROMOLAND
Address:

Address	*City*	*Assessor's parcel no.*	*Zip code*
n/a	n/a	n/a	n/a

PLSS: T5S R3W Sec. SBBM
T6S R3W Sec. SBBM
UTMs: Zone 10 479147mE 3728123mN NAD83 (TR 31822-2)

Management status

Database record metadata

	Date	*User*
Entered:	1/12/2018	studenteic
Last modified:	6/15/2023	aruadmin

IC actions:

Date	*User*	*Action taken*
1/12/2018	studenteic	Entered into database. Bo Cheshire

Record status:

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-33-010944	CA-RIV-006619	Other - New West	Site	Prehistoric	AP02	2000 (Jean A. Keller, Jean A. Keller, Cultural Resources Consultant et. Al.)	RI-04516, RI-04517

PRIMARY RECORD

RECEIVED IN
JAN 0 2 2001
EIC

Primary #: 33 - 10944
HRI #:
Trinomial: CA-RIA-6619
NRHP Status Code:

Other Listings:
Review Code ___ Reviewer _________ Date _________

***Resource Name or #** (Assigned by recorder): New West

P1. Other Identifier:

P2.* Location: √ **Not for Publication** ___ **Unrestricted**

a.* County: Riverside

and (P2b and P2c or P2d; attach location map)

b.* USGS Quad: Romoland 7.5' **dated** 1953 **photorevised** 1979
Twp: 5s **Rng:** 3w NE1/4 SE1/4 SE1/4 **Section** 30, **SBBM**
Elevation: 1552'- 1570'

c. Address: **City:** **Zip:**

d.* UTM: (Give more than one for large and/or linear resources) **Zone** 11: 479300 **mE**/ 3728930 **mN**
UTM Derivation: √ USGS Quad ___ GPS
GPS UTM Corrected: ___ Yes ___ No **GPS brand/model:**

e. Other Locational Data (e.g. parcel number, directions to resource, etc. as appropriate):
Eastern site boundary is 255 meters north of Ridgemoor Road terminus and 106 meters west of power pole line

P3a.* Description (Describe resource and its major elements; include design, materials, condition, alterations, size, setting, and boundaries):
Lithic scatter comprised of 3 metate fragments, 1 mano, 1 partially formed scraper blade and 15 waste flakes, covering an area 36 meters N-S by 31 meters east west. The site is in very poor condition due to substantial earthmoving activities pushing the site soil from its original location on top of a flat terrace downslope.

3b.* Resource Attributes (List attributes and codes):
AP2: Lithic Scatter

P3c. Environmental Context for Isolates:
Nearest water: USGS-designated blueline stream (intermittent water) adjacent to north
Vegetation: barren
Landform: terrace above watercourse
Geology: So. Calif. Batholith
Exposure/Slope: open

P4.* Resources Present: ___ Building ___ Structure ___ Object √ Site ___ District ___ Element of District ___ Isolate ___ Other

P5a. Photograph or Drawing (Required for HRI buildings, structures, and objects [see box next page]):

PRIMARY RECORD - continued

Primary #: 33 - 10944
HRI #:
Trinomial: CA- CA-RIA-6619

*Resource Name or #: New West

P5b. Description of Photo (View, date, accession #):
Looking northwest across site, December 10, 2000

P6.* Date Constructed/Age and Source: √ Prehistoric ___ Historic ___ Both
San Luis Rey I & II (A.D. 1400-1850)

P7.* Owner and Address: private

P8.* Recorded by: Jean A. Keller, Cultural Resources Consultant
Project #: TTM 28920

P9.* Date recorded: December 10, 2000

P10.* Type of Survey (Describe): Phase I cultural resources assessment – records search, literature search, and comprehensive on-foot field survey

P11.* Report citation (Cite survey report and other sources or enter "none"):
"A Phase I Cultural Resources Assessment of a Portion of Tentative Tract Map 28920, ±60.0 Acres of Land Near Sun City, County of Riverside, California."

Attachments:
- √ Location Map (7.5' USGS quadrangle)
- √ Archaeological Site Record
- √ Sketch Map
- ___ Feature Record
- ___ Milling Station Record
- ___ Rock Art Record
- ___ Artifact Record
- ___ Illustration Sheet

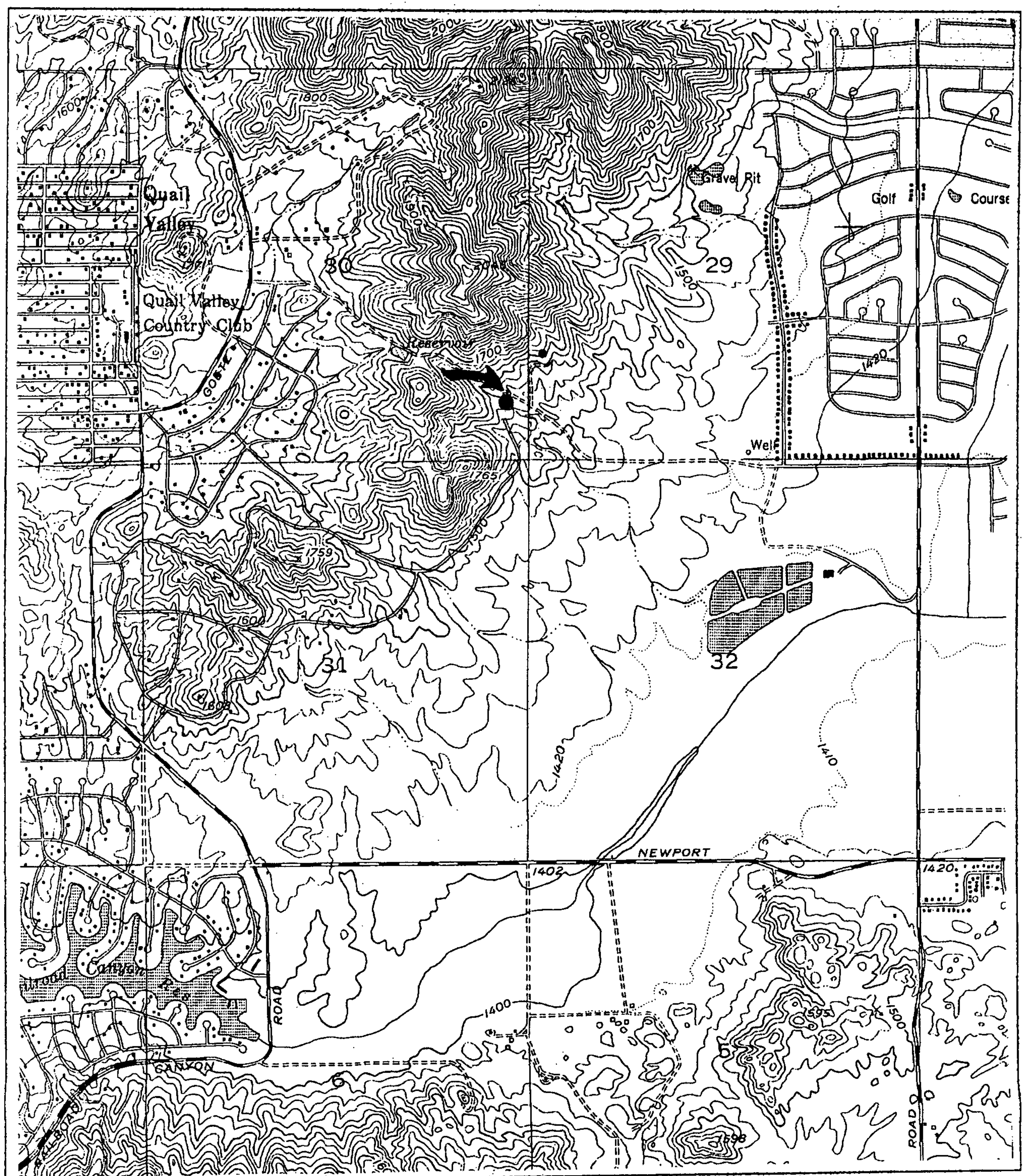
LOCATION MAP

Primary #: 33 - 10944
HRI #:
Trinomial: CA- CA-RIV-6619

Page 3 **of** 6

***Resource Name or #:** New West

***Map Name:** Romoland 7.5' ***dated** 1953 **photorevised** 1979



ARCHAEOLOGICAL SITE RECORD

Primary #: 33 - 10944
Trinomial: CA- CA-RIV-6619

Resource Name or #: New West

A1.* **Dimensions: a. Length** 35.9 m (N/S) **x b. Width** 31.0 m (E/W)

Method of measurement: ___ Paced _√_ Taped ___ Visual estimate ___ Other:

Method of determination (Check any that apply): _√_ Artifacts ___ Features ___ Soil ___ Vegetation ___ Topography ___ Cut bank ___ Animal burrow ___ Excavation ___ Property boundary ___ Other (Explain):

Reliability of determination: ___ High _√_ Medium ___ Low Explain:

Limitations (Check any that apply): ___ Restricted access ___ Paved/built over _√_ Site limits incompletely defined _√_ Disturbances ___ Vegetation ___ Other (Explain):

A2. **Depth:** _√_ None ___ Unknown **Method of Determination:** visual inspection

A3.* **Human Remains:** ___ Present ___ Absent ___ Possible _√_ Unknown: (Explain) None observed, but subsurface testing has not been conducted

A4.* **Features** (Number, describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map): None

A5.* **Cultural Constituents** (Describe and quantify artifacts, human-introduced organic residues, etc. not associated with features): Three granitic metate fragments, 1 granitic bifacial mano, 1 granitic partially formed scraper blade, and 15 flakes (granitic, basalt, quartzite, quartz)

A6.* **Were Specimens Collected?** _√_ No ___ Yes (If yes, attach Artifact Record or catalog and identify where specimens are curated)

A7.* **Site Condition:** ___ Good ___ Fair _√_ Poor (Describe disturbances.) Substantial earthmoving activities have pushed soil containing artifacts from top of terrace down slope to the base.

A8.* **Nearest Water** (Type, distance, and direction): Intermittanet daraingae in USGS-designated blueline stream adjacent to north

A9.* **Elevation:** 1552' – 1570'

A10. **Environmental Setting:**
Vegetation (Site and vicinity): barren
Soil (Site and surrounding): coarsely-sorted DG
Landform: terrace above watercourse
Geology: So. Calif. Batholith
Exposure/Slope: open
Other associations: none

ARCHAEOLOGICAL SITE RECORD – continued

Primary #: 33-10944
HRI#:
Trinoimial: CA-RIV-6619

***Resource Name or #:** New West

A11. Historical Information:

A12.* Age: √ Prehistoric ___ 1542-1769 ___ 1769-1848 ___ 1848-1880 ___ 1880-1914 ___ 1914-1945 ___ Post 1945 ___ Undetermined

Factual or estimated dates of occupation (Explain): Late prehistoric San Luis Rey Complex (1400-1850 A.D.) (Meighan 1954)

A13. Interpretations (Discuss scientific, interpretive, ethnic, and other values of site, if known): Probably small, temporary camp similar to others recorded in study area, but uncertain due to disturbances

A14. Remarks: Phase II test investigation recommended to determine vertical and horizontal extent of site

A15. References (Documents, consultants, maps, and other references): "A Phase I Cultural Resources Assessment of a Portion of Tentative Tract Map 28920. ±60.0 Acres of Land Near Sun City, County of Riverside, California."

A16. Photographs (List subject(s), direction of view, and accession numbers or attach a Photograph Record):
Looking northwest across site, December 10, 2000.

ATTACHMENT B

PALEONTOLOGICAL RESOURCES RECORDS SEARCH (WSC)

WESTERN SCIENCE CENTER

May 5th, 2023

Patrick O. Maxon
VCS Environmental
30900 Rancho Viejo Road, Suite 100
San Juan Capistrano, CA 92675

Dear Mr. Maxon,

This letter presents the results of a record search conducted for the Oak Hills Project located in the City of Menifee, Riverside County, California. The project site is located north of Las Flores Drive and east of Goetz Road in Section 30 of Township 5 South, Range 3 West on the *Romoland, CA* USGS 7.5 minute quadrangle.

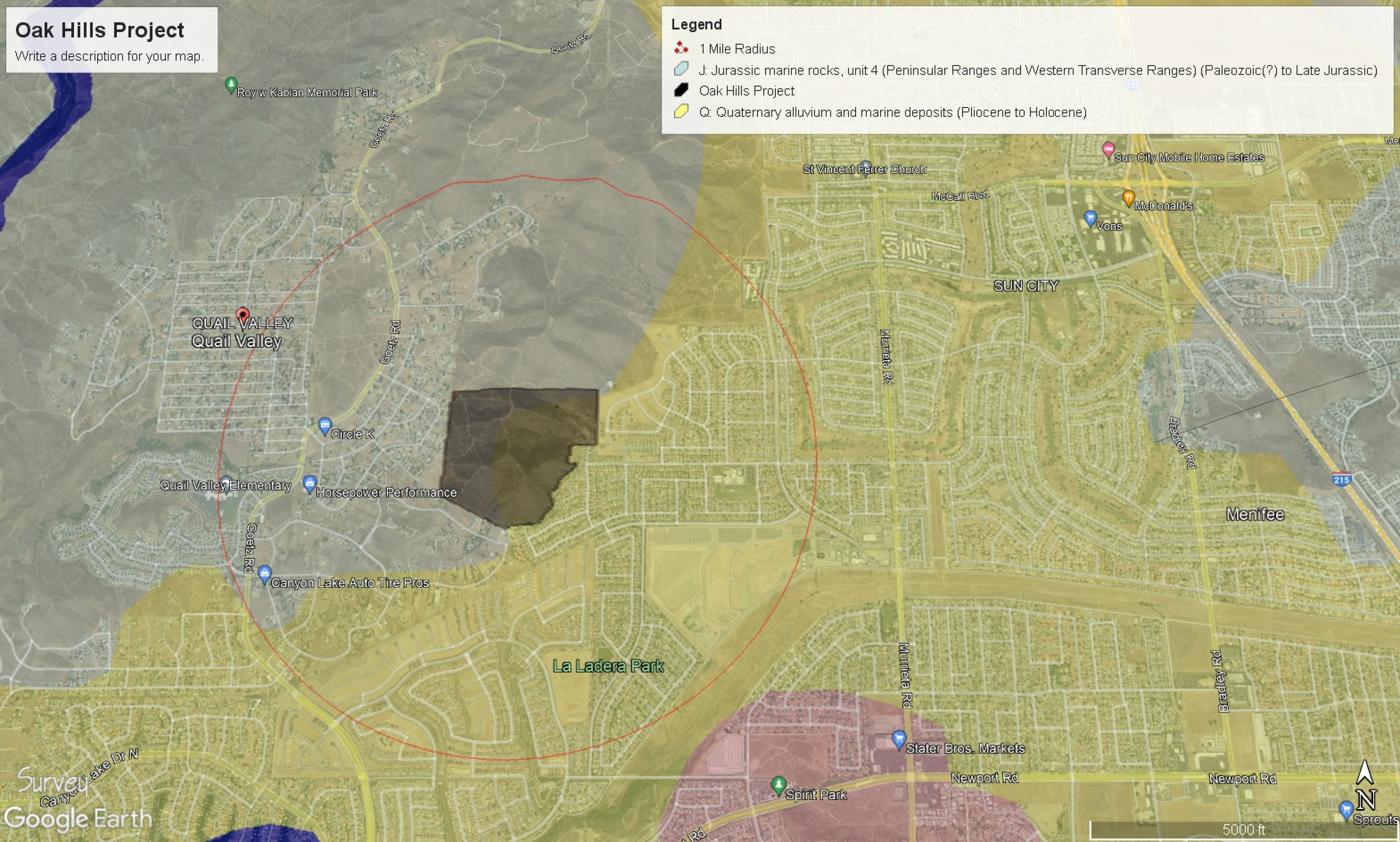
The geologic units underlying this project are mapped as deposits of quartz-rich rocks and fissile black phyllite from the Mesozoic, with the northwest corner of the project extending into very old alluvial fan deposits from the middle to early Pleistocene (Morton and Weber 2003). Pleistocene alluvial units are considered to be fossiliferous and highly paleontologically sensitive. The Western Science Center does not have any localities within the project area or within a 1 mile radius, although we do have localities from similarly mapped units from across Southern California.

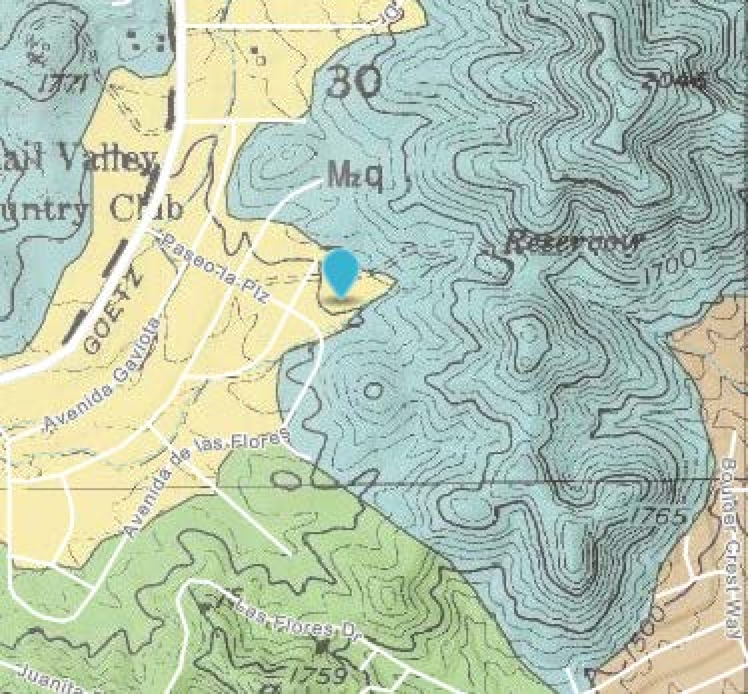
Any fossil specimens recovered from the Oak Hills Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from the study area.

If you have any questions, or would like further information, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,

Brittney Elizabeth Stoneburg, MSc
Collections Manager


Oak Hills Project
Write a description for your map.
Legend
1 Mile Radius
J: Jurassic marine rocks, unit 4 (Peninsular Ranges and Western Transverse Ranges) (Paleozoic(?) to Late Jurassic)
Oak Hills Project
Q: Quaternary alluvium and marine deposits (Pliocene to Holocene)
Roy w Kabian Memorial Park
Goetz Rd
St Vincent Ferrer Church
Sun City Mobile Home Estates
McCall Blvd
McDonald's
Vons
SUN CITY
QUAIL VALLEY
Quail Valley
Murrieta Rd
Circle K
Bradley Rd
215
Quail Valley Elementary
Horsepower Performance
Menifee
Canyon Lake Auto Tire Pros
La Ladera Park
Stater Bros. Markets
Newport Rd
Spirit Park
Canyon Lake Dr N
Sprouts
N
5000 ft
Google Earth


30
Mzq
Reservoir
1700
765
1759
Paseo la Paz
GOETZ
Avenida Gaviota
Avenida de las Flores
Las Flores Dr
Boulder Crest Way

ATTACHMENT C

NATIVE AMERICAN HERITAGE COMMISSION (NAHC)

Local Government Tribal Consultation List Request

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

Type of List Requested

☑ **CEQA Tribal Consultation List (AB 52)** – ***Per Public Resources Code § 21080.3.1, subs. (b), (d), (e) and 21080.3.2***

☐ **General Plan (SB 18)** - ***Per Government Code § 65352.3.***

Local Action Type:

___ **General Plan** ___ **General Plan Element** ___ **General Plan Amendment**

___ **Specific Plan** ___ **Specific Plan Amendment** ___ **Pre-planning Outreach Activity**

Required Information

Project Title: Oak Hills

Local Government/Lead Agency: City of Menifee

Contact Person: Brandon Cleary

Street Address: 29844 Haun Road

City: San Juan Capistrano **Zip:** 92675

Phone: (949) 489-2700 **Fax:** ___

Email: pmaxon@vcsenvironmental.com

Specific Area Subject to Proposed Action

County: Riverside **City/Community:** Sun City

Project Description:

The Project is proposing to develop 37 dwelling units clustered on the 14+ acre eastern portion of the 75.26-acre property, with streets, wet and dry utilities, and open undisturbed land on the remaining land. Storm drains, and BMP's (i.e., water quality basins) will also be constructed

Additional Request

☑ **Sacred Lands File Search - *Required Information:***

USGS Quadrangle Name(s): Romoland

Township: 5 South **Range:** 3 West **Section(s):** 30

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

August 16, 2023

Brandon Cleary
City of Menifee

Via Email to: bcleary@cityofmenifee.us

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Oak Hills Project, Riverside County

Dear Mr. Cleary:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measures.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, 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
Riverside County
8/16/2023

Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
Agua Caliente Band of Cahuilla Indians	F	Patricia Garcia, Director of Historic Preservation	5401 Dinah Shore Drive Palm Springs, CA, 92264	(760) 699-6907	(760) 699-6919	pagarcia@aguacaliente.net	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	7/20/2023
Augustine Band of Cahuilla Mission Indians	F	Amanda Vance, Chairperson	84-001 Avenue 54 Coachella, CA, 92236	(760) 398-4722	(760) 369-7161	hhaines@augustinetribe.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	
Cabazon Band of Mission Indians	F	Doug Welmas, Chairperson	84-245 Indio Springs Parkway Indio, CA, 92203	(760) 342-2593	(760) 347-7880	jstapp@cabazonindians-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	
Cahuilla Band of Indians	F	Anthony Madrigal, Tribal Historic Preservation Officer	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		anthonymad2002@gmail.com	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	6/28/2023
Cahuilla Band of Indians	F	BobbyRay Esaprza, Cultural Director	52701 CA Highway 371 Anza, CA, 92539	(951) 763-5549		besparza@cahuilla-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	6/28/2023
Cahuilla Band of Indians	F	Daniel Salgado, Chairperson	52701 CA Highway 371 Anza, CA, 92539	(951) 972-2568	(951) 763-2808	chairman@cahuilla-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	6/28/2023
Campo Band of Diegueno Mission Indians	F	Ralph Goff, Chairperson	36190 Church Road, Suite 1 Campo, CA, 91906	(619) 478-9046	(619) 478-5818	rgoff@campo-nsn.gov	Diegueno	Imperial,Orange,Riverside,San Diego	
Ewiiaapaayp Band of Kumeyaay Indians	F	Robert Pinto, Chairperson	4054 Willows Road Alpine, CA, 91901	(619) 368-4382	(619) 445-9126	ceo@ebki-nsn.gov	Diegueno	Imperial,Orange,Riverside,San Diego	
Ewiiaapaayp Band of Kumeyaay Indians	F	Michael Garcia, Vice Chairperson	4054 Willows Road Alpine, CA, 91901	(619) 933-2200	(619) 445-9126	michaelg@leaningrock.net	Diegueno	Imperial,Orange,Riverside,San Diego	
La Posta Band of Diegueno Mission Indians	F	Gwendolyn Parada, Chairperson	8 Crestwood Road Boulevard, CA, 91905	(619) 478-2113	(619) 478-2125	LP13boots@aol.com	Diegueno	Imperial,Orange,Riverside,San Diego	
La Posta Band of Diegueno Mission Indians	F	Javaughn Miller, Tribal Administrator	8 Crestwood Road Boulevard, CA, 91905	(619) 478-2113	(619) 478-2125	jmiller@LPtribe.net	Diegueno	Imperial,Orange,Riverside,San Diego	
Los Coyotes Band of Cahuilla and Cupeño Indians	F	Ray Chapparosa, Chairperson	P.O. Box 189 Warner Springs, CA, 92086-0189	(760) 782-0711	(760) 782-0712		Cahuilla	Imperial,Riverside,San Bernardino,San Diego	
Manzanita Band of Kumeyaay Nation	F	Angela Elliott Santos, Chairperson	P.O. Box 1302 Boulevard, CA, 91905	(619) 766-4930	(619) 766-4957		Diegueno	Imperial,Orange,Riverside,San Diego	
Mesa Grande Band of Diegueno Mission Indians	F	Michael Linton, Chairperson	P.O Box 270 Santa Ysabel, CA, 92070	(760) 782-3818	(760) 782-9092	mesagrandeband@msn.com	Diegueno	Imperial,Orange,Riverside,San Diego	
Morongo Band of Mission Indians	F	Ann Brierty, THPO	12700 Pumarra Road Banning, CA, 92220	(951) 755-5259	(951) 572-6004	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego	
Morongo Band of Mission Indians	F	Robert Martin, Chairperson	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110	(951) 755-5177	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego	
Pala Band of Mission Indians	F	Alexis Wallick, Assistant THPO	PMB 50, 35008 Pala Temecula Road Pala, CA, 92059	(760) 891-3537		awallick@palatribe.com	Cupeno Luiseno	Orange,Riverside,San Bernardino,San Diego	3/23/2023
Pala Band of Mission Indians	F	Shasta Gaughen, Tribal Historic Preservation Officer	PMB 50, 35008 Pala Temecula Road Pala, CA, 92059	(760) 891-3515	(760) 742-3189	sgaughen@palatribe.com	Cupeno Luiseno	Orange,Riverside,San Bernardino,San Diego	3/23/2023
Pechanga Band of Indians	F	Tuba Ebru Ozdil, Pechanga Cultural Analyst	P.O. Box 2183 Temecula, CA, 92593	(951) 770-6313	(951) 695-1778	eozdil@pechanga-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	8/2/2023
Pechanga Band of Indians	F	Steve Bodmer, General Counsel for Pechanga Band of Indians	P.O. Box 1477 Temecula, CA, 92593	(951) 770-6171	(951) 695-1778	sbodmer@pechanga-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	8/2/2023
Quechan Tribe of the Fort Yuma Reservation	F	Manfred Scott, Acting Chairman - Kw'ts'an Cultural Committee	P.O. Box 1899 Yuma, AZ, 85366	(928) 210-8739		culturalcommittee@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
Quechan Tribe of the Fort Yuma Reservation	F	Jordan Joaquin, President, Quechan Tribal Council	P.O.Box 1899 Yuma, AZ, 85366	(760) 919-3600		executivesecretary@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
Quechan Tribe of the Fort Yuma Reservation	F	Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ, 85366	(928) 261-0254		historicpreservation@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
Ramona Band of Cahuilla	F	Joseph Hamilton, Chairperson	P.O. Box 391670 Anza, CA, 92539	(951) 763-4105	(951) 763-4325	admin@ramona-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	
Rincon Band of Luiseno Indians	F	Joseph Linton, Tribal Council/Culture Committee Member	One Government Center Lane Valley Center, CA, 92082	(760) 803-3548		jlinton@rincon-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	5/31/2023
Rincon Band of Luiseno Indians	F	Laurie Gonzalez, Tribal Council/Culture Committee Member	One Government Center Lane Valley Center, CA, 92082	(760) 484-4835		lgonzalez@rincon-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	5/31/2023
Rincon Band of Luiseno Indians	F	Cheryl Madrigal, Cultural Resources Manager/Tribal Historic Preservation Officer	One Government Center Lane Valley Center, CA, 92082	(760) 648-3000		cmadrigal@rincon-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	5/31/2023
Rincon Band of Luiseno Indians	F	Denise Turner Walsh, Attorney General	One Government Center Lane Valley Center, CA, 92082	(760) 689-5727		dwalsh@rincon-nsn.gov	Luiseno	Los Angeles,Orange,Riverside,San Bernardino,San Diego,Santa Barbara,Ventura	7/7/2023
Santa Rosa Band of Cahuilla Indians	F	Lovina Redner, Tribal Chair	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	lsaul@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	
Soboba Band of Luiseno Indians	F	Jessica Valdez, Cultural Resource Specialist	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-6261	(951) 654-4198	jvaldez@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023

Native American Heritage Commission
Native American Contact List
Riverside County
8/16/2023

Soboba Band of Luiseno Indians	F	Joseph Ontiveros, Tribal Historic Preservation Officer	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-5279	(951) 654-4198	jontiveros@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
Torres-Martinez Desert Cahuilla Indians	F	Thomas Tortez, Chairperson	P.O. Box 1160 Thermal, CA, 92274	(760) 397-0300	(760) 397-8146	thomas.tortez@torresmartinez-nsn.gov	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	

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 Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Oak Hills Project, Riverside County.

Record: PROJ-2023-004094
Report Type: AB52 GIS
Counties: Riverside
NAHC Group: All

ATTACHMENT D

PERSONNEL QUALIFICATIONS

PATRICK MAXON, M.A., RPA

Director | Cultural Services

EDUCATION

1994/MA/Anthropology/California State University, Fullerton

1987/BA/Psychology/Sociology/Towson State University, Towson, MD

VCS TEAM MEMBER SINCE 2017

CERTIFICATIONS/TRAINING

Riverside County Transportation and Land Management Agency Certified Archaeologist/Riverside County

California Energy Commission Cultural Resources Specialist/

Registered Professional Archaeologist (National)/No. 11468/Register of Professional Archaeologists

Orange County Certified Archaeologist/Orange County

National Historic Preservation Act Section 106 Compliance Advanced Certification, 2002/

Principal Investigator, Southern California/Bureau of Land Management

Qualified Archaeologist-Secretary of Interior Standards and Guidelines of Professional Qualification & Standards for Archeology, as per Title 36, Code of Federal Regulations, Part 61/

PROFESSIONAL AFFILIATIONS

ABOUT

Patrick Maxon M.A., RPA is a Registered Professional Archaeologist who meets the Secretary of Interior's standards for historic preservation programs for archaeology and who has a permit to perform work on Bureau of Land Management land. Patrick has 29 years of experience in all aspects of cultural resources management, including prehistoric and historic archaeology, paleontology, ethnography, and tribal consultation. He has expertise in compliance with NEPA, CEQA, the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act, and the Clean Water Act, among others. Patrick has completed hundreds of cultural resources projects that have involved (1) agency, client, Native American, and subcontractor coordination; (2) treatment plans and research design development; (3) archival research; (4) field reconnaissance; (5) site testing; (6) data recovery excavation; (7) construction monitoring; (8) site recordation; (9) site protection/preservation; (10) mapping/cartography; (11) laboratory analysis; and (12) report production. He has managed a number of projects within the jurisdiction of the USACE, the Bureau of Land Management, the Bureau of Reclamation, and other federal agencies that require compliance with Section 106 of the NHPA. He has also completed projects throughout Southern California under CEQA for State and local governments and municipalities, including Caltrans, the Department of General Services (DGS), the California Energy Commission, the California Department of Water Resources, the Los Angeles County Department of Public Works (LACDPW), the Los Angeles Department of Water and Power, the Los Angeles Unified School District, and others.

SELECT EXPERIENCE/PROJECTS

Godinho Dairy Project Phase I Cultural Resources Assessment, Eastvale, California. Mr. Maxon was the Cultural Resources Project Manager for the Godhino Dairy Project located in the City of Eastvale. He conducted a Phase I cultural resources study for the project, which included cultural and paleontological resources literature reviews, Native American scoping, and a pedestrian field survey of the project site. The site contains the extant remains of the Godinho Dairy which dates to at least the early 1960s. Three prehistoric archaeological sites are recorded within one mile of the project site; one (CA-RIV-2801) was recorded just a few hundred feet to the southeast. The Santa Ana River was used extensively by prehistoric populations of the area. Paleontologically sensitive Older Quaternary Alluvium likely lies at depth on the project site. No significant archeological resources were discovered on the project site during the survey. The extant Godinho Dairy complex appears to exceed 50 years of age and its recordation and evaluation as a historic resource was recommended. The proposed project would allow for development of the dairy property into a residential neighborhood.

La Rivera Drainage Project Cultural Resources Services, Riverside, California. Mr. Maxon served as the Cultural Resources Project Manager for the La Rivera Drainage Project located in the City of Riverside. The Phase I cultural resources study included (1) a cultural resources literature review of the project site at the Eastern Information Center (EIC) at the University of California, Riverside; (2) contact with the Native American Heritage Commission (NAHC) for a review of its Sacred Lands File and to obtain a list of Native American contacts for the project area; (3) preparation of informational letters to all the NAHC-listed contacts in order to ensure a good-faith

30900 Rancho Viejo Road, Suite 100
San Juan Capistrano, CA 92675
949.489.2700 | vcsenvironmental.com

effort of participation and (4) conducted a paleontological resources literature review for the project at the Natural History Museum of Los Angeles County (NHMLA). No cultural resources were discovered and no impacts are anticipated. The project proposed to improve existing drainage conditions within the La Rivera residential development and BonTerra Consulting prepared an Initial Study/Mitigated Negative Declaration (IS/MND) for its implementation.

Riverside Energy Resource Center Archaeological and Paleontological, and Biological Services, Riverside County. Mr. Maxon served as the Program Director for the archaeological, paleontological, and biological services at the Riverside Energy Resource Center in Riverside County. He managed all aspects of the archaeological, paleontological, historic, and biological surveys of the power plant site and its associated transmission lines and pipelines; he also coordinated monitoring the power plant site and its associated facilities. Mr. Maxon maintained client contacts, coordinated with the California Energy Commission, and communicated with the Riverside public utilities. In addition, he conducted cultural resources surveys and monitoring, completed the cultural resources survey report, and wrote monthly cultural resources monitoring reports and a final project report.

Biological and Cultural Resources Surveys, Jurisdictional Delineations, Track Upgrade from Thermal to Araz. Mr. Maxon was the Cultural Resources Project Manager for the Biological and Cultural Resources Surveys, Jurisdictional Delineations, and Track Upgrade from Thermal to Araz. The project began by consulting and coordinating with local, State, and/or federal agencies (as appropriate); the State Historic Preservation Officer (SHPO); the Union Pacific Railroad (UPRR); and other relevant agencies to develop a Programmatic Memorandum of Agreement (MOA) to consider the cultural resources associated with the project. Mr. Maxon and his crew conducted an intensive 100 percent pedestrian cultural resources survey of the area of potential effect (APE) in transects. Initial Native American consultation and bridge and culvert recordation were provided. There are approximately 609 structures (bridges and culverts) in the project area, of which 512 were built between 1903 and 1960 and are considered historic. An Architectural Historian visited each structure and produced a Primary Record (DPR 523A) and a Location Map (DPR523J).

Desert Ranch Project Cultural Survey, Riverside County. Mr. Maxon served as the Project Manager for the Desert Ranch Project, which consists of approximately seven square miles of desert overlooking the Salton Sea. He helped to provide a Phase I Cultural Resource Inventory for the Client, which entailed a walk of the entire property to survey for archaeological sites. Over 40 sites were recorded and excavation of several is anticipated. In addition to conducting surveys, Mr. Maxon met with the local Indian tribe, the Torres-Martinez Band of Cahuilla Indians, regarding this project.

Lake Elsinore East Lake Specific Plan Amendment Area Cultural Resources Services, City of Lake Elsinore. Mr. Maxon was the Project Manager of the Lake Elsinore East Lake Specific Plan Amendment Area. He was responsible for the assessment of known cultural resources and preparation of final report.

Encino Water Quality Improvement Program Archaeological Monitoring, Encino. As the Project Manager for the Encino Water Quality Improvement Program, Mr. Maxon monitored excavations for pipelines.

Stone Canyon Water Quality Improvement Project Prehistoric Cultural and Biological Resources Investigation and Monitoring, City of Los Angeles. Mr. Maxon was the

Project Manager for the Stone Canyon Water Quality Improvement Project in Los Angeles County and was responsible for reconnaissance and report preparation.

Aliso Creek Emergency Sewer Project Archaeological Survey, Orange County. As Project Manager of the Aliso Creek Emergency Sewer Project, Mr. Maxon was responsible for surveying the project area, complying with Section 106 of the NHPA, developing a treatment plan, performing hollow stem auger coring of several prehistoric archaeological sites, and assisting in the preparation of a report.

Salton Sea Solar Evaporation Pond Pilot Project Archaeological Survey, Imperial County. Mr. Maxon was the Project Manager of the Salton Sea Solar Evaporation Pond Pilot Project. He conducted a field reconnaissance and produced a final report.

East Branch Extension Phase II Water Pipeline Project, Mentone. Mr. Maxon was the Cultural Resources Manager for the East Branch Extension Phase II Water Pipeline Project. The project involved the preparation of all CEQA/NEPA environmental documents, the acquisition of regulatory permits, and construction monitoring. Mr. Maxon was responsible for a full range of cultural resources services including historic, prehistoric and paleontological archival research, field surveys, evaluation of resources, and report preparation 6th Street Viaduct Project, Los Angeles. As Cultural Resources Project Manager, Mr. Maxon was responsible for coordinating with the California Department of Transportation's (Caltrans's) District 7 on the previously submitted draft Archaeological Survey Report (ASR) and the project's Area of Potential Effects (AEP) and completing the ASR and Environmentally Sensitive Area (ESA) Action Plan, which included several revisions, for the proposed project. The ESA Action Plan was developed to protect an archaeological site that was recorded within the AEP. The plan entails surrounding the site with fencing during construction and monitoring of construction in the vicinity of the site.

Saddleback Meadows Development Archaeological Test Excavations, Orange County. Mr. Maxon was the Program Director of archaeological test excavations for the Saddleback Meadows Development Project. He performed test excavations of ten prehistoric archaeological sites and developed a treatment plan and research design in compliance with Section 106 of the NHPA for two sites (CA-ORA-710 and CA-ORA-711). Mr. Maxon conducted test excavations on two additional sites (CA-ORA-1435H and CA-ORA-1437), a data recovery excavation (CA-ORA-711), and laboratory and report preparation. Additionally, he developed a testing plan to evaluate two prehistoric sites (CA-ORA-713 and CA-ORA-715), managed the excavation of those sites, and maintained budgets and relations with the client (TPG Management) and the USACE.

Orange County Water District On-Call Environmental Analyses Services, Orange County, CA: Cultural Resources Manager for the On-Call Contract. Mr. Maxon has provided environmental analyses services on an as-needed basis as part of on-call contracts with the Orange County Water District since 2010. Representative cultural resources task orders completed as part of the on-call contracts, include the following:

- La Palma Recharge Basin, Anaheim, CA
- Prado Basin Mitigation Sites, Orange County, CA
- Fletcher Basin Improvement Project Cultural and Paleontological Resources Mitigation Monitoring Plan, City of Orange, CA
- Centennial Park Injection Well Project, Santa Ana, CA
- EW-1 Groundwater Containment and Treatment Project, City of Fullerton, CA.
- Santiago Recharge Basin Project, Orange, CA

GeoSoils, Inc.

Geotechnical • Coastal • Geologic • Environmental

26590 Madison Avenue • Murrieta, California 92562 • (909) 677-9651 • FAX (909) 677-9301

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County of Riverside
Building & Safety

MAR 31 2004

MURRIETA

March 22, 2004 W.O. 3214-C-SC

John Laing Homes
255 E. Rincon, Suite 100
Corona, California 92879-1330

Attention: Ms. Linda Valia

Subject: Geotechnical Review of Precise Grading Plans, Lots 1 through 139, Tract 28920-1, Newport Hills II, Menifee, Riverside County, California

Dear Ms. Valia:

In accordance with the request of representatives of the County of Riverside, and your authorization, GeoSoils, Inc. (GSI) has reviewed the referenced precise grading plans (see the Appendix) by The Cornerstone Group (TCG), the geotechnical reports for the subject tract in the Appendix, and the Uniform Building Code (UBC), which is the basis for the California Building Code. The scope of our services has included a review of the applicable reports and plans for the site, appropriate engineering and geologic analysis of data, and preparation of this summary review. Additionally, as requested by the County of Riverside, GSI reviewed the adjusted setback dimensions from the toe of slope in Lots 40, 41, 44, and 45 as they now generally conform to the UBC. GSI also requested that the setback zone on Lot 67 be adjusted by the design engineer to generally conform to the UBC. TCG has apparently applied the changes to the precise grading plans. Unless specifically superceded by recommendations presented herein, the recommendations and conclusions contained in the referenced reports in the Appendix by GSI, remain pertinent and applicable, and should be appropriately implemented during planning, design, and construction.

The precise plans appear in general compliance with the referenced reports by GSI, with the following comments:

1. The slope setback dimensions on the above mentioned lots have been adjusted, and generally comply with UBC specifications, from a geotechnical viewpoint.

2. As indicated in the referenced reports by GSI, all footing excavations should be observed by the geotechnical engineer subsequent to trenching and prior to concrete form and reinforcement placement. The purpose of the observations is to verify that the excavations are made into the recommended bearing material and to the minimum widths and depths recommended for construction. If loose or

compressible materials are exposed within the footing excavation, a deeper footing or removal and recompaction of the subgrade materials would be recommended at that time. Footing trench spoil and any excess soils generated from utility trench excavations should be compacted to a minimum relative compaction of 90 percent if not removed from the site.

3. For very low to low expansive soils, the moisture content of the subgrade soils should be equal to or greater than optimum moisture content to a depth below subgrade of 12 inches for one-story structures and 18 inches for two-story floor load structures, prior to pouring concrete. This soil moisture content should be verified by a GSI representative prior to visqueen and sand placement. Once pre-construction testing is completed, the visqueen barrier should be placed on the moistened soil within 72 hours and the slab should be poured within 72 hours.

LIMITATIONS

The materials encountered on the project site and utilized for our analysis are believed representative of the area; however, soil and bedrock materials vary in character between excavations and natural outcrops or conditions exposed during mass grading. Site conditions may vary due to seasonal changes or other factors.

Inasmuch as our study is based upon our review and engineering analyses and laboratory data, the conclusions and recommendations are professional opinions. These opinions have been derived in accordance with current standards of practice, and no warranty is expressed or implied. Standards of practice are subject to change with time. GSI assumes no responsibility or liability for work or testing performed by others, or their inaction; or work performed when GSI is not requested to be onsite, to evaluate if our recommendations have been properly implemented. Use of this report constitutes an agreement and consent by the user to all the limitations outlined above, notwithstanding any other agreements that may be in place. In addition, this report may be subject to review by the controlling authorities.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to contact our office.

Respectfully submitted,

GeoSoils, Inc.

John P. Franklin
Engineering Geologist, CEG 1340

REGISTERED GEOLOGIST
JOHN P. FRANKLIN
NO. 1340
Certified
Engineering
Geologist
STATE OF CALIFORNIA

Reviewed by:

David W. Skelly
Civil Engineer, RCE 47857

REGISTERED PROFESSIONAL ENGINEER
DAVID W. SKELLY
No. RCE 47857
Exp. 12/31/05
CIVIL
STATE OF CALIFORNIA

RSP/DWS/JPF/jk

Enclosure: Appendix - References

Distribution: (5) Addressee
(1) The Cornerstone Group, Attention: Mr. Russell E. Sharp

APPENDIX

REFERENCES

CSL Engineering, Inc., 2003, Rough grading plan for Tract 28920-1, JN 578, 4 sheets, scale: 1"=40', dated August 7 and 11.

Geopacifica Geotechnical Consultants, 2003, Building and Safety, Grading Division, Geotechnical engineering report check corrections, BGR 020798, dated February 27.

_____, 2002, Building and Safety, Grading Division, Geotechnical engineering report check corrections, BGR 020798, dated July 26.

GeoSoils, Inc., 2003a, Geotechnical report of grading, Lots 1 through 139, Tract 28920-1, Menifee, Riverside County, California, W.O. 3214-B-SC, dated December 29.

_____, 2003a, Cast-in-place concrete storm drain geotechnical conditions, Tract 28920-1, Sun City area, Riverside County, California, W.O. 3214-D-SC, dated June 27.

_____, 2003b, Slope stability evaluation and most current 40-scale grading plan review, Tract 28920-1, Sun City area, Riverside County, California, BGR 020798, W.O. 3214-A1-SC, dated February 19.

_____, 2003c, Response to county review, geotechnical update, and 40-scale review, Tentative tract 28920, Sun City area, Riverside County, California, BGR 020798, W.O. 3214-A-SC, dated January 27.

_____, 2002, Preliminary pavement designs, Tract 28920, Sun City area, Riverside County, California, W.O. 3214-E-SC, dated January 14.

_____, 2000, Preliminary geotechnical investigation, Tentative tract map no. 28920, Sun City area, Riverside County, California, W.O. 2836-A2-SC, dated April 17.

International Conference of Building Officials, 1997, Uniform building code, dated April.

The Cornerstone Group, 2003, County of Riverside, Precise grading plan for Newport Hills II, Tract 28920-1,Llots 1 thru 139, 13 sheets, 20-scale, dated November 10.

GEOTECHNICAL REPORT OF GRADING
LOTS 1 THROUGH 139, TRACT 28920-1
MENIFEE, RIVERSIDE COUNTY, CALIFORNIA

FOR

JOHN LAING HOMES
INLAND DIVISION
255 E. RINCON, SUITE 100
CORONA, CALIFORNIA 92879

W.O. 3214-B-SC DECEMBER 29, 2003

EARTHWORK CONSTRUCTION

Earthwork operations have been completed in general accordance with recommendations provided in the field based upon conditions exposed and/or in accordance with the recommendations provided in the approved referenced reports.

Preparation of Existing Ground

1. Deleterious material, such as concentrated organic matter and miscellaneous debris, were stripped from the surface and disposed of offsite, prior to placing any fill.

2. Compressible topsoil/colluvium, alluvium, and potentially compressible bedrock were removed to the limits indicated in the approved referenced reports (see Appendix A).

3. Subsequent to the above removals, the exposed subsoils were scarified to a depth of about 12 inches, brought to at least optimum moisture content, then compacted to a minimum relative compaction of 90 percent of the laboratory standard ASTM D-1557.

4. All processing of original ground was observed by a representative of GSI.

Fill Placement

1. In areas that received fill, soils consisting of native onsite sediments were placed in 6- to 8-inch lifts, watered, and mixed to achieve at least optimum moisture conditions, and compacted to a minimum relative compaction of 90 percent of the laboratory standard using earth scrapers, bulldozers, and water trucks. The approximate maximum depth of fill placed in the individual lots is presented in the enclosed Table 1.

2. Materials larger than 12 inches in diameter were routinely placed deeper than approximately 10 feet from finish grade.

Transition Areas

In order to reduce the potential for differential settlement between cut and fill materials, the entire cut portion of cut/fill transition lots were generally overexcavated to a minimum depth of 3 feet below finish grade, and/or a maximum ratio of fill thickness on the lot of 3:1 (maximum to minimum), and replaced with compacted fill. Hard rock and/or excavation difficulties may exist below the overexcavated zone.

Slopes

1. Fill slopes, up to 25 feet high, and cut slopes, up to 48½ feet high, were constructed at inclinations of 2:1 (horizontal:vertical), or flatter. A portion of the cut slope behind Lot 41, up to 30½ feet high, was constructed at inclinations of 1¾:1 (h:v), or flatter. The fill slopes were keyed into competent granitic bedrock, as defined in the referenced reports.

2. All slopes were field inspected by GSI personnel and are considered grossly and surficially stable and should remain so under normal conditions of care, maintenance, and rainfall. Slopes may be subject to some erosion/gullying under concentrated flow from irrigation and/or misdirected surface drainage. Landscaping of these slopes should be implemented as soon as possible to mitigate such conditions. Other mitigation measures are presented in the "Development Criteria" section of this report.

Field Testing

1. Field density tests were performed using the nuclear densometer methods ASTM D-2922 and D-3017, and the sand cone method ASTM D-1556. The test results are presented in the enclosed Table 2. The approximate locations of the field density tests are presented on the enclosed Plates 1 through 3, which utilize the 40-scale rough grading plans prepared by CSL Engineering, Inc., dated August, 2003, as the base map.

2. Field density tests were taken at periodic intervals and selected locations to check the compactive efforts provided by the contractor. Where test results indicated less than optimum moisture content or less than 90 percent relative compaction, the contractor was notified and the area was reworked until retesting indicated at least optimum moisture and a minimum relative compaction of 90 percent were attained. Based upon the grading operations observed, the test results presented herein are considered representative of the compacted fill.

3. Visual classification, supplemented by laboratory testing, was the basis for evaluating which maximum density value to use for a given density test.

Subdrains

No perched water or buried canyons were encountered during rough grading operations at the subject site. Further, there was generally not sufficient cover (i.e., more than about 10 feet of planned fill) and/or there was no potential subdrain outlet area for flow at removal bottom elevations, therefore GSI did not recommend subdrain emplacement. If, in the future, perched water conditions are observed due to heavy irrigation, precipitation, or other factors not obvious during grading, GSI should be contacted for recommendations for mitigation of the perched water conditions. Such conditions should be anticipated.

LABORATORY TESTING

Maximum Density Testing

The laboratory maximum dry density and optimum moisture content for each of the major soil types was determined according to test method ASTM D-1557. The following table presents the results:

SOIL TYPE	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
A - Yellowish Brown, SILTY SAND	133.5	9.0
B - Reddish Brown, SILTY SAND	127.5	10.5

Expansion Potential

Expansion Index (E.I.) testing was performed for the typical foundation soil types exposed at pad grades in general accordance with the Uniform Building Code ([UBC] International Conference of Building Officials [ICBO], 1997). Based on the test results obtained, the expansive potential of the soils for the subject lots may be classified as very low (i.e., E.I. between 0 to 20). Results of the expansion testing are presented below:

LOTS	EXPANSION INDEX *	UBC CLASSIFICATION
1 - 3	7	Very Low
4 - 8	9	Very Low
9 - 13	5	Very Low
14 - 18	0	Very Low
19 - 22	0	Very Low
23 - 28	0	Very Low
29 - 33	1	Very Low
34 - 38	4	Very Low
39 - 43	6	Very Low
44 - 48	3	Very Low
49 - 53	3	Very Low
54 - 58	0	Very Low

LOTS	EXPANSION INDEX *	UBC CLASSIFICATION
59 - 63	5	Very Low
64 - 68	3	Very Low
69 - 73	5	Very Low
74 - 78	9	Very Low
79 - 83	16	Very Low
84 - 88	3	Very Low
89 - 93	3	Very Low
94 - 98	12	Very Low
99 - 105	4	Very Low
106 - 110	9	Very Low
111 - 115	6	Very Low
116 - 119	11	Very Low
120 - 122	6	Very Low
123 - 127	2	Very Low
128 - 132	5	Very Low
133 - 136	4	Very Low
137 - 139	12	Very Low

Soluble Sulfates/Corrosivity

Subsequent to grading, typical samples of the site materials were analyzed for soluble sulfates and corrosion potential. The soluble sulfate and corrosion potential results are provided as the attached Figures B-1 through B-8 (Laboratory Data Sheets, see Appendix B), and are summarized as follows:

LOTS	SOLUBLE SULFATES PERCENTAGE BY WEIGHT	pH	RESISTIVITY (OHMS-CM)
1 - 3	Not Detected	7.5	3,800
4 - 8	0.0025	7.8	2,400
9 - 13	Not Detected	7.6	3,500
14 - 18	Not Detected	7.8	3,600
19 - 22	Not Detected	7.7	3,200
23 - 28	Not Detected	7.6	5,100

LOTS	SOLUBLE SULFATES PERCENTAGE BY WEIGHT	pH	RESISTIVITY (OHMS-CM)
29 - 33	Not Detected	7.8	3,600
34 - 38	Not Detected	7.8	3,200
39 - 43	Not Detected	7.4	3,200
44 - 48	Not Detected	7.2	3,500
49 - 53	Not Detected	7.2	2,500
54 - 58	0.0027	7.3	1,900
59 - 63	Not Detected	7.4	2,400
64 - 68	Not Detected	7.3	2,200
69 - 73	Not Detected	7.4	2,300
74 - 78	Not Detected	7.5	3,100
79 - 83	Not Detected	7.4	2,600
84 - 88	Not Detected	6.6	3,200
89 - 93	Not Detected	6.9	2,700
94 - 98	Not Detected	7.0	2,700
99 - 105	0.0034	7.8	2,100
106 - 110	Not Detected	8.0	3,700
111 - 115	Not Detected	7.4	4,100
116 - 119	Not Detected	7.6	3,700
120 - 122	Not Detected	8.0	3,300
123 - 127	Not Detected	7.0	2,700
128 - 132	Not Detected	7.2	3,100
133 - 136	Not Detected	7.1	2,700
137 - 139	Not Detected	7.4	2,600

Based upon the soluble sulfate test results and the latest edition of the UBC, the soluble sulfate content is categorized as negligible (0.00-0.10 Water-Soluble Sulfate in Soil, Percentage by Weight) and sulfate-resistant concrete will not be required. Additionally, a modified cement to water ratio and modified concrete compressive strength will not be required.

Based on the results of the resistivity and pH testing, the onsite soils are neutral to moderately alkaline and are corrosive to moderately corrosive toward ferrous metals (range

1,000 to 2,000 ohm-cm is considered corrosive and range 2,000 to 10,000 ohm-cm is considered moderately corrosive).

Such resistivities are moderately corrosive to ferrous metals in a saturated state. It is our understanding that standard concrete cover over reinforcing steel is usually appropriate for these conditions; a qualified corrosion engineer should be retained to provide specific recommendations for foundation and pipes.

Seismic Shaking Parameters

The Elsinore fault is the design earthquake fault for the site, located ±11 kilometers west of the site. The following updated seismic parameters, per Chapter 16 of the UBC (ICBO, 1997), are provided.

1997 UBC CHAPTER 16	Lots 1-13, 15, 19-21, 23-26, 35, 42-44, 52-62, 64-71, 73, 74, 76-83, 88-92, and 96-122	Lots 14, 16-18, 22, 27-34, 36-41, 45-51, 63, 72, 75, 84-87, 93-95, and 123-139
Seismic Zone Factor (per Table 16-I*)	0.40	0.40
Soil Profile Type (per Table 16-J*)	S_B	S_C
Seismic Coefficient C_a (per Table 16-Q*)	$0.40N_a$	$0.40N_a$
Seismic Coefficient C_v (per Table 16-R*)	$0.40N_v$	$0.56N_v$
Near Source Factor N_a (per Table 16-S*)	1.0	1.0
Near Source Factor N_v (per Table 16-T*)	1.0	1.0
Seismic Source Type (per Table 16-U*)	B	B

Settlement

Settlement sensitive structures on the subject lots should be designed for the combination of site-specific soil parameters and differential settlement of at least 0.85 inches in 40 feet, or an angular distortion of 1/565. This magnitude covers post construction settlement of the fill plus the building loads.

CONCLUSIONS AND RECOMMENDATIONS

Recommendations for foundation design parameters, foundation construction, post-tensioned slab systems, and development criteria were presented in our referenced reports in Appendix A. All findings, conclusions and recommendations in that report remain pertinent and applicable except as specifically superceded herein. For convenience, the recommendations are reiterated below. It should be noted, however, that materials greater than 12 inches in diameter were routinely placed below 10 feet from finish grade, and may exist and/or excavation difficulties may be encountered at depths as shallow as 3 feet, or less, below finish grade. Thus, the potential for excavation difficulties and oversized materials should be disclosed to all homeowners and other interested parties.

Conventional Foundation Design

1. Conventional spread and continuous footings may be used to support the proposed residential structures provided they are founded entirely in properly compacted fill or other competent bearing material.

2. Analyses indicate that an allowable bearing value of 1,500 pounds per square foot (psf) may be used for the design of footings which maintain a minimum width of 12 inches and a minimum depth of at least 12 inches. The bearing value may be increased by 20 percent (per code) for each additional 12 inches in depth to a maximum of 2,500 psf. The upper 6 inches should be excluded from the embedment due to the effects of landscaping.

3. For lateral sliding resistance, a 0.35 coefficient of friction may be utilized for a concrete to soil contact when multiplied by the dead load.

4. Passive earth pressure may be computed as an equivalent fluid having a density of 250 pounds per cubic foot (pcf) with a maximum earth pressure of 2,500 psf.

5. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

6. All footings should maintain a minimum 7-foot horizontal distance between the base of the footing and any adjacent descending slope, and minimally comply with the guidelines depicted on Figure No. 18-I-1 of the UBC (current edition).

Construction

The following foundation construction recommendations are presented as a minimum criteria from a soils engineering viewpoint. The onsite soils expansion potentials are in the very low range (E.I. of 0 to 20).

Accordingly, the following foundation construction recommendations assume that the soils in the top 3 feet from finish grade will have a very low expansion potential. Recommendations by the project's design-structural engineer or architect, which may exceed the soils engineer's recommendations, should take precedence over the following minimum requirements.

Very Low Expansive Soils (E.I. 0 to 20)

1. Continuous exterior footings should be founded at minimum depths of 12 and 18 inches below the lowest adjacent ground surface, for one- or two-story floor loads, respectively, and in accordance with the minimum requirements of the latest edition of the UBC. Continuous interior footings may be founded at a minimum depth of 12 inches below the lowest adjacent ground surface. Footings should be a minimum of 12 inches wide, or as determined by the structural engineer and the latest edition of the UBC. The structural engineer should review and approve these recommendations. All footings should have one No. 4 reinforcing bar placed at the top and one No. 4 reinforcing bar placed at the bottom of each footing.

2. Isolated column footings and piers should be 24 inches square and should be founded at a minimum depth of 18 inches (excluding the landscape zone).

3. A grade beam, reinforced as above and at least 12 inches by 12 inches, should be provided across the garage entrances. The base of the grade beam should be at the same elevation as the adjoining footings.

4. Concrete slabs within areas to be covered with moisture sensitive flooring should be underlain with a vapor barrier consisting of a minimum 6-mil, visqueen membrane with all laps sealed. This membrane should be covered with a minimum of 2 inches of sand to aid in uniform curing of the concrete.

5. A minimum slab thickness of 4 inches is recommended. The design engineer should determine the actual thickness of concrete slabs based upon proposed loading and use.

6. Concrete slabs, including garage areas, should be reinforced with No. 3 rebar at 18 inches on center, both ways or 6x6-W1.4xW1.4 welded wire mesh (6x6-10x10). All slab reinforcement should be supported to ensure proper positioning at mid-height in the slab during placement of concrete. "Hooking" of reinforcement is <u>not</u> an acceptable method of positioning.

7. Garage slabs should be poured separately from living area footings and quartered. A positive separation should be maintained with expansion joint material to permit relative movement.

8. Pre-moistening and/or presaturation of the slab areas is recommended for these soil conditions on a preliminary basis. The moisture content of the subgrade soils should be equal to, or greater than, optimum moisture to a depth equivalent to the exterior footing depth in the slab areas. Pre-moistening and/or presaturation should be verified by the soils engineer within 72 hours prior to visqueen placement.

POST-TENSIONED SLAB SYSTEMS

The recommendations presented below should be followed in addition to those presented above, as appropriate. The information and recommendations presented below in this section are not meant to supercede design by a registered structural engineer or civil engineer familiar with post-tensioned slab design. Upon request, GSI can provide additional data/consultation regarding soil parameters as related to post-tensioned slab design.

From a soil expansion/shrinkage standpoint, a common contributing factor to distress of structures using post-tensioned slabs is fluctuation of moisture in soils underlying the perimeter of the slab, compared to the center, causing a "dishing" or "arching" of the slabs. To mitigate this possibility, a combination of soil presaturation and construction of a perimeter cut-off wall should be employed.

Perimeter cut-off walls should be a minimum of 12 inches deep for very low to low expansive soils. The cut-off walls may be integrated into the slab design or independent of the slab, and should be a minimum of 6 inches thick. The vapor barrier should be covered with a 2-inch layer of sand to aid in uniform curing of the concrete; and it should be sealed adequately to provide a continuous water-proof barrier under the entire slab.

Specific soil presaturation is not required; however, the moisture content of the subgrade soils should be equal to, or greater than, the soils' optimum moisture content to a depth of 12 inches below grade for very low expansive soils.

Post-tensioned slabs should be designed using sound engineering practice and be in accordance with local and/or national code requirements. Soil related parameters for post-tensioned slab design are presented below:

Allowable surface bearing value	1,000 psf
Modulus of subgrade reaction	75 psi per inch
Coefficient of friction	0.35
Passive pressure	250 pcf

<u>Post-Tensioning Institute Method</u>: Post-tensioned slabs should have sufficient stiffness to resist excessive bending due to non-uniform swell and shrinkage of subgrade soils. The differential movement can occur at the corner, edge, or center of slab. The potential for differential uplift can be evaluated using the 1997 UBC Section 1816, based on design specifications of the Post-Tensioning Institute. The following table presents suggested minimum coefficients to be used in the Post-Tensioning Institute design method.

Thornthwaite Moisture Index	-20 inches/year
Correction Factor for Irrigation	20 inches/year
Depth to Constant Soil Suction	7 feet
Constant Soil Suction (pf)	3.6
Modulus of Subgrade Reaction (pci)	75
Moisture Velocity	0.7 inch/month

The coefficients are considered minimums and may not be adequate to represent worst case conditions such as adverse drainage and/or improper landscaping and maintenance. The above parameters are applicable provided structures have positive drainage that is maintained away from structures. Therefore, it is important that information regarding drainage, site maintenance, settlements, and effects of expansive soils be passed on to future owners.

Based on the above parameters, the following values were obtained from figures or tables of the 1997 UBC Section 1816. The values may not be appropriate to account for possible differential settlement of the slab due to other factors. If a stiffer slab is desired, higher values of y_m may be warranted.

EXPANSION INDEX OF SOIL SUBGRADE (per UBC)	**VERY LOW EXPANSION POTENTIAL (E.I. 0 to 20)**
e_m center lift	5.0 feet
e_m edge lift	2.5 feet
y_m center lift	1.0 inch
y_m edge lift	0.3 inch

Deepened footings/edges around the slab perimeter must be used to minimize non-uniform surface moisture migration (from an outside source) beneath the slab. An edge depth of 12 inches should be considered a minimum. The bottom of the deepened footing/edge should be designed to resist tension, using cable or reinforcement per the structural engineer. Other applicable recommendations presented under conventional foundation and the California Foundation Slab Method should be adhered to during the design and construction phase of the project.

WALL DESIGN PARAMETERS

Conventional Retaining Walls

The design parameters provided below assume that either very low expansive soils (Class 2 permeable filter material or Class 3 aggregate base) or native materials (with a very low to medium expansion potential) are used to backfill any retaining walls. The type of backfill (i.e., select or native), should be specified by the wall designer, and clearly shown on the plans. Building walls, below grade, should be water-proofed or damp-proofed, depending on the degree of moisture protection desired. The foundation system for the proposed retaining walls should be designed in accordance with the recommendations presented in this and preceding sections of this report, as appropriate. Footings should be embedded a minimum of 18 inches below adjacent grade (excluding landscape layer, 6 inches) and should be 24 inches in width. There should be no increase in bearing for footing width. Recommendations for specialty walls (i.e., crib, earthstone, geogrid, etc.) can be provided upon request, and would be based on site specific conditions.

Restrained Walls

Any retaining walls that will be restrained prior to placing and compacting backfill material or that have re-entrant or male corners, should be designed for an at-rest equivalent fluid pressure (EFP) of 65 pcf, plus any applicable surcharge loading. For areas of male or re-entrant corners, the restrained wall design should extend a minimum distance of twice the height of the wall (2H) laterally from the corner.

Cantilevered Walls

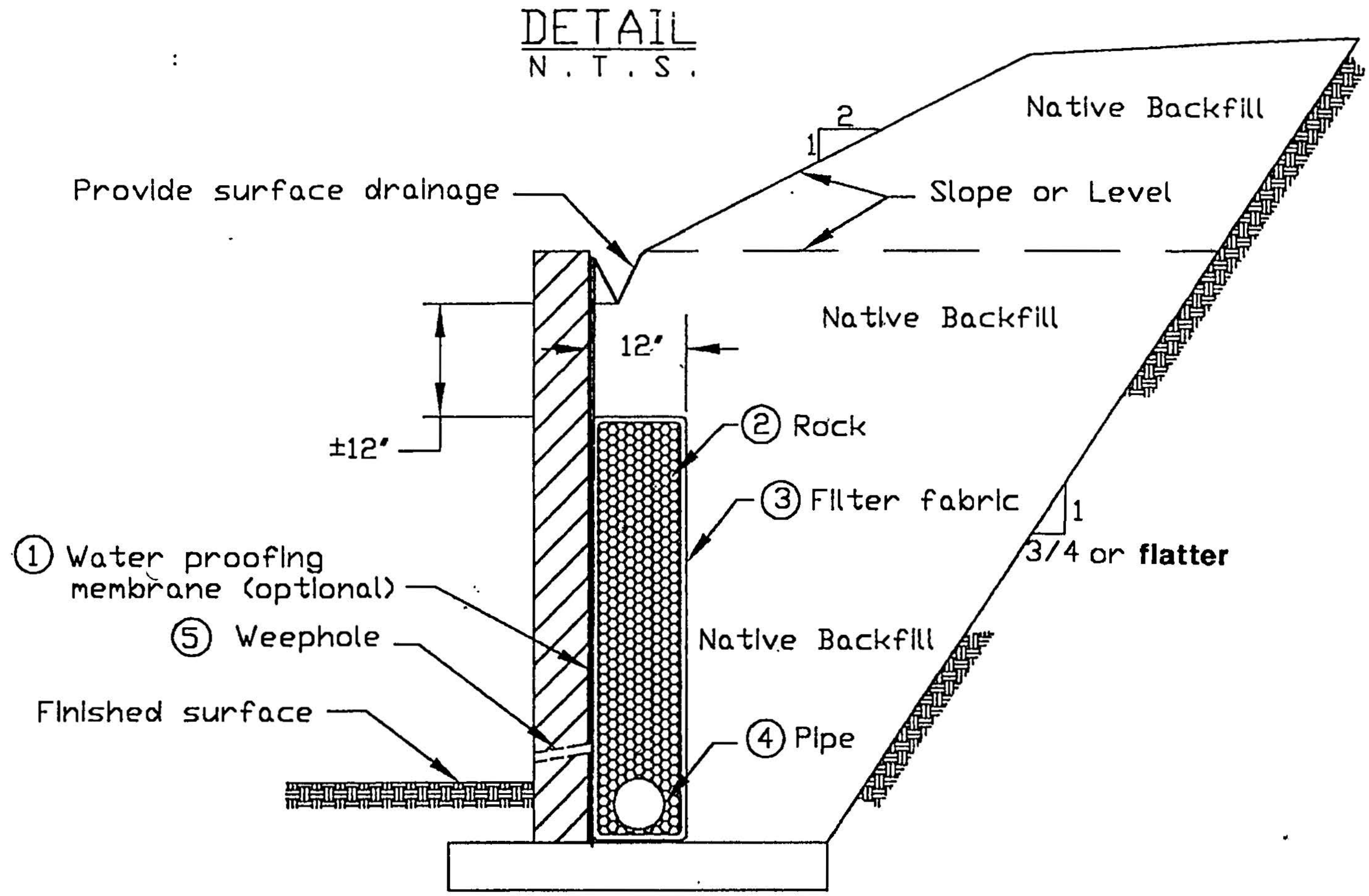
The recommendations presented below are for cantilevered retaining walls up to 10 feet high. Design parameters for walls less than 3 feet in height may be superseded by City and/or County standard design. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections. An equivalent fluid pressure approach may be used to compute the horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific slope gradients of the retained material. These do not include other superimposed loading conditions due to traffic, structures, seismic events or adverse geologic conditions. When wall configurations are finalized, the appropriate loading conditions for superimposed loads can be provided upon request.

SURFACE SLOPE OF RETAINED MATERIAL (H:V)	EQUIVALENT FLUID WEIGHT P.C.F. (SELECT BACKFILL)	EQUIVALENT FLUID WEIGHT P.C.F. (NATIVE BACKFILL)
Level*	38	45
2 to 1	55	60
* Level backfill behind a retaining wall is defined as compacted earth materials, properly drained, without a slope for a distance of 2H behind the wall.		

Retaining Wall Backfill and Drainage

Positive drainage must be provided behind all retaining walls in the form of gravel wrapped in geofabric and outlets. A backdrain system is considered necessary for retaining walls that are 2 feet or greater in height. Details 1, 2, and 3, present the back drainage options discussed below. Backdrains should consist of a 4-inch diameter perforated PVC or ABS pipe encased in either Class 2 permeable filter material or ½-inch to ¾-inch gravel wrapped in approved filter fabric (Mirafi 140 or equivalent). For low expansive backfill, the filter material should extend a minimum of 1 horizontal foot behind the base of the walls and upward at least 1 foot. For native backfill that has up to medium expansion potential, continuous Class 2 permeable drain materials should be used behind the wall. This material should be continuous (i.e., full height) behind the wall, and it should be constructed in accordance with the enclosed Detail 1 (Typical Retaining Wall Backfill and Drainage Detail). For limited access and confined areas, (panel) drainage behind the wall may be constructed in accordance with Detail 2 (Retaining Wall Backfill and Subdrain Detail Geotextile Drain). Materials with an E.I. potential of greater than 90 should not be used as backfill for retaining walls. For more onerous expansive situations, backfill and drainage behind the retaining wall should conform with Detail 3 (Retaining Wall And Subdrain Detail Clean Sand Backfill).

Outlets should consist of a 4-inch diameter solid PVC or ABS pipe spaced no greater than ±100 feet apart, with a minimum of two outlets, one on each end. The use of weep holes in walls higher than 2 feet should not be considered. The surface of the backfill should be sealed by pavement or the top 18 inches compacted with native soil (E.I. $\leq$90). Proper surface drainage should also be provided. For additional mitigation, consideration should be given to applying a water-proof membrane to the back of all retaining structures. The use of a waterstop should be considered for all concrete and masonry joints.



(1) WATER PROOFING MEMBRANE (optional):
Liquid boot or approved equivalent.

(2) ROCK:
3/4 to 1-1/2" (inches) rock.

(3) FILTER FABRIC:
Mirafi 140N or approved equivalent place fabric flap behind core.

(4) PIPE:
4" (inches) diameter perforated PVC. schedule 40 or approved alternative with minimum of 1% gradient to proper outlet point.

(5) WEEPHOLE:
Minimum 2" (inches) diameter placed at 20' (feet) on centers along the wall, and 3" (inches) above finished surface.

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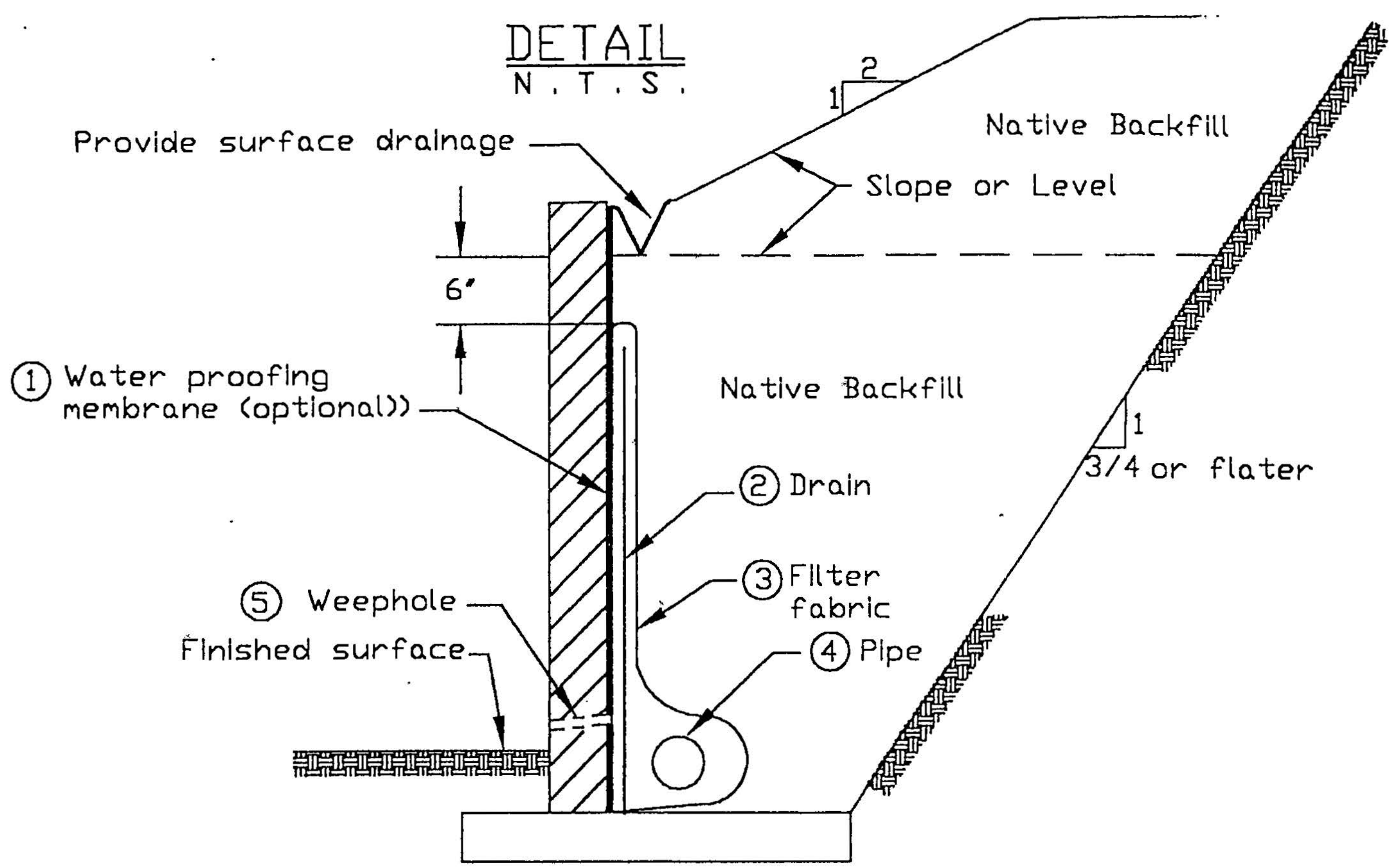
TYPICAL RETAINING WALL BACKFILL AND DRAINAGE DETAIL

DETAIL 1

Geotechnical • Geologic • Environmental



(1) WATER PROOFING MEMBRANE (optional):
Liquid boot or approved equivalent.

(2) DRAIN:
Miradrain 6000 or J-drain 200 or equivalent for non-waterproofed walls.
Miradrain 6200 or J-drain 200 or equivalent for water proofed walls.

(3) FILTER FABRIC:
Mirafi 140N or approved equivalent place fabric flap behind core.

(4) PIPE:
4" (inches) diameter perforated PVC. schedule 40 or approved alternative with minimum of 1% gradient to proper outlet point.

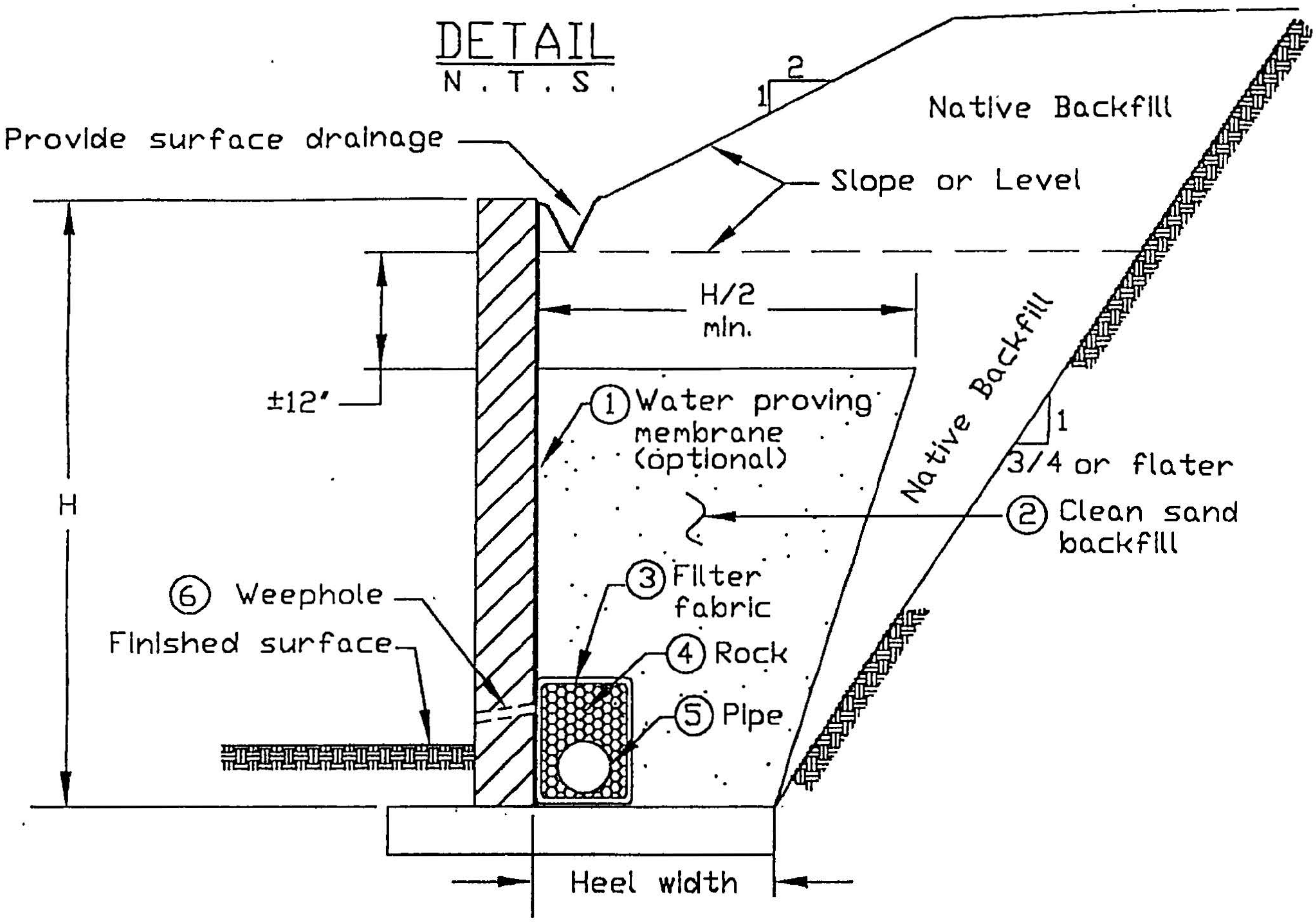
(5) WEEPHOLE:
Minimum 2" (inches) diameter placed at 20' (feet) on centers along the wall, and 3" (inches) above finished surface.

GeoSoils, Inc.

RETAINING WALL BACKFILL AND SUBDRAIN DETAIL GEOTEXTILE DRAIN

DETAIL 2

Geotechnical • Geologic • Environmental



① WATER PROOFING MEMBRANE (optional):
Liquid boot or approved equivalent.

② CLEAN SAND BACKFILL:
Must have sand equivalent value of 30 or greater; can be densified by water jetting.

③ FILTER FABRIC:
Mirafi 140N or approved equivalent.

④ ROCK:
1 cubic foot per linear feet of pipe of 3/4 to 1-1/2" (inches) rock

⑤ PIPE:
4" (inches) diameter perforated PVC. schedule 40 or approved alternative with minimum of 1% gradient to proper outlet point.

⑥ WEEPHOLE:
Minimum 2" (inches) diameter placed at 20' (feet) on centers along the wall, and 3" (inches) above finished surface.

GeoSoils, Inc.

RETAINING WALL AND SUBDRAIN DETAIL
CLEAN SAND BACKFILL

DETAIL 3

Geotechnical • Geologic • Environmental

Wall/Retaining Wall Footing Transitions

Site walls are anticipated to be founded on footings designed in accordance with the recommendations in this report. Should wall footings transition from cut to fill, the civil designer may specify either:

a) A minimum of a 2-foot overexcavation and recompaction of cut materials for a distance of 2H, from the point of transition.

b) Increase of the amount of reinforcing steel and wall detailing (i.e., expansion joints or crack control joints) such that a angular distortion of 1/360 for a distance of 2H on either side of the transition may be accommodated. Expansion joints should be sealed with a flexible, non-shrink grout.

c) Embed the footings entirely into native formational material (i.e., deepened footings).

If transitions from cut to fill transect the wall footing alignment at an angle of less than 45 degrees (plan view), then the designer should follow recommendation "a" (above) and until such transition is between 45 and 90 degrees to the wall alignment.

TOP-OF-SLOPE WALLS/FENCES/IMPROVEMENTS

Slope Creep

Soils at the site may contain some expansive materials and therefore, may become desiccated when allowed to dry. Such soils are susceptible to surficial slope creep, especially with seasonal changes in moisture content. Typically in southern California, during the hot and dry summer period, these soils become desiccated and shrink, thereby developing surface cracks. The extent and depth of these shrinkage cracks depend on many factors such as the nature and expansivity of the soils, temperature and humidity, and extraction of moisture from surface soils by plants and roots. When seasonal rains occur, water percolates into the cracks and fissures, causing slope surfaces to expand, with a corresponding loss in soil density and shear strength near the slope surface. With the passage of time and several moisture cycles, the outer 3 to 5 feet of slope materials experience a very slow, but progressive, outward and downward movement, known as slope creep. For slope heights greater than 10 feet, this creep related soil movement will typically impact all rear yard flatwork and other secondary improvements that are located within about 15 feet from the top of slopes, such as swimming pools, concrete flatwork, etc., and in particular top of slope fences/walls. This influence is normally in the form of detrimental settlement, and tilting of the proposed improvements. The dessication/swelling and creep discussed above continues over the life of the improvements, and generally becomes progressively worse. Accordingly, the developer should provide this information to any homeowners and homeowners association, for slopes that exist onsite that are greater than about 10 to 15 feet in overall height.

Top of Slope Walls/Fences

Due to the potential for slope creep for slopes higher than about 10 feet, some settlement and tilting of the walls/fence with the corresponding distress, should be expected. To mitigate the tilting of top of slope walls/fences, we recommend that the walls/fences be constructed on either deepened foundations or a combination of grade beam and caisson foundations. The grade beam should be at a minimum of 12 inches by 12 inches in cross section, supported by drilled caissons, 12 inches minimum in diameter, placed at a maximum spacing of 6 feet on center, and with a minimum embedment length of 7 feet below the bottom of the grade beam. The strength of the concrete and grout should be evaluated by the structural engineer of record. The proper ASTM tests for the concrete and mortar should be provided along with the slump quantities. The concrete used should be appropriate to mitigate sulfate corrosion, as warranted. The design of the grade beam and caissons should be in accordance with the recommendations of the project structural engineer, and include the utilization of the following geotechnical parameters:

Creep Zone: 5-foot vertical zone below the slope face and projected upward parallel to the slope face.

Creep Load: The creep load projected on the area of the grade beam should be taken as an equivalent fluid approach, having a density of 60 pcf. For the caisson, it should be taken as a uniform 900 pounds per linear foot of caisson's depth, located above the creep zone.

Point of Fixity: Located a distance of 1.5 times the caisson's diameter, below the creep zone.

Passive Resistance: Passive earth pressure of 300 psf per foot of depth per foot of caisson diameter, to a maximum value of 4,500 psf may be used to determine caisson depth and spacing, provided that they meet or exceed the minimum requirements stated above. To determine the total lateral resistance, the contribution of the creep prone zone above the point of fixity, to passive resistance, should be disregarded.

Allowable Axial Capacity:

Shaft capacity : 350 psf applied below the point of fixity over the surface area of the shaft.

Tip capacity: 4,500 psf.

DRIVEWAY, FLATWORK, AND OTHER IMPROVEMENTS

Some of the soil materials on site may be expansive. The effects of expansive soils are cumulative, and typically occur over the lifetime of any improvements. On relatively level areas, when the soils are allowed to dry, the dessication and swelling process tends to cause heaving and distress to flatwork and other improvements. The resulting potential for distress to improvements may be reduced, but not totally eliminated. To that end, it is recommended that the developer should notify any homeowners or homeowners association of this long-term potential for distress. To reduce the likelihood of distress, the following recommendations are presented for all exterior flatwork on expansive soils:

1. The subgrade area for concrete slabs should be compacted to achieve a minimum 90 percent relative compaction, and then be presoaked to 2 to 3 percentage points above (or 125 percent of) the soils' optimum moisture content, to a depth of 18 inches below subgrade elevation. The moisture content of the subgrade should be verified within 72 hours prior to pouring concrete.

2. Concrete slabs should be cast over a relatively non-yielding surface, consisting of a 4-inch layer of crushed rock, gravel, or clean sand, that should be compacted and level prior to pouring concrete. The layer should be wet-down completely prior to pouring concrete, to minimize loss of concrete moisture to the surrounding earth materials.

3. Exterior slabs should be a minimum of 4 inches thick. Driveway slabs and approaches should additionally have a thickened edge (12 inches) adjacent to all landscape areas, to help impede infiltration of landscape water under the slab.

4. The use of transverse and longitudinal control joints are recommended to help control slab cracking due to concrete shrinkage or expansion. Two ways to mitigate such cracking are: a) add a sufficient amount of reinforcing steel, increasing tensile strength of the slab; and, b) provide an adequate amount of control and/or expansion joints to accommodate anticipated concrete shrinkage and expansion.

   In order to reduce the potential for unsightly cracks, slabs should be reinforced at mid-height with a minimum of No. 3 bars placed at 18 inches on center, in each direction. The exterior slabs should be scored or saw cut, ½ to ⅜ inches deep, often enough so that no section is greater than 10 feet by 10 feet. For sidewalks or narrow slabs, control joints should be provided at intervals of every 6 feet. The slabs should be separated from the foundations and sidewalks with expansion joint filler material.

5. No traffic should be allowed upon the newly poured concrete slabs until they have been properly cured to within 75 percent of design strength. Concrete compression strength should be a minimum of 2,500 psi.

6. Driveways, sidewalks, and patio slabs adjacent to the house should be separated from the house with thick expansion joint filler material. In areas directly adjacent to a continuous source of moisture (i.e., irrigation, planters, etc.), all joints should be additionally sealed with flexible mastic.

7. Planters and walls should not be tied to the house.

8. Overhang structures should be supported on the slabs, or structurally designed with continuous footings tied in at least two directions.

9. Any masonry landscape walls that are to be constructed throughout the property should be grouted and articulated in segments no more than 20 feet long. These segments should be keyed or doweled together.

10. Utilities should be enclosed within a closed utilidor (vault) or designed with flexible connections to accommodate differential settlement and expansive soil conditions.

11. Positive site drainage should be maintained at all times. Finish grade on the lots should provide a minimum of 1 to 2 percent fall to the street, as indicated herein. It should be kept in mind that drainage reversals could occur, including post-construction settlement, if relatively flat yard drainage gradients are not periodically maintained by the homeowner or homeowners association.

12. Air conditioning (A/C) units should be supported by slabs that are incorporated into the building foundation or constructed on a rigid slab with flexible couplings for plumbing and electrical lines. A/C waste water lines should be drained to a suitable non-erosive outlet.

13. Shrinkage cracks could become excessive if proper finishing and curing practices are not followed. Finishing and curing practices should be performed per the Portland Cement Association Guidelines. Mix design should incorporate rate of curing for climate and time of year, sulfate content of soils, corrosion potential of soils, and fertilizers used on site.

DEVELOPMENT CRITERIA

Slope Deformation

Compacted fill slopes designed using customary factors of safety for gross or surficial stability and constructed in general accordance with the design specifications should be expected to undergo some differential vertical heave or settlement in combination with differential lateral movement in the out-of-slope direction, after grading. This post-construction movement occurs in two forms: slope creep, and lateral fill extension (LFE). Slope creep is caused by alternate wetting and drying of the fill soils which results in slow downslope movement. This type of movement is expected to occur throughout the life of the slope, and is anticipated to potentially affect improvements or structures (i.e., separations and/or cracking), placed near the top-of-slope, up to a maximum distance of approximately 15 feet from the top-of-slope, depending on the slope height. This movement generally results in rotation and differential settlement of improvements located within the creep zone. LFE occurs due to deep wetting from irrigation and rainfall on slopes comprised of expansive materials. Although some movement should be expected, long-term movement from this source may be minimized, but not eliminated, by placing the fill throughout the slope region, wet of the fill's optimum moisture content, such as was done at the subject site.

It is generally not practical to attempt to eliminate the effects of either slope creep or LFE. Suitable mitigative measures to reduce the potential of lateral deformation typically include: setback of improvements from the slope faces (per the UBC and/or California Building Code), positive structural separations (i.e., joints) between improvements, and stiffening and deepening of foundations. All of these measures are recommended for design of structures and improvements. The ramifications of the above conditions, and recommendations for mitigation, should be provided to each homeowner and/or any homeowners association.

Slope Maintenance and Planting

Water has been shown to weaken the inherent strength of all earth materials. Slope stability is significantly reduced by overly wet conditions. Positive surface drainage away from slopes should be maintained and only the amount of irrigation necessary to sustain plant life should be provided for planted slopes. Over-watering should be avoided as it can adversely affect site improvements, and cause perched groundwater conditions. Graded slopes constructed utilizing onsite materials would be erosive. Eroded debris may be minimized and surficial slope stability enhanced by establishing and maintaining a suitable vegetation cover soon after construction. Compaction to the face of fill slopes would tend to minimize short-term erosion until vegetation is established. Plants selected for landscaping should be light weight, deep rooted types that require little water and are capable of surviving the prevailing climate. Jute-type matting or other fibrous covers may aid in allowing the establishment of a sparse plant cover. Utilizing plants other than those recommended above will increase the potential for perched water, staining, mold, etc., to develop. A rodent control program to prevent burrowing should be implemented. Irrigation of natural (ungraded) slope areas is generally not recommended. These recommendations regarding plant type, irrigation practices, and rodent control should be provided to each homeowner. Over-steepening of slopes should be avoided during building construction activities and landscaping.

Drainage

Adequate lot surface drainage is a very important factor in reducing the likelihood of adverse performance of foundations, hardscape, and slopes. Surface drainage should be sufficient to prevent ponding of water anywhere on a lot, and especially near structures and tops of slopes. Lot surface drainage should be carefully taken into consideration during fine grading, landscaping, and building construction. Therefore, care should be taken that future landscaping or construction activities do not create adverse drainage conditions. Positive site drainage within lots and common areas should be provided and maintained at all times. Drainage should not flow uncontrolled down any descending slope. Water should be directed away from foundations and not allowed to pond and/or seep into the ground. In general, the area within 5 feet around a structure should slope away from the structure. We recommend that unpaved lawn and landscape areas have a minimum gradient of one percent sloping away from structures, and whenever possible, should be above adjacent paved areas. Consideration should be given to avoiding construction of planters adjacent to structures (buildings, pools, spas, etc.). Pad drainage should be directed toward the street or other approved area(s). Although not a geotechnical requirement, roof gutters, down spouts, or other appropriate means may be utilized to control roof drainage. Down spouts, or drainage devices should outlet a minimum of 5 feet from structures or into a subsurface drainage system. Areas of seepage may develop due to irrigation or heavy rainfall, and should be anticipated. Minimizing irrigation will lessen this potential. If areas of seepage develop, recommendations for minimizing this effect could be provided upon request.

Erosion Control

Cut and fill slopes will be subject to surficial erosion during and after grading. Onsite earth materials have a moderate to high erosion potential. Consideration should be given to providing hay bales and silt fences for the temporary control of surface water, from a geotechnical viewpoint.

Landscape Maintenance

Only the amount of irrigation necessary to sustain plant life should be provided. Over-watering the landscape areas will adversely affect proposed site improvements. We would recommend that any proposed open-bottom planters adjacent to proposed structures be eliminated for a minimum distance of 10 feet. As an alternative, closed-bottom type planters could be utilized. An outlet placed in the bottom of the planter, could be installed to direct drainage away from structures or any exterior concrete flatwork. If planters are constructed adjacent to structures, the sides and bottom of the planter should be provided with a moisture barrier to prevent penetration of irrigation water into the subgrade. Provisions should be made to drain the excess irrigation water from the planters without saturating the subgrade below or adjacent to the planters. Graded slope areas should be planted with drought resistant vegetation. Consideration should be given to the type of vegetation chosen and their potential effect upon surface improvements (i.e., some trees will have an effect on concrete flatwork with their extensive root systems). From a geotechnical standpoint leaching is not recommended for establishing landscaping. If the surface soils are processed for the purpose of adding amendments, they should be recompacted to 90 percent minimum relative compaction.

Gutters and Downspouts

As previously discussed in the drainage section, the installation of gutters and downspouts should be considered to collect roof water that may otherwise infiltrate the soils adjacent to the structures. If utilized, the downspouts should be drained into PVC collector pipes or non-erosive devices that will carry the water away from the house. Downspouts and gutters are not a requirement; however, from a geotechnical viewpoint, provided that positive drainage is incorporated into project design (as discussed previously).

Subsurface and Surface Water

Subsurface and surface water are not anticipated to affect site development, provided that the recommendations contained in this report are incorporated into final design and construction and that prudent surface and subsurface drainage practices are incorporated into the construction plans. Perched groundwater conditions along zones of contrasting permeabilities may not be precluded from occurring in the future due to site irrigation, poor drainage conditions, or damaged utilities, and should be anticipated. Should perched groundwater conditions develop, this office could assess the affected area(s) and provide the appropriate recommendations to mitigate the observed groundwater conditions. Groundwater conditions may change with the introduction of irrigation, rainfall, or other factors.

Site Improvements

Recommendations for exterior concrete flatwork design and construction can be provided upon request. If in the future, any additional improvements (e.g., pools, spas, etc.) are planned for the site, recommendations concerning the geological or geotechnical aspects of design and construction of said improvements could be provided upon request. This office should be notified in advance of any fill placement, grading of the site, or trench backfilling after rough grading has been completed. This includes any grading, utility trench, and retaining wall backfills.

Tile Flooring

Tile flooring can crack, reflecting cracks in the concrete slab below the tile, although small cracks in a conventional slab may not be significant. Therefore, the designer should consider additional steel reinforcement for concrete slabs-on-grade where tile will be placed. The tile installer should consider installation methods that reduce possible cracking of the tile such as slipsheets. Slipsheets or a vinyl crack isolation membrane (approved by the Tile Council of America/Ceramic Tile Institute) are recommended between tile and concrete slabs on grade.

Additional Grading

This office should be notified in advance of any fill placement, supplemental regrading of the site, or trench backfilling after rough grading has been completed. This includes completion of grading in the street and parking areas and utility trench and retaining wall backfills.

Footing Trench Excavation

All footing excavations should be observed by a representative of this firm subsequent to trenching and prior to concrete form and reinforcement placement. The purpose of the observations is to verify that the excavations are made into the recommended bearing material and to the minimum widths and depths recommended for construction. If loose or compressible materials are exposed within the footing excavation, a deeper footing or removal and recompaction of the subgrade materials would be recommended at that time. Footing trench spoil and any excess soils generated from utility trench excavations should be compacted to a minimum relative compaction of 90 percent, if not removed from the site.

Trenching

Considering the nature of the onsite soils, it should be anticipated that caving or sloughing could be a factor in subsurface excavations and trenching. Shoring or excavating the trench walls at the angle of repose (typically 25 to 45 degrees) may be necessary and should be anticipated. All excavations should be observed by one of our representatives and minimally conform to CAL-OSHA and local safety codes.

Utility Trench Backfill

1. All interior utility trench backfill should be brought to at least 2 percent above optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of the laboratory standard. As an alternative for shallow (12-inch to 18-inch) under-slab trenches, sand having a sand equivalent value of 30 or greater may be utilized and jetted or flooded into place. Observation, probing and testing should be provided to verify the desired results.

2. Exterior trenches adjacent to, and within areas extending below a 1:1 plane projected from the outside bottom edge of the footing, and all trenches beneath hardscape features and in slopes, should be compacted to at least 90 percent of the laboratory standard. Sand backfill, unless excavated from the trench, should not be used in these backfill areas. Compaction testing and observations, along with probing, should be accomplished to verify the desired results.

3. All trench excavations should conform to CAL-OSHA and local safety codes.

4. Utilities crossing grade beams, perimeter beams, or footings should either pass below the footing or grade beam utilizing a hardened collar or foam spacer, or pass through the footing or grade beam in accordance with the recommendations of the structural engineer.

SUMMARY OF RECOMMENDATIONS REGARDING GEOTECHNICAL OBSERVATION AND TESTING

We recommend that observation and/or testing be performed by GSI at each of the following construction stages:

- During grading/recertification.
- After excavation of building footings, retaining wall footings, and free standing walls footings, prior to the placement of reinforcing steel or concrete.
- Prior to pouring any slabs or flatwork, after presoaking/presaturation of building pads and other flatwork subgrade, before the placement of concrete, reinforcing steel, capillary break (i.e., sand, pea-gravel, etc.), or vapor barriers (i.e., visqueen, etc.).
- During retaining wall subdrain installation, prior to backfill placement.
- During placement of backfill for area drain, interior plumbing, utility line trenches, and retaining wall backfill.
- During slope construction/repair.
- When any unusual soil conditions are encountered during any construction operations, subsequent to the issuance of this report.
- When any developer or homeowner improvements, such as flatwork, spas, pools, walls, etc., are constructed.
- A report of geotechnical observation and testing should be provided at the conclusion of each of the above stages, in order to provide concise and clear documentation of site work, and/or to comply with code requirements.

OTHER DESIGN PROFESSIONALS/CONSULTANTS

The design civil engineer, structural engineer, post-tension designer, architect, landscape architect, wall designer, etc., should review the recommendations provided herein, incorporate those recommendations into all their respective plans, and by explicit reference, make this report part of their project plans.

PLAN REVIEW

Final project plans should be reviewed by this office prior to construction, so that construction is in accordance with the conclusions and recommendations of this report. Based on our review, supplemental recommendations and/or further geotechnical studies may be warranted.

LIMITATIONS

The materials encountered on the project site and utilized for our analysis are believed representative of the area; however, soil and bedrock materials vary in character between excavations and natural outcrops or conditions exposed during mass grading. Site conditions may vary due to seasonal changes or other factors.

Inasmuch as our study is based upon our review and engineering analyses and laboratory data, the conclusions and recommendations are professional opinions. These opinions have been derived in accordance with current standards of practice, and no warranty is expressed or implied. Standards of practice are subject to change with time. GSI assumes no responsibility or liability for work or testing performed by others, or their inaction; or work performed when GSI is not requested to be onsite to evaluate if our recommendations have been properly implemented. Use of this report constitutes an agreement and consent by the user to all the limitations outlined above, notwithstanding any other agreements that may be in place. In addition, this report may be subject to review by the controlling authorities.

REGULATORY COMPLIANCE

This report was prepared in general accordance with Section 3317.3 of the latest edition of the UBC. Processing of original/existing ground and placement of compacted fills under the purview of this report have been completed under the observation of and with selective testing provided by representatives of GSI, and are found to be to the best of GSI's knowledge, in general accordance and compliance with the approved soils engineering report, applicable provisions of the Grading Code of the City of Riverside, and Chapter 33 of the latest edition of the UBC (ICBO, 1997). The site is suitable for the intended use (residential), from a geotechnical viewpoint.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to contact our office.

Respectfully submitted,

GeoSoils, Inc.

John P. Franklin
Engineering Geologist, CEG 1340

Reviewed by:

David W. Skelly
Civil Engineer, RCE 47857

RSP/JPF/DWS/jh/jk

Enclosures: Table 1 - Approximate Maximum Depth of Fill per Lot
Table 2 - Field Density Test Results
Appendix A - References
Appendix B - Laboratory Data
Plates 1 through 3 - As Graded Geotechnical Maps

Distribution: (6) Addressee

TABLE 1
APPROXIMATE DEPTH OF FILL PER LOT

Tract 28920-1

LOT NUMBER	DEPTH OF FILL (ft)	LOT NUMBER	DEPTH OF FILL (ft)
1	0 (cut)	36	4 - 11½
2	0 (cut)	37	8½ - 21 3
3	0 (cut)	38	21½ - 25
4	3 - 5	39	11 - 29
5	4 - 6½	40	6 - 18
6	3 - 5	41	6 - 15
7	3 - 8	42	3
8	6 - 10	43	3
9	4½ - 10	44	3 - 6
10	3 - 8	45	5½ - 14
11	4½ - 6½	46	7½ - 21½
12	5 - 8½	47	9½ - 20
13	6½ - 9½	48	11 - 19½
14	7½ - 11	49	8 - 19
15	6 - 10	50	8 - 18
16	7½ - 13	51	10 - 16½
17	7½ - 16½	52	5½ - 8
18	6½ - 13	53	3 - 8
19	6½ - 9	54	3 - 6½
20	3 - 9	55	3 - 4½
21	3½ - 9½	56	3
22	5 - 12½	57	3
23	0 (cut)	58	3 - 6
24	0 (cut)	59	4 - 6½
25	0 (cut)	60	4
26	3 - 6	61	4 - 5½
27	4½ - 12	62	3 - 6½
28	4½ - 13	63	3½ - 10½
29	6½ - 19	64	3½ - 10
30	6½ - 19	65	3½ - 5
31	6 - 18	66	3 - 4
32	8½ - 17½	67	3 - 6½
33	12½ - 14½	68	4½ - 6½
34	9½ - 10½	69	4 - 7½
35	5 - 10	70	3½ - 10
71	3 - 9	106	3
72	5 - 14½	107	3

LOT NUMBER	DEPTH OF FILL (ft)	LOT NUMBER	DEPTH OF FILL (ft)
73	3½ - 4½	108	3½
74	3 - 3½	109	4 - 4½
75	3½ - 10½	110	3½ - 4½
76	3 - 8½	111	3 - 4
77	3 - 5½	112	3½ - 4½
78	7 - 9½	113	3 - 5
79	3½ - 10	114	3 - 4½
80	3½ - 9½	115	3½ - 8½
81	3½ - 10	116	3 - 4
82	4 - 7½	117	3 - 4
83	4½ - 8½	118	3 - 6
84	7½ - 10½	119	5 - 8
85	5 - 11½	120	3½ - 8
86	4½ - 10½	121	4 - 6½
87	5 - 11	122	3 - 7
88	5 - 10	123	13 - 15½
89	4½ - 8	124	13½ - 21½
90	3 - 8½	125	11½ - 19½
91	3½ - 9½	126	10 - 17
92	3½ - 9	127	6½ - 15
93	4 - 12	128	9 - 14½
94	5½ - 12	129	8½ - 24½
95	5½ - 11	130	9½ - 24
96	3 - 8	131	9 - 17
97	3½ - 7	132	14½ - 23
98	5 - 9½	133	11½ - 22½
99	4½ - 9	134	11 - 17½
100	3 - 4½	135	13½ - 15
101	3 - 4½	136	10½ - 14½
102	3½ - 4	137	7 - 14½
103	3 - 4	138	5 - 14
104	3 - 3½	139	4 - 11½
105	3 - 7		

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
BT-1	8/25/03	Lot 91	28920-1	1456.0		120.3		ND	
1	8/25/03	Slope Rear - Lot 94	28920-1	1455.0	9.1	122.6	91.8	ND	A
2	8/25/03	Slope Rear - Lot 90	28920-1	1460.0	10.0	125.5	94.0	ND	A
3	8/25/03	Lot 92	28920-1	1460.0	9.3	125.0	93.6	ND	A
4	8/25/03	Lot 95	28920-1	1459.0	10.5	118.5	92.9	ND	B
5	8/25/03	Lot 97	28920-1	1458.0	9.2	125.3	93.9	ND	A
6	8/26/03	Slope Rear - Lot 86	28920-1	1469.0	9.5	124.3	93.1	ND	A
7	8/26/03	Lot 89	28920-1	1465.0	10.2	125.8	94.2	ND	A
8	8/26/03	Lot 93	28920-1	1460.0	10.1	123.9	92.8	ND	A
9	8/26/03	Lot 98	28920-1	1458.0	9.8	123.5	92.5	ND	A
10	8/26/03	Lot 84	28920-1	1477.0	9.6	122.6	91.8	SC	A
11	8/27/03	Lot 86	28920-1	1473.0	10.1	122.6	91.8	ND	A
12	8/27/03	Lot 82	28920-1	1481.0	10.6	123.7	92.7	SC	A
13	8/27/03	Lot 85	28920-1	1476.0	9.8	124.7	93.4	ND	A
14	8/27/03	Lot 80	28920-1	1487.0	10.8	118.0	92.5	ND	B
15*	8/27/03	Lot 125	28920-1	1480.0	8.6	111.2	87.2	ND	B
15A	8/27/03	Lot 125	28920-1	1480.0	10.6	124.1	93.0	ND	A
16	8/27/03	Lot 132	28920-1	1468.0	10.0	124.3	93.1	ND	A
17*	8/28/03	Lot 133	28920-1	1472.0	8.4	116.7	87.4	ND	A
17A	8/28/03	Lot 133	28920-1	1472.0	9.8	121.8	91.2	ND	A
18	8/28/03	Lot 96	28920-1	1458.0	10.1	124.3	93.1	ND	A
19	8/28/03	Lot 94	28920-1	1460.0	9.2	123.8	92.7	ND	A
20	8/28/03	Lot 131	28920-1	1476.0	9.1	124.7	93.4	ND	A
21	8/28/03	Lot 91	28920-1	1462.5	10.0	125.5	94.0	ND	A
22	8/28/03	Lot 135	28920-1	1471.0	10.4	123.7	92.7	ND	A
23	8/28/03	Lot 134	28920-1	1475.0	9.6	122.9	92.1	ND	A
24	8/28/03	Lot 128	28920-1	1481.0	9.3	122.7	91.9	SC	A
25	8/28/03	Slope Rear - Lot 127	28920-1	1474.0	9.9	124.7	93.4	SC	A
26	8/28/03	Lot 126	28920-1	1479.0	10.8	116.7	91.5	SC	B
27	8/29/03	Lot 129	28920-1	1470.0	10.1	122.5	91.8	ND	A
28	8/29/03	Lot 136	28920-1	1469.0	9.2	124.2	93.0	ND	A
29	8/29/03	Slope Rear - Lot 132	28920-1	1463.0	9.3	124.5	93.3	ND	A
30	8/29/03	Slope Rear - Lot 135	28920-1	1465.0	9.9	125.7	94.2	ND	A
31	8/29/03	Slope Rear - Lot 129	28920-1	1471.0	11.0	118.6	93.0	ND	B
32	8/29/03	Slope Rear - Lot 124	28920-1	1481.0	10.6	118.0	92.5	ND	B
33	8/29/03	Lot 132	28920-1	1477.0	10.1	124.1	93.0	ND	A
34	8/29/03	Slope Rear - Lot 128	28920-1	1378.0	9.3	122.1	91.5	SC	A
35	8/29/03	Slope Rear - Lot 130	28920-1	1373.0	9.1	123.9	92.8	ND	A
36	8/29/03	Slope Rear - Lot 125	28920-1	1387.0	9.8	125.8	94.2	ND	A
37	8/29/03	Slope Rear - Lot 123	28920-1	1389.0	10.0	125.1	93.7	ND	A
38	8/29/03	Lot 88	28920-1	1469.0	9.7	121.8	91.2	ND	A
39	8/29/03	Lot 127	28920-1	1482.0	9.2	123.7	92.6	ND	A
BT-2	9/2/03	Lot 49	28920-1	1482.0		121.4		ND	
40	9/2/03	Slope Rear - Lot 50	28920-1	1480.0	10.1	120.7	90.4	ND	A
41	9/2/03	Slope Rear - Lot 47	28920-1	1483.0	9.6	124.1	93.0	ND	A
42	9/2/03	Lot 49	28920-1	1483.0	9.2	122.9	92.1	ND	A
43	9/2/03	Lot 47	28920-1	1491.0	9.9	122.4	91.7	ND	A

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
44	9/2/03	Slope Rear - Lot 51	28920-1	1480.0	10.7	118.9	93.3	ND	B
45	9/2/03	Lot 123	28920-1	1492.0	11.0	119.6	93.8	ND	B
46	9/2/03	Lot 125	28920-1	1488.0	10.0	122.3	91.6	SC	A
47	9/2/03	Lot 50	28920-1	1491.0	9.6	123.9	92.8	SC	A
48	9/3/03	Slope Rear - Lot 53	28920-1	1484.0	11.0	119.6	93.8	ND	B
49	9/3/03	Lot 48	28920-1	1493.0	10.6	121.3	95.1	ND	B
50	9/3/03	Slope Rear - Lot 50	28920-1	1485.0	10.4	123.8	92.7	ND	A
51	9/3/03	Slope Rear - Lot 47	28920-1	1487.0	9.6	123.1	92.2	ND	A
52	9/3/03	Lot 49	28920-1	1487.0	9.8	124.2	93.0	ND	A
53	9/3/03	Slope Rear - Lot 53	28920-1	1492.0	9.5	122.3	91.6	ND	A
55	9/4/03	Slope Rear - Lot 48	28920-1	1493.0	10.8	118.4	92.9	ND	B
56	9/4/03	Lot 51	28920-1	1491.5	10.5	116.6	91.5	ND	B
57	9/4/03	Lot 50	28920-1	1493.0	9.6	125.5	94.0	ND	A
60	9/5/03	Slope Rear - Lot 47	28920-1	1494.0	10.1	122.9	92.1	ND	A
61	9/5/03	Lot 51	28920-1	1492.5	9.6	124.3	93.1	ND	A
62	9/5/03	Lot 49	28920-1	1494.0	9.9	125.0	93.6	ND	A
64	9/8/03	Lot 49	28920-1	1498.0	10.2	122.3	91.6	SC	A
65	9/8/03	Lot 51	28920-1	1494.0	9.3	123.4	92.4	ND	A
66	9/8/03	Lot 47	28920-1	1502.0	10.0	122.9	92.1	ND	A
67	9/8/03	Lot 48	28920-1	1501.0	9.1	124.9	93.6	ND	A
68	9/8/03	Slope Rear - Lot 134	28920-1	1473.0	10.6	118.5	92.9	ND	B
69	9/8/03	Lot 132	28920-1	1474.0	10.8	117.0	91.8	ND	B
BT-3	9/9/03	Lot 34	28920-1	1483.0		119.8		SC	
70	9/9/03	Lot 35	28920-1	1485.0	9.1	123.7	92.7	ND	A
71*	9/9/03	Lot 33	28920-1	1487.0	8.0	117.8	88.2	ND	A
71A	9/9/03	Lot 33	28920-1	1487.0	9.4	125.5	94.0	ND	A
72	9/9/03	Lot 31	28920-1	1490.0	11.4	118.9	93.3	ND	B
73	9/9/03	Slope Rear - Lot 33	28920-1	1488.0	9.6	124.9	93.6	ND	A
74	9/10/03	Lot 34	28920-1	1488.0	9.4	122.6	91.8	ND	A
75	9/10/03	Lot 32	28920-1	1492.0	9.2	123.4	92.4	ND	A
76	9/10/03	Lot 33	28920-1	1490.0	10.1	123.0	92.1	ND	A
77	9/10/03	Lot 31	28920-1	1496.0	10.4	121.4	90.9	ND	A
78	9/10/03	Lot 35	28920-1	1487.0	9.9	125.5	94.0	ND	A
79	9/11/03	Lot 35	28920-1	1488.5	10.9	118.8	93.2	ND	B
80	9/11/03	Lot 34	28920-1	1491.0	11.4	118.4	92.9	ND	B
81	9/11/03	Lot 134	28920-1	1474.0	10.8	118.5	92.9	SC	B
82	9/11/03	Slope Rear - Lot 133	28920-1	1475.0	9.8	122.3	91.6	ND	A
83	9/11/03	Lot 53	28920-1	1474.0	10.1	125.8	94.2	ND	A
84	9/11/03	Lot 32	28920-1	1495.0	9.3	124.9	93.6	ND	A
85	9/12/03	Slope Rear - Lot 34	28920-1	1491.0	10.6	117.2	91.9	ND	B
86	9/12/03	Slope Rear - Lot 34	28920-1	1488.0	10.9	117.9	92.5	ND	B
87	9/12/03	Lot 135	28920-1	1474.0	10.8	119.5	93.7	ND	B
88	9/12/03	Slope Rear - Lot 132	28920-1	1476.0	9.4	124.3	93.1	ND	A
89	9/12/03	Lot 32	28920-1	1496.0	10.0	123.5	92.5	ND	A
90	9/12/03	Lot 32	28920-1	1498.0	9.2	125.5	94.0	ND	A
91	9/12/03	Lot 33	28920-1	1494.0	9.1	124.7	93.4	ND	A
92	9/15/03	Lot 133	28920-1	1479.0	9.9	122.9	92.1	ND	A

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV. OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
93	9/15/03	Lot 136	28920-1	1477.0	10.1	125.7	94.2	ND	A
94	9/15/03	Lot 129	28920-1	1481.0	9.2	124.6	93.3	ND	A
95	9/15/03	Lot 126	28920-1	1485.0	9.4	124.9	93.6	ND	A
96	9/15/03	Slope Rear - Lot 36	28920-1	1494.0	9.9	123.4	92.4	ND	A
98	9/16/03	Lot 134	28920-1	1479.0	9.1	122.6	91.8	ND	A
99	9/16/03	Lot 133	28920-1	1480.0	9.8	125.8	94.2	ND	A
100	9/16/03	Lot 135	28920-1	1480.0	9.3	124.2	93.0	ND	A
102	9/16/03	Lot 130	28920-1	1482.0	10.6	118.1	92.6	ND	B
103	9/16/03	Lot 131	28920-1	1482.0	10.8	118.8	93.2	ND	B
104	9/17/03	Lot 36	28920-1	1495.0	9.9	122.3	91.6	ND	A
105	9/17/03	Slope Rear - Lot 35	28920-1	1495.0	9.1	123.4	92.4	ND	A
106	9/17/03	Lot 97	28920-1	FG	9.0	121.4	90.9	ND	A
107	9/17/03	Lot 96	28920-1	FG	9.6	122.9	92.1	ND	A
108	9/17/03	Lot 95	28920-1	FG	9.5	122.3	91.6	ND	A
109	9/17/03	Lot 94	28920-1	FG	10.1	124.3	93.1	ND	A
110	9/17/03	Lot 93	28920-1	FG	9.4	123.9	92.8	ND	A
111	9/17/03	Lot 92	28920-1	FG	9.8	122.9	92.1	ND	A
112	9/17/03	Lot 91	28920-1	FG	9.3	124.7	93.4	ND	A
113	9/17/03	Lot 90	28920-1	FG	9.2	123.7	92.7	ND	A
114	9/17/03	Lot 89	28920-1	FG	9.9	122.7	91.9	ND	A
115	9/17/03	Lot 88	28920-1	FG	9.2	123.8	92.7	ND	A
116	9/18/03	Lot 36	28920-1	1498.0	9.6	125.1	93.7	SC	A
117	9/18/03	Lot 37	28920-1	1500.0	9.2	123.4	92.4	ND	A
118	9/18/03	Lot 123	28920-1	1490.0	9.1	122.3	91.6	ND	A
119	9/18/03	Lot 127	28920-1	1482.0	9.2	125.5	94.0	ND	A
120	9/18/03	Lot 124	28920-1	1491.0	9.4	124.5	93.3	ND	A
121	9/18/03	Slope Rear - Lot 34	28920-1	1502.0	9.9	125.4	93.9	ND	A
122	9/18/03	Slope Rear - Lot 39	28920-1	1502.0	10.1	123.1	92.2	ND	A
124	9/19/03	Slope Rear - Lot 38	28920-1	1499.0	9.2	125.8	94.2	ND	A
125	9/19/03	Lot 129	28920-1	1483.0	10.4	122.3	91.6	ND	A
126	9/19/03	Lot 125	28920-1	1493.0	10.0	122.7	91.9	ND	A
127	9/19/03	Lot 123	28920-1	1498.0	9.6	123.9	92.8	ND	A
BT-4	9/19/03	Lot 66	28920-1	1486.5		121.9		ND	
128	9/19/03	Lot 66	28920-1	1487.5	9.8	124.5	93.3	ND	A
129	9/19/03	Lot 65	28920-1	1484.0	9.1	122.5	91.8	ND	A
130	9/19/03	Lot 64	28920-1	1483.5	9.8	122.7	91.9	ND	A
131	9/19/03	Lot 37	28920-1	1504.0	9.9	123.7	92.7	ND	A
133	9/22/03	Lot 37	28920-1	1507.0	11.2	118.9	93.3	ND	B
134	9/22/03	Slope Rear - Lot 38	28920-1	1507.0	11.4	119.9	94.0	ND	B
135	9/22/03	Slope Rear - Lot 39	28920-1	1509.0	10.0	123.5	92.5	ND	A
136	9/22/03	Sunset Vista Ave. - 15+38	28920-1	1471.0	9.6	125.7	94.2	SC	A
133'	9/23/03	Lot 38	28920-1	1507.0	11.0	118.6	93.0	ND	B
134'	9/23/03	Slope Rear - Lot 30	28920-1	1509.0	10.8	118.2	92.7	ND	B
136'	9/24/03	Slope Rear - Lot 39	28920-1	1510.0	9.5	124.2	93.0	ND	A
137	9/24/03	Lot 38	28920-1	1509.0	9.8	123.5	92.5	ND	A
138	9/24/03	Lot 39	28920-1	1512.0	9.2	125.7	94.2	ND	A
139	9/24/03	Lot 39	28920-1	1512.0	10.6	119.4	93.6	ND	B

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
140	9/25/03	Lot 122	28920-1	1476.0	9.9	125.8	94.2	SC	A
141	9/25/03	Lot 119	28920-1	1466.0	9.4	125.0	93.6	SC	A
142	9/25/03	Lot 116	28920-1	1462.0	9.8	125.4	93.9	ND	A
143	9/25/03	Lot 120	28920-1	1470.0	9.1	127.0	95.1	ND	A
BT-5	9/25/03	Lot 41	28920-1	1463.0		122.8			
144	9/25/03	Slope Rear - Lot 139	28920-1	1458.0	9.2	122.9	92.1	ND	A
145	9/25/03	Lot 138	28920-1	1464.0	9.0	122.7	91.9	ND	A
146	9/25/03	Slope Side - Lot 139	28920-1	1462.0	9.2	125.0	93.6	ND	A
147	9/26/03	Lot 137	28920-1	1466.0	9.4	123.9	92.8	ND	A
148	9/26/03	Slope Rear - Lot 107	28920-1	1466.0	9.8	127.0	95.1	ND	A
149	9/26/03	Lot 139	28920-1	1467.0	9.2	125.1	93.7	ND	A
150	9/26/03	Lot 138	28920-1	1468.0	9.0	123.9	92.8	ND	A
151	9/26/03	Slope Rear - Lot 61	28920-1	1484.0	9.0	123.0	92.1	ND	A
152	9/26/03	Slope Rear - Lot 61	28920-1	1488.0	9.4	124.7	93.4	ND	A
153	9/26/03	Slope Rear - Lot 60	28920-1	1490.0	9.5	124.6	93.3	ND	A
154	9/26/03	Slope Rear - Lot 61	28920-1	1492.0	9.1	123.7	92.7	ND	A
155	9/29/03	Lot 46	28920-1	1494.0	9.2	125.0	93.6	ND	A
156*	9/29/03	Slope Rear - Lot 62	28920-1	1496.0	6.6	109.8	86.1	ND	B
156A	9/29/03	Slope Rear - Lot 62	28920-1	1496.0	11.4	118.5	92.9	ND	B
157	9/29/03	Lot 139	28920-1	1470.0	9.3	125.7	94.2	ND	A
158	9/29/03	Lot 138	28920-1	1471.0	9.8	123.9	92.8	ND	A
159	9/29/03	Lot 137	28920-1	1472.0	9.2	122.1	91.5	ND	A
160	9/30/03	Lot 104	28920-1	1453.0	10.1	127.0	95.1	ND	A
161	9/30/03	Lot 102	28920-1	1454.0	9.2	125.0	93.6	ND	A
162	9/30/03	Lot 101	28920-1	1455.0	9.8	123.9	92.8	ND	A
163	9/30/03	Lot 46	28920-1	1496.0	11.4	118.5	92.9	ND	B
164	9/30/03	Lot 45	28920-1	1497.0	10.9	118.8	93.2	ND	B
165	9/30/03	Lot 60	28920-1	1480.0	10.0	123.9	92.8	ND	A
166	9/30/03	Lot 58	28920-1	1476.0	9.6	122.3	91.6	ND	A
167	9/30/03	Lot 59	28920-1	1478.5	10.1	125.8	94.2	ND	A
168	10/1/03	Lot 45	28920-1	1501.0	9.9	122.3	91.6	SC	A
169	10/1/03	Lot 46	28920-1	1501.0	10.2	127.1	95.2	SC	A
170	10/1/03	Lot 38	28920-1	1512.0	9.1	125.1	93.7	ND	A
171	10/1/03	Slope Rear - Lot 39	28920-1	1515.0	9.3	125.3	93.9	ND	A
172	10/1/03	Lot 108	28920-1	1456.0	10.2	123.5	92.5	ND	A
173	10/1/03	Lot 110	28920-1	1458.0	9.6	122.3	91.6	ND	A
174	10/1/03	Lot 112	28920-1	1459.5	10.6	118.6	93.0	ND	B
175	10/1/03	Lot 109	28920-1	1457.0	11.4	120.2	94.3	ND	B
176	10/1/03	Lot 115	28920-1	1460.0	9.2	123.7	92.7	ND	A
177	10/2/03	Lot 45	28920-1	1503.0	10.2	124.3	93.1	ND	A
178	10/2/03	Lot 46	28920-1	1503.0	11.1	126.9	95.1	ND	A
179	10/2/03	Lot 45	28920-1	1505.0	9.6	123.7	92.7	ND	A
180*	10/2/03	Lot 30	28920-1	1495.0	9.9	118.1	88.5	ND	A
180A	10/2/03	Lot 30	28920-1	1495.0	10.0	122.2	91.5	ND	A
181	10/2/03	Lot 29	28920-1	1499.0	9.2	123.0	92.1	ND	A
182	10/2/03	Lot 38	28920-1	1515.0	9.8	123.7	92.7	ND	A
183	10/2/03	Lot 39	28920-1	1516.0	9.2	124.7	93.4	ND	A

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
184	10/3/03	Lot 44	28920-1	1509.5	9.3	121.0	90.6	SC	A
185	10/3/03	Lot 43	28920-1	1502.5	9.8	122.1	91.5	ND	A
186	10/3/03	Slope Rear - Lot 100	28920-1	1451.0	9.6	123.8	92.7	ND	A
187	10/3/03	Lot 39	28920-1	1519.0	9.5	122.9	92.1	ND	A
188	10/3/03	Lot 40	28920-1	1518.5	9.6	122.7	91.9	ND	A
189	10/3/03	Lot 99	28920-1	1454.0	9.4	123.7	92.7	ND	A
190	10/3/03	Slope Rear - Lot 29	28920-1	1519.0	9.8	125.3	93.9	ND	A
191	10/3/03	Slope Rear - Lot 99	28920-1	1456.0	10.6	116.6	91.5	ND	B
192	10/3/03	Lot 100	28920-1	1456.0	10.9	117.4	92.1	ND	B
193	10/6/03	Sunset Vista Avenue - 15+82	28920-1	1473.0	10.7	118.8	93.2	ND	B
BT-6	10/6/03	Lot 41	28920-1	1519.0		121.8		ND	
194	10/6/03	Lot 40	28920-1	1523.0	9.2	123.4	92.4	ND	A
195	10/6/03	Slope Rear - Lot 42	28920-1	1506.0	9.9	124.0	92.9	ND	A
196	10/6/03	Sunset Vista Avenue - 16+40	28920-1	1475.0	9.3	122.7	91.9	ND	A
197	10/6/03	Slope - Lot 41	28920-1	1511.0	9.4	125.5	94.0	ND	A
198	10/6/03	Slope Rear - Lot 30	28920-1	1525.0	9.1	125.1	93.7	ND	A
199	10/7/03	Slope Rear - Lot 43	28920-1	1512.0	10.2	124.2	93.0	ND	A
200	10/7/03	Lot 43	28920-1	1500.0	9.4	123.7	92.7	ND	A
201	10/7/03	Sunset Vista Avenue - 14+85	28920-1	1477.0	10.6	117.9	92.5	ND	B
202	10/7/03	Lot 40	28920-1	1425.0	10.0	122.6	91.8	ND	A
203	10/7/03	Lot 41	28920-1	1517.0	9.5	125.1	93.7	ND	A
204	10/8/03	Lot 41	28920-1	1520.0	9.4	124.3	93.1	ND	A
205	10/8/03	Lot 40	28920-1	1528.0	9.8	123.5	92.5	ND	A
206*	10/8/03	Lot 31	28920-1	1501.0	8.2	113.8	85.2	ND	A
206A	10/8/03	Lot 31	28920-1	1501.0	9.9	122.1	91.5	ND	A
207*	10/8/03	Lot 78	28920-1	1495.5	8.1	110.1	86.4	ND	B
207A	10/8/03	Lot 78	28920-1	1495.5	11.1	118.8	93.2	ND	B
208	10/8/03	Lot 75	28920-1	1513.5	10.8	118.1	92.6	ND	B
209	10/9/03	Lot 28	28920-1	1507.0	9.6	122.1	91.5	ND	A
210	10/9/03	Lot 30	28920-1	1498.0	9.8	123.1	92.2	ND	A
211	10/9/03	Lot 79	28920-1	1494.0	9.2	124.3	93.1	ND	A
212	10/9/03	Lot 31	28920-1	1503.5	9.4	123.9	92.8	ND	A
213	10/9/03	Lot 55	28920-1	1471.5	11.4	116.6	91.5	ND	B
214	10/9/03	Lot 57	28920-1	1473.5	11.0	117.2	91.9	ND	B
215	10/9/03	Lot 123	28920-1	FG	9.1	123.3	92.4	ND	A
216	10/9/03	Lot 124	28920-1	FG	9.3	125.5	94.0	ND	A
217	10/9/03	Lot 125	28920-1	FG	9.5	122.9	92.1	ND	A
218	10/9/03	Lot 126	28920-1	FG	9.3	123.7	92.7	ND	A
219	10/9/03	Lot 127	28920-1	FG	9.2	122.7	91.9	ND	A
220	10/9/03	Lot 128	28920-1	FG	9.8	123.8	92.7	ND	A
221	10/9/03	Lot 129	28920-1	FG	9.1	124.5	93.3	ND	A
222	10/9/03	Lot 130	28920-1	FG	9.0	122.2	91.5	ND	A
223	10/10/03	Lot 29	28920-1	1504.0	9.9	124.2	93.0	SC	A
224	10/10/03	Lot 27	28920-1	1509.0	10.1	125.7	94.2	ND	A
225	10/10/03	Lot 77	28920-1	1503.0	9.3	124.5	93.3	ND	A
226	10/10/03	Lot 74	28920-1	1518.5	9.5	124.2	93.0	ND	A
227	10/10/03	Lot 30	28920-1	1505.0	10.9	117.5	92.2	ND	B

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
228	10/10/03	Lot 29	28920-1	1508.0	10.0	125.1	93.7	ND	A
229	10/10/03	Lot 76	28920-1	1508.0	9.6	121.8	91.2	ND	A
230	10/10/03	Lot 28	28920-1	1512.0	9.4	121.3	90.9	ND	A
231	10/13/03	Lot 131	28920-1	FG	10.8	119.5	93.7	ND	B
232	10/13/03	Lot 132	28920-1	FG	10.9	117.5	92.2	ND	B
233	10/13/03	Lot 133	28920-1	FG	10.5	118.4	92.9	ND	B
234	10/13/03	Lot 134	28920-1	FG	9.9	125.5	94.0	ND	A
235	10/13/03	Lot 135	28920-1	FG	10.1	122.3	91.6	ND	A
236	10/13/03	Lot 136	28920-1	FG	9.2	123.1	92.2	ND	A
237	10/13/03	Lot 137	28920-1	FG	9.8	122.7	91.9	ND	A
238	10/13/03	Lot 138	28920-1	FG	9.5	124.5	93.3	ND	A
239	10/13/03	Lot 139	28920-1	FG	9.4	122.6	91.8	ND	A
240	10/13/03	Lot 62	28920-1	1482.5	9.6	125.5	94.0	ND	A
241	10/13/03	Lot 61	28920-1	1481.0	9.2	123.0	92.1	ND	A
242	10/13/03	Lot 63	28920-1	1481.5	9.8	124.2	93.0	ND	A
243	10/13/03	Lot 68	28920-1	1490.0	9.4	126.1	94.5	ND	A
244	10/13/03	Lot 70	28920-1	1493.0	9.6	124.1	93.0	ND	A
245	10/14/03	Sunset Vista Avenue - 11+53	28920-1	1491.0	9.6	120.5	90.3	ND	A
246	10/14/03	Lot 69	28920-1	1493.5	9.1	122.6	91.8	ND	A
247	10/14/03	Lot 70	28920-1	1497.5	9.8	122.1	91.4	ND	A
248	10/14/03	Sunset Vista Avenue - 11+85	28920-1	1492.0	9.4	125.0	93.6	ND	A
249	10/14/03	Slope Rear - Lot 70	28920-1	1500.0	9.8	124.1	93.0	ND	A
250	10/15/03	Slope Side - Lot 4	28920-1	1461.0	11.0	119.1	93.4	ND	B
251	10/15/03	Lot 4	28920-1	1463.0	10.9	118.4	92.9	ND	B
252	10/15/03	Lot 5	28920-1	1467.5	9.9	122.2	91.5	ND	A
253*	10/15/03	Slope Rear - Lot 71	28920-1	1506.0	8.6	115.9	86.8	ND	A
253A	10/15/03	Slope Rear - Lot 71	28920-1	1506.0	9.0	122.7	91.9	ND	A
254	10/15/03	Slope Rear - Lot 70	28920-1	1509.0	9.6	123.7	92.7	ND	A
255	10/15/03	Slope Rear - Lot 71	28920-1	1510.0	9.4	123.5	92.5	ND	A
256	10/15/03	Lot 72	28920-1	1512.0	9.9	122.5	91.8	ND	A
257	10/16/03	Slope Rear- Lot 70	28920-1	1515.0	9.2	122.1	91.5	ND	A
258	10/16/03	Lot 72	28920-1	1517.0	9.8	124.2	93.0	ND	A
259	10/16/03	Lot 72	28920-1	1519.0	9.1	123.5	92.5	ND	A
257'	10/17/03	Slope Rear - Lot 70	28920-1	1515.0	9.6	124.3	93.1	ND	A
258'	10/17/03	Lot 72	28920-1	1517.0	9.2	123.7	92.7	ND	A
259'	10/17/03	Lot 72	28920-1	1519.0	9.8	124.1	93.0	ND	A
BT-7	1/17/03	Lot 7	28920-1	1469.0		120.8		SC	
260	10/17/03	Lot 6	28920-1	1471.0	10.9	120.0	94.1	ND	B
261	10/17/03	Lot 8	28920-1	1473.0	11.0	118.2	92.7	ND	B
260'	10/17/03	Lot 6	28920-1	1471.0	9.9	121.1	90.7	ND	A
261'	10/17/03	Lot 8	28920-1	1473.0	9.2	122.1	91.5	ND	A
262	10/17/03	Lot 7	28920-1	1474.5	9.6	122.9	92.1	ND	A
263	10/20/03	Lot 9	28920-1	1481.0	10.2	120.7	90.4	SC	A
264	10/20/03	Lot 10	28920-1	1484.0	9.2	123.5	92.5	ND	A
265	10/20/03	Lot 8	28920-1	1477.0	9.0	124.3	93.1	ND	A
266	10/20/03	Lot 9	28920-1	1482.5	9.6	123.3	92.4	ND	A
267	10/21/03	Lot 10	28920-1	1485.5	11.4	116.3	91.2	ND	B

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
268	10/21/03	Lot 11	28920-1	1487.0	9.6	121.4	90.9	ND	A
269	10/21/03	Lot 12	28920-1	1488.0	9.8	125.1	93.7	ND	A
270	10/21/03	Lot 12	28920-1	1492.0	9.9	122.9	92.1	ND	A
271	10/21/03	Lot 13	28920-1	1492.5	9.1	123.7	92.7	ND	A
272	10/22/03	Lot 14	28920-1	1494.0	9.6	124.7	93.4	ND	A
273	10/22/03	Lot 13	28920-1	1494.0	9.1	127.0	95.1	ND	A
274	10/22/03	Lot 13	28920-1	1496.0	9.3	123.4	92.4	ND	A
275	10/23/03	Lot 15	28920-1	1496.0	9.0	128.3	96.1	ND	A
276	10/23/03	Lot 14	28920-1	1495.0	9.6	123.5	92.5	ND	A
277	10/23/03	Slope Rear- Lot 17	28920-1	1499.0	9.8	124.5	93.3	ND	A
278	10/23/03	Lot 16	28920-1	1497.0	9.2	122.3	91.6	ND	A
279	10/24/03	Lot 16	28920-1	1502.0	9.1	121.7	91.2	ND	A
280	10/24/03	Lot 18	28920-1	1505.0	9.5	125.1	93.7	ND	A
281	10/24/03	Lot 14	28920-1	1498.0	9.2	124.2	93.0	ND	A
282	10/24/03	Lot 15	28920-1	1501.0	9.9	124.1	93.0	ND	A
283	10/27/03	Slope Lot 22	28920-1	1511.0	9.3	125.3	93.9	ND	A
284	10/27/03	Rear Slope Lot 22	28920-1	1513.0	9.1	122.7	91.9	ND	A
285	10/27/03	Lot 22	28920-1	1515.0	9.2	121.8	91.2	ND	A
286	10/27/03	Lot 21	28920-1	1515.0	9.8	124.7	93.4	ND	A
287	10/28/03	Lot 22	28920-1	1517.0	9.2	123.7	92.7	ND	A
288	10/28/03	Lot 21	28920-1	1517.0	9.9	122.1	91.5	ND	A
289	10/28/03	Lot 87	28920-1	FG	9.0	123.7	92.7	ND	A
290	10/28/03	Lot 86	28920-1	FG	10.1	124.9	93.6	ND	A
291	10/28/03	Lot 85	28920-1	FG	9.6	123.4	92.4	ND	A
292	10/28/03	Lot 84	28920-1	FG	9.4	122.6	91.8	ND	A
293	10/28/03	Lot 83	28920-1	FG	9.2	123.0	92.1	ND	A
294	10/28/03	Lot 82	28920-1	FG	9.8	125.0	93.6	ND	A
295	10/28/03	Lot 81	28920-1	FG	9.6	126.2	94.5	ND	A
296	10/28/03	Lot 80	28920-1	FG	9.4	123.9	92.8	ND	A
297	10/28/03	Lot 79	28920-1	FG	9.1	122.3	91.6	ND	A
298	10/28/03	Lot 78	28920-1	FG	9.3	122.9	92.1	ND	A
299	10/28/03	Lot 77	28920-1	FG	9.7	125.7	94.2	ND	A
300	10/28/03	Lot 76	28920-1	FG	9.2	124.1	93.0	ND	A
301	10/29/03	Lot 75	28920-1	FG	9.6	122.3	91.6	ND	A
302	10/29/03	Lot 74	28920-1	FG	9.2	123.9	92.8	ND	A
303	10/29/03	Lot 73	28920-1	FG	9.0	123.0	92.1	ND	A
304	10/29/03	Lot 72	28920-1	FG	9.8	124.5	93.3	ND	A
305	10/29/03	Lot 71	28920-1	FG	9.1	122.3	91.6	ND	A
306	10/29/03	Lot 70	28920-1	FG	9.5	122.1	91.5	ND	A
307	10/29/03	Lot 69	28920-1	FG	9.6	125.3	93.9	ND	A
308	10/29/03	Lot 68	28920-1	FG	9.2	124.1	93.0	ND	A
309	10/29/03	Lot 67	28920-1	FG	9.4	125.1	93.7	ND	A
310	10/29/03	Lot 66	28920-1	FG	9.8	125.5	94.0	ND	A
311	10/29/03	Lot 65	28920-1	FG	9.6	124.3	93.1	ND	A
312	10/29/03	Lot 64	28920-1	FG	9.3	123.5	92.5	ND	A
313	10/29/03	Lot 63	28920-1	FG	9.1	128.2	96.0	ND	A
314	10/29/03	Lot 62	28920-1	FG	9.2	125.8	94.2	ND	A

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
315	10/29/03	Slope Rear- Lot 138	28920-1	1468.0	9.0	125.1	93.7	ND	A
316	10/29/03	Slope Rear- Lot 134	28920-1	1466.0	9.1	124.1	93.0	ND	A
317	10/29/03	Slope Rear- Lot 127	28920-1	1485.5	9.4	125.7	94.2	ND	A
318	10/29/03	Slope Rear- Lot 70	28920-1	1515.0	9.6	122.9	92.1	ND	A
319	10/29/03	Slope Rear- Lot 46	28920-1	1500.0	9.2	122.3	91.6	ND	A
320	10/29/03	Slope Rear- Lot 50	28920-1	1488.0	9.5	123.5	92.5	ND	A
321	10/29/03	Slope Rear- Lot 37	28920-1	1507.0	9.3	124.5	93.3	ND	A
322	10/29/03	Slope Rear- Lot 30	28920-1	1524.0	9.2	124.3	93.1	ND	A
323	10/29/03	Lot 61	28920-1	FG	9.8	123.8	92.7	ND	A
324	10/29/03	Lot 60	28920-1	FG	9.1	122.3	91.6	ND	A
325	10/29/03	Lot 59	28920-1	FG	9.6	122.7	91.9	ND	A
326	10/29/03	Lot 58	28920-1	FG	9.4	123.4	92.4	ND	A
327	10/29/03	Lot 57	28920-1	FG	9.8	123.9	92.8	ND	A
328	10/29/03	Lot 56	28920-1	FG	9.3	122.2	91.5	ND	A
329	10/30/03	Lot 26	28920-1	1515.0	10.1	123.0	92.1	ND	A
329'	10/30/03	Lot 105	28920-1	FG	10.2	124.3	93.1	ND	A
330	10/30/03	Lot 104	28920-1	FG	9.8	125.1	93.7	ND	A
331	10/30/03	Lot 103	28920-1	FG	9.2	123.7	92.7	ND	A
332	10/30/03	Lot 102	28920-1	FG	9.4	122.1	91.5	ND	A
333	10/30/03	Lot 101	28920-1	FG	9.0	125.5	94.0	ND	A
334	10/30/03	Lot 100	28920-1	FG	9.1	124.3	93.1	ND	A
335	10/30/03	Lot 99	28920-1	FG	9.7	123.7	92.7	ND	A
336	10/30/03	Lot 98	28920-1	FG	9.3	123.9	92.8	ND	A
337	10/31/03	Slope Rear- Lot 98	28920-1	1506.0	10.0	124.2	93.0	ND	A
BT-8	10/31/03	Lot 17	28920-1	1498.0		118.2		ND	
338	10/31/03	Lot 17	28920-1	1507.0	9.5	123.7	92.7	ND	A
339	11/3/03	Lot 18	28920-1	1508.0	9.6	124.2	93.0	SC	A
340	11/3/03	Lot 17	28920-1	1509.0	10.0	123.7	92.7	ND	A
341	11/4/03	Lot 18	28920-1	1510.5	9.9	123.9	92.8	ND	A
342	11/4/03	Lot 17	28920-1	1511.5	10.0	122.3	91.6	ND	A
343	11/5/03	Lot 122	28920-1	FG	9.1	124.3	93.1	ND	A
344	11/5/03	Lot 121	28920-1	FG	9.6	122.9	92.1	ND	A
345	11/5/03	Lot 120	28920-1	FG	9.2	123.7	92.7	ND	A
346	11/5/03	Lot 119	28920-1	FG	9.0	120.7	90.4	ND	A
347	11/5/03	Lot 118	28920-1	FG	9.0	121.5	91.0	ND	A
348	11/5/03	Lot 117	28920-1	FG	9.1	121.0	90.6	ND	A
349	11/5/03	Lot 116	28920-1	FG	9.7	122.2	91.5	ND	A
350	11/5/03	Lot 115	28920-1	FG	9.3	123.8	92.7	ND	A
351	11/5/03	Lot 114	28920-1	FG	9.4	124.2	93.0	ND	A
352	11/5/03	Lot 113	28920-1	FG	9.1	123.5	92.5	ND	A
353	11/5/03	Lot 112	28920-1	FG	9.2	123.0	92.1	ND	A
354	11/5/03	Lot 111	28920-1	FG	9.9	125.1	93.7	ND	A
355	11/5/03	Lot 110	28920-1	FG	9.3	124.4	93.2	ND	A
356	11/5/03	Lot 109	28920-1	FG	9.2	124.1	93.0	ND	A
357	11/6/03	Lot 108	28920-1	FG	9.0	125.4	93.9	ND	A
358	11/6/03	Lot 107	28920-1	FG	9.6	123.7	92.7	ND	A
359	11/6/03	Lot 106	28920-1	FG	9.2	123.9	92.8	ND	A

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
360	11/6/03	Lot 4	28920-1	FG	9.1	122.5	91.8	ND	A
361	11/6/03	Lot 5	28920-1	FG	9.3	122.7	91.9	ND	A
362	11/6/03	Lot 6	28920-1	FG	9.4	120.7	90.4	ND	A
363	11/6/03	Lot 51	28920-1	FG	9.6	123.5	92.5	ND	A
364	11/6/03	Lot 50	28920-1	FG	9.2	122.3	91.6	ND	A
365	11/6/03	Lot 49	28920-1	FG	9.1	124.2	93.0	ND	A
366	11/6/03	Lot 48	28920-1	FG	9.8	123.0	92.1	ND	A
367	11/6/03	Lot 47	28920-1	FG	9.7	123.8	92.7	ND	A
368	11/6/03	Lot 46	28920-1	FG	9.5	124.3	93.1	ND	A
369	11/6/03	Lot 45	28920-1	FG	9.8	123.7	92.7	ND	A
370	11/6/03	Lot 44	28920-1	FG	9.0	125.5	94.0	ND	A
371	11/7/03	Lot 55	28920-1	FG	9.1	123.8	92.7	ND	A
372	11/7/03	Lot 54	28920-1	FG	9.0	122.6	91.8	ND	A
373	11/7/03	Lot 53	28920-1	FG	9.0	124.3	93.1	ND	A
374	11/7/03	Lot 52	28920-1	1418.5	9.3	122.9	92.1	ND	A
375	11/7/03	Lot 52	28920-1	FG	9.5	121.8	91.2	ND	A
376	11/7/03	Lot 43	28920-1	FG	9.7	122.1	91.5	ND	A
377	11/7/03	Lot 42	28920-1	FG	9.2	124.5	93.2	ND	A
378	11/7/03	Lot 41	28920-1	FG	9.8	123.7	92.7	ND	A
379	11/7/03	Lot 40	28920-1	FG	9.1	125.5	94.0	ND	A
380	11/7/03	Lot 39	28920-1	FG	9.2	124.3	93.1	ND	A
381	11/7/03	Lot 38	28920-1	FG	9.1	123.7	92.7	ND	A
382	11/7/03	Lot 37	28920-1	FG	9.0	121.5	91.0	ND	A
383	11/7/03	Lot 36	28920-1	FG	9.8	121.1	90.7	ND	A
384	11/17/03	Lot 35	28920-1	FG	9.4	123.0	92.1	ND	A
385	11/17/03	Lot 34	28920-1	FG	9.1	124.2	93.0	ND	A
386	11/17/03	Lot 33	28920-1	FG	9.8	122.3	91.6	ND	A
387	11/17/03	Lot 32	28920-1	FG	9.2	123.4	92.4	ND	A
388	11/17/03	Lot 31	28920-1	FG	9.9	122.9	92.1	ND	A
389	11/17/03	Lot 30	28920-1	FG	9.6	122.2	91.5	ND	A
390	11/17/03	Lot 17	28920-1	1513.0	9.5	125.1	93.7	ND	A
391	11/17/03	Lot 18	28920-1	1511.5	9.9	124.1	93.0	SC	A
392	11/19/03	Lot 16	28920-1	FG	9.1	123.5	92.5	ND	A
393	11/19/03	Lot 15	28920-1	FG	9.8	121.9	91.3	ND	A
394	11/19/03	Lot 14	28920-1	FG	9.5	122.2	91.5	ND	A
395	11/19/03	Lot 13	28920-1	FG	10.1	122.7	91.9	ND	A
396	11/19/03	Lot 12	28920-1	FG	9.6	124.1	93.0	ND	A
397	11/19/03	Lot 11	28920-1	FG	9.3	123.1	92.2	SC	A
398	11/19/03	Lot 10	28920-1	FG	9.5	121.5	91.0	ND	A
399	11/19/03	Lot 9	28920-1	FG	9.3	122.3	91.6	ND	A
400	11/19/03	Lot 8	28920-1	FG	10.4	120.8	90.5	ND	A
401	11/19/03	Lot 7	28920-1	FG	9.8	122.8	92.0	ND	A
402	11/20/03	Slope Rear Lot 24	28920-1	1530.0	9.2	121.8	91.2	ND	A
403*	11/20/03	Slope Rear Lot 23	28920-1	1532.0	8.6	114.6	85.8	ND	A
403A	11/20/03	Slope Rear Lot 23	28920-1	1532.0	9.0	123.6	92.6	SC	A
404	11/20/03	Lot 18	28920-1	1511.0	9.2	121.9	91.3	ND	A
405	11/20/03	Lot 17	28920-1	1513.0	9.7	121.2	90.8	ND	A

Table 2

FIELD DENSITY TEST RESULTS

TEST NO.	DATE	TEST LOCATION	TRACT NO.	ELEV OR DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	REL COMP (%)	TEST METHOD	SOIL TYPE
406	11/21/03	Lot 18	28920-1	FG	9.3	124.9	93.6	ND	A
407	11/21/03	Lot 17	28920-1	FG	9.9	122.1	91.5	ND	A
408	11/21/03	Lot 29	28920-1	FG	9.5	122.7	91.9	ND	A
409	11/21/03	Lot 28	28920-1	FG	10.1	121.2	90.8	ND	A
410	11/21/03	Slope Rear Lot 24	28920-1	1532.0	9.5	122.2	91.5	SC	A
BT-9	11/24/03	Lot 20	28920-1	1511.0		120.5		ND	
411	11/24/03	Lot 19	28920-1	1511.0	9.2	122.1	91.5	ND	A
412	11/24/03	Lot 20	28920-1	1512.0	9.8	124.3	93.1	ND	A
413	11/24/03	Slope Rear Lot 23	28920-1	1534.0	9.6	122.8	92.0	ND	A
414	11/25/03	Lot 26	28920-1	FG	9.1	123.1	92.2	ND	A
415	11/25/03	Lot 27	28920-1	FG	9.6	122.7	91.9	ND	A
414	12/8/03	Lot 19	28920-1	1514.0	9.4	123.2	92.3	ND	A
415*	12/8/03	Lot 21	28920-1	1517.0	8.3	116.8	87.5	ND	A
415A	12/8/03	Lot 21	28920-1	1517.0	9.1	121.2	90.8	ND	A
416	12/8/03	Lot 20	28920-1	1515.0	9.6	122.3	91.6	ND	A
417	12/8/03	Lot 19	28920-1	1516.0	9.3	121.8	91.2	SC	A
418	12/8/03	Slope Rear Lot 24	28920-1	1537.0	9.7	122.9	92.1	ND	A
419*	12/9/03	Slope Rear Lot 23	28920-1	1538.0	9.1	115.1	86.2	ND	A
419A	12/9/03	Slope Rear Lot 23	28920-1	1538.0	9.3	120.8	90.5	ND	A
420	12/9/03	Slope Rear Lot 24	28920-1	1539.0	9.1	121.9	91.3	ND	A
421	12/9/03	Lot 20	28920-1	1516.0	9.8	122.9	92.1	ND	A
422	12/10/03	Slope Rear Lot 23	28920-1	1540.0	9.7	122.4	91.7	ND	A
423	12/10/03	Slope Rear Lot 24	28920-1	1540.0	9.9	122.8	92.0	ND	A
424	12/11/03	Slope Rear Lot 24	28920-1	1542.0	9.6	121.2	90..8	ND	A
425	12/11/03	Lot 22	28920-1	FG	9.8	121.6	91.1	ND	A
426	12/11/03	Lot 21	28920-1	FG	9.5	121.4	90.9	ND	A
427	12/12/03	Lot 20	28920-1	FG	9.3	121.2	90.8	ND	A
428	12/12/03	Lot 19	28920-1	FG	9.1	120.7	90.4	ND	A
429	12/12/03	Slope Rear Lot 24	28920-1	1524.0	9.6	121.8	91.2	ND	A
430	12/12/03	Slope Rear Lot 23	28920-1	1538.0	9.2	121.1	90.7	ND	A

LEGEND

' = Repeated Test Number
* = Failing Test
A = Retest
BT = Bottom Test
FG = Finish Grade
ND = Nuclear Densometer Test
SC = Sand Cone Test

APPENDIX A

REFERENCES

APPENDIX A

REFERENCES

CSL Engineering, Inc., 2003, Rough grading plan for Tract 28920-1, JN 578, 4 sheets, scale: 1"=40', dated August 7 and 11.

Geopacifica Geotechnical Consultants, 2003, Building and Safety, Grading Division, Geotechnical engineering report check corrections, BGR 020798, dated February 27.

_____, 2002, Building and Safety, Grading Division, Geotechnical engineering report check corrections, BGR 020798, dated July 26.

GeoSoils, Inc., 2003a, Cast-in-place concrete storm drain geotechnical conditions, Tract 28920-1, Sun City area, Riverside County, California, W.O. 3214-D-SC, dated June 27.

_____, 2003b, Slope stability evaluation and most current 40-scale grading plan review, Tract 28920-1, Sun City area, Riverside County, California, BGR 020798, W.O. 3214-A1-SC, dated February 19.

_____, 2003c, Response to county review, geotechnical update, and 40-scale review, Tentative Tract 28920, Sun City area, Riverside County, California, BGR 020798, W.O. 3214-A-SC, dated January 27.

_____, 2002, Preliminary pavement designs, Tract 28920, Sun City area, Riverside County, California, W.O. 3214-E-SC, dated January 14.

_____, 2000, Preliminary geotechnical investigation, Tentative tract map no. 28920, Sun City area, Riverside County, California, W.O. 2836-A2-SC, dated April 17.

International Conference of Building Officials, 1997, Uniform building code, dated April.

APPENDIX B

LABORATORY DATA

M. J. Schiff & Associates, Inc.
Consulting Corrosion Engineers - Since 1959
431 W. Baseline Road
Claremont, CA 91711
Phone: (909) 626-0967 Fax: (909) 626-3316
E-mail lab@mjschiff.com
website: mjschiff.com

Table 1 - Laboratory Tests on Soil Samples

GeoSoils, Inc.
Laing Homes
Your #3214-B-SC, MJS&A #03-1306LAB
6-Nov-03

Sample ID			E-19 Lot 3 Rep 1-3	E-20 Lot 5 Rep 4-8	E-21 Lot 10 Rep 9-13	E-22 Lot 101 Rep 99-105	E-23 Lot Rep 106-110
Resistivity		**Units**					
as-received		ohm-cm	39,000	21,000	32,000	33,000	20,000
saturated		ohm-cm	3,800	2,400	3,500	2,100	3,700
pH			7.5	7.8	7.6	7.8	8.0
Electrical Conductivity		mS/cm	0.43	0.12	0.07	0.13	0.08
Chemical Analyses							
Cations							
calcium	Ca^{2+}	mg/kg	24	32	20	40	20
magnesium	Mg^{2+}	mg/kg	19	10	ND	7	10
sodium	Na^{1+}	mg/kg	ND	19	8	29	7
Anions							
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	49	113	82	140	128
chloride	Cl^{1-}	mg/kg	ND	30	ND	30	ND
sulfate	SO_4^{2-}	mg/kg	ND	25	ND	34	ND
Other Tests							
ammonium	NH_4^{1+}	mg/kg	na	na	na	na	na
nitrate	NO_3^{1-}	mg/kg	na	na	na	na	na
sulfide	S^{2-}	qual	na	na	na	na	na
Redox		mV	na	na	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

Figure B-1

M. J. Schiff & Associates, Inc.
Consulting Corrosion Engineers - Since 1959
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Table 1 - Laboratory Tests on Soil Samples

Laing Homes
Your #3214-B-SC, MJS&A #03-1479LAB
16-Dec-03

Sample ID			Lot 16 (Rep 14-18)	Lot 20 (Rep 19-22)	Lot 25 (Rep 23-28)
Resistivity		**Units**			
as-received		ohm-cm	21,000	13,000	18,000
saturated		ohm-cm	3,600	3,200	5,100
pH			7.8	7.7	7.6
Electrical Conductivity		mS/cm	0.06	0.07	0.05
Chemical Analyses					
Cations					
calcium	Ca^{2+}	mg/kg	32	40	32
magnesium	Mg^{2+}	mg/kg	ND	ND	10
sodium	Na^{1+}	mg/kg	ND	ND	ND
Anions					
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	46	24	49
chloride	Cl^{1-}	mg/kg	ND	ND	ND
sulfate	SO_4^{2-}	mg/kg	ND	ND	ND
Other Tests					
ammonium	NH_4^{1+}	mg/kg	na	na	na
nitrate	NO_3^{1-}	mg/kg	na	na	na
sulfide	S^{2-}	qual	na	na	na
Redox		mv	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

Figure B-2

M. J. Schiff & Associates, Inc.
Consulting Corrosion Engineers - Since 1959
431 W. Baseline Road
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Table 1 - Laboratory Tests on Soil Samples

John Laing Homes
Your #3214-B-SC, MJS&A #03-1276LAB
3-Nov-03

Sample ID			
			E-18 Lots 29-33
Resistivity		**Units**	
as-received		ohm-cm	24,000
saturated		ohm-cm	3,600
pH			7.8
Electrical Conductivity		mS/cm	0.05
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	20
magnesium	Mg^{2+}	mg/kg	ND
sodium	Na^{1+}	mg/kg	9
Anions			
carbonate	CO_3^{2-}	mg/kg	ND
bicarbonate	HCO_3^{1-}	mg/kg	58
chloride	Cl^{1-}	mg/kg	15
sulfate	SO_4^{2-}	mg/kg	ND
Other Tests			
ammonium	NH_4^{1+}	mg/kg	na
nitrate	NO_3^{1-}	mg/kg	na
sulfide	S^{2-}	qual	na
Redox		mv	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
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Table 1 - Laboratory Tests on Soil Samples

John Laing Homes
Your #3214-B-SC, MJS&A #03-1276LAB
3-Nov-03

Sample ID			E-6	E-14	E-15	E-16	E-17
			Lots 133-136	Lot 49-53	Lots 44-48	Lots 39-43	Lots 34-38
Resistivity		**Units**					
as-received		ohm-cm	1,300,000	35,000	19,000	11,000	17,000
saturated		ohm-cm	2,700	2,500	3,500	3,200	3,200
pH			7.1	7.2	7.2	7.4	7.8
Electrical Conductivity		mS/cm	0.09	0.09	0.09	0.07	0.06
Chemical Analyses							
Cations							
calcium	Ca^{2+}	mg/kg	20	32	20	ND	20
magnesium	Mg^{2+}	mg/kg	ND	ND	7	ND	ND
sodium	Na^{1+}	mg/kg	40	22	24	47	6
Anions							
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	140	122	119	98	76
chloride	Cl^{1-}	mg/kg	15	20	25	15	ND
sulfate	SO_4^{2-}	mg/kg	ND	ND	ND	ND	ND
Other Tests							
ammonium	NH_4^{1+}	mg/kg	na	na	na	na	na
nitrate	NO_3^{1-}	mg/kg	na	na	na	na	na
sulfide	S^{2-}	qual	na	na	na	na	na
Redox		mv	na	na	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
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Table 1 - Laboratory Tests on Soil Samples

John Laing Homes
Your #3214-B-SC, MJS&A #03-1262LAB
30-Oct-03

Sample ID			E12 Lots 54-58	E13 Lots 137-139
Resistivity		**Units**		
as-received		ohm-cm	1,300,000	42,000
saturated		ohm-cm	1,900	2,600
pH			7.3	7.4
Electrical Conductivity		mS/cm	0.10	0.06
Chemical Analyses				
Cations				
calcium	Ca^{2+}	mg/kg	24	24
magnesium	Mg^{2+}	mg/kg	15	15
sodium	Na^{1+}	mg/kg	41	6
Anions				
carbonate	CO_3^{2-}	mg/kg	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	143	137
chloride	Cl^{1-}	mg/kg	45	15
sulfate	SO_4^{2-}	mg/kg	27	ND
Other Tests				
ammonium	NH_4^{1+}	mg/kg	na	na
nitrate	NO_3^{1-}	mg/kg	na	na
sulfide	S^{2-}	qual	na	na
Redox		mv	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

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Table 1 - Laboratory Tests on Soil Samples

John Laing Homes
Your #3214-B-SC, MJS&A #03-1262LAB
30-Oct-03

Sample ID			E7 Lots 79-83	E8 Lots 74-78	E9 Lots 69-73	E10 Lots 64-68	E11 Lots 59-63
Resistivity		**Units**					
as-received		ohm-cm	11,000,000	48,000	61,000	490,000	220,000
saturated		ohm-cm	2,600	3,100	2,300	2,200	2,400
pH			7.4	7.5	7.4	7.3	7.4
Electrical Conductivity		mS/cm	0.10	0.07	0.08	0.09	0.07
Chemical Analyses							
Cations							
calcium	Ca^{2+}	mg/kg	40	24	16	28	36
magnesium	Mg^{2+}	mg/kg	10	19	7	ND	ND
sodium	Na^{1+}	mg/kg	20	ND	27	29	ND
Anions							
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	165	125	122	119	73
chloride	Cl^{1-}	mg/kg	35	ND	20	25	15
sulfate	SO_4^{2-}	mg/kg	ND	ND	ND	ND	ND
Other Tests							
ammonium	NH_4^{1+}	mg/kg	na	na	na	na	na
nitrate	NO_3^{1-}	mg/kg	na	na	na	na	na
sulfide	S^{2-}	qual	na	na	na	na	na
Redox		mV	na	na	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
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Table 1 - Laboratory Tests on Soil Samples

John Laing Homes
Your #3214-B-SC, MJS&A #03-1276LAB
3-Nov-03

Sample ID			E-1 Lots 94-98	E-2 Lots 89-93	E-3 Lots 84-88	E-4 Lots 123-127	E-5 Lots 128-132
Resistivity		**Units**					
as-received		ohm-cm	480,000	15,000	170,000	220,000	67,000
saturated		ohm-cm	2,700	2,700	3,200	2,700	3,100
pH			7.0	6.9	6.6	7.0	7.2
Electrical Conductivity		mS/cm	0.12	0.10	0.10	0.08	0.08
Chemical Analyses							
Cations							
calcium	Ca^{2+}	mg/kg	48	32	32	20	16
magnesium	Mg^{2+}	mg/kg	15	19	19	10	ND
sodium	Na^{1+}	mg/kg	4	ND	ND	3	45
Anions							
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	204	162	174	119	107
chloride	Cl^{1-}	mg/kg	15	15	ND	ND	35
sulfate	SO_4^{2-}	mg/kg	ND	ND	ND	ND	ND
Other Tests							
ammonium	NH_4^{1+}	mg/kg	na	na	na	na	na
nitrate	NO_3^{1-}	mg/kg	na	na	na	na	na
sulfide	S^{2-}	qual	na	na	na	na	na
Redox		mV	na	na	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
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website: mjschiff.com

Table 1 - Laboratory Tests on Soil Samples

Laing Homes
Your #3214-B-SC, MJS&A #03-1306LAB
6-Nov-03

Sample ID			E-24 Lot 113 Rep 111-115	E-25 Lot 118 Rep 116-119	E-26 Lot 121 Rep 120-122
Resistivity		**Units**			
as-received		ohm-cm	32,000	34,000	19,000
saturated		ohm-cm	4,100	3,700	3,300
pH			7.4	7.6	8.0
Electrical Conductivity		mS/cm	0.06	0.08	0.10
Chemical Analyses					
Cations					
calcium	Ca^{2+}	mg/kg	16	28	24
magnesium	Mg^{2+}	mg/kg	ND	7	10
sodium	Na^{1+}	mg/kg	21	ND	28
Anions					
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	79	95	195
chloride	Cl^{1-}	mg/kg	15	ND	ND
sulfate	SO_4^{2-}	mg/kg	ND	ND	ND
Other Tests					
ammonium	NH_4^{1+}	mg/kg	na	na	na
nitrate	NO_3^{1-}	mg/kg	na	na	na
sulfide	S^{2-}	qual	na	na	na
Redox		mv	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
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SLOPE STABILITY EVALUATION
AND MOST CURRENT 40-SCALE GRADING PLAN REVIEW
TRACT 28920-1
SUN CITY AREA, RIVERSIDE COUNTY, CALIFORNIA
BGR 020798

FOR

JOHN LAING HOMES, INLAND DIVISION
255 E. RINCON, SUITE 100
CORONA, CALIFORNIA 92879

W.O. 3214-A1-SC FEBRUARY 19, 2003

GeoSoils, Inc.

Geotechnical • Geologic • Environmental

26590 Madison Avenue • Murrieta, California 92562 • (909) 677-9651 • FAX (909) 677-9301

February 19, 2003

W.O. 3214-A1-SC
BGR 020798

John Laing Homes, Inland Division
255 E. Rincon, Suite 100
Corona, California 92879

Attention: Ms. Linda Valia and Mr. Tim Jones

Subject: Slope Stability Evaluation and Most Current 40-scale Grading Plan Review, Tract 28920-1, Sun City area, Riverside County, California

References:

1. "Response to County Review, Geotechnical Update, and 40-scale Grading Plan Review, Tentative Tract Map No. 28920, Sun City area, Riverside County, California," W.O. 3214-A-SC, dated January 27, 2003, by GeoSoils, Inc.

2. "Building and Safety, Grading Division, Geotechnical Engineering Report Check Corrections, BGR 020798," dated July 26, 2002, by Geopacifica Geotechnical Consultants.

3. "Rough Grading Plan - Tract 28920-1," sheets 2 through 4, 40-scale plans, J.N. 578, dated January 29, 2003, by CSL Engineering, Inc.

4. "Preliminary Geotechnical Investigation, Tentative Tract Map No. 28920, Sun City Area, Riverside County, California," W.O. 2836-A2-SC, dated April 17, 2000, by GeoSoils, Inc.

Dear Ms. Valia and Mr. Jones:

In accordance with your request and authorization, GeoSoils, Inc. (GSI), is presenting this slope stability evaluation and review of the most current 40-scale grading plans for the subject tract. The scope of our work has included a review of the referenced documents, preparation of a geologic cross section depicting the highest proposed 1¾:1 (horizontal to vertical) cut slope, slope stability analyses, analysis of data, and preparation of this response. Unless specifically superceded herein, the conclusions and recommendations contained in the referenced reports by GSI remain pertinent and applicable, and should be appropriately implemented during planning, design, and construction.

PLAN REVIEW

GSI has reviewed the most current 40-scale grading plans for the site (CSL, 2003). Based on our review, the following discussion is presented:

1. The plans indicate that typical cut and fill grading techniques would be utilized to prepare the site for construction of approximately 124 single-family residences, with associated infrastructure and underground utilities. With the exception of the cut slopes behind Lots 40 through 45, the design grades have not changed significantly from the plans previously reviewed (GSI, 2003).

2. Grading will create cut slopes designed at inclinations of 1¾:1 (horizontal to vertical), up to about 30½ feet high (with small retaining walls at the top and toe of slope), and 2:1 (h:v), or flatter, up to about 34½ feet high, as well as fill slopes designed at inclinations of 2:1 (h:v), or flatter, up to about 17 feet high. Fill over cut slopes are also proposed. Approximate maximum thicknesses of cuts and fills are still on the order of 21 feet and 14 feet, respectively.

3. Since only the cut slopes behind lots 40 through 45 have changed, no geotechnical benefit is realized by transferring geologic data to that specific grading plan sheet. Geologic Cross-Section D-D' is also included herein as Figure 1 (attached). The location of the cross-section is shown on Plate 1.

SLOPE STABILITY

Current slope stability analyses for the maximum 1¾:1 (h:v) cut slope are included in the Appendix. A discussion of the methods utilized in our analysis, strength parameters, etc., are included in GSI (2000, and 2003), and are summarized below:

Method of Analysis

Available data concerning the site geology was compiled on Cross-Section D-D'. The cross-section is presented on the attached Figure 1. Two-dimensional slope stability analyses were performed using the "GSTABL7 with STEDWIN" computer program, with shear strength parameters discussed previously (GSI, 2003). The Simplified Bishop, or Janbu Block methods were used to model arcuate failure conditions within massive granitic bedrock, or weakened planes in the bedrock, respectively. Three-dimensional analysis were previously performed by using Markland test plot option of the RockPac2 computer program. The results of the two-dimensional slope stability analysis is provided in the Appendix.

Design Slope Stability

Slope stability analysis under the final design conditions indicated factors of safety in excess of the required 1.5, and 1.1 for static and seismic conditions, respectively (i.e., static factor of safety is much greater than 1.7). Prior surficial slope stability analyses (GSI, 2002) also indicated an adequate factor of safety against failure for 1½:1 (h:v) cut slopes, and thus are considered applicable for proposed flatter 1¾:1 (h:v) cut slopes.

Three Dimensional Analysis

Three-dimensional analysis for the critical slopes at this site was performed and submitted in GSI (2000), for slopes as steep as 1½:1 (h:v). No significant design changes have occurred for the planned slopes to necessitate new three-dimensional analysis, inasmuch as the discontinuities are regional, and the cut slopes are proposed at a flatter angle. The three-dimensional analysis referred to herein, was performed using Rockpac2 computer program. The analytical capabilities of this program include stereonet plotting of the rock slope geologic structure, which is used in the Marklands test plots for the interpretation of slope stability. The results of our analysis indicates that no wedges are formed by the planes of discontinuities, that could result in slope failure, and are still considered valid.

In conclusion, the proposed 1¾:1 (h:v) cut slope possesses an adequate calculated factor of safety against gross (static and seismic) and surficial failure, provided our recommendations are implemented.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to contact our office.

Respectfully submitted,

GeoSoils, Inc.

REGISTERED GEOLOGIST
JOHN P. FRANKLIN
NO. 1340
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Engineering
Geologist
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John P. Franklin
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Reviewed by:

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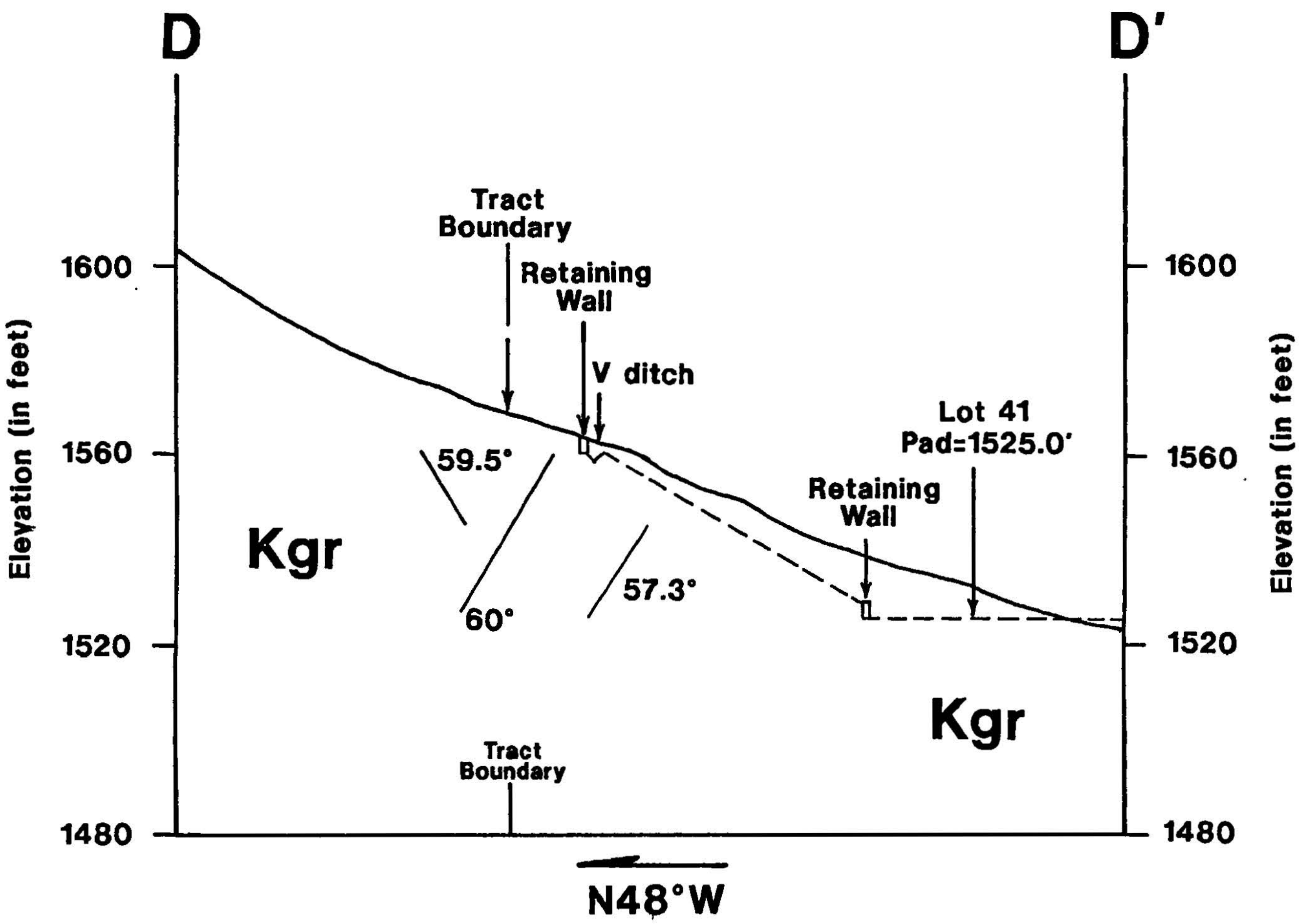
BEN SHAHRVINI
No. 2296
Exp. 12/04
GEOTECHNICAL
STATE OF CALIFORNIA

Ben Shahrvini
Geotechnical Engineer, GE 2296

JPF/BBS/jh

Attachments: Figure 1 - Geologic Cross Section D-D'
Appendix - Slope Stability Analysis
Plate 1 - Cross Section Location Map

Distribution: (2) Addressee
(2) County of Riverside, Building & Safety Department, Murrieta Office, Attention: Mr. Paul Zolfaghari (wet signatures)
(2) CSL Engineering, Inc., Attention: Mr. Richard A. Scianni, P.E.



LEGEND

Existing Grade

Proposed Grade

Kgr Cretaceous granitics

60° Attitude of joint with apparent dip in degrees

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LOS ANGELES CO.
RIVERSIDE CO.
ORANGE CO.
SAN DIEGO CO.

GEOLOGIC CROSS SECTION D-D'

Figure 1

W.O.3214-A1-SC DATE 2/03 SCALE 1"=40'

APPENDIX

SLOPE STABILITY ANALYSIS

JOHN LAING HOMES SECTION D-D' - 1 3/4: 1 CUT SLOPE STATIC

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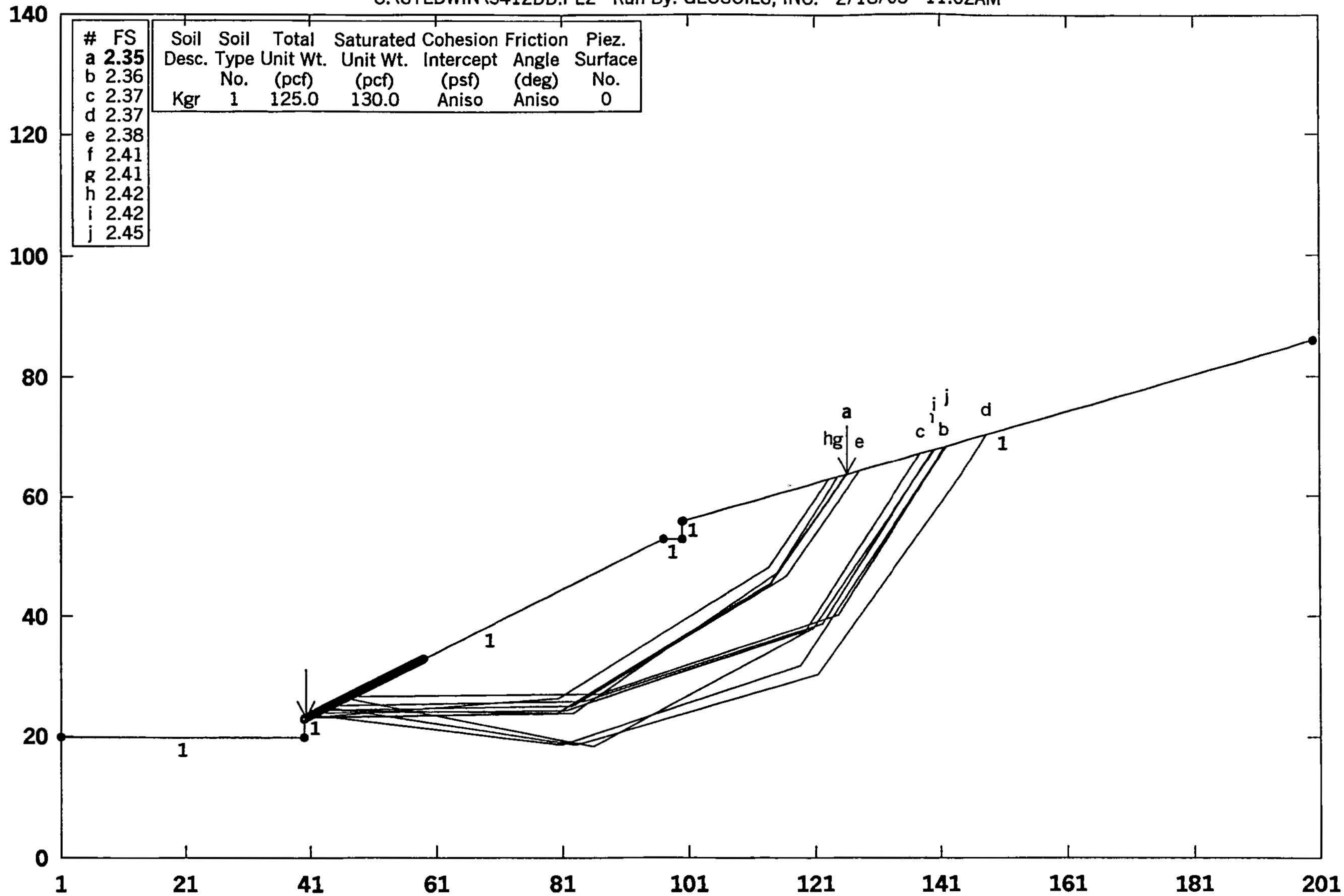

GSTABL7 v.2 FSmin=2.35

Safety Factors Are Calculated By The Simplified Janbu Method

STED

Plate B-1

PRELIMINARY GEOTECHNICAL INVESTIGATION
TENTATIVE TRACT MAP NO. 28920
SUN CITY AREA, RIVERSIDE COUNTY, CALIFORNIA

FOR

NEW WEST PROPERTIES
369 SAN MIGUEL DRIVE, SUITE 375A
NEWPORT BEACH, CALIFORNIA 92660

W.O. 2836-A2-SC APRIL 17, 2000

GeoSoils, Inc.

Geotechnical • Geologic • Environmental

24890 Jefferson Ave. • Murrieta, California 92562 • (909) 677-9651 • FAX (909) 677-9301

April 17, 2000

W.O. 2836-A2-SC

New West Properties
369 San Miguel Drive, Suite 375A
Newport Beach, California 92660

Attention: Mr. Curt Ensign, President

Subject: Preliminary Geotechnical Investigation, Tentative Tract Map No. 28920, Sun City Area, Riverside County, California

Dear Sir:

In accordance with your request and authorization, this report presents the results of our preliminary geotechnical investigation of the subject site. The purpose of the study was to evaluate the onsite soils and geologic conditions and their effects on the proposed development from a geotechnical viewpoint. In particular, the primary purpose of our study was to evaluate potential remedial removal depths, slope stability for proposed cut slopes, rock hardness evaluation, groundwater conditions and provide shrinkage/bulking parameters. A secondary purpose of this study was to provide preliminary geotechnical foundation design parameters, and general earthwork and grading guidelines.

EXECUTIVE SUMMARY

Based on our review of data (Appendix A), field exploration, laboratory testing, and geologic and engineering analyses, the proposed project appears suitable for its intended use, from a geotechnical viewpoint, provided the recommendations presented in the text of this report are implemented.

- Removal of any colluvial (topsoil) deposits, alluvial deposits, and weathered bedrock materials will be necessary prior to fill placement. Approximate depths of removals are outlined in the conclusions and recommendations section of this report. For preliminary planning purposes, these depths are estimated to be on the order of 1 ± to 8± feet across the site in areas proposed for settlement sensitive improvements, with localized deeper removals up to 10± feet deep, if not removed by planned excavation.

- In general and based upon the available data to date, groundwater is not expected to be a major factor in development of the site. No perched groundwater was observed in our test pits during our field exploration. However, due to the nature of the site materials, seepage may be encountered throughout the site along with seasonal perched water within any drainage areas and seepage may be encountered in "daylighted" joint systems within the colluvial deposits and/or granitic bedrock. Subdrainage systems for the control of localized groundwater seepage should be anticipated, should such conditions develop during or after grading.

- Based on the proposed development minor slopes, field observations, sampling, laboratory testing, and evaluation by GSI, the proposed 1.5:1 (horizontal:vertical) cut slopes and 2:1 (horizontal to vertical) cut and fill slopes are considered grossly and surficially stable.

- Based upon the proposed development and our field exploration, the granitic materials in the site area are considered easily to moderately rippable, however difficult to possible blasting of bedrock may be anticipated in the northern portion of the site, based on <u>currently proposed grades</u> and assumed utility depths. This should be further evaluated when plans are finalized.

- Due to the nature of the site materials, it is <u>likely</u> that moderate amounts of oversized rock materials will be generated during grading.

- Our review indicates no known active faults are crossing the project area, and the site is not within an Alquist-Priolo Earthquake Fault Zone.

- Adverse geologic features that would preclude project feasibility, such as landslides and/or liquefaction potential were not encountered, and/or will be mitigated by the recommendations provided herein.

- The recommendations presented in this report should be incorporated into the design and construction considerations of the project.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to contact our office.

Respectfully submitted,

GeoSoils, Inc.

John P. Franklin
Engineering Geologist, CEG 1340

Reviewed by:

Albert R. Kleist
Geotechnical Engineer, GE 476

RS/BV/JPF/ARK/mo

Distribution: (6) Addressee

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FIGURES:

ATTACHMENTS:

PRELIMINARY GEOTECHNICAL INVESTIGATION
TENTATIVE TRACT MAP NO. 28920
SUN CITY AREA, RIVERSIDE COUNTRY, CALIFORNIA

SCOPE OF SERVICES

The scope of our services has included the following:

1. Review of available soils and geologic data for the site area, including previous geotechnical reports near the subject area (Appendix A).

2. Geologic site reconnaissance and geologic mapping of significant geologic structures and mapping of surficial deposits.

3. Subsurface exploration consisted of the excavation of 10 test pits for geotechnical logging and sampling (Appendix B) and 5 seismic refraction traverses.

4. Rock hardness evaluation (Appendix C).

5. General areal seismicity evaluation (Appendix D).

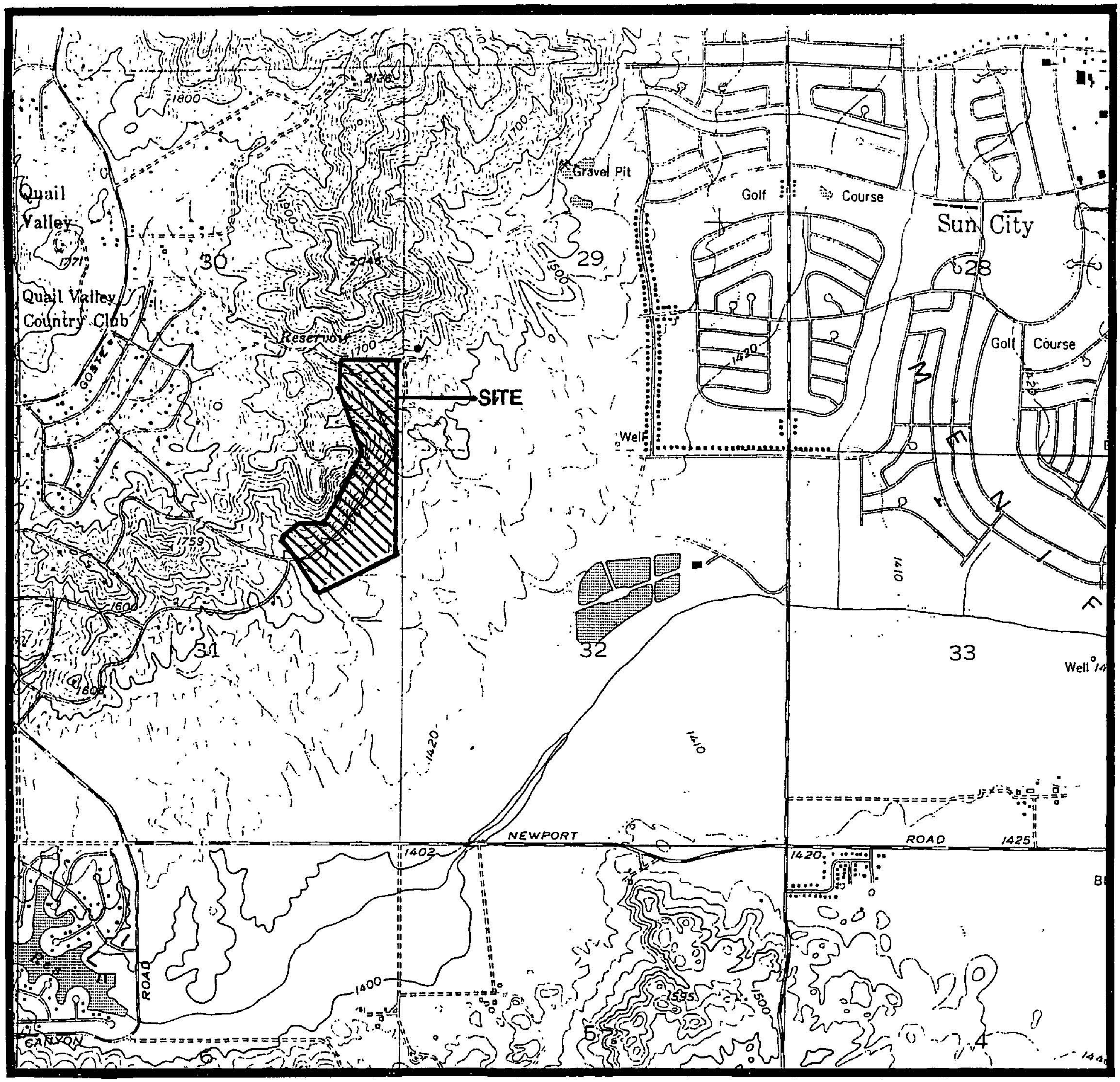
6. Pertinent laboratory testing of representative soil samples collected during our subsurface exploration program. Testing included in-situ moisture and density, maximum density testing, consolidation, shear, soluble sulfate, corrosion analysis, and expansion index testing of the materials encountered during our field studies. Results of our laboratory testing are provided in Appendix E.

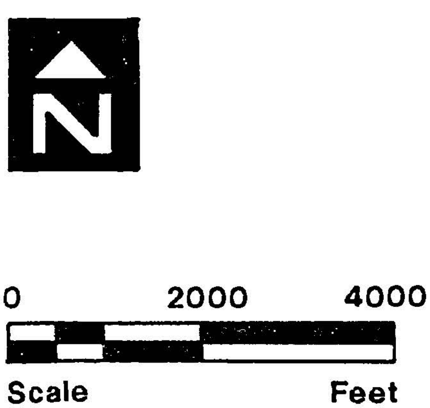
7. Slope stability and wedge failure analysis of proposed 1.5 (horizontal:vertical) and 2:1 (horizontal to vertical) cut slopes and slope stability of proposed 2:1 (horizontal:vertical) fill slopes (Appendix F).

8. Appropriate engineering and geologic analyses of data collected and preparation of this report and accompaniments.

SITE DESCRIPTION

The project area is located west of Ridgemoor Road, and north of proposed Honeyrun road in the Sun City Area, Riverside County, California (see Figure 1, Site Location Map). Topographically, the site, which was previously utilized as an "agricultural" area, is dominated by gently rolling terrain, however steep terrain dominates the western portion of the site. Elevations, decreasing from northwest to southeast, range from 1680 feet Mean Sea Level (MSL) to 1460 MSL, for a total relief of approximately 220 feet. Drainage, flowing northwest to southeast, is accommodated by relatively wide and gentle drainage channels in the southern portion of the site, while relatively thin deeply incised drainage channels dominate the northern portion of the site. Drainage is outlet to open spaces southeast of the site. Vegetation consists of chaparral and other native shrubs and grasses.





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W.O.

2836-A2-SC

SITE LOCATION MAP

Figure 1

PROPOSED DEVELOPMENT

The tentative tract map (CSL Engineering, Inc., 1999) indicates that typical cut and fill grading techniques would be utilized to prepare the site for construction of approximately 180 single family residences, with associated infrastructure and underground utilities, including storm drains. According to the tentative tract plans and conversations with CSL personnel, rough grading will create cut slopes designed at inclinations of 1.5:1 (horizontal:vertical) and 2:1 (h:v), up to 58 feet high, and fill slopes designed at inclinations of 2:1 (horizontal:vertical), up to 30 feet high. Approximate maximum depths of cut and fill are on the order of 19 feet and 15½ feet, respectively. It is our understanding that the buildings would be one- and/or two-story structures, utilizing typical wood-frame construction with slabs-on-grade and continuous footings. Building loads are assumed to be typical for this type of relatively light construction. Sewage disposal is assumed to be accommodated by tying into the regional municipal system. The need for import soils is not known at this time.

FIELD STUDIES

As indicated above, field studies conducted during our evaluation of the property for this investigation consisted of geologic reconnaissance mapping and excavation of ten exploratory test pits throughout the site, for evaluation of near-surface soil and geologic conditions. Additionally, five seismic refraction profile surveys were performed for rock hardness evaluation. Field exploration was performed on March 1, 2, and 28, 2000. The logs of the test pits are presented in Appendix B. The seismic refraction profiles are presented in Appendix C. Locations of the test pits and seismic profiles are presented on Plate 1 (Geotechnical Map).

REGIONAL GEOLOGY

The subject property is located within a prominent natural geomorphic province in southwestern California known as the Peninsular Ranges. It is characterized by steep, elongated ranges and valleys that trend northwestward. The site area is situated along the western border of the Perris block, an eroded mass of Cretaceous-age and older rocks.

The Santa Ana Mountains lie along the western side of the Elsinore fault zone, and the Perris Block is located along the eastern side of the fault zone. The mountain ranges are underlain by pre-Cretaceous metasedimentary and metavolcanic rocks and Cretaceous plutonic rocks of the southern California batholith. Tertiary sediments and volcanics, and Quaternary sediments flank the mountain ranges. The Tertiary and Quaternary rocks are generally comprised of nonmarine sediments consisting of sandstones, mudstones, conglomerates, and scattered volcanic rocks. These older rocks have been eroded, with the resulting detritus deposited as a series of coalescing alluvial fans, filling the valleys with younger drainages, in turn eroding and incising the valley alluvium.

GEOLOGIC UNITS

The geologic units encountered during our investigation within the project site consist of colluvium, alluvium, and Cretaceous-aged granitic rock. The approximate limits of the mappable units are presented on Plate 1. These units are described, from youngest to oldest, as follows:

Colluvium - (Map Symbol Qcol)

Colluvium was observed in our subsurface investigation mantling the granitic bedrock materials throughout the site. These materials were generally observed to range from 1½± to 7± feet in thickness. The colluvium varied from light brown to dark reddish brown, silty and clayey, fine- to coarse-grained sands and gravels. The materials were generally damp to moist and loose. These materials typically have a low expansion potential; however, some clayey materials may have a medium expansion potential. Due to the potentially compressible nature of these soils, they are considered unsuitable for support of structures and/or improvements in their existing state.

Alluvium - younger (Map Symbol - Qal)

Quaternary alluvial sediments were encountered within drainage channels in the northern portion of the site. The sediments generally were observed to be predominantly dark brown and yellowish brown, silty and clayey, fine- to coarse-grained sands and gravels. The alluvial sediments varied from damp to wet, and were generally loose and porous. Where encountered, these materials ranged from 1± to 5± feet in thickness. These sediments typically have a low expansion potential; however, some clayey materials in the site have a medium expansion potential. Due to the potentially compressible nature of these soils, they are considered unsuitable for support of structures and/or improvements in their existing state.

Cretaceous-Aged Granitics (Map Symbol - Kgr)

Cretaceous plutonic rocks (commonly called "granitics") underlie the site at various depths and at the surface. The granitic materials encountered in our test pits were generally moderately weathered. The plutonic rocks in this area have been documented as being of tonalitic and granodioritic in composition (Larsen, 1948). The granitics generally were observed to be damp to moist and dense to hard. Typically, these materials have a low expansive potential; however, weathered, near-surface materials may have a medium expansive potential.

Lineament Analysis

In order to identify possible unmapped faults, identify possible fissures, and to evaluate topographic expressions of published fault and lineament traces, a lineament analysis was performed. As indicated previously, stereoscopic "false-color" infrared photographs aerial photographs (United State Department of Agriculture, 1980) at a scale of approximately 1:40,000 were utilized in our lineament analysis.

Lineaments are classified according to their development as strong, moderate, or weak. A strong lineament is a well defined feature that can be continuously traced several hundred feet to a few thousand feet. A moderate lineament is less well defined, somewhat discontinuous, and can be traced for only a few hundred feet. A weak lineament is discontinuous, poorly defined, and can be traced for a few hundred feet or less. Several moderate lineaments were observed on the site associated with differential weathering between the granitic hills and colluvial drainage areas in the western portion of the site.

FAULTING AND REGIONAL SEISMICITY

The site is situated in an area of active as well as potentially-active faults. The nearby Elsinore and San Jacinto fault zones are considered active and are included within an Alquist-Priolo Earthquake Fault Zone.

Our review indicates that there are no known active faults crossing the site within the areas proposed for development. The site is not within an Alquist-Priolo Earthquake Fault Zone. During our review of aerial photographs (USDA, 1980), we did not observe photo lineaments likely associated with active faulting transecting the site. As stated above, several weak lineaments were observed on the site associated with water erosion and prior grading operations.

The following table lists the major faults and fault zones in southern California that could have a significant effect on the site should they experience activity.

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE MILES (KM)
Casa Loma (San Jacinto)	14 (23)
Chino	19 (31)
Cucamonga	36 (58)
Elsinore	7 (11)
Glen Helen-Lytle Creek-Claremont (San Jacinto)	16 (26)

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE MILES (KM)
Hot Springs-Buck Ridge (San Jacinto)	19 (30)
Newport-Inglewood-(North) and Offshore	34 (55)
San Andreas (S. Bernardino)	30 (49)
San Gorgonio-Banning	23 (36)
Whittier-North Elsinore	24 (39)

The acceleration-attenuation relations of Joyner and Boore (1982), Campbell and Bozorgnia (1994), and Sadigh et.al. (1989) have been incorporated into EQFAULT (Blake, 1989). For this study, peak horizontal ground accelerations anticipated at the site were determined based on the random mean and random mean plus 1 - sigma attenuation curves developed by Joyner and Boore (1982), Campbell and Bozorgnia (1994), and Sadigh et.al. (1989). These acceleration-attenuation relations have been incorporated in EQFAULT, a computer program by Thomas F. Blake (1989), which performs deterministic seismic hazard analyses using up to 150 digitized California faults as earthquake sources. The program estimates the closest distance between each fault and a user-specified file. If a fault is found to be within a user-selected radius, the program estimates peak horizontal ground acceleration that may occur at the site from the "maximum credible" and "maximum probable" earthquakes on that fault. Site acceleration (g) is computed by any of the 19 user-selected acceleration-attenuation relations that are contained in EQFAULT. Based on the above, peak horizontal ground accelerations from a maximum credible event may be on the order of 0.550 g to 0.765 g, and a maximum probable event may be on the order of 0.389 g to 0.475 g.

Historical site seismicity was evaluated with the acceleration-attenuation relations of Joyner and Boore (1982) and the computer program EQSEARCH (Blake, 1989, updated to 2000). This program performs a search of historical earthquake records for magnitude 5.0 to 9.0 seismic events within a 100 mile radius, between the years 1800 to 2000. Based on the selected acceleration-attenuation relationship, a peak horizontal ground acceleration is estimated, which may have effected the site during the specific event listed. Based on the available data and the attenuation relationship used, the estimated maximum (peak) site acceleration during the period 1800 to June, 1999 was 0.167g. In addition, site specific probability of exceeding various peak horizontal ground accelerations and a seismic recurrence curve are also estimated/generated from the historical data.

A probabilistic seismic hazards analysis was performed using FRISK89 (Blake, 1989) which models earthquake sources as lines and evaluates the site specific probabilities. Based on a review of these data, and considering the relative seismic activity of the southern California region, a repeatable horizontal ground acceleration of 0.193g was calculated.

This value was chosen as it corresponds to a 10 percent probability of exceedance in 50 years (or a 475 year return period).

The possibility of ground shaking at the site may be considered similar to the southern California region as a whole. The relationship of the site location to these major mapped faults is indicated on the Fault Map of Southern California (Figure 2).

Seismic Shaking Parameters

Based on the site conditions, Chapter 16 of the Uniform Building Code (International Conference of Building Officials, 1997) and Peterson and others (1996), the following seismic parameters are provided.

1997 UBC CHAPTER 16 TABLE NO.	CUT LOTS
16-I (Seismic Zone Safety Factor)	0.40
16-J (Soil Profile Types)	S_B
16-Q (Seismic Coefficient C_a)	$0.40N_a$
16-R (Seismic Coefficient C_v)	$0.40N_v$
16-S (Near-Source Factor N_a)	1.0
16-T (Near-Source Factor N_v)	1.0
16-U (Seismic Source Type)	B

SUBSURFACE WATER

No subsurface perched water was encountered in the excavations completed during this study. These observations reflect site conditions at the time of our investigation and do not preclude changes in local groundwater conditions in the future from dry periods, heavy irrigation, precipitation, or other factors not obvious at the time of our field work. Additional discussions of groundwater are presented within the conclusions section of this report.

LIQUEFACTION POTENTIAL

Liquefaction of cohesionless soils can be caused by a strong, vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils with a certain range of grain size distribution, saturated by a relatively shallow groundwater table are most susceptible to liquefaction.

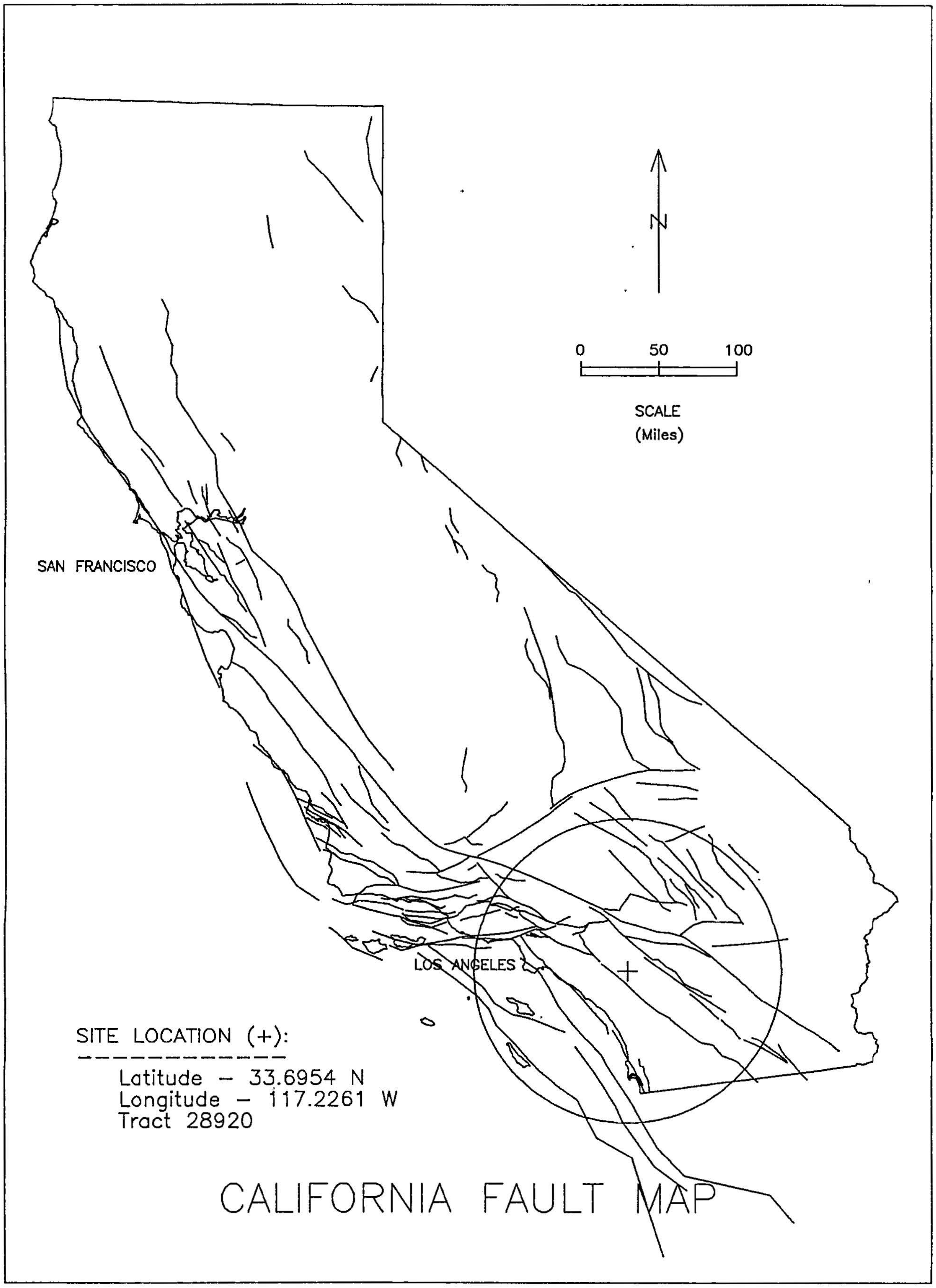

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Figure 2

In view of the relatively dense nature of the underlying granitic bedrock, and limited amounts of colluvial and younger alluvial deposits, which will be removed and replaced with properly compacted fill during grading operations, it is our opinion that the potential for liquefaction or seismically-induced dynamic settlement is nil to low at the site. Recommendations for the mitigation of the loose surficial soils are provided herein.

SUBSIDENCE

Our review of readily available data did not indicate that the site area is subsiding due to down-faulting along bordering fault zones, groundwater withdrawal, or hydroconsolidation. The scope of this potential for affecting the subject site is beyond the scope of this current study; however, areal subsidence in the site area is considered unlikely but may not be totally precluded. It should not be any greater at the site than for nearby and existing already developed properties.

OTHER GEOLOGIC HAZARDS

Mass wasting refers to the various processes by which earth materials are moved down slope in response to the force of gravity. Indications of deep-seated landsliding, slope creep, or significant surficial failures on the site were not observed during our site investigations.

LABORATORY TESTING

Classification

Soils were classified visually according to the Unified Soils Classification System. The soil classifications are shown on the test pit logs, Appendix B; and the laboratory test results are presented in Appendix E.

Moisture Density

The field moisture contents and dry unit weights were determined for undisturbed samples and by the nuclear densometer methods ASTM D-2922 and D-3017 for the soils encountered in the test pits. The dry unit weight was determined in pounds per cubic foot and the field moisture content was determined as a percentage of the dry unit weight. The results of these tests are shown on the boring logs (Appendix B).

Laboratory Standard

The maximum density and optimum moisture content was determined for the major soil type encountered in the test pits. The laboratory standard used was ASTM D-1557. The moisture-density relationship obtained for this soil is shown below:

SOIL TYPE (Map Unit)	LOCATION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
Silty SAND, brown (Qcol)	TP-2 @ 0-4'	128.0	9.5

Consolidation Testing

A consolidation test was performed on relatively undisturbed soil samples in general accordance with ASTM test method D-2435-90. The consolidation test results are presented in Appendix E.

Expansion Potential

Expansion index tests were performed on representative samples of site earth materials in general accordance with Table 18-I-B of the Uniform Building Code. Test results of 0 indicate that site soils are generally very low in expansive potential (EI from 0 to 50). Variations may occur, including soils exhibiting medium expansion potential (EI from 51 to 90), and additional expansion index test should be performed during future development to verify conditions.

Soluble Sulfates/Corrosion

Typical samples of the site materials were analyzed for soluble sulfates, pH, and resistivity. The soluble sulfate and corrosion potential results are shown as follows:

Location	Soluble Sulfates Percentage by Weight	pH	Resistivity (OHMS-CM)
TP-2 @ 0-4' (Qcol)	Non-Detected	5.2	2,700
TP-2 @ 4-6' (Kgr)	Non-Detected	8.1	4,800

For preliminary planning purposes, based upon the soluble sulfate test results and the latest edition of the Uniform Building Code, the soluble sulfate content is categorized as negligible (0.00-0.10 Water-Soluble Sulfate in Soil, Percentage by Weight) and sulfate-resistant concrete will not be necessary. Additionally, a modified cement to water ration and modified concrete compressive strength will not be necessary.

Based on the results of the resistivity and pH testing, the onsite soils are slightly acidic to moderately alkaline (pH 6.2 to 8.1) and are moderately corrosive toward ferrous metals (range 2,000 to 10,000 ohm-cm is considered moderately corrosive). For preliminary planning purposes, based on the laboratory test results, consideration should be given to consulting with a corrosion engineer to provide specific recommendations.

SLOPE STABILITY EVALUATION

Analyses was performed utilizing the two dimensional slope stability computer program "XSTABL." The program calculates the factor of safety for specified circles or searches for the circular, block, or irregular slip surface having the minimum factor of safety using the simplified Bishop Method, Janbu or general limit equilibrium (Spencer). Additional information regrading the methodology utilized in this program are included in Appendix F.

Utilizing data from our current study, on-going geotechnical studies in adjacent tracts, and the referenced tract map, a slope stability analysis was performed on the highest proposed fill slope (29± feet) in the tract. Laboratory data obtained from test pits in an adjacent tract were utilized for the current analysis, and are considered representative of the subject study area. The presence of adverse geologic structures should be further evaluated during rough grading so that mitigative measures can be provided, if warranted. Sampling of exposed materials to confirm anticipated soil parameters also should be performed during grading.

Computer print-outs of calculations and shear strength parameters used are provided in Appendix F.

Gross Stability Analysis

Based on the available data, the constraints outlined above, and our stability calculations shown in Appendix F, a calculated factor-of-safety greater than 1.5 or 1.15 has been obtained for the proposed fill slope, located in proposed Lot 147 (below proposed Lot 157), when analyzed from a static or pseudo-static (seismic) viewpoint, respectively. This assumes that the slope is designed and constructed as depicted on the tentative tract map, and in accordance with the GSI Grading Guidelines presented in Appendix G, and provided that they are constructed with soils that have strength parameters equal to or greater than those assumed in our analysis.

Surficial Slope Stability

The surficial stability of the proposed slope has been analyzed utilizing the shear strength parameters in Appendix F. Calculations shown in Appendix F indicate a static surficial safety factor greater than 1.5 for the proposed fill slope.

Wedge Failure Analysis

Based on the calculations in Appendix F , the proposed 1.5:1 (h:v) and 2:1 (h:v) cut slopes, proposed up to 58 feet high, have a very low potential for plane or wedge failure to occur. Our analyses did indicate that minor discontinuity intersections may exist if all the joint systems mapped by GSI in the area are continuous, which is very unlikely. It is our opinion that such discontinuities do not represent a significant hazard to development of proposed cut slopes within the tract. As previously recommended, and reiterate herein, close monitoring and inspection of all cut slopes will be required during grading to assess individual cut slopes to evaluate the presence or absence of adversely oriented bedrock structures (i.e., joints, foliation, fractures, etc.).

PRELIMINARY EARTHWORK FACTORS

Preliminary earthwork factors (shrinkage and bulking) for the subject property have been estimated based upon our field and laboratory testing, visual site observations, and experience in the site area. It is apparent that shrinking would vary with depth and with areal extent over the site based on previous site use. Variables include vegetation, weed control, discing, and previous filling or exploring. However, all these factors are difficult to define in a three-dimensional fashion.

Therefore, the information presented below represents average shrinkage/bulking values:

Colluvium	10-20% shrinkage
Alluvium	12-20% shrinkage
Granitic Bedrock	5% shrinkage to 5% bulking

An additional shrinkage factor item would include the removal of root systems of individual large plants or trees. These plants and trees vary in size but, when pulled, they may generally result in a loss of ½ to 1½ cubic yards, to locally greater than 1½ cubic yards of volume, respectively. This factor needs to be multiplied by the number of significant plants, trees, or tree roots present to determine the net loss.

The above facts indicate that earthwork balance for the site would be difficult to define and flexibility in design is essential to achieve a balanced end product.

ROCK HARDNESS EVALUATION

Five seismic refraction lines were conducted using a EG & G Geometrics 12-channel signal enhancement seismograph with a hammer/plate energy source. The approximate seismic line locations are shown on the enclosed Plate 1, and the velocity and depth interval results are summarized in Appendix C.

An evaluation was made of the seismic refraction line data to estimate the approximate depth to non-rippable trenching and to non-rippable bedrock. Approximate cut-off velocities of 3800± and 6000± fps were used as a basis for non-rippable trenching, and non-rippable bedrock, respectively.

Bedrock excavatability with respect to trenching shallower than the approximate 3800± fps cut-off depth is expected to vary from easy to very difficult, and the necessity for localized areas requiring blasting in the northern portion of the site, cannot be entirely precluded. Previous studies indicate our calculations should be considered conservative.

Similarly, bedrock rippability shallower than the approximate 6000± fps cut-off depth is expected to vary from easy to very difficult, and the necessity for localized areas requiring blasting in the northern portion of the site cannot be entirely precluded.

Variations should be expected. As such, bedrock excavations may generate oversize rock. The bulk of the materials derived from the weathered portion of the bedrock (up to and including the 3800-6000± fps cut-off) are anticipated to disintegrate to approximately 12 to 36 inch and smaller constituents. Any oversize materials generated would require special handling for use in fills, as outlined later in this report under "Rock Disposal."

Our interpretations of the seismic data are presented in Appendix C. The following discussion presents our findings regarding the rippability/rock hardness for the site. Other interpretations are possible.

Based upon our experience in this area, and the seismic refraction data obtained and reviewed, granitic bedrock throughout much of the site should be generally rippable (i.e., seismic velocities of less than about 6000 ft/sec) to depths of proposed cuts. There are localized areas, however, which may potentially require very difficult ripping to possible blasting in areas where cut depths in excess of 1± feet as indicated by the tentative tract map (CSL, 1999) in the northern portion of the property (i.e., Lots 173 to 178).

Seismic velocities at/near or exceeding 3800 fps generally occur at depths ranging from 2± to 8± feet. Using the 3800 fps cut-off for non-rippable trenching, it is likely that very difficult ripping to possible blasting (e.g., "line-shooting") may be necessary for trenching of utilities in the areas of Lots 17 and 139 through 180. As an alternate to blasting for utilities, consideration should be given to overexcavation of the street areas during rough grading to facilitate utility line trenching. Such overexcavation should be performed to a depth of about 1 foot below the lowest utility invert.

CONCLUSIONS AND RECOMMENDATIONS

Based on our field exploration, laboratory testing, and our engineering and geologic analyses, it is our opinion that the project site appears suited for the proposed use from a soils engineering and geologic viewpoint. The recommendations presented below should be incorporated in the design, grading, and construction considerations.

General

1. Soils engineering and compaction testing services should be provided during grading operations to assist the contractor in removing unsuitable soils and in his effort to compact the fill.

2. Geologic observations should be performed during grading to verify and/or further evaluate geologic conditions. Although unlikely, if adverse geologic structures are encountered, supplemental recommendations and earthwork may be warranted.

3. In general and based upon the available data to date, groundwater is not expected to be a major factor in development of the site. However, due to the nature of the site materials, seepage may be encountered throughout the site along with seasonal perched water within any drainage areas. In addition, seepage may be encountered in "daylighted" joint systems within the bedrock. Thus, subdrain systems are recommended within canyon areas, where filled. In addition, subdrainage systems for the control of localized groundwater seepage should be anticipated. Preliminary subdrain locations can be provided by GSI when grading plans become available.

4. Based upon our field explorations bedrock throughout the site should be rippable to the proposed depths. It cannot be precluded there are areas within the site which may potentially require very difficult ripping to possibly blasting (i.e., northen end of property).

5. Due to the noncohesive nature of some of the onsite materials, some caving and sloughing may be anticipated to be a factor in subsurface excavations and trenching. Therefore, current local and state/federal safety ordinances for subsurface trenching should be enforced.

6. General Earthwork and Grading Guidelines are provided at the end of this report as Appendix G. Specific recommendations are provided below.

Demolition/Grubbing

1. Any existing surficial/subsurface structures, major vegetation, tree remains, and any miscellaneous debris should be removed from the areas of proposed grading.

2. The project soils engineer should be notified of any previous foundation, irrigation lines, cesspools, septic tanks, leach fields, or other subsurface structures that are uncovered during the recommended removals, so that appropriate remedial recommendations can be provided.

3. Cavities or loose soils (including all previous exploratory test pits) remaining after demolition and site clearance should be cleaned out, observed by the soils engineer, processed, and replaced with fill that has been moisture conditioned to at least optimum moisture content and compacted to at least 90 percent of the laboratory standard.

Treatment of Existing Ground

1. All colluvium deposits and alluvium should be removed to competent bedrock, moisture conditioned, and recompacted if not removed by proposed excavation within areas proposed for settlement-sensitive improvements. Weathered bedrock should be removed to competent bedrock, moisture conditioned, and recompacted. Thicknesses of colluvium deposits are discussed in earlier sections of this report. Variations from the previously discussed remedial removal thicknesses ($\pm 1\frac{1}{2}$ to ± 8 feet) should be anticipated. Actual depths of removals will be evaluated in the field during grading by the soil engineer.

2. Subsequent to the above removals, the upper 12 inches of the exposed bedrock should be scarified, brought to at least optimum moisture content, and recompacted to a minimum relative compaction of 90 percent of the laboratory standard.

3. Existing, colluvium, alluvium, weathered bedrock, etc., may be reused as compacted fill provided that major concentrations of vegetation and miscellaneous debris are removed prior to or during fill placement.

4. Localized deeper removal may be necessary due to buried drainage channel meanders or dry porous materials. The project soils engineer/geologist should observe all removal areas during the grading.

Fill Placement

1. Fill materials should be brought to at least optimum moisture, placed in thin 6- to 8-inch lifts and mechanically compacted to obtain a minimum relative compaction of 90 percent of the laboratory standard.

2. Fill materials should be cleansed of major vegetation and debris prior to placement.

3. Any oversized rock materials greater than 12 inches in diameter should be placed under the observation of the soils engineer.

4. Any import materials should be observed and determined suitable by the soils engineer prior to placement on the site. Foundation designs may be altered if import materials have a greater expansion value than the onsite materials encountered in this investigation.

Slope Considerations and Slope Design

Based on our experience on adjacent projects, proposed cut and fill slopes constructed using onsite materials, to the heights proposed, should be grossly and surficially stable provided the recommendations contained herein are implemented during site development.

All slopes should be designed and constructed in accordance with the minimum requirements of the County of Riverside, the recommendations in the General Earthwork and Grading Guidelines section of this report (Appendix G), and the following:

1. Fill slopes should be designed and constructed at a 2:1 (horizontal to vertical) gradient or flatter and should not exceed 30 feet in height. Fill slopes should be properly built and compacted to a minimum relative compaction of 90 percent throughout, including the slope surfaces. Guidelines for slope construction are presented in Appendix G.

2. Cut slopes should be designed at gradients of 1.5:1 (horizontal to vertical) or flatter and should not exceed 60 feet in height. While stabilization of such slopes is not anticipated, locally adverse geologic conditions (i.e., daylighted joints/fractures or severely weathered bedrock) may be encountered which may require remedial grading or laying back of the slope to an angle flatter than the adverse geologic condition.

3. Local areas of highly to severely weathered bedrock may be present. Should these materials be exposed in cut slopes, the potential for long term maintenance or possible slope failure exists. Evaluation of cut slopes during grading would be necessary in order to identify any areas of severely weathered rock or non-cohesive

sands. Should any of these materials be exposed during construction, the soils engineer/geologist, would assess the magnitude and extent of the materials and their potential affect on long-term maintenance or possible slope failures. Recommendations would then be made at the time of the field inspection.

4. Loose rock debris and fines remaining on the face of the cut slopes should be removed during grading. This can be accomplished by high pressure water washing or by hand scaling, as warranted.

5. Where loose materials are exposed on the cut slopes, the project's engineering geologist would require that the slope be cleaned as described above prior to making their final inspection. Final approval of the cut slope can only be made subsequent to the slope being fully cut and cleaned.

Transition and Overexcavation Areas

In order to reduce the potential for differential settlements between cut and fill materials, materials of differing expansion potentials, or dense bedrock, the entire cut portion of cut/fill transitions should be overexcavated to a minimum depth of 3 feet below finish grade and replaced with compacted fill. In addition, if hard rock is exposed during grading in cut pads, as well as in street areas, consideration should be given overexcavating the pads and streets (to 1±foot below lowest invert) in order to facilitate foundation and utility trenching. For rock hardness (not transitions), this is not a geotechnical requirement, however.

ROCK PLACEMENT GUIDELINES

Rock Disposal

We anticipate that import soils to be utilized as fill material for the subject tracts may contain rock. Appropriately, the need for rock disposal may be necessary during grading operations on the site. Generally for the purpose of this report, the materials may be described as either 12 inches or less, greater than 12 and less than 36 inches, and greater than 36 inches. These three categories set the basic dimensions for where and how the materials are to be placed.

Materials 12 Inches in Diameter or Less

Since imported rock fragments along with the overburden materials are anticipated to be a part of the materials used in the grading of the site, a criteria is needed to facilitate the placement of these materials within guidelines which would be workable during the rough grading, post-grading improvements, and serve as acceptable compacted fill.

1. Fines and rock fragments 12 inches or less in diameter may be placed as compacted fill cap materials within the building pads, slopes, and street areas as described below. The rock fragments and fines should be brought to at least optimum moisture content and compacted to a minimum relative compaction of 90 percent of the laboratory standard.

2. The purpose for the 12-inch-diameter limits is to allow reasonable sized rock fragments into the fill under selected conditions (optimum moisture or above) surrounded with compacted fines. The 12-inch-diameter size also allows a greater volume of the rock fragments to be handled during grading, while staying in reasonable limits for later onsite excavation equipment (backhoes and trenchers) to excavate footings and utility lines.

3. Fill materials 12 inches or less in diameter should be placed, but not limited to, within the upper 5 feet of proposed fill pads, the upper 3 feet of overexcavated cut areas of cut fill transition pads, and the entire street right-of-way width, including the proposed overexcavated areas and replacement fill areas, from the depth of the lowest utility to subgrade. Overexcavation is discussed later in this report.

Materials Greater Than 12 and Less Than 36 Inches in Diameter

1. During the process of bedrock excavation, a significant amount of rock fragments or constituents larger than 12 inches in diameter may be generated. These significant amounts of oversized materials between greater than 12 and less than 36 inches in diameter may be incorporated into the fills utilizing a series of rock blankets.

2. Each rock blanket should consist of rock fragments of approximately greater than 12 and less than 36 inches in diameter along with fines generated from the proposed cuts and overburden materials from removal areas. The blankets should be limited to 24 to 36 inches in thickness and should be placed with granular fines which are flooded into and around the rock fragments.

3. Rock blankets should be restricted to areas which are at least 1 foot below the lowest utility invert within the street right-of-way, 5 feet below finish grade on the proposed fill lots, and a minimum of 15 horizontal feet from any fill slope surface.

4. Compaction may be achieved by utilizing wheel rolling methods with scrapers and water trucks, track-walking by bulldozers, and sheepsfoot tampers.

5. Each rock blanket should be completed with its surface compacted prior to placement of any subsequent rock blanket or rock windrow.

Materials Greater Than 36 Inches in Diameter

1. Oversize rock greater than 36 inches in diameter should be placed in single rock windrows. The windrows should be at least 15 feet or an equipment width apart, whichever is greatest.

2. The void spaces between rocks in windrows should be filled with the more granular soils by flooding them into place.

3. A minimum vertical distance of 3 feet between soil fill and rock lift should be maintained. Also, the windrows should be staggered from lift to lift. Rock windrows should not be placed closer than 15 feet from the face of fill slopes.

4. Larger rocks too difficult to be placed into windrows may be individually placed into a dozer trench. Each trench should be excavated into the compacted fill or dense natural ground a minimum of 1 foot deeper than the size of the rock to be buried. After the rocks are placed in the trench (not immediately adjacent to each other), granular fill material should be flooded into the trench to fill the voids.

5. The oversize rock trenches should be no closer together than 15 feet at a particular elevation and at least 15 feet from any slope face. Trenches at higher elevations should be staggered and there should be 4 feet of compacted fill between the top of one trench and the bottom of the next higher trench. Placement of rock into these trenches should be under the full-time inspection of the soils engineer.

6. Consideration should be given to using oversize materials in open space "green belt" areas that would be designated as non-structural fills.

RECOMMENDATIONS - FOUNDATIONS

General

The foundation design and construction recommendations are based on laboratory testing and engineering analysis of onsite earth materials by GSI. Recommendations for conventional foundation systems are provided in the following sections. The foundation systems may be used to support the proposed structures, provided they are founded in competent bearing material. The proposed foundation systems should be designed and constructed in accordance with the guidelines contained in the Uniform Building Code.

Conventional Foundation Design

1. Conventional spread and continuous footings may be used to support the proposed residential structures provided they are founded entirely in properly compacted fill or other competent bearing material.

2. Analyses indicate that an allowable bearing value of 1,500 pounds per square foot may be used for design of footings which maintain a minimum width of 12 inches (continuous) and 24 inches square (isolated), and a minimum depth of at least 12 inches into the properly compacted fill or bedrock. The bearing value may be increased by ⅓ for seismic or other temporary loads. This value may be increased by 200 pounds per square foot for each additional 12 inches in depth and by 100 pounds per square foot for each additional 12 inches in width, to a maximum of 2,500 pounds per square foot.

3. For lateral sliding resistance, a 0.4 coefficient of friction may be utilized for a concrete to soil contact when multiplied by the dead load.

4. Passive earth pressure may be computed as an equivalent fluid having a density of 250 pounds per cubic foot with a maximum earth pressure of 2,500 pounds per square foot.

5. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

6. All footings should maintain a minimum 7-foot horizontal distance between the base of the footing and any adjacent descending slope, and minimally comply with the guidelines depicted on Figure No. 18-I-1 of the UBC (current edition).

Construction

The following foundation construction recommendations are presented as a minimum criteria from a soils engineering viewpoint. The onsite soils expansion potentials are generally in the very low to low range (expansion index 0 to 50), however soils with medium expansion potentials (expansion index 51 to 90) should not be precluded.

Accordingly, the following foundation construction recommendations assume that the soils in the top 3 feet from finish grade will have a very low to low expansion potential, with the possibility of occasional medium expansion potential. Recommendations by the project's design-structural engineer or architect, which may exceed the soils engineer's recommendations, should take precedence over the following minimum requirements. Final foundation design will be provided based on the expansion potential of the near surface soils encountered during grading.

Very Low to Low Expansive Soils (Expansion Index 0 to 50)

1. Exterior and interior footings should be founded at minimum depths of 12 and 18 inches, for one and two story floor loads, respectively, below the lowest adjacent surface. All footings should be reinforced with two No. 4 reinforcing bars, one placed near the top and one placed near the bottom of the footing.

2. A grade beam, reinforced as above, and at least 12 inches wide should be provided across large entrances. The base of the grade beam should be at the same elevation as the bottom of adjoining footings.

3. Concrete slabs should be underlain by a minimum of 2-inches of sand. Where moisture condensation is undesirable, concrete slabs should be underlain with a vapor barrier consisting of a minimum 6-mil, polyvinyl-chloride or equivalent membrane, with all laps sealed. This membrane should be placed on acceptable pad grade materials and the 2-inch thickness of sand placed over the visqueen to aid in uniform curing of the concrete. If proven by testing (i.e., sand equivalent greater than 30 and less than ¼ inch in any dimension), some of the native sands could be utilized over the visqueen.

4. Concrete slabs, including garage slabs, should be minimally reinforced with 6" x 6"-W1.4 x W1.4 welded wire mesh or No. 3 reinforcement bars placed on 18-inch centers, each way. All slab reinforcement should be supported and positioned near the vertical midpoint of the slab. "Hooking" of reinforcement is not an acceptable method of positioning.

5. Garage slabs should be poured separately from the adjacent footings and be quartered with expansion joints or saw cuts. A positive separation from the footings should be maintained with expansion joint material to permit relative movement.

6. Premoistening is recommended for these soil conditions, with the moisture content of the subgrade soils equal to or greater than the optimum moisture content to a depth of 12 and 18 inches, for one and two story floor loads, respectively, prior to pouring slabs and prior to placing visqueen or reinforcement.

Medium Expansive Soils (Expansion Index 51 to 90)

1. Exterior footings should be founded at a minimum depth of 18 inches below the lowest adjacent ground surface. Interior footings should have a minimum embedment of 18 inches below the top of the lowest adjacent concrete slab surface; however, a minimum penetration of 12 inches into the soil is required. All footings should be reinforced with a minimum of two No. 4 reinforcing bars one placed near the top and one placed near the bottom of the footing. Exterior posts

should be founded at a minimum depth of 24 inches and tied to the main foundation system using grade beams.

2. A grade beam, reinforced as above and at least 12 inches wide, should be utilized across all large (e.g. garage) entrances. The base of the grade beam should be at the same elevation as the bottom of the adjoining footings.

3. Concrete slabs should be underlain by a minimum of 2-inches of sand. Where moisture condensation is undesirable, concrete slabs should be underlain with a vapor barrier consisting of a minimum 6-mil, polyvinyl-chloride or equivalent membrane, with all laps sealed. This membrane could be placed on the sand an a 2-inch thickness of sand should be placed over the visqueen to aid in uniform curing of the concrete (a total of 4 inches of sand). If proven by testing (i.e., sand equivalent greater than 30 and less than ¼ inch in any dimension), some of the native sands could be utilized over the visqueen.

4. Concrete slabs, should be minimally reinforced with 6" x 6"-W2.9 x W2.9 welded-wire mesh or No. 3 reinforcement bars placed on 18 inch centers, each way. All slab reinforcement should be supported to ensure placement near the vertical midpoint of the concrete. "Hooking" the reinforcement in not considered an acceptable method of positioning the steel.

5. Garage slabs should be poured separately from the adjacent footings and be quartered with expansion joints or saw cuts. A positive separation from the footings should be maintained with expansion joint material to permit relative movement.

6. Presaturation is recommended for these soil conditions. The moisture condition of each slab area should be equal to or greater than 120 percent of the optimum moisture content to a depth of 18 inches below slab grade. Prior to placing visqueen or reinforcement, soil presaturation should be verified by this office within 72 hours of pouring slabs.

Retaining Walls

The design parameters provided below assume that very low expansive soils (clean sand or class 2 base) are used to backfill any retaining walls. If expansive soils are used to backfill the proposed walls, increased active and at-rest earth pressures will need to be utilized for retaining wall design.

Building walls, below grade, should be water-proofed or damp-proofed, depending on the degree of moisture protection desired. The foundation system for the proposed retaining walls should be designed in accordance with the recommendations presented in Conventional Foundation Design section of this report.

Restrained Walls

Any proposed retaining walls that will be restrained prior to placing and compacting backfill material or that have re-entrant or male corners, should be designed for an at-rest equivalent fluid pressure of 65 pcf, plus any applicable surcharge loading. For areas of male or re-entrant corners, the restrained wall design should extend a minimum distance of twice the height of the wall laterally from the corner.

Cantilevered Walls

The recommendations presented below are for proposed cantilevered retaining walls up to 15 feet high. Active earth pressure may be used for retaining wall design, provided the top of the wall is not restrained from minor deflections. An equivalent fluid pressure approach may be used to compute the horizontal pressure against the wall. Appropriate fluid unit weights are given below for specific slope gradients of the retained material. These do not include other superimposed loading conditions such as traffic, structures, seismic events or adverse geologic conditions.

SURFACE SLOPE OF RETAINED MATERIAL HORIZONTAL TO VERTICAL	EQUIVALENT FLUID WEIGHT P.C.F.
Level	35
2 to 1	55

Wall Backfill and Drainage

All proposed retaining walls should be provided with an adequate backdrain and outlet system (a minimum two outlets per wall), to prevent buildup of hydrostatic pressures and be designed in accordance with minimum standards presented herein. Gravel used in the backdrain systems should be a minimum of 1 cubic foot per lineal foot of ⅜- to 1½inch clean crushed rock wrapped in filter fabric (Mirafi 140 or equivalent). The surface of the backfill should be sealed by pavement or the top 18 inches compacted to 90 percent relative compaction with native soil. Proper surface drainage should also be provided. Where the walls are less than or equal to 3 feet in height, in lieu of a specific backdrain system, it is recommended that mortar be omitted from the head joints of the first course of blocks. Granular native materials may be used as backfill.

Transition Conditions - Retaining Walls

Should any proposed retaining walls be situated upon cut-fill transitions, two options may be employed: 1) Increase the amount of reinforcing steel and wall detailing (i.e., expansion joints or crack control joints) such that an angular distortion of 1/360 for a distance of 2H on either side of the transition is accommodated, or; 2) overexcavate the cut portion of the foundation materials to a minimum depth of 3 feet and replace with fill compacted to 90 percent relative compaction.

DEVELOPMENT CRITERIA

Graded Slope Maintenance and Planting

Water has been shown to weaken the inherent strength of all earth materials. Slope stability is significantly reduced by overly wet conditions. Positive surface drainage away from graded slopes should be maintained and only the amount of irrigation necessary to sustain plant life should be provided for planted slopes. Over watering should be avoided as it can adversely affect site improvements. Graded slopes constructed within and utilizing onsite materials would be erosive. Eroded debris may be minimized and surficial slope stability enhanced by establishing and maintaining a suitable vegetation cover soon after construction.

Compaction to the face of fill slopes would tend to minimize short-term erosion until vegetation is established. Plants selected for landscaping should be light weight, deep rooted types that require little water and are capable of surviving the prevailing climate. From a geotechnical standpoint leaching is not recommended for establishing landscaping. If the surface soils are processed for the purpose of adding amendments they should be recompacted to 90 percent minimum relative compaction.

Drainage

Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope. Water should be directed away from foundations and not allowed to pond and/or seep into the ground. Pad drainage should be directed toward the street or other approved area. Roof gutters and down spouts should be considered to control roof drainage. Down spouts should outlet a minimum of 5 feet from proposed structures or into a subsurface drainage system. Areas of seepage may develop due to irrigation or heavy rainfall. Minimizing irrigation will lessen this potential. If areas of seepage develop, recommendations for minimizing this effect could be provided upon request.

Site Improvements

Recommendations for exterior concrete flatwork design and construction can be provided upon request. If in the future, any additional improvements are planned for the site, recommendations concerning the geological or geotechnical aspects of design and construction of said improvements could be provided upon request. This office should be notified in advance of any additional fill placement, regrading of the site, or trench backfilling after rough grading has been completed. This includes any grading, utility trench and retaining wall backfills.

Trenching

Considering the nature of the onsite soils, it should be anticipated that caving or sloughing could be a factor in subsurface excavations and trenching. Shoring or excavating the trench walls at the angle of repose (typically 25 to 45 degrees) may be necessary and should be anticipated. All excavations should be observed by one of our representatives and minimally conform to CAL-OSHA and local safety codes.

Footing Trench Excavation

All footing excavations should be observed by a representative of this firm subsequent to trenching and prior to concrete form and reinforcement placement. The purpose of the observations is to verify that the excavations are made into the recommended bearing material and to the minimum widths and depths recommended for construction. If loose or compressible materials are exposed within the footing excavation, a deeper footing or removal and recompaction of the subgrade materials would be recommended at that time. Footing trench spoil and any excess soils generated from utility trench excavations should be compacted to a minimum relative compaction of 90 percent if not removed from the site.

Utility Trench Backfill

1. All interior utility trench backfill should be brought to at least two percent above optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of the laboratory standard. As an alternative for shallow (12 inch to 18 inch) under-slab trenches, sand having a sand equivalent value of 30 or greater may be utilized and jetted or flooded into place. Observation, probing and testing should be provided to verify the desired results.

2. Exterior trenches adjacent to, and within areas extending below a 1:1 plane projected from the outside bottom edge of the footing, and all trenches beneath hardscape features and in slopes, should be compacted to at least 90 percent of the laboratory standard. Sand backfill, unless excavated from the trench, should

not be used in these backfill areas. Compaction testing and observations, along with probing, should be accomplished to verify the desired results.

3. All trench excavations should conform to CAL-OSHA and local safety codes.

Appurtenant Structures

Plans for construction of any proposed appurtenant structures such as pool, retaining walls, spas, gazebos, decks, etc. should be reviewed by a soils engineer/geologist.

Hard granitic bedrock can be expected at various depths below the existing compacted fills. Extreme excavation difficulties below the fills should be anticipated.

PLAN REVIEW

Final grading plans as well as foundation and improvement plans should be submitted to this office for review and comment, as they become available, to minimize any misunderstandings between the plans and recommendations presented herein. In addition, foundation excavations and earthwork construction performed on the site should be observed and tested by this office. If conditions are found to differ substantially from those stated, appropriate recommendations would be offered at that time.

INVESTIGATION LIMITATIONS

The materials encountered on the project site and utilized in our laboratory are believed representative of the total area; however, soil materials may vary in characteristics between test pits. Inasmuch as our investigation is based upon previous studies, the site materials observed, selective laboratory testing, and engineering analyses, the recommendations are professional opinions. It is possible that variations in the soil conditions could exist beyond the points explored in this investigation. Also, changes in groundwater conditions could occur at some time in the near future due to variations in temperature, regional rainfall, and other factors.

These opinions have been derived in accordance with current standards of practice, and no warranty is expressed or implied. Standards of practice are subject to change with time. GSI assumes no responsibility or liability for work or testing performed by others. In addition, this report may be subject to review by the controlling authorities.

APPENDIX A

REFERENCES

APPENDIX A

REFERENCES

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APPENDIX B

TEST PIT LOGS

GeoSoils, Inc.

W.O. 2836-A-SC
New West Properties
March 2000
Tract 28920

LOG OF EXPLORATORY TEST PITS

TEST PIT NO.	DEPTH (ft.)	GROUP SYMBOL	SAMPLE DEPTH (ft.)	MOISTURE (%)	FIELD DRY DENSITY (pcf)	DESCRIPTION
TP-1	0-1.5	SM				**COLLUVIUM:** SILTY SAND, dark brown, moist, loose; fine to coarse, gravel and cobble metamorphic clasts.
	1.5-4					**GRANITICS:** TONALITE, , dark grey and black, damp, hard; fine to course.
						Joint: N85W 81S 1' Spacing Joint: N40E 50N no Spacing Joint: N25W 59N 1" Spacing
						Total Depth = 5' No groundwater encountered Backfilled 03-00
TP-2	0-4	SM	0-4 Bulk			**COLLUVIUM:** SILTY SAND, light brown, damp, loose; fine to coarse, minor gravel
	4-6		4-6 Bulk			**GRANITICS:** GRANODIORITE, dark yellowish brown, damp, very dense; fine to coarse.
						Total Depth = 6' No groundwater encountered Backfilled 03-00

GeoSoils, Inc.

W.O. 2836-A-SC
New West Properties
March 2000
Tract 28920

LOG OF EXPLORATORY TEST PITS

TEST PIT NO.	DEPTH (ft.)	GROUP SYMBOL	SAMPLE DEPTH (ft.)	MOISTURE (%)	FIELD DRY DENSITY (pcf)	DESCRIPTION
TP-3	0-7	SM	1-N 3-N 5-N	15.9 10.3 11.1	104.6 86.9 95.2	**COLLUVIUM:** SILTY SAND, reddish brown, moist, loose; fine to coarse, occasional pebbles.
	7-8					**GRANITICS:** GRANODIORITE, medium brown, moist, dense; fine to coarse.
						Total Depth = 8' No groundwater encountered Backfilled 03-00
TP-4	0-5	SM				**COLLUVIUM:** SILTY SAND, dark brown, moist, loose; fine to coarse.
	5-6					**GRANITICS:** GRANODIORITE, yellowish brown, moist, dense; fine to coarse.
						Total Depth =6' No groundwater encountered Backfilled 03-00

GeoSoils, Inc.

W.O. 2836-A-SC
New West Properties
March 2000
Tract 28920

LOG OF EXPLORATORY TEST PITS

TEST PIT NO.	DEPTH (ft.)	GROUP SYMBOL	SAMPLE DEPTH (ft.)	MOISTURE (%)	FIELD DRY DENSITY (pcf)	DESCRIPTION
TP-5	0-5.5	SM	3-Ring 0-5.5 Bulk			**COLLUVIUM:** SILTY SAND, reddish brown, moist, loose; fine to coarse, moderate gravel to cobble metamorphic clasts.
	5.5-6.5					**GRANITICS:** GRANODIORITE, yellowish brown, damp, dense to very dense; fine to coarse.
						Total Depth = 6.5' No groundwater encountered Backfilled 03-00
TP-6	0-2	SC				**COLLUVIUM:** CLAYEY SAND, dark reddish brown, moist, loose; fine to coarse, gravel to cobble metamorphic fragments.
	2-4					**GRANITICS:** GRANODIORITE, yellowish brown, damp, dense to very dense; fine to coarse
						Joint: N85W 71N 1' Spacing Joint: N38E 58N no Spacing Joint: N30E 61S 6" Spacing
						Total Depth = 4' No groundwater encountered Backfilled 03-00

W.O. 2836-A-SC
New West Properties
March 2000
Tract 28920

LOG OF EXPLORATORY TEST PITS

TEST PIT NO.	DEPTH (ft.)	GROUP SYMBOL	SAMPLE DEPTH (ft.)	MOISTURE (%)	FIELD DRY DENSITY (pcf)	DESCRIPTION
TP-7	0-3	SM/SC	0-3 Bulk			**COLLUVIUM:** SILTY/CLAYEY SAND, dark reddish brown, moist, loose; fine to coarse, abundant gravel, occasional cobble metamorphic clasts.
	3-4					**GRANITICS:** GRANODIORITE, light yellowish brown, damp, hard; fine to coarse.
						Refusal @ 4' No groundwater encountered Backfilled 03-00
TP-8	0-1	SM				**COLLUVIUM:** SILTY SAND, dark brown, moist, loose; fine to coarse, abundant gravel to cobble metamorphic clasts.
	1-5	GM				**ALLUVIUM - YOUNGER:** SILTY/SANDY GRAVEL, dark brown, moist, loose matrix; fine to coarse.
	5-6					**GRANITICS:** GRANODIORITE, light grayish brown, damp, dense; fine to coarse.
						Total Depth = 6' No groundwater encountered Backfilled 03-00

APPENDIX C

ROCK HARDNESS EVALUATION

SL-1
CALCULATIONS

1st Layer (T_1) = $R_1 \times D_1$	Where:	R1 =	Velocity (fps) Ratio Factor (V2:V1)
		D1 =	Critical Distance
2nd Layer (T_2) = $R_2 \times (D_2 - (C_1 \times T_1))$	Where:	R2 =	Velocity (fps) Ratio Factor (V3:V2)
		D2 =	Critical Distance
		C1 =	Distance Correction Value (V3:V1)
3rd Layer (T_3) = $R_3 \times (D_3 - (C_1 \times T_1)+(C_2 \times T_2))$	Where:	R3 =	Velocity (fps) Ratio Factor (V4:V3)
		D3 =	Critical Distance
		C1 =	Distance Correction Value (V4:V1)
		C2 =	Distance Correction Value (V4:V2)
4th Layer (T_4) = $R_4 \times (D_4 - (C_1 \times T_1)+(C_2 \times T_2)+(C_3 \times T_3))$	Where:	R4 =	Velocity (fps) Ratio Factor (V5:V4)
		D4 =	Critical Distance
		C1 =	Distance Correction Value (V5:V1)
		C2 =	Distance Correction Value (V5:V2)
		C3 =	Distance Correction Value (V5:V3)

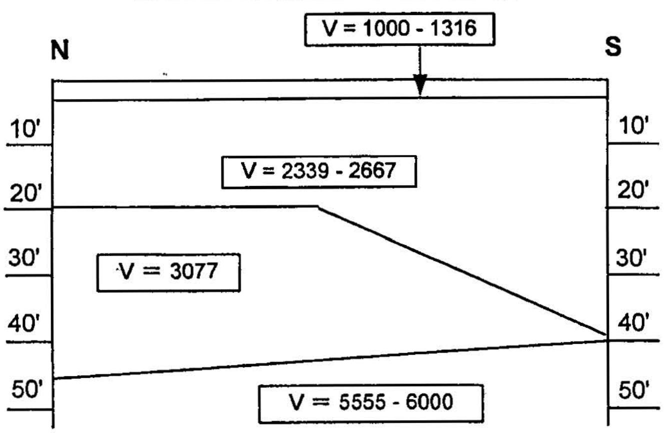
Seismic Velocity/Depth Summary

NE	SW
Depth (ft)	**Velocity (fps)**
0 - 1.8	1316
1.8 - 19.9	2239
19.9 - 45.4	3077
45.4 - ####	5555
#### - +	0 +

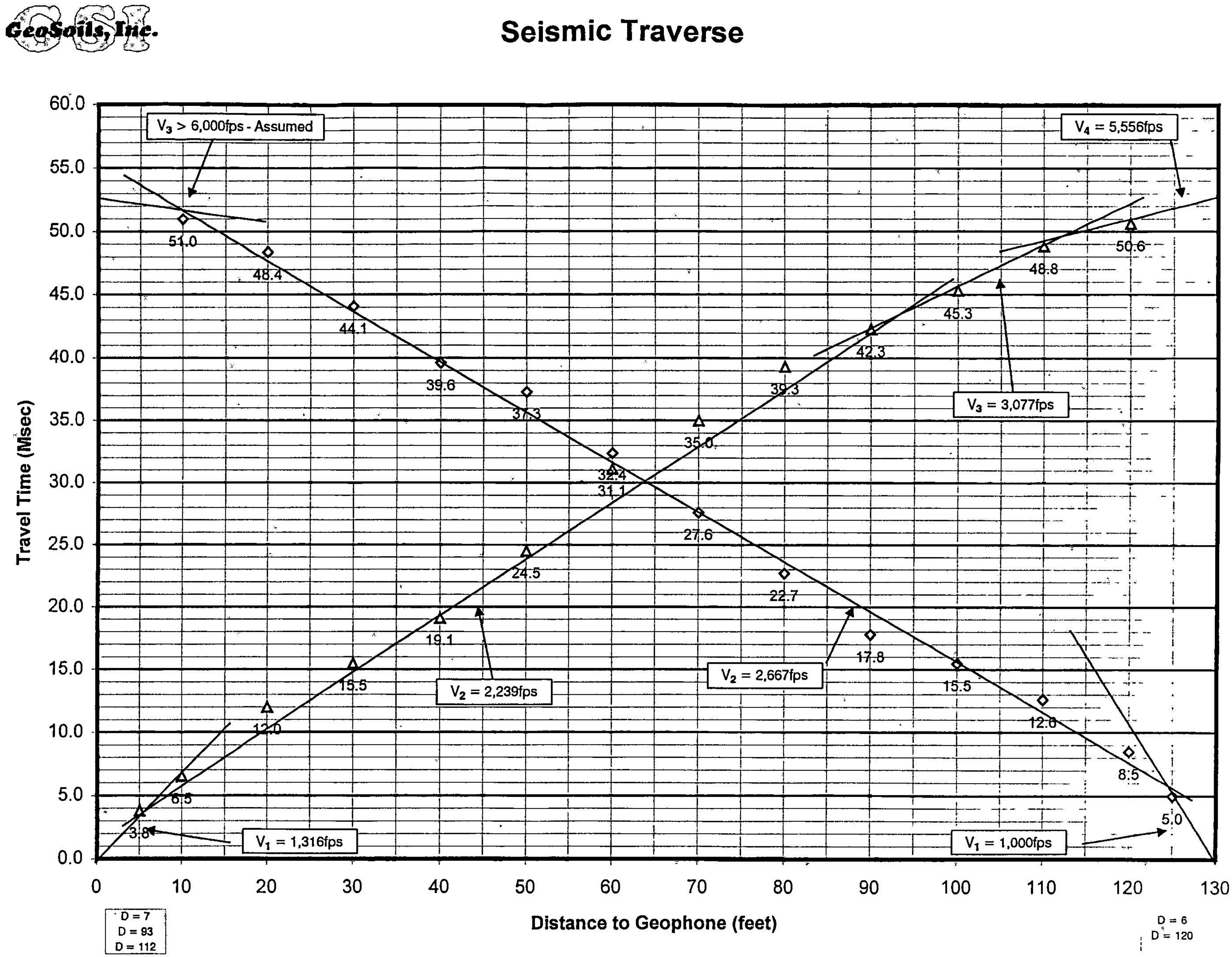
SW	NE
Depth (ft)	**Velocity (fps)**
0 - 2.0	1000
2.0 - 39.0	2667
39.0 - ####	6000
#### - ####	0
#### - +	0 +

V1 = Seismic Velocity (fps) of 1st Layer
V2 = Seismic Velocity (fps) of 2nd Layer
V3 = Seismic Velocity (fps) of 3rd Layer
V4 = Seismic Velocity (fps) of 4th Layer

	SL-1	
	NE-SW	SW-NE
D	7	6
D2	93	120
D3	112	
D4		
V1	1316	1000
V2	2239	2667
V3	3077	6000
V4	5555	
V5		
T1	1.78	2.02
T2	18.13	37.00
T3	25.49	#####
T4	#####	#####
T1+T2	19.91	39.02
T1+T2+T3	45.40	#####
T1+T2+T3+T4	#####	#####



SCHEMATIC CROSS SECTION



NE

SW

Traverse Date: 3/29/00

Orientation: N 50 E

Traverse No.: SL-1

W.O. 2836-A-SC

Plate C-1a

SL-2
CALCULATIONS

1st Layer (T_1) = $R_1 \times D_1$	Where:	R1 = Velocity (fps) Ratio Factor (V2:V1) D1 = Critical Distance
2nd Layer (T_2) = $R_2 \times (D_2 - (C_1 \times T_1))$	Where:	R2 = Velocity (fps) Ratio Factor (V3:V2) D2 = Critical Distance C1 = Distance Correction Value (V3:V1)
3rd Layer (T_3) = $R_3 \times (D_3 - (C_1 \times T_1)+(C_2 \times T_2))$	Where:	R3 = Velocity (fps) Ratio Factor (V4:V3) D3 = Critical Distance C1 = Distance Correction Value (V4:V1) C2 = Distance Correction Value (V4:V2)
4th Layer (T_4) = $R_4 \times (D_4 - (C_1 \times T_1)+(C_2 \times T_2)+(C_3 \times T_3))$	Where:	R4 = Velocity (fps) Ratio Factor (V5:V4) D4 = Critical Distance C1 = Distance Correction Value (V5:V1) C2 = Distance Correction Value (V5:V2) C3 = Distance Correction Value (V5:V3)

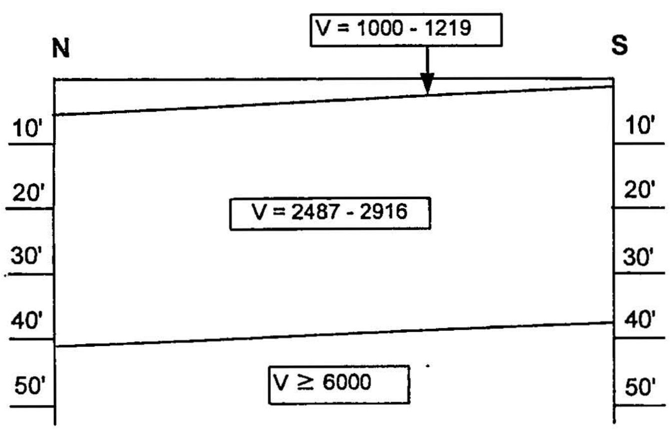
Seismic Velocity/Depth Summary

NE			SW
Depth (ft)			**Velocity (fps)**
0	-	6.1	1219
6.1	-	40.9	2916
40.9	-	####	6000
####	-	####	0
####	-	+	0 +

SW			NE
Depth (ft)			**Velocity (fps)**
0	-	1.0	1000
1.0	-	38.5	2487
38.5	-	####	6000
####	-	####	0
####	-	+	0 +

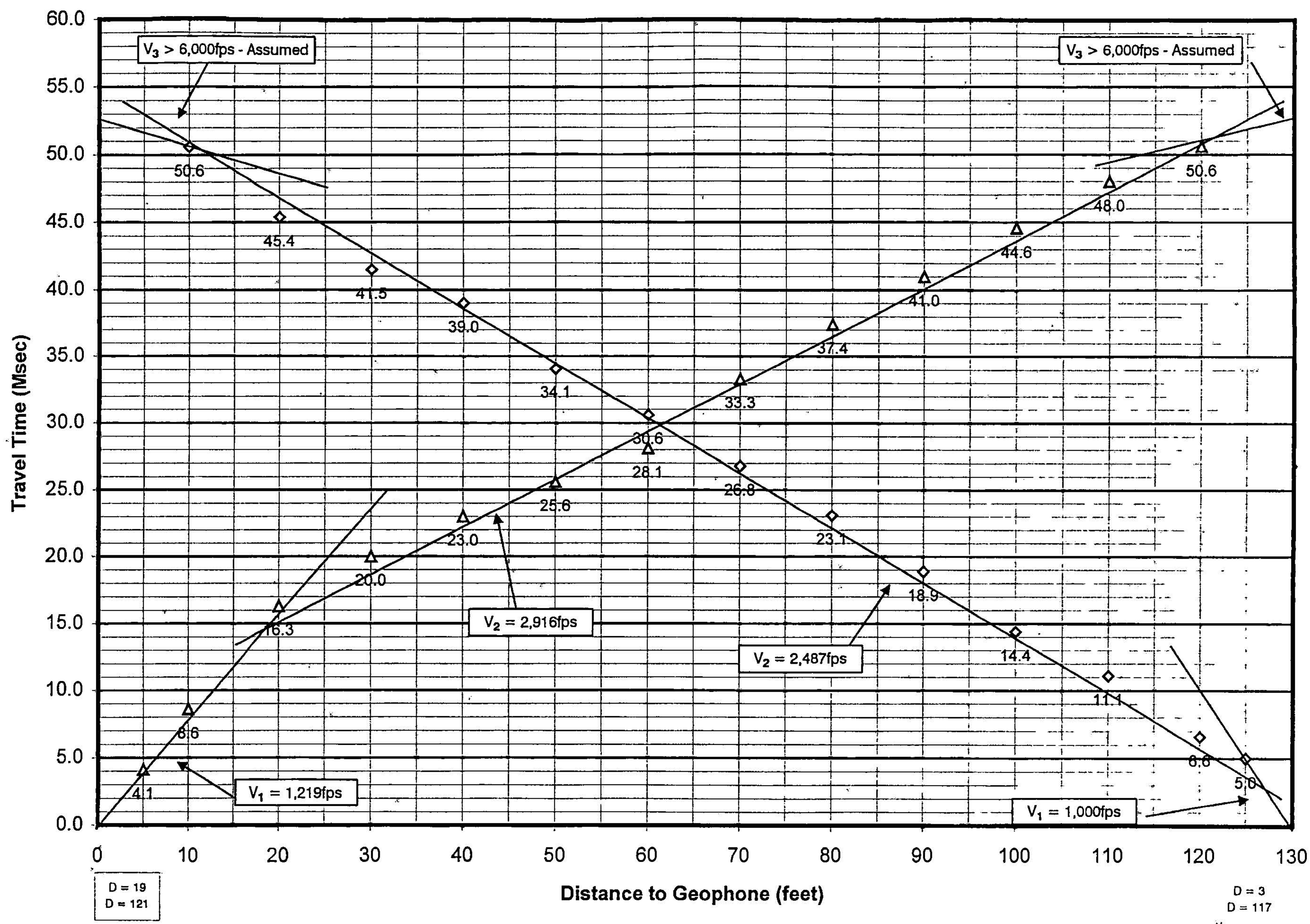
V1 = Seismic Velocity (fps) of 1st Layer
V2 = Seismic Velocity (fps) of 2nd Layer
V3 = Seismic Velocity (fps) of 3rd Layer
V4 = Seismic Velocity (fps) of 4th Layer

	SL-2	
	NE-SW	SW-NE
D	19	3
D2	121	117
D3		
D4		
V1	1219	1000
V2	2916	2487
V3	6000	6000
V4		
V5		
T1	6.09	0.98
T2	34.84	37.53
T3	#####	#####
T4	#####	#####
T1+T2	40.93	38.51
T1+T2+T3	#####	#####
T1+T2+T3+T4	#####	#####



SCHEMATIC CROSS SECTION

Seismic Traverse



NE

Traverse Date: 3/29/00
Orientation: N 30 E

SW

W.O. 2836-A-SC
Plate C-2a

Traverse No.: SL-2

SL-3
CALCULATIONS

1st Layer (T_1) = $R_1 \times D_1$	Where:	R1 = Velocity (fps) Ratio Factor (V2:V1) D1 = Critical Distance
2nd Layer (T_2) = $R_2 \times (D_2 - (C_1 \times T_1))$	Where:	R2 = Velocity (fps) Ratio Factor (V3:V2) D2 = Critical Distance C1 = Distance Correction Value (V3:V1)
3rd Layer (T_3) = $R_3 \times (D_3 - (C_1 \times T_1)+(C_2 \times T_2))$	Where:	R3 = Velocity (fps) Ratio Factor (V4:V3) D3 = Critical Distance C1 = Distance Correction Value (V4:V1) C2 = Distance Correction Value (V4:V2)
4th Layer (T_4) = $R_4 \times (D_4 - (C_1 \times T_1)+(C_2 \times T_2)+(C_3 \times T_3))$	Where:	R4 = Velocity (fps) Ratio Factor (V5:V4) D4 = Critical Distance C1 = Distance Correction Value (V5:V1) C2 = Distance Correction Value (V5:V2) C3 = Distance Correction Value (V5:V3)

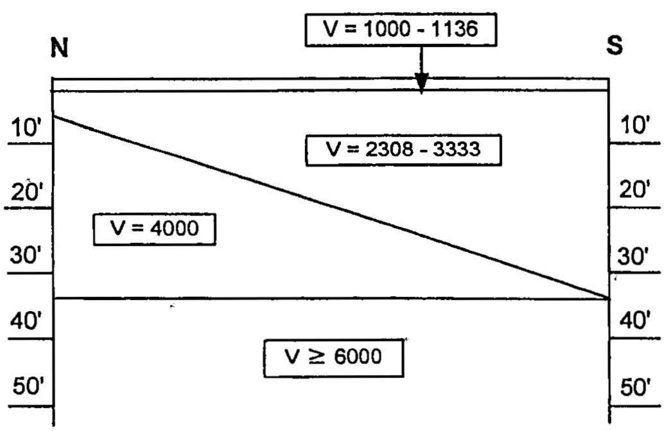
V1 = Seismic Velocity (fps) of 1st Layer
V2 = Seismic Velocity (fps) of 2nd Layer
V3 = Seismic Velocity (fps) of 3rd Layer
V4 = Seismic Velocity (fps) of 4th Layer

Seismic Velocity/Depth Summary

NE	SW
Depth (ft)	**Velocity (fps)**
0 - 1.5	1136
1.5 - 6.9	2308
6.9 - 33.3	4000
33.3 - ####	6000
#### - +	0 +

SW	NE
Depth (ft)	**Velocity (fps)**
0 - 1.5	1000
1.5 - 33.7	3333
33.7 - ####	6000
#### - ####	0
#### - +	0 +

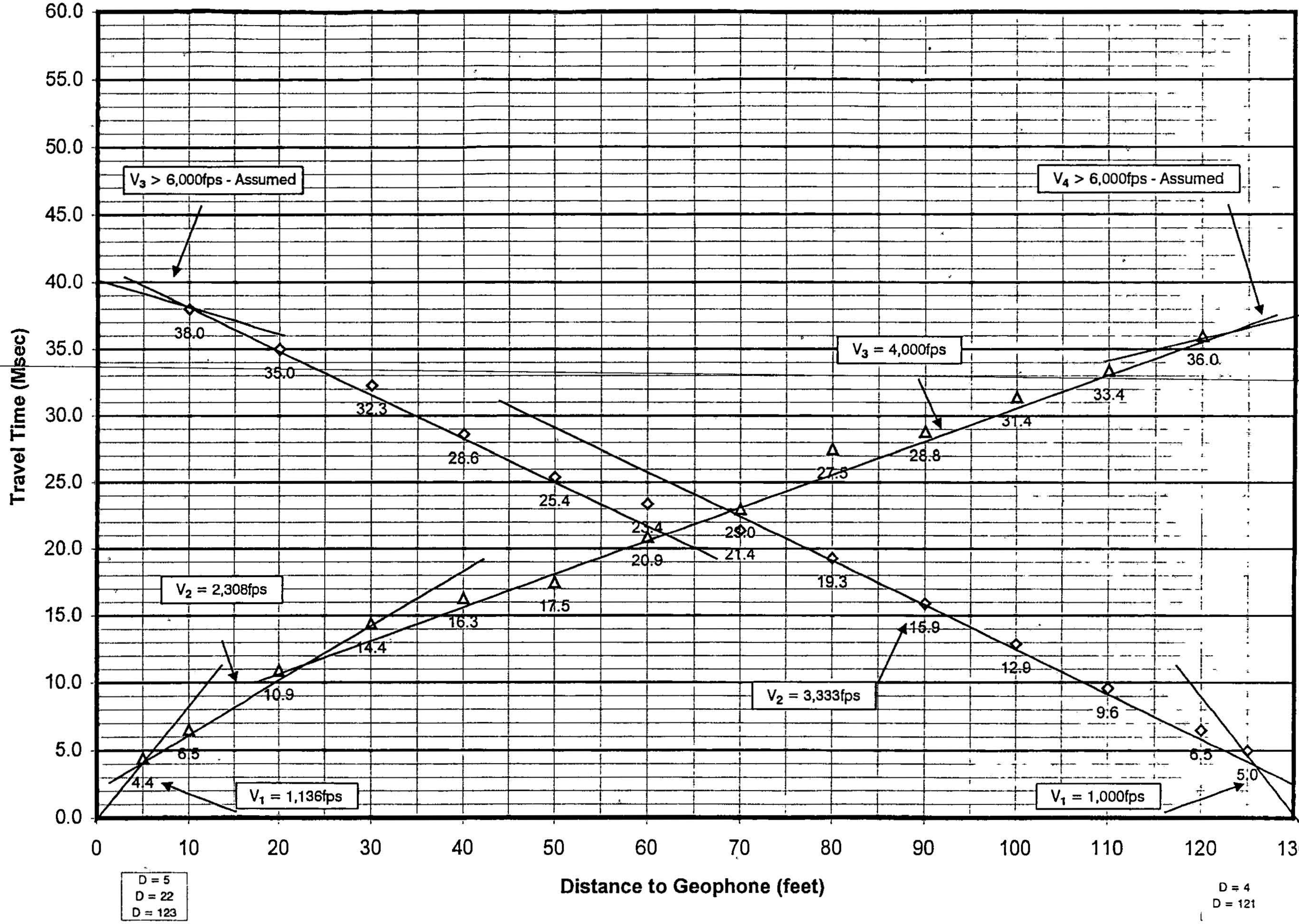
SL-3	NE-SW	SW-NE
D	5	4
D2	22	121
D3	123	
D4		
V1	1136	1000
V2	2308	3333
V3	4000	6000
V4	6000	
V5		
T1	1.46	1.47
T2	5.47	32.21
T3	26.36	#####
T4	#####	#####
T1+T2	6.93	33.68
T1+T2+T3	33.29	#####
T1+T2+T3+T4	#####	#####



SCHEMATIC CROSS SECTION

GeoSoils, Inc.

Seismic Traverse



NE

Traverse Date: 3/29/00

Orientation: N 10 E

SW

W.O. 2836-A-SC

Plate C-3a

Traverse No.: SL-3

SL-4
CALCULATIONS

1st Layer (T_1) = $R_1 \times D_1$ Where: R1 = Velocity (fps) Ratio Factor (V2:V1)
D1 = Critical Distance

2nd Layer (T_2) = $R_2 \times (D_2 - (C_1 \times T_1))$ Where: R2 = Velocity (fps) Ratio Factor (V3:V2)
D2 = Critical Distance
C1 = Distance Correction Value (V3:V1)

3rd Layer (T_3) = $R_3 \times (D_3 - (C_1 \times T_1)+(C_2 \times T_2))$ Where: R3 = Velocity (fps) Ratio Factor (V4:V3)
D3 = Critical Distance
C1 = Distance Correction Value (V4:V1)
C2 = Distance Correction Value (V4:V2)

4th Layer (T_4) = $R_4 \times (D_4 - (C_1 \times T_1)+(C_2 \times T_2)+(C_3 \times T_3))$ Where: R4 = Velocity (fps) Ratio Factor (V5:V4)
D4 = Critical Distance
C1 = Distance Correction Value (V5:V1)
C2 = Distance Correction Value (V5:V2)
C3 = Distance Correction Value (V5:V3)

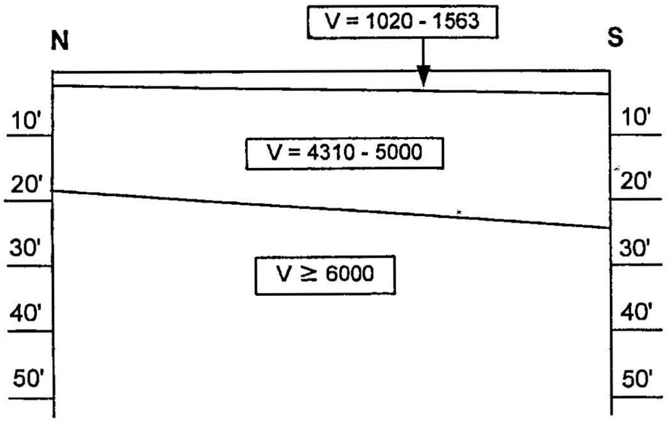
V1 = Seismic Velocity (fps) of 1st Layer
V2 = Seismic Velocity (fps) of 2nd Layer
V3 = Seismic Velocity (fps) of 3rd Layer
V4 = Seismic Velocity (fps) of 4th Layer

Seismic Velocity/Depth Summary

NE	SW
Depth (ft)	**Velocity (fps)**
0 - 1.6	1020
1.6 - 19.3	5000
19.3 - ####	6000
#### - ####	0
#### - +	0 +

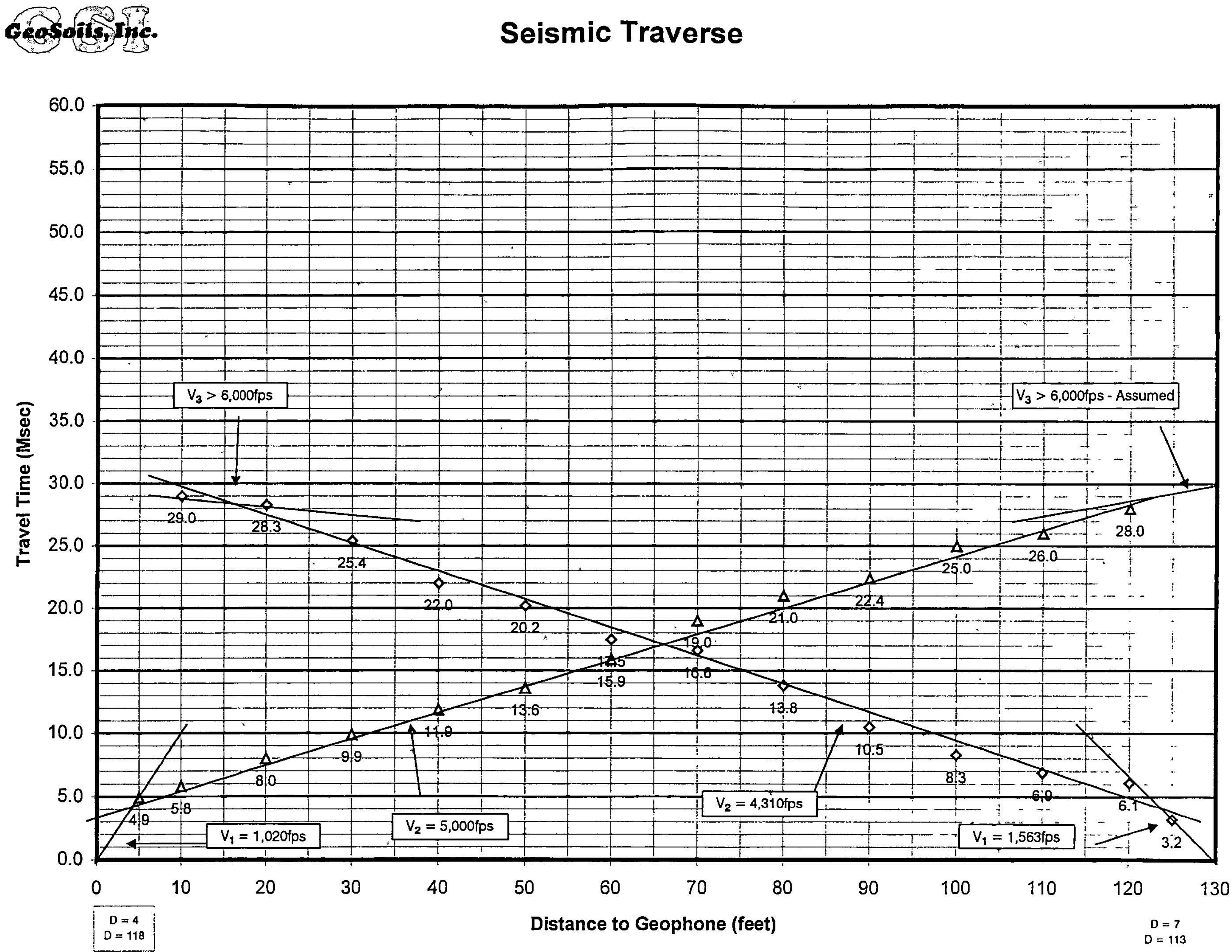
SW	NE
Depth (ft)	**Velocity (fps)**
0 - 2.4	1563
2.4 - 25.0	4310
25.0 - ####	6000
#### - ####	0
#### - +	0 +

	SL-4	
	NE-SW	SW-NE
D	4	7
D2	118	113
D3		
D4		
V1	1020	1563
V2	5000	4310
V3	6000	6000
V4		
V5		
T1	1.63	2.39
T2	17.70	22.61
T3	#####	#####
T4	#####	#####
T1+T2	19.33	25.01
T1+T2+T3	#####	#####
T1+T2+T3+T4	#####	#####



SCHEMATIC CROSS SECTION

Seismic Traverse



NE

Traverse Date: 3/29/00
Orientation: N 50 E

Traverse No.: SL-4

SW

W.O. 2836-A-SC
Plate C-4a

SL-5
CALCULATIONS

1st Layer (T_1) =	$R_1 \times D_1$	Where:	R1 =	Velocity (fps) Ratio Factor (V2:V1)
			D1 =	Critical Distance
2nd Layer (T_2) =	$R_2 \times (D_2 - (C_1 \times T_1))$	Where:	R2 =	Velocity (fps) Ratio Factor (V3:V2)
			D2 =	Critical Distance
			C1 =	Distance Correction Value (V3:V1)
3rd Layer (T_3) =	$R_3 \times (D_3 - (C_1 \times T_1)+(C_2 \times T_2))$	Where:	R3 =	Velocity (fps) Ratio Factor (V4:V3)
			D3 =	Critical Distance
			C1 =	Distance Correction Value (V4:V1)
			C2 =	Distance Correction Value (V4:V2)
4th Layer (T_4) =	$R_4 \times (D_4 - (C_1 \times T_1)+(C_2 \times T_2)+(C_3 \times T_3))$	Where:	R4 =	Velocity (fps) Ratio Factor (V5:V4)
			D4 =	Critical Distance
			C1 =	Distance Correction Value (V5:V1)
			C2 =	Distance Correction Value (V5:V2)
			C3 =	Distance Correction Value (V5:V3)

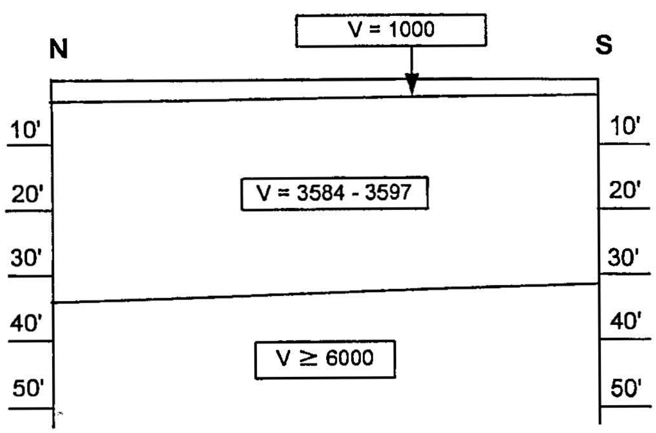
Seismic Velocity/Depth Summary

N	S
Depth (ft)	**Velocity (fps)**
0 - 3.0	1000
3.0 - 34.3	3597
34.3 - ####	6000
#### - ####	0
#### - +	0 +

S	N
Depth (ft)	**Velocity (fps)**
0 - 2.6	1000
2.6 - 31.3	3584
31.3 - ####	6000
#### - ####	0
#### - +	0 +

V1 = Seismic Velocity (fps) of 1st Layer
V2 = Seismic Velocity (fps) of 2nd Layer
V3 = Seismic Velocity (fps) of 3rd Layer
V4 = Seismic Velocity (fps) of 4th Layer

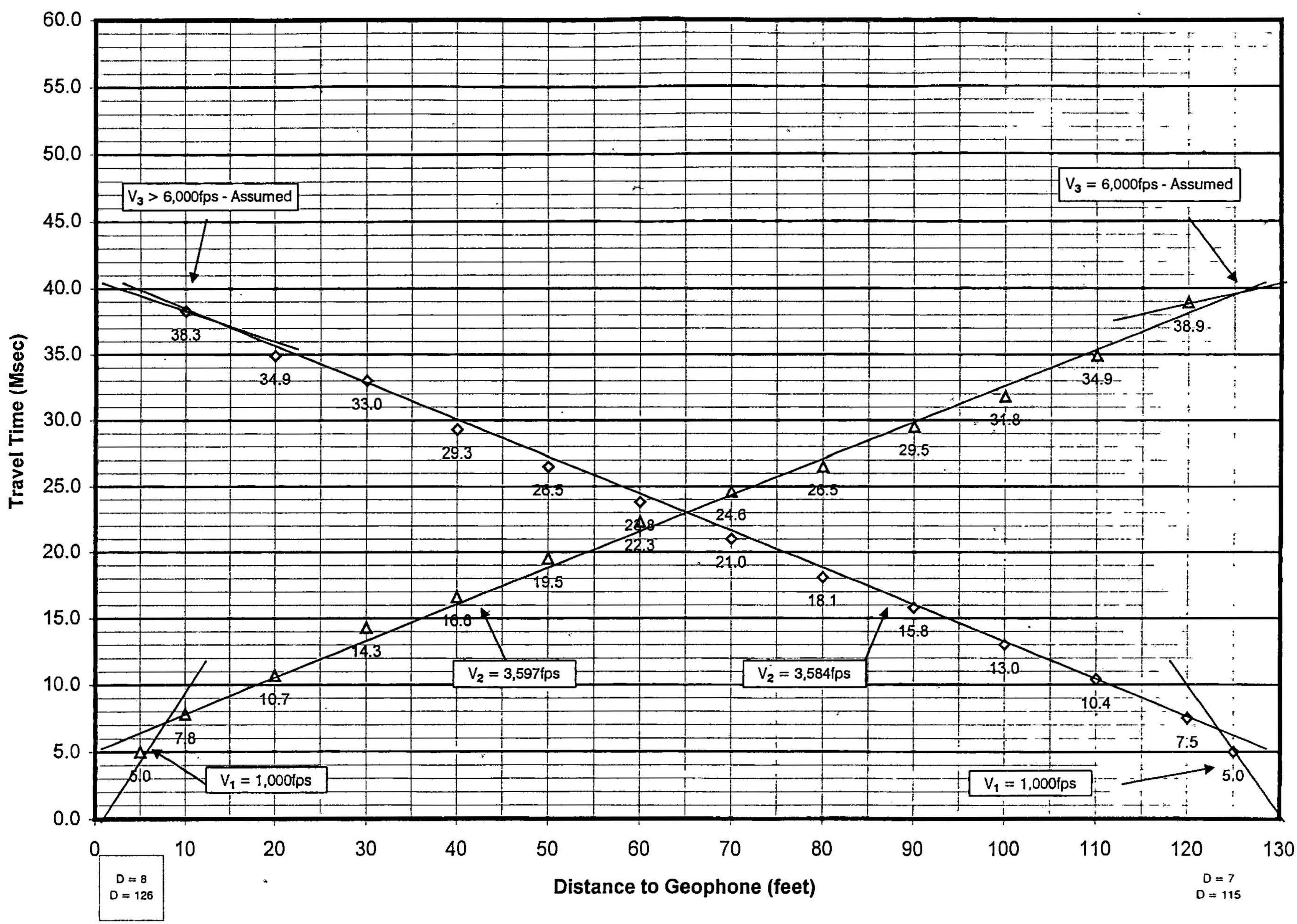
	SL-5	
	N - S	S - N
D	8	7
D2	126	115
D3		
D4		
V1	1000	1000
V2	3597	3584
V3	6000	6000
V4		
V5		
T1	3.01	2.63
T2	31.27	28.65
T3	#####	#####
T4	#####	#####
T1+T2	34.28	31.27
T1+T2+T3	#####	#####
T1+T2+T3+T4	#####	#####



SCHEMATIC CROSS SECTION

GeoSoils, Inc.

Seismic Traverse



N

Traverse Date: 3/29/00
Orientation: N - S

S

W.O. 2836-A-SC

Traverse No.: SL-5

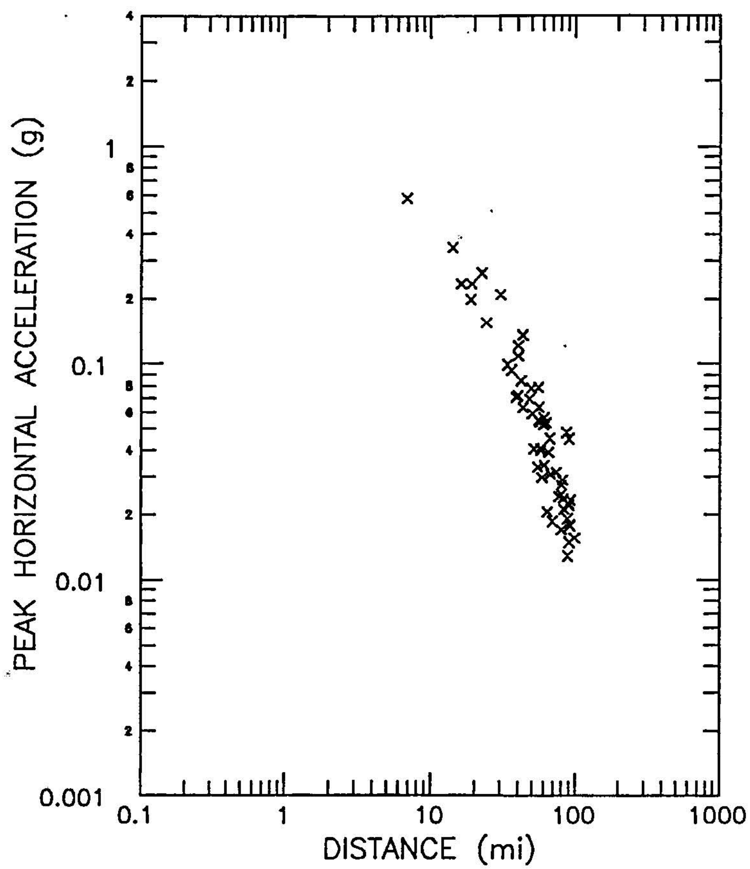
Plate C-5a

APPENDIX D

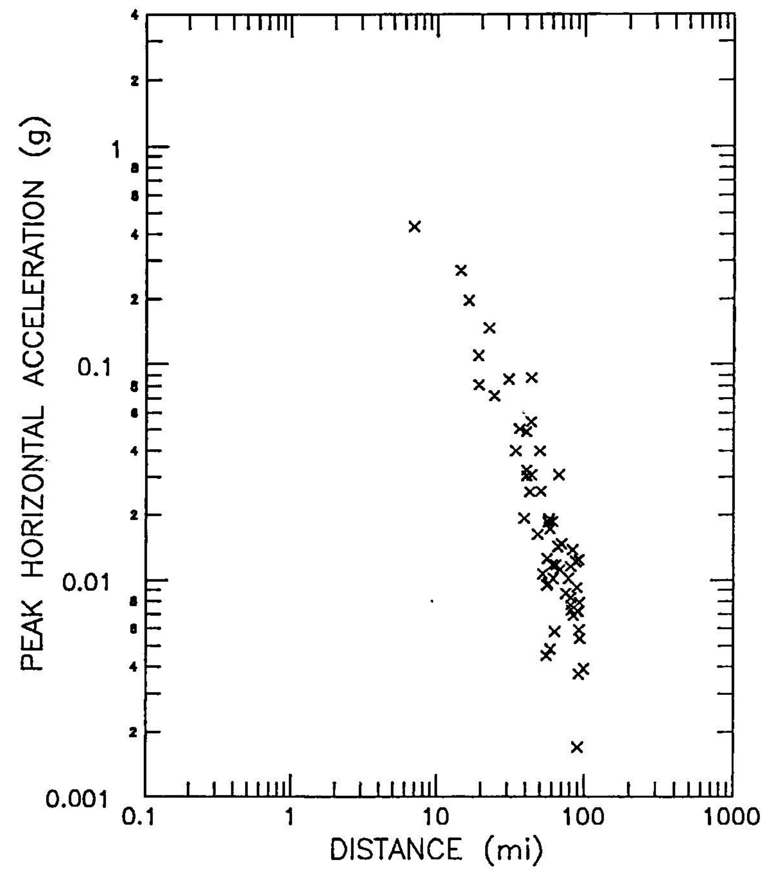
EQFAULT DATA

COMPARISON OF MAXIMUM EARTHQUAKES

MAXIMUM CREDIBLE EARTHQUAKES

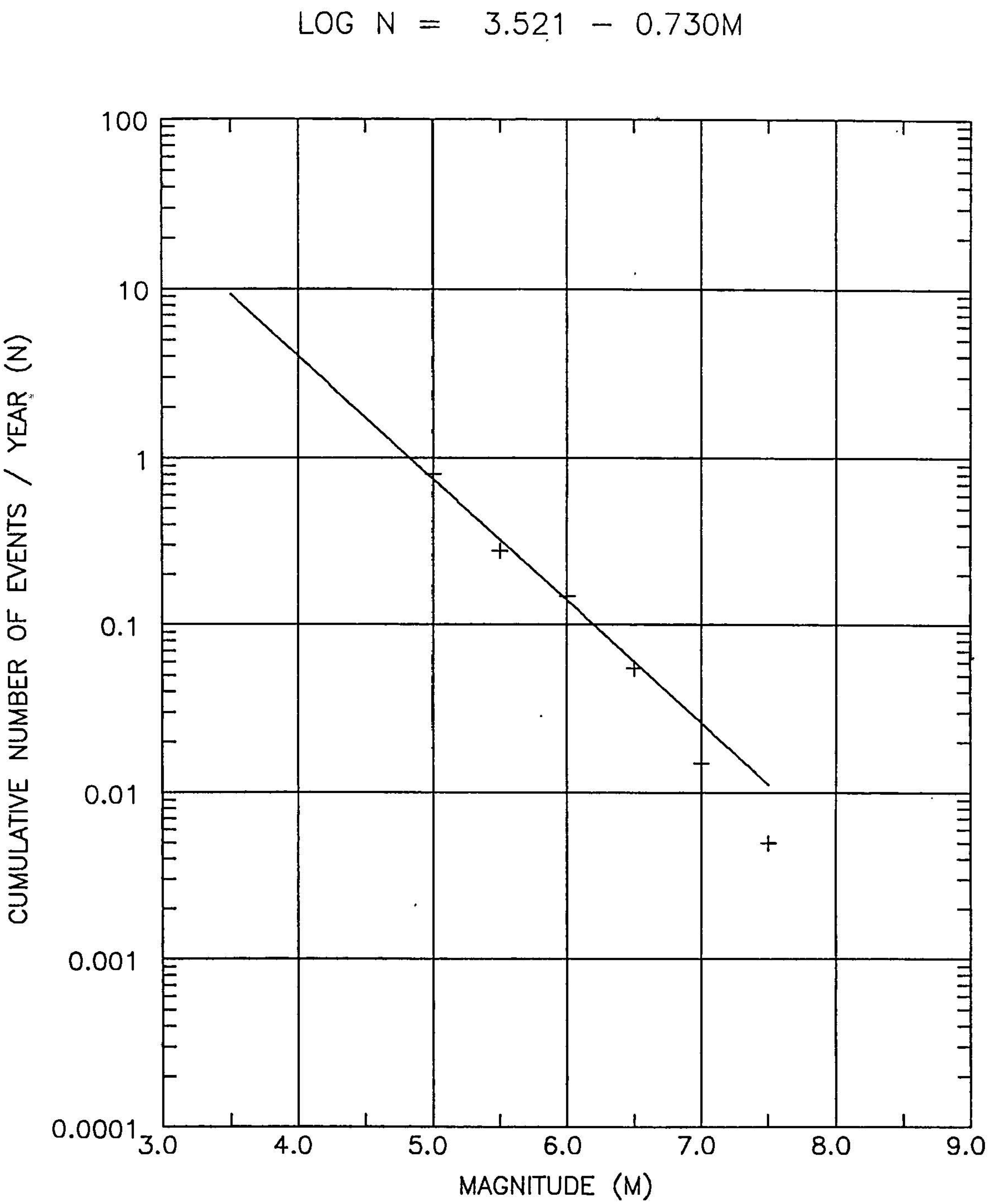


MAXIMUM PROBABLE EARTHQUAKES



JOB NO.: W.O. 2836–A–SC

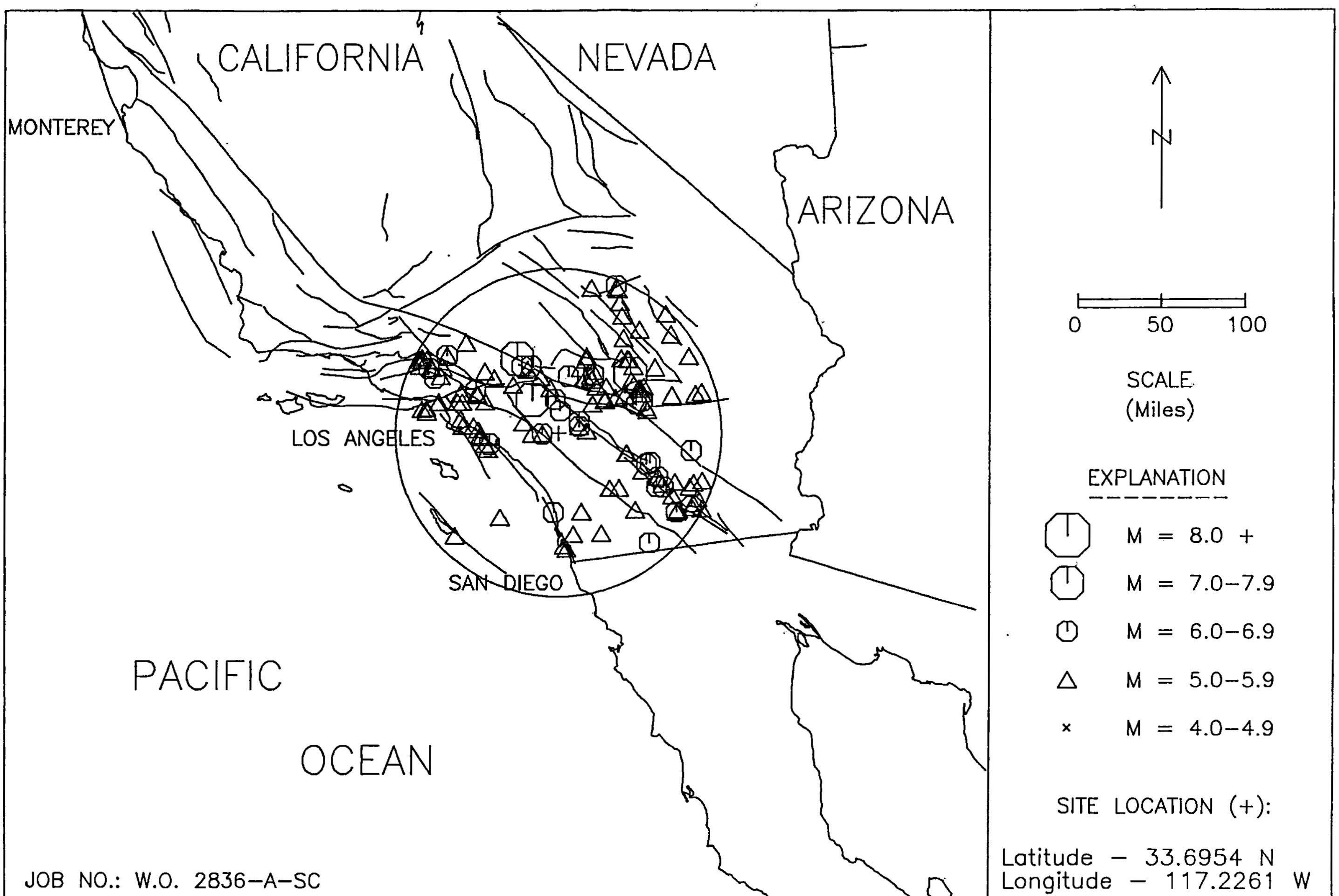
LATITUDE: 33.6954 N – LONGITUDE: 117.2261 W



SEISMIC RECURRENCE CURVE

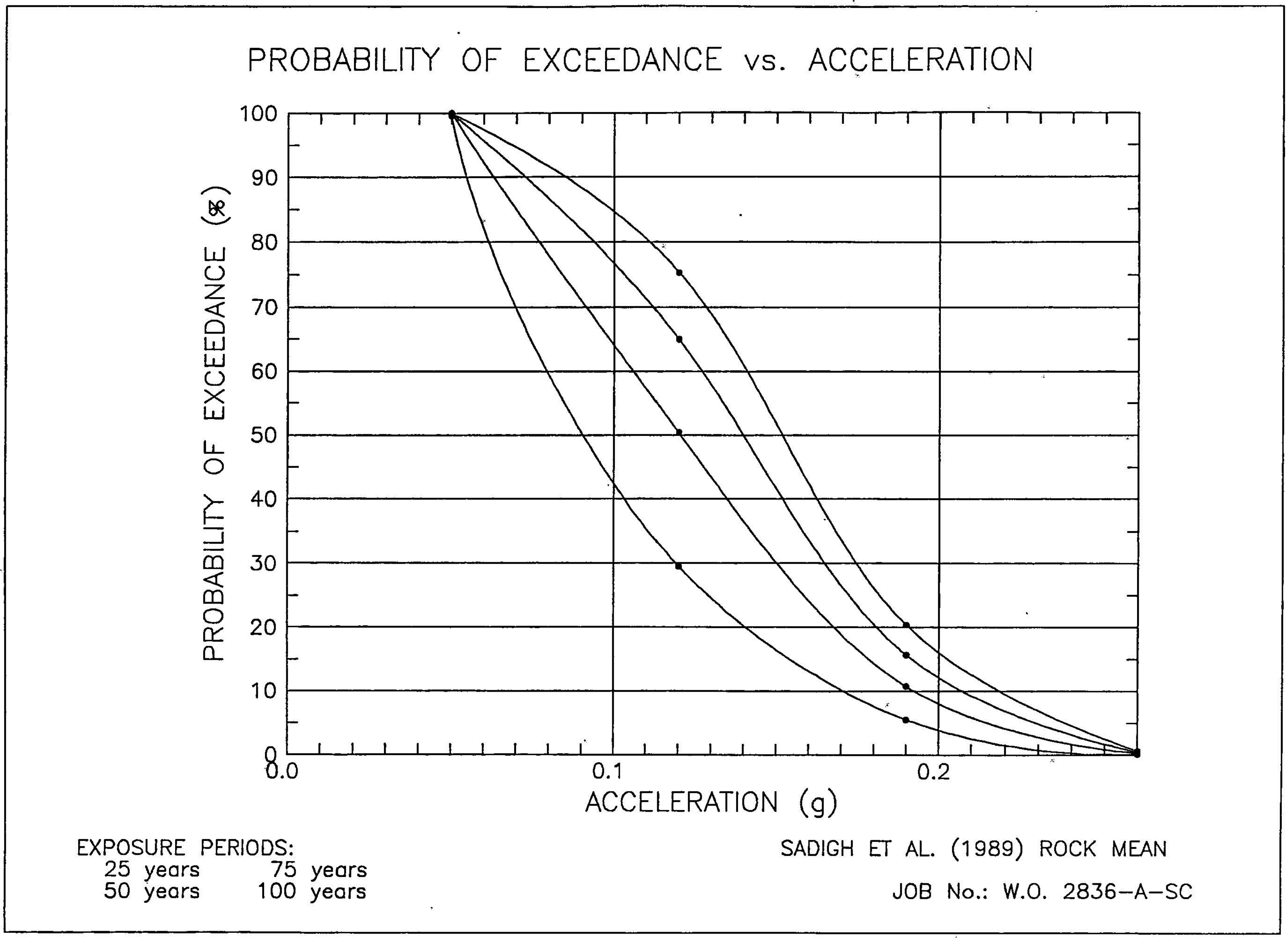
HISTORICAL EARTHQUAKES FROM 1800 TO 2000

Tract 28920



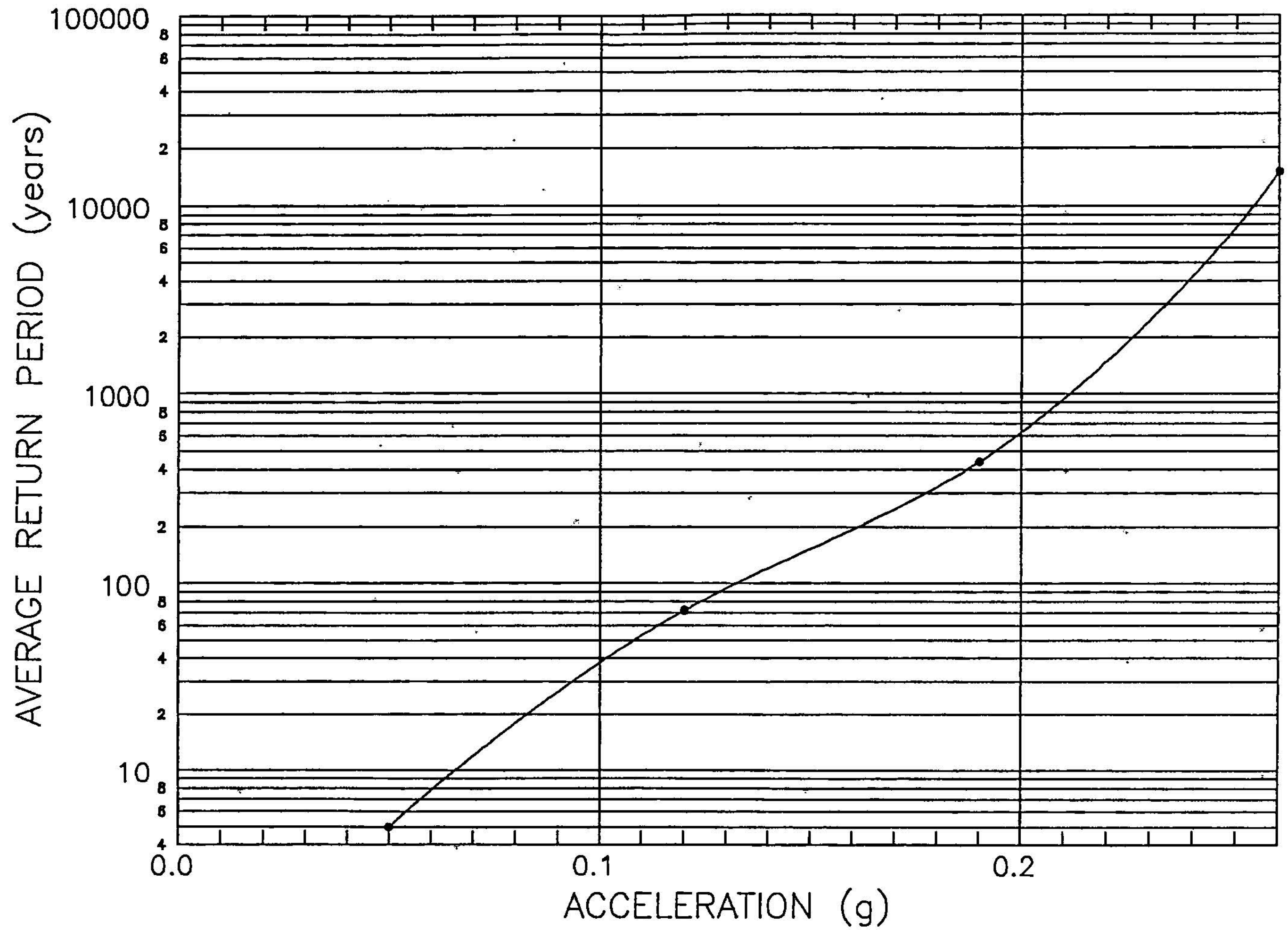
HISTORICAL EARTHQUAKES 1800 TO 2000

Plate D-3



PROBABILITY OF EXCEEDANCE vs. ACCELERATION
PROBABILITY OF EXCEEDANCE (%)
100
90
80
70
60
50
40
30
20
10
0
0.0
0.1
0.2
ACCELERATION (g)
EXPOSURE PERIODS:
25 years
75 years
50 years
100 years
SADIGH ET AL. (1989) ROCK MEAN
JOB No.: W.O. 2836-A-SC

AVERAGE RETURN PERIOD vs. ACCELERATION



Tract 28920

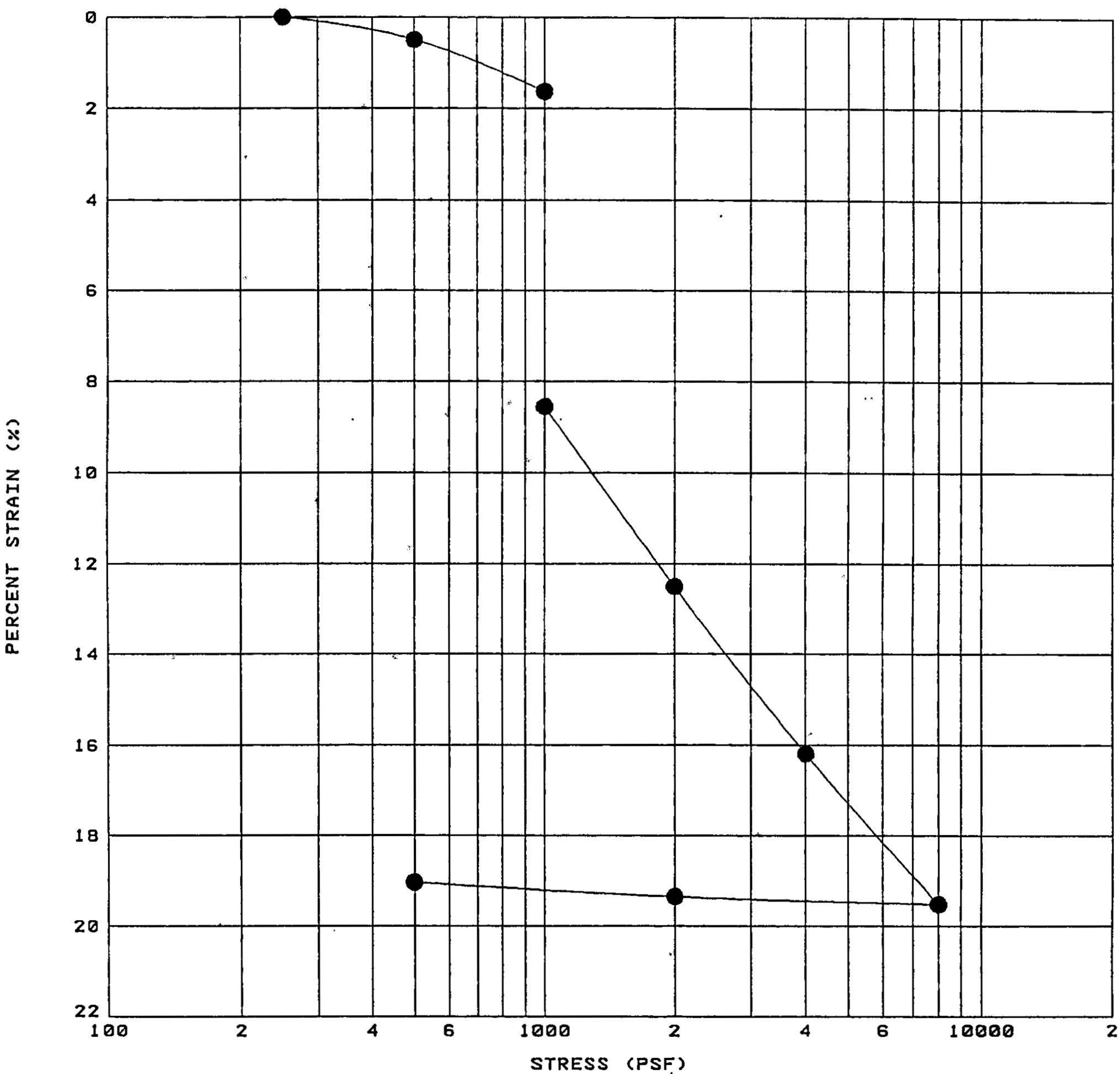
SADIGH ET AL. (1989) ROCK MEAN

JOB No.: W.O. 2836-A-SC

Plate D-5

APPENDIX E

LABORATORY TEST RESULTS



Exploration: 28920TP5 Depth: 3.0'

Undisturbed Ring Sample

Dry Density (pcf): 98.1

Water Content (%): 5.2

Sample Innundated @ 1000 psf

GeoSoils, Inc.

CONSOLIDATION TEST RESULTS

NEW WEST

April 2000

W.O.: 2836-SC

Plate: **E-1**

APPENDIX F

SLOPE STABILITY ANALYSIS

APPENDIX F

SLOPE STABILITY ANALYSIS

INTRODUCTION OF XSTABL COMPUTER PROGRAM

Introduction

XSTABL is a fully integrated slope stability analysis program. It permits the engineer to develop the slope geometry interactively and perform slope analysis from within a single program. The slope analysis portion of XSTABL uses a modified version of the popular STABL program, originally developed at Purdue University.

XSTABL performs a two dimensional limit equilibrium analysis to compute the factor of safety for a layered slope using the simplified Bishop or Janbu methods. This program can be used to search for the most critical surface or the factor of safety may be determined for specific surfaces. XSTABL, Version 5.005, is programmed to handle:

1. Heterogenous soil systems
2. Anisotropic soil strength properties
3. Reinforced slopes
4. Nonlinear Mohr-Coulomb strength envelope
5. Pore water pressures for effective stress analysis using:
    a. Phreatic and piezometric surfaces
    b. Pore pressure grid
    c. R factor
    d. Constant pore water pressure
6. Pseudo-static earthquake loading
7. Surcharge boundary loads
8. Automatic generation and analysis of an unlimited number of circular, noncircular and block-shaped failure surfaces
9. Analysis of right-facing slopes
10. Both SI and Imperial units

General Information

If the reviewer wishes to obtain more information concerning slope stability analysis, the following publications may be consulted initially:

1. The Stability of Slopes, by E.N. Bromhead, Surrey University Press, Chapman and Hall, N.Y., 411 pages, ISBN 412 01061 5, 1992.

2. Rock Slope Engineering, by E. Hoek and J.W. Bray, Inst. of Mining and Metallurgy, London, England, Third Edition, 358 pages, ISNB 0 900488 573, 1981.

3. Landslides: Analysis and Control, by R.L. Schuster and R.J. Krizek (editors), Special Report 176, Transportation Research Board, National Academy of Sciences, 234 pages, ISBN 0 309 02804 3, 1978.

XSTABL Features

The present version of XSTABL contains the following features:

1. Allows user to calculate factors of safety for static stability and dynamic stability situations.

2. Allows user to analyze stability situations with different failure modes.

3. Allows user to edit input for slope geometry and calculate corresponding factor of safety.

4. Allows user to readily review on-screen the input slope geometry.

5. Allows user to automatically generate and analyze unlimited number of circular, non-circular and block-shaped failure surfaces (i.e., bedding plane, slide plane, etc.).

Input Data

Input data includes the following items:

1. Unit weight, residual cohesion, residual friction angle, peak cohesion, and peak friction angle of fill material, bedding plane, and bedrock, respectively. Residual cohesion and friction angle is used for static stability analysis, where as peak cohesion and friction angle is for dynamic stability analysis.

2. Slope geometry and surcharge boundary loads.

3. Apparent dip of bedding plane can be specified in angular range (i.e., from 0 to 90 degrees.

4. Pseudo-static earthquake loading (an earthquake loading of 0.15g was used in the analysis).

Seismic Discussion

Seismic stability analyses were approximated using a pseudo-static approach. The major difficulty in the pseudo-static approach arises from the appropriate selection of the seismic coefficient used in the analysis. The use of a static inertia force equal to this acceleration during an earthquake (rigid-body response) would be extremely conservative for several reasons including: (1) only low height, stiff/dense embankments or embankments in confined areas may respond essentially as rigid structures; (2) an earthquake's inertia force is enacted on a mass for a short time period. Therefore, replacing a transient force by a pseudo-static force representing the maximum acceleration is considered unrealistic; (3) Assuming that total pseudo-static loading is applied evenly throughout the embankment for an extended period of time is an incorrect assumption, as the length of the failure surface analyzed is usually much greater than the wave length of seismic waves generated by earthquakes; and (4) the seismic waves would place portions of the mass in compression and some in tension, resulting in only a limited portion of the failure surface analyzed moving in a downslope direction, at any one instant of time.

The coefficients usually suggested by regulating agencies, counties and municipalities are in the range of 0.05g to 0.25g. For example, past regulatory guidelines within the city and county of Los Angeles indicated that the slope stability pseudostatic coefficient = 0.15g.

The method developed by Krinitzsky, Gould, and Edinger (1993) which was in turn based on Taniguchi and Sasaki, 1986, (T&S, 1986), was referenced. This method is based on empirical data and the performance of existing earth embankments during seismic loading. Our review of "Guidelines for Evaluating and Mitigating Seismic Hazards in California (Davis, 1997) indicates the State of California recommends using pseudo-static coefficient of 0.15 for design earthquakes of M 8.25 or greater and using 0.1 for earthquake parameter M 6.5. Therefore, a seismic coefficient of 0.15 was used in our analysis.

Output Information

Output information includes:

1. All input data.

2. Factors of safety for the ten most critical surfaces for static and pseudo-static stability situation.

3. High quality plots can be generated. The plots include the slope geometry, the critical surfaces and the factor of safety.

4. Note, that in the analysis, a minimum of 100 trial surfaces were analyzed for each section for either static or pseudo-static analyses.

Results of Slope Stability Calculation

Table 1 shows parameters used in slope stability calculations. Detailed output information is presented in Plates F-1 through F-4. Summaries of the slope stability analysis are presented in Table 2. Surficial slope stability analysis is presented as Plate F-5.

TABLE 1
Soil Parameters Used

SOIL MATERIALS	PEAK VALUES	
	C (psf)	*Φ (degrees)*
Compacted Fill (Qalo)	343	31
Compacted Fill (Kgr)	321	36

TABLE 2
Summary of Slope Analysis

STABILITY	SLOPE CONFIGURATION	SLOPE GRADIENT	FACTORS OF SAFETY		REMARKS
			STATIC	*SEISMIC*	
Gross	Section Lot 147/157	2:1 (Fill/Qalo)	2.201	1.610	Bishop, circular
Gross	Section Lot 5/6	2:1 (Fill/Kgr)	2.545	1.855	Bishop, circular

Rock Slope Stability Analysis

RockPack Program

The RockPack Program has applications in rock slope stability analyses. The analytical capabilities include stereonet plotting of the rock slope geologic structure, which is used in the interpretation of slope stability. The program works utilizing fundamental principles of rock slope evaluation by stereonet projection and limit equilibrium analysis.

Following a field mapping and subsurface data collection exercise, the engineering geologist enters rock discontinuity data pertaining to orientation of fractures, joints, bedding, foliations, shear zones, etc. The program may also model physical properties of adjacent rock, infilling material and groundwater conditions.

RockPack has the capability to analyze a rock slope for factor of safety against translational sliding. Rock bolting or other artificial support systems may be modeled for an improved slope stability factor of safety.

Wedge and Toppling Failure Analyses

Introduction

The wedge failure analyses were performed to study the potential wedge failures of the proposed cut slopes. The procedure for wedge stability analyses was as follows:

1. Field investigation of rock discontinuities and collection of fracture parameters such as type, orientation, spacing, opening and roughness of bedding (foliation), joint, fracture, shear zone, etc.

2. Stereographic projection of rock discontinuities and determination of representative rock discontinuities.

3. Analyses of mechanic feasibility of potential wedge failure.

4. Analyses of kinematic feasibility of potential wedge failure.

5. Evaluation of potential wedge failure.

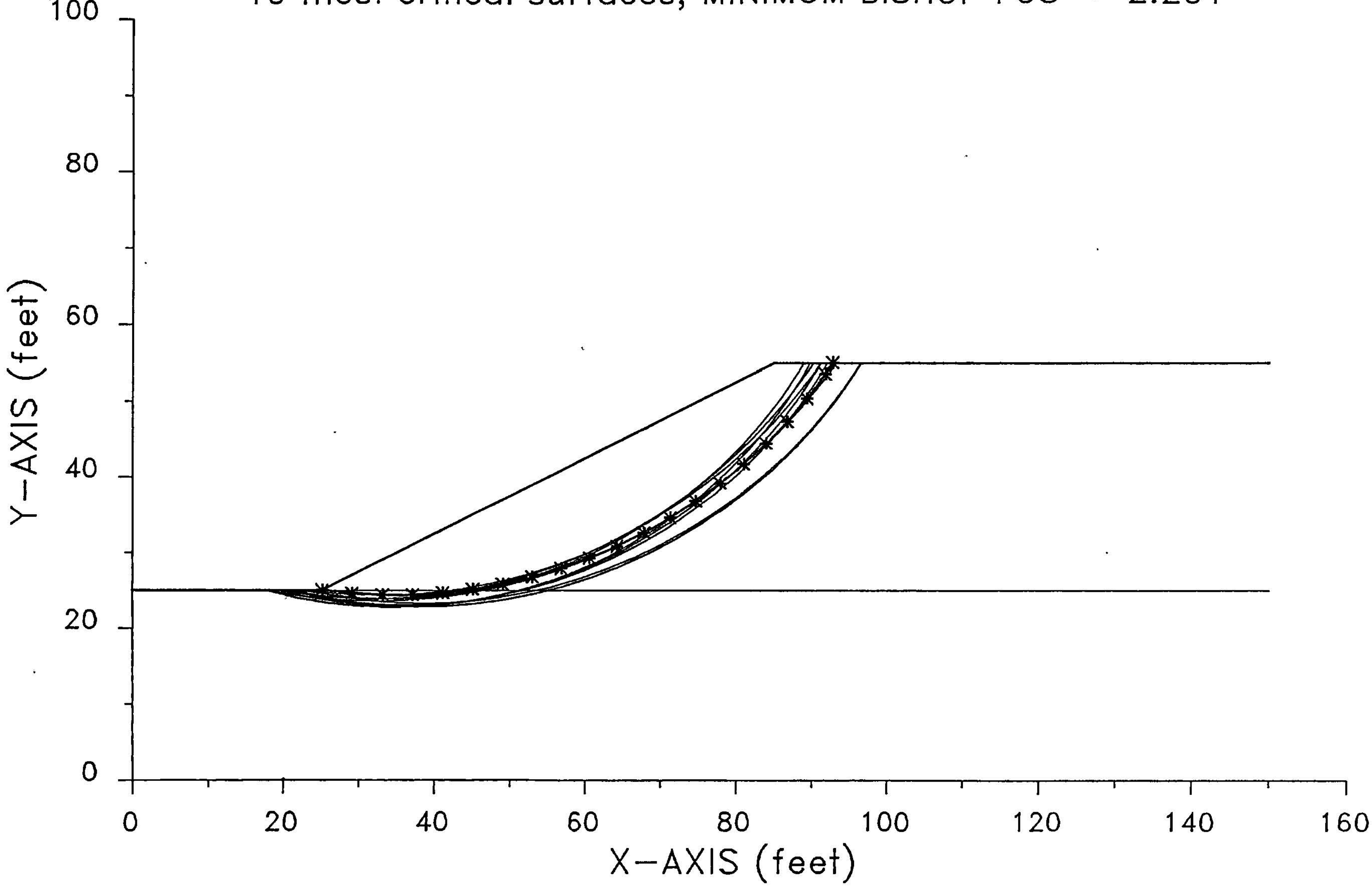
Detailed output information is presented in Plates F-6 to F-38. Table 3 presents the analysis of wedge failure.

Table 3
Wedge Failure Analysis

TYPE OF ANALYSIS	SLOPE	HEIGHT (FT.)	FACTORS OF SAFETY
CASE 1 WEDGE	1.5:1	58	No Wedge Formed
CASE 2 WEDGE	2.1	58	No Wedge Formed
CASE 3 WEDGE	1.5:1	32	2 Wedges Formed >1.5
CASE 4 WEDGE	2:1	32	2 Wedges Formed >1.5
CASE 5 WEDGE	1.5:1	32	No Wedge Formed
CASE 6 WEDGE	2:1	32	No Wedge Formed
CASE 7 WEDGE	1.5:1	45	No Wedge Formed
CASE 8 WEDGE	2:1	45	No wedge formed

2836DT1 4-10-** 16:12

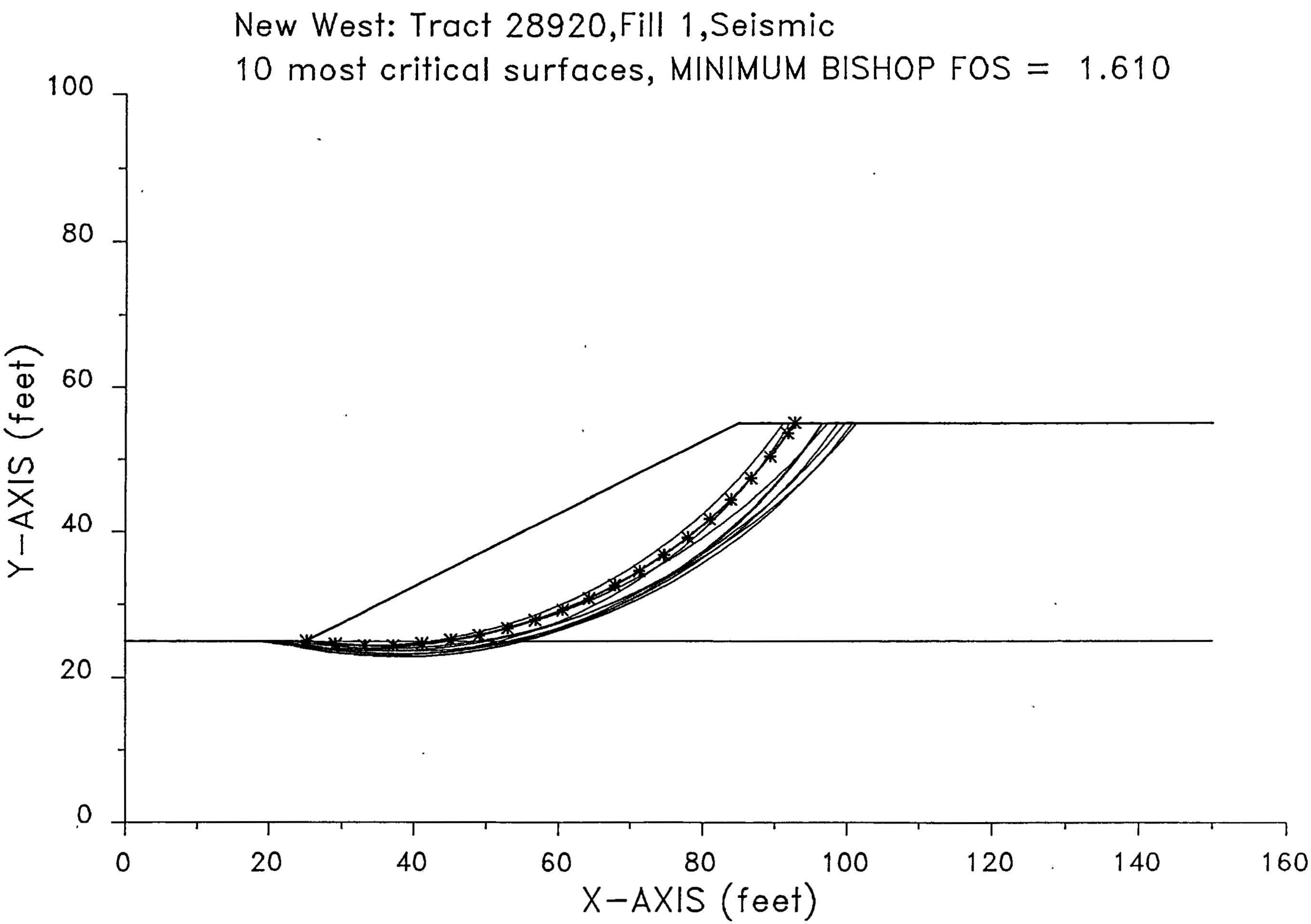
New West: Tract 28920, Fill 1,Static
10 most critical surfaces, MINIMUM BISHOP FOS = 2.201



GeoSoils, Inc.

Plate F-1

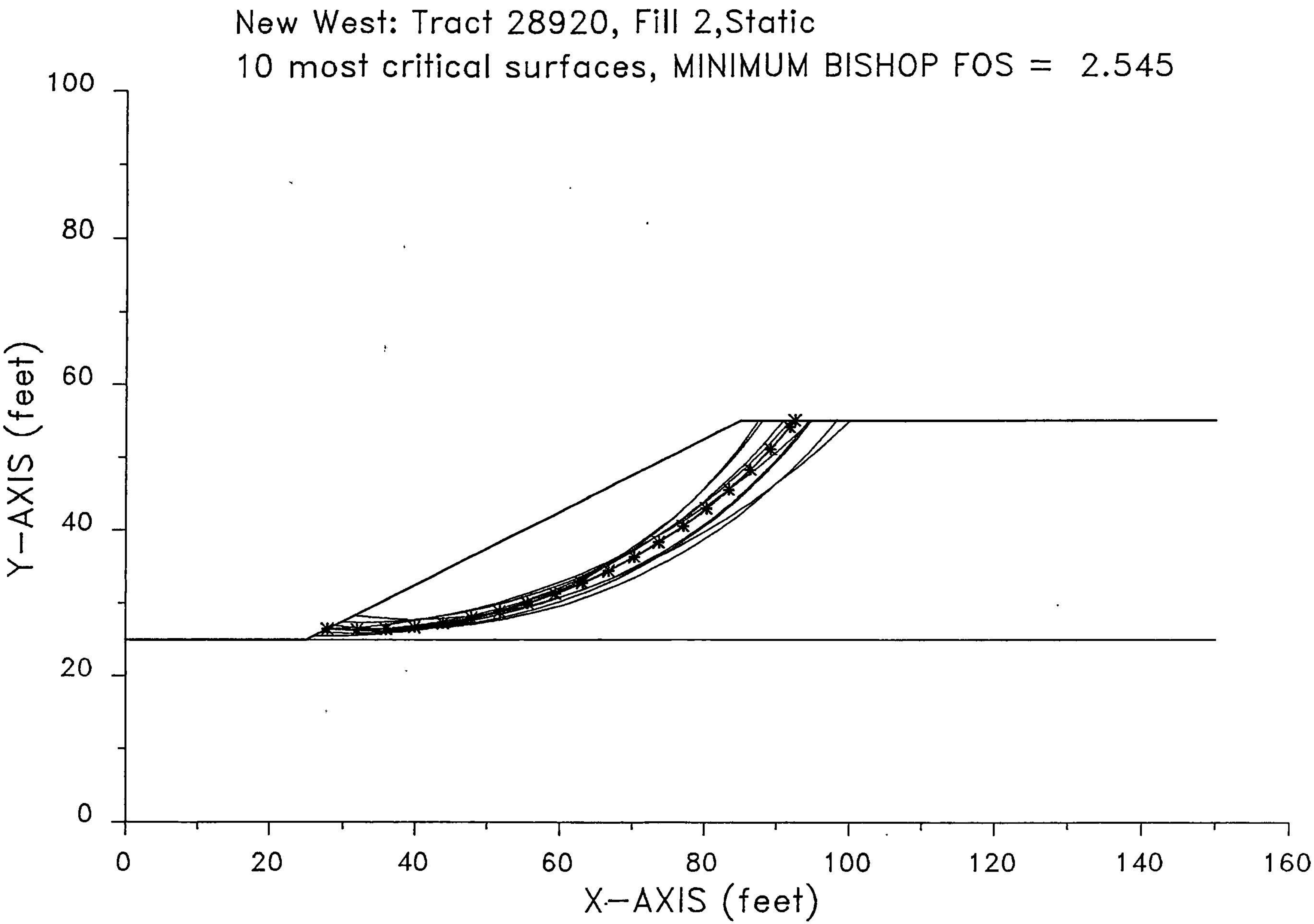
2836DS1 4-10-** 16:14



GeoSoils, Inc.

Plate F-2

2836ET1   4-10-**   16:17



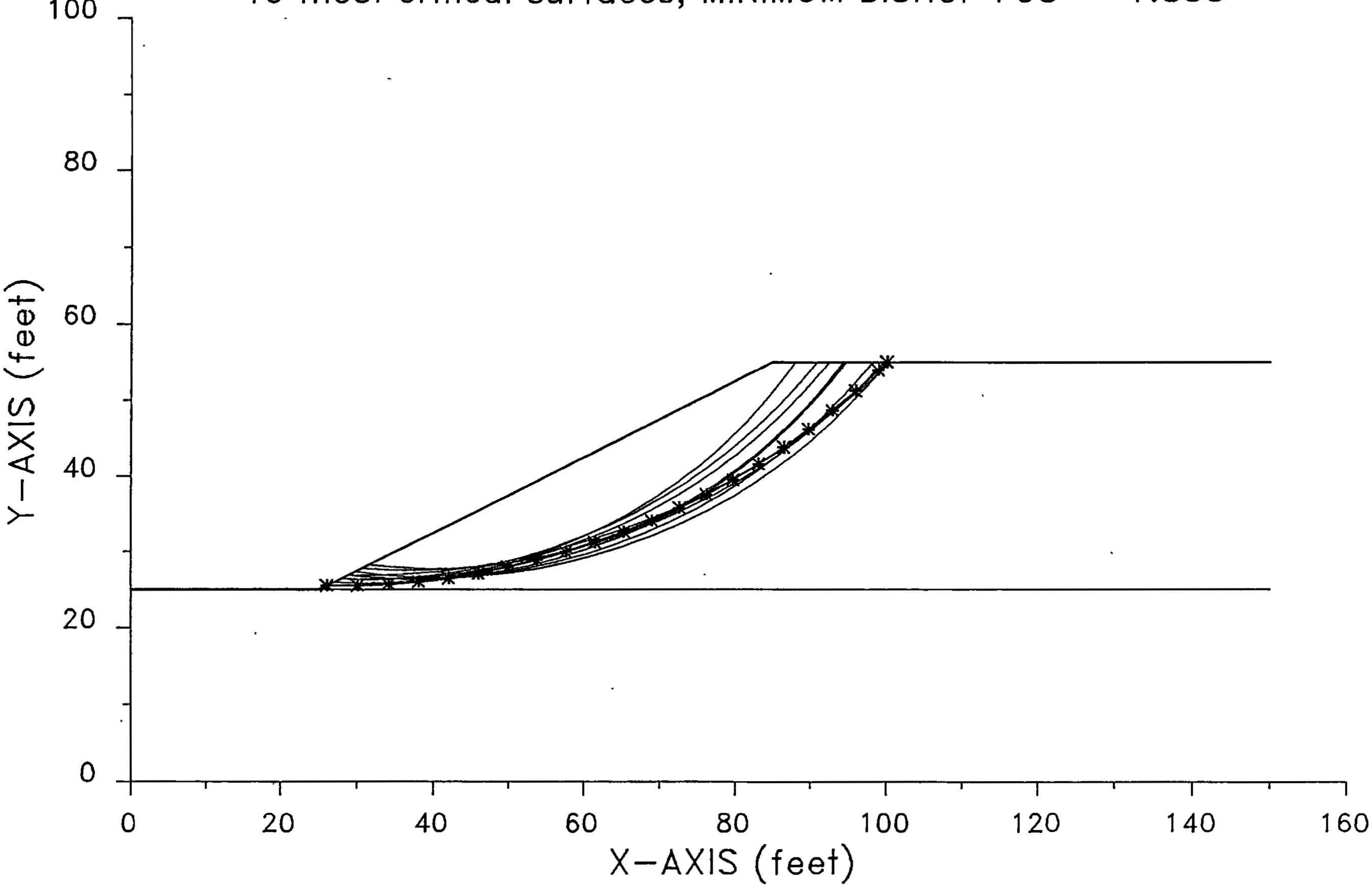
GeoSoils, Inc.

Plate F-3

2836ES1 4-10-** 16:21

New West: Tract 28920,Fill 2,Seismic

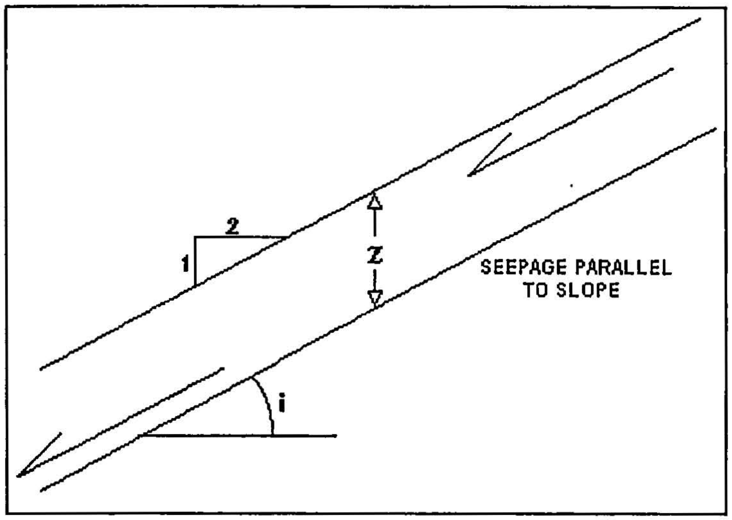
10 most critical surfaces, MINIMUM BISHOP FOS = 1.855



GeoSoils, Inc.

Plate F-4

SURFICIAL SLOPE STABILITY ANALYSIS



W.O 2836-A-SC

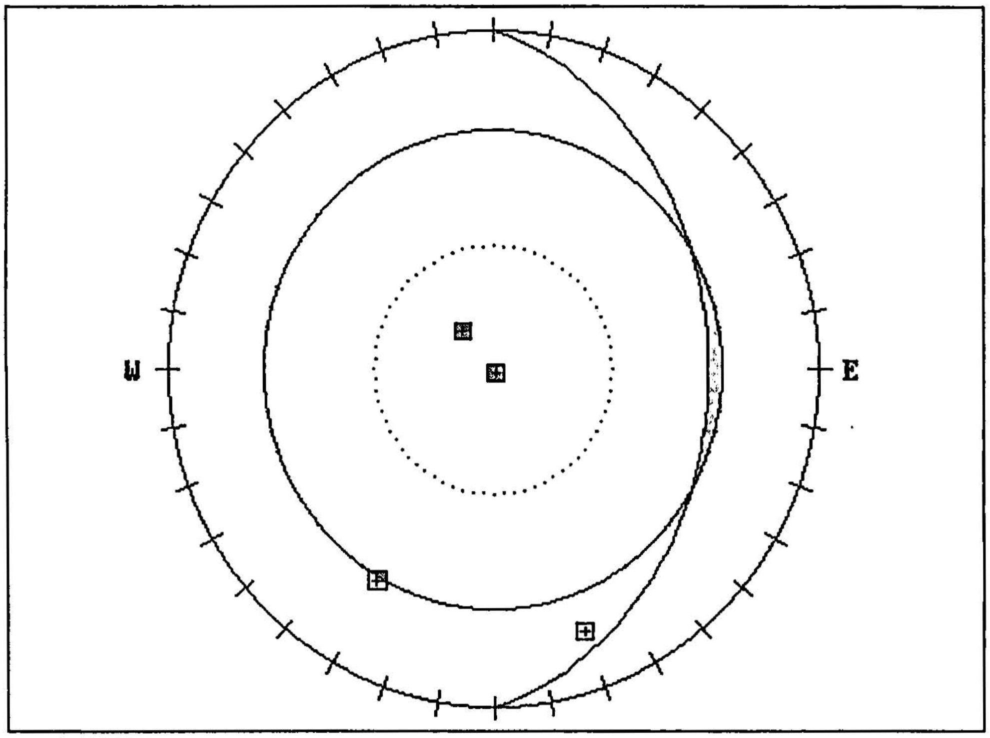
Material Type: Compacted Fill	FILL (Qalo)	Fill (Kgr)
	SECTION Lot 147/157	**SECTION** Lot 147/157
Depth of Saturation (z) =	3 ft	3 ft
Slope Angle (i) (for 2:1 slopes)	26.6°	26.6
Unit Weight of Water (γ_W)	62.4 pcf	62.4 pcf
Saturated Unit of Soil (γ_{SAT})	120 pcf	120 pcf
Apparent Angle of Internal Friction (ϕ)	31°	36°
Apparent Cohesion (C) =	343 psf	321 psf

Fs, Static Safety Factor = $\dfrac{z\,(\gamma_{SAT}-\gamma_w)\,\cos^2(i)\,\tan(\phi) + C}{z\,(\gamma_{SAT})\,\sin(i)\,\cos(i)}$

DEPTH OF SATURATION	STATIC F.S. FILL (Qalo)	STATIC F.S. FILL (Kgr)
3 FEET	2.95	2.93

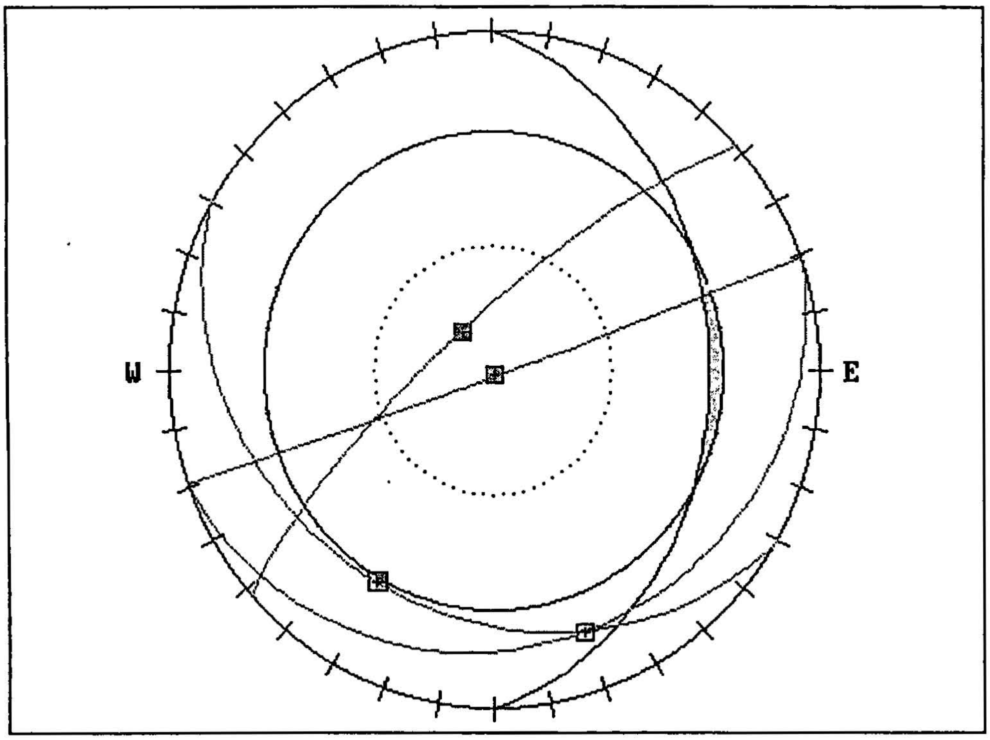
Plate F-5

CASE 1



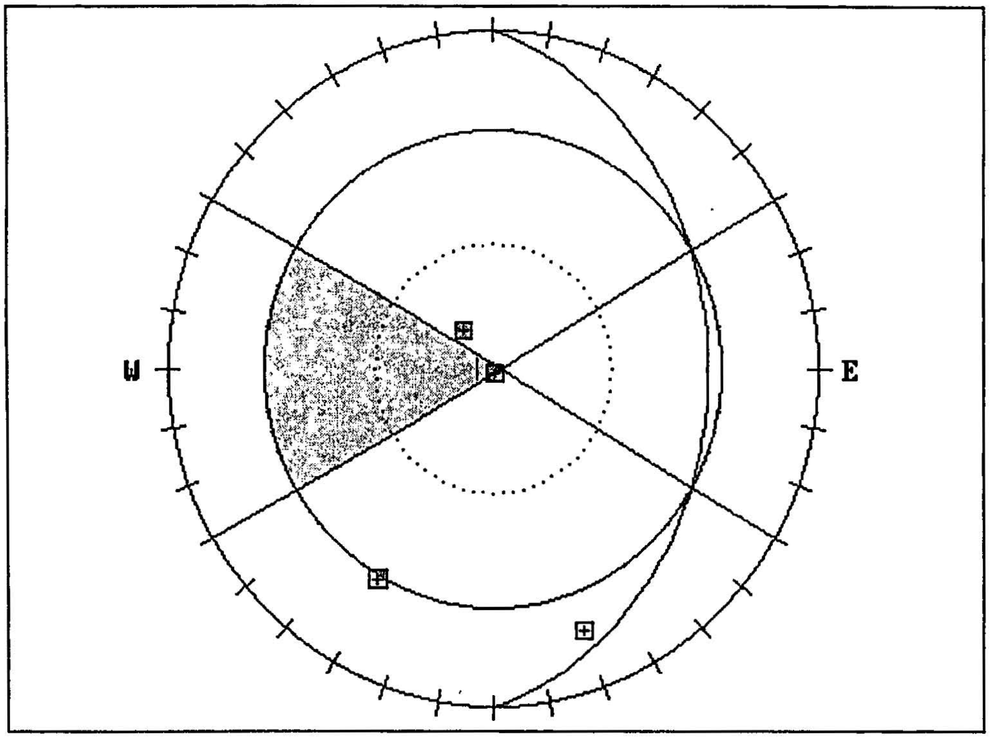
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c1a.DAT
Friction Angle = 30 degrees
Slope dip direction = 90 degrees, Dip = 34 degrees
Number of Stations = 4

CASE 1



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c1a.DAT
Friction Angle = 30 degrees
Slope dip direction = 90 degrees, Dip = 34 degrees
Number of Stations = 4

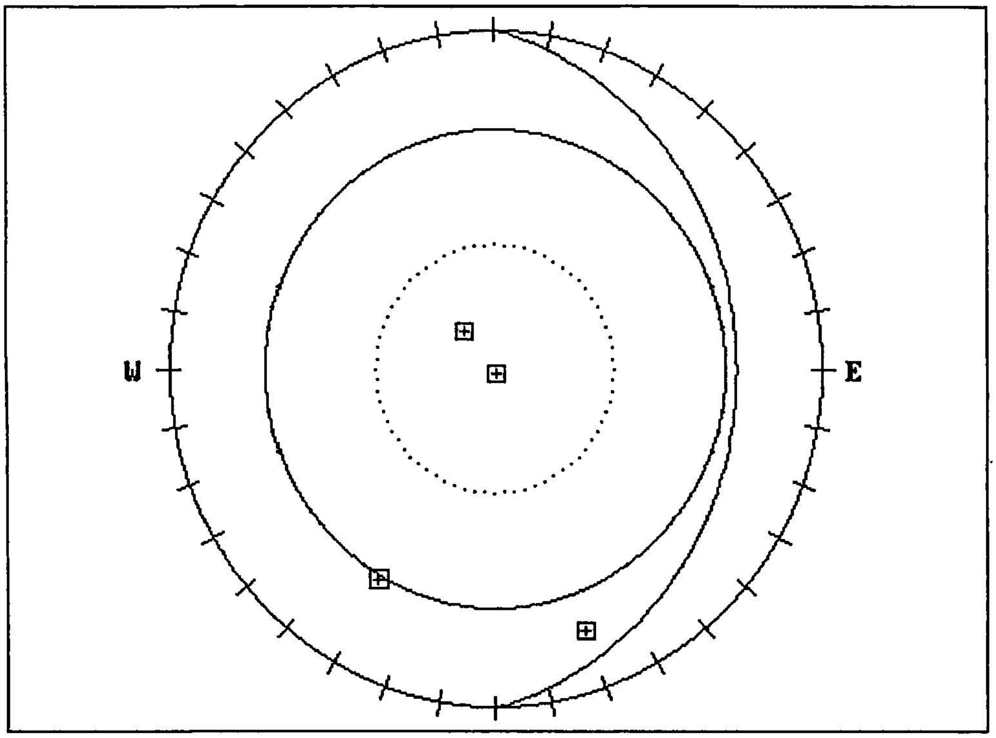
CASE 1



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c1a.DAT
Friction Angle = 30 degrees
Slope dip direction = 90 degrees, Dip = 34 degrees
Number of Stations = 4

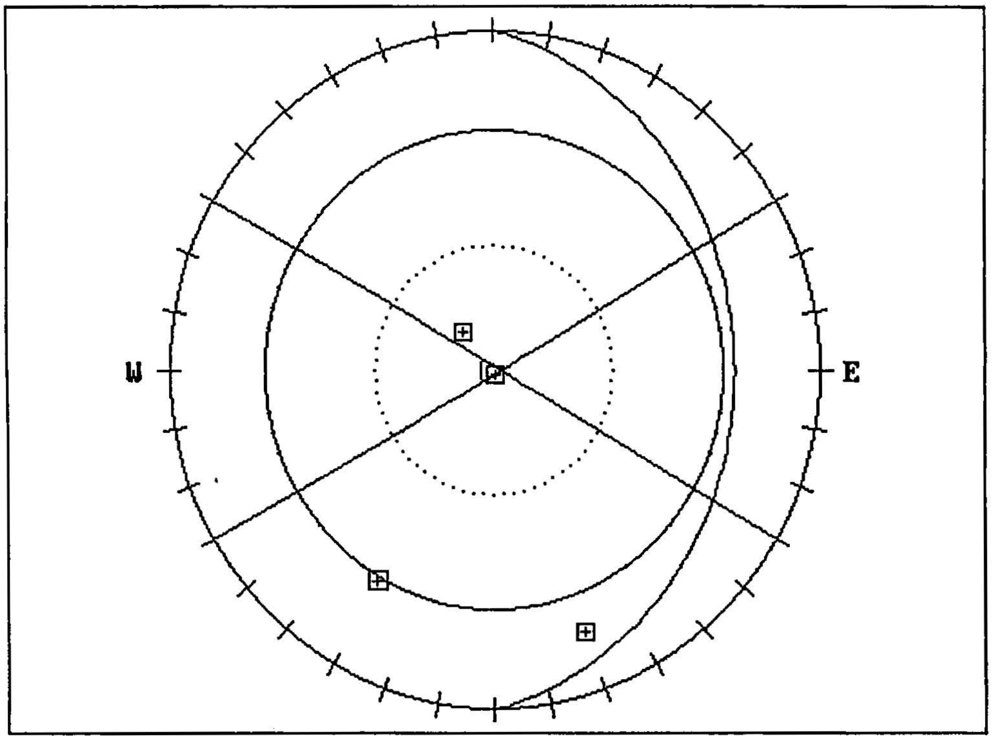
Plate F-8

Case 2



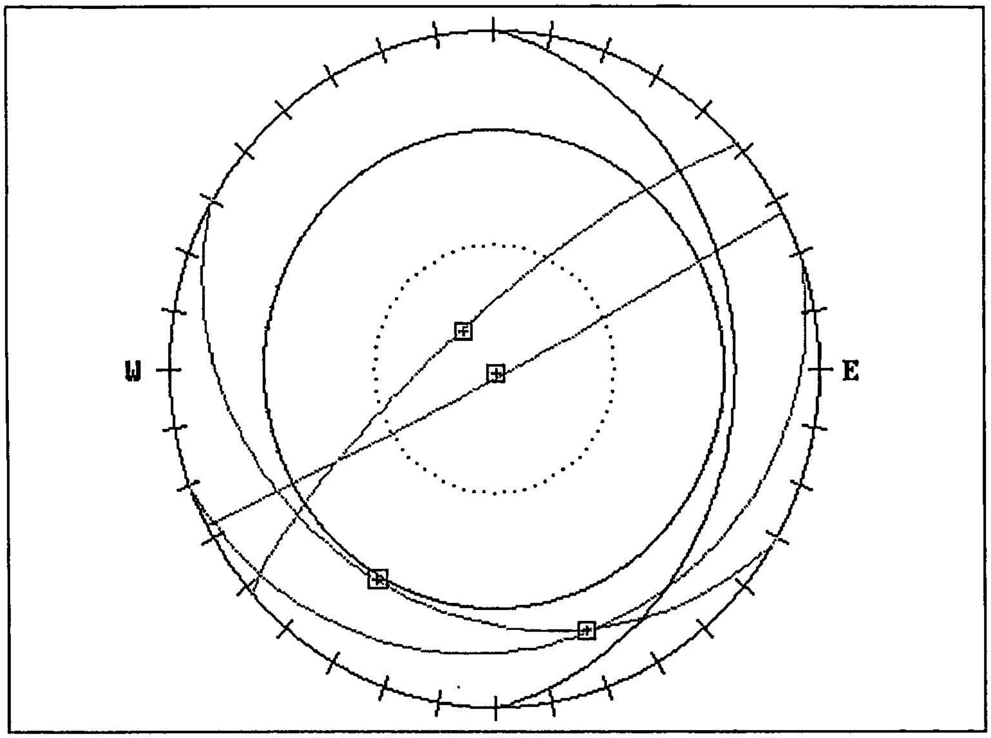
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c2a.DAT
Friction Angle = 30 degrees
Slope dip direction = 90 degrees, Dip = 27 degrees
Number of Stations = 4

Case 2



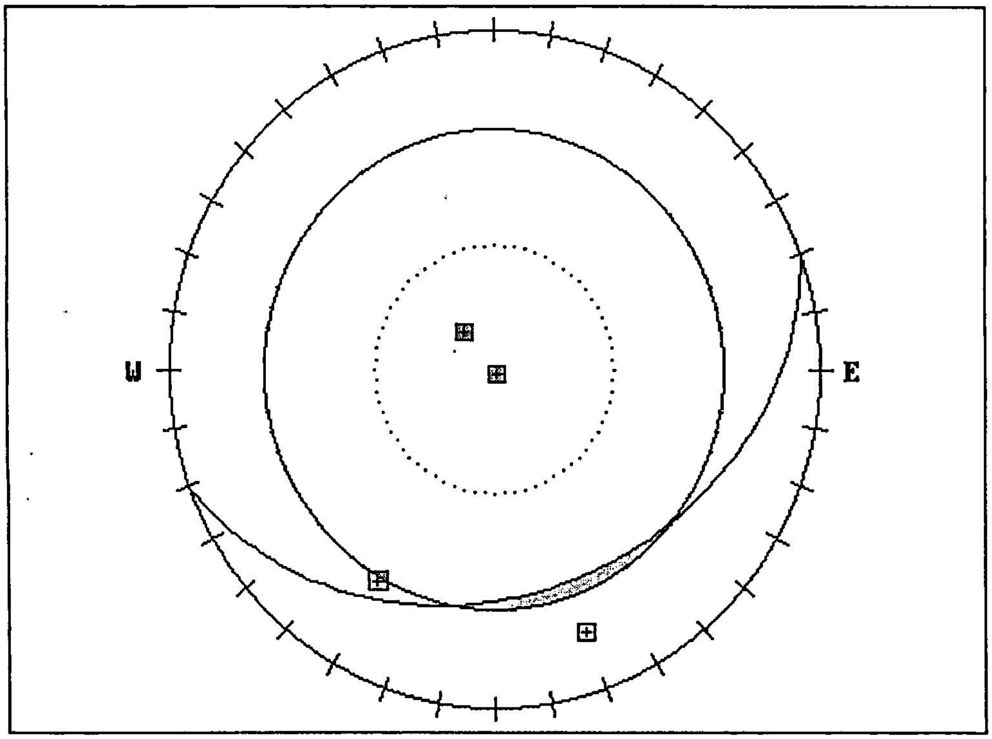
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c2a.DAT
Friction Angle = 30 degrees
Slope dip direction = 90 degrees, Dip = 27 degrees
Number of Stations = 4

Case 2



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c2a.DAT
Friction Angle = 30 degrees
Slope dip direction = 90 degrees, Dip = 27 degrees
Number of Stations = 4

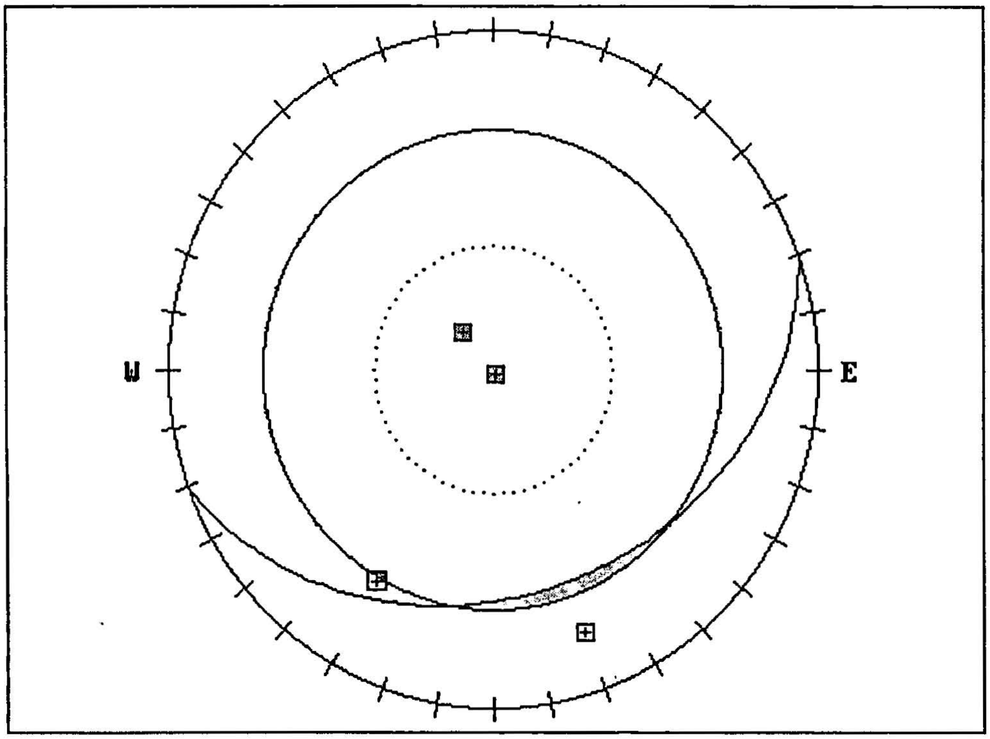
CASE 3



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c3a.DAT
Friction Angle = 30 degrees
Slope dip direction = 160 degrees, Dip = 34 degrees
Number of Stations = 4

Plate F-12

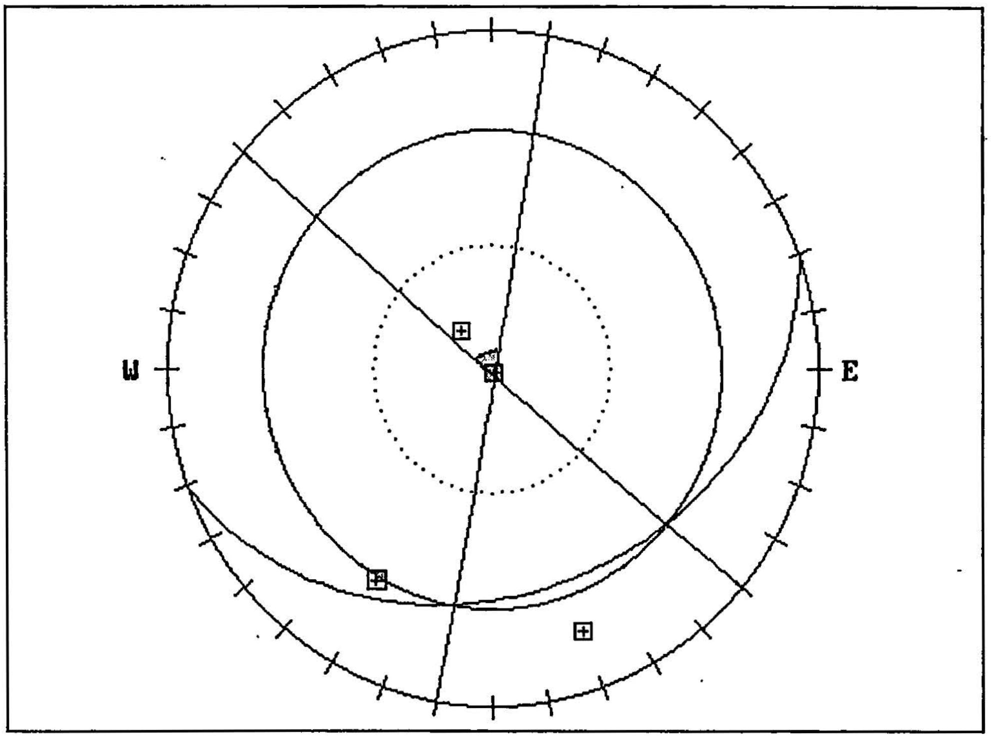
CASE 3



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c3a.DAT
Friction Angle = 30 degrees
Slope dip direction = 160 degrees, Dip = 34 degrees
Number of Stations = 4

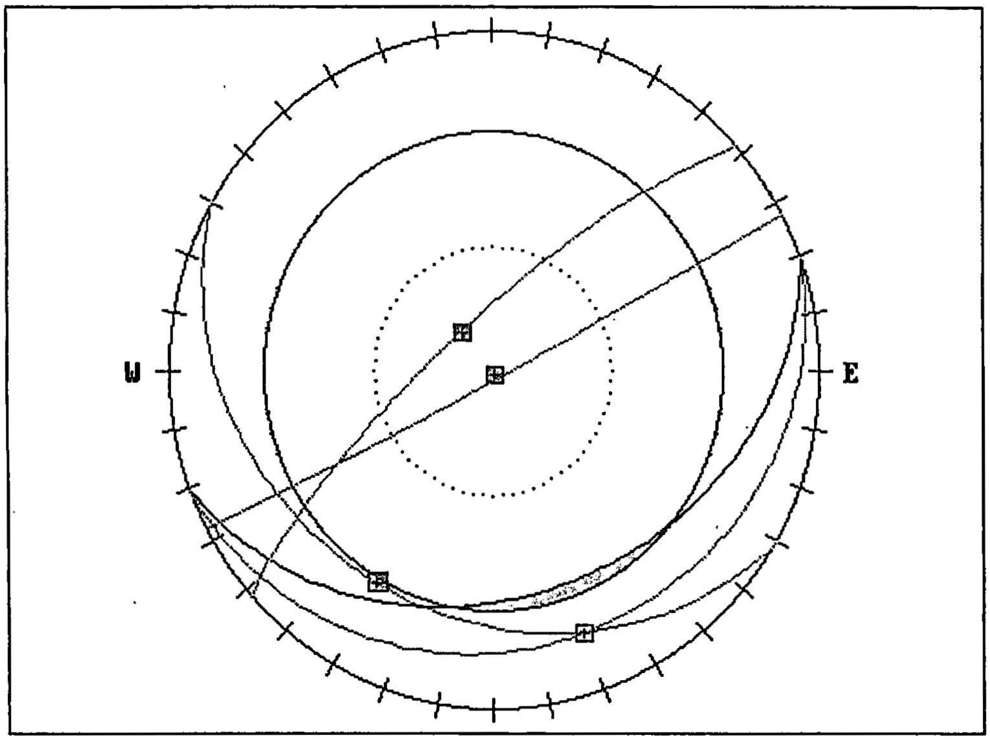
Plate F-13

CASE 3



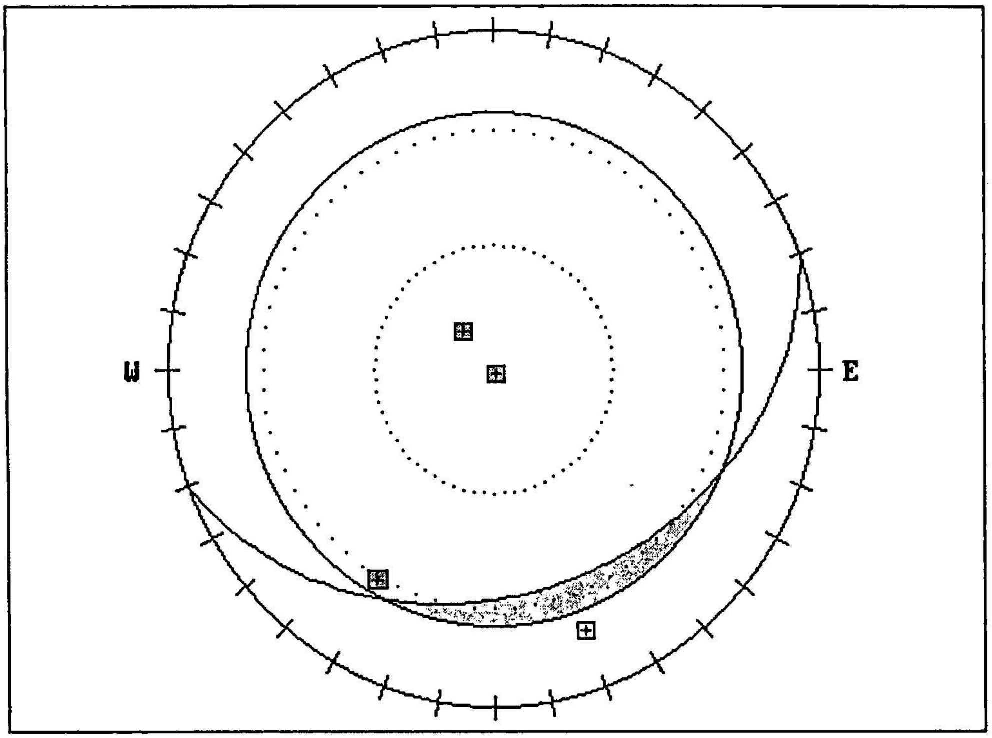
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c3a.DAT
Friction Angle = 30 degrees
Slope dip direction = 160 degrees, Dip = 34 degrees
Number of Stations = 4

CASE 3



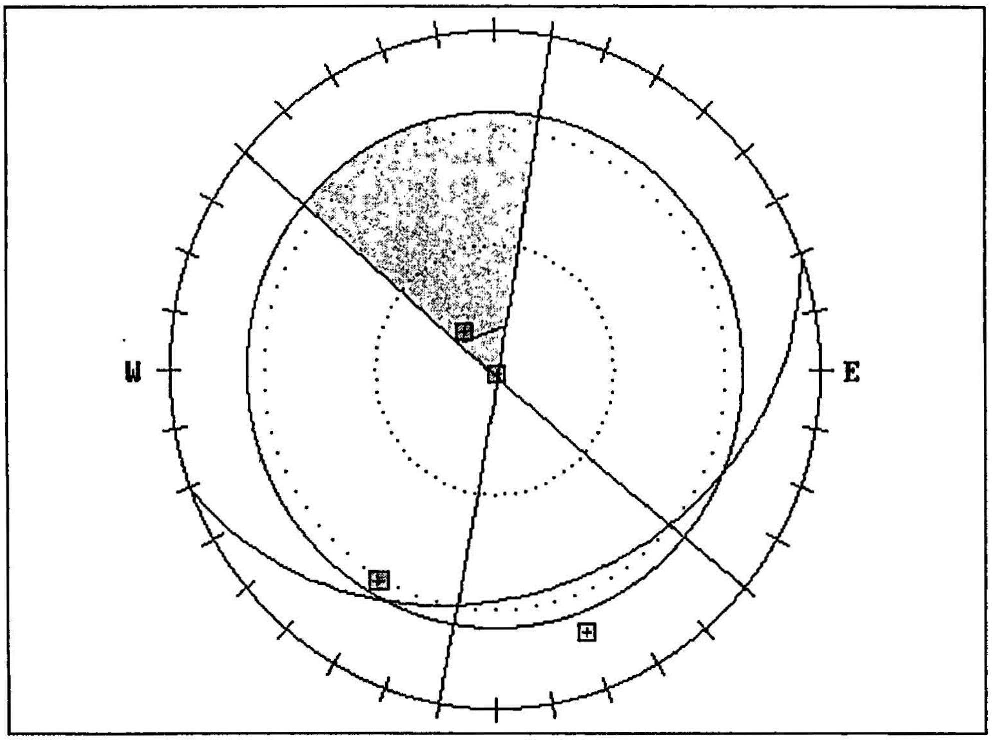
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c3a.DAT
Friction Angle = 30 degrees
Slope dip direction = 160 degrees, Dip = 34 degrees
Number of Stations = 4

CASE 3



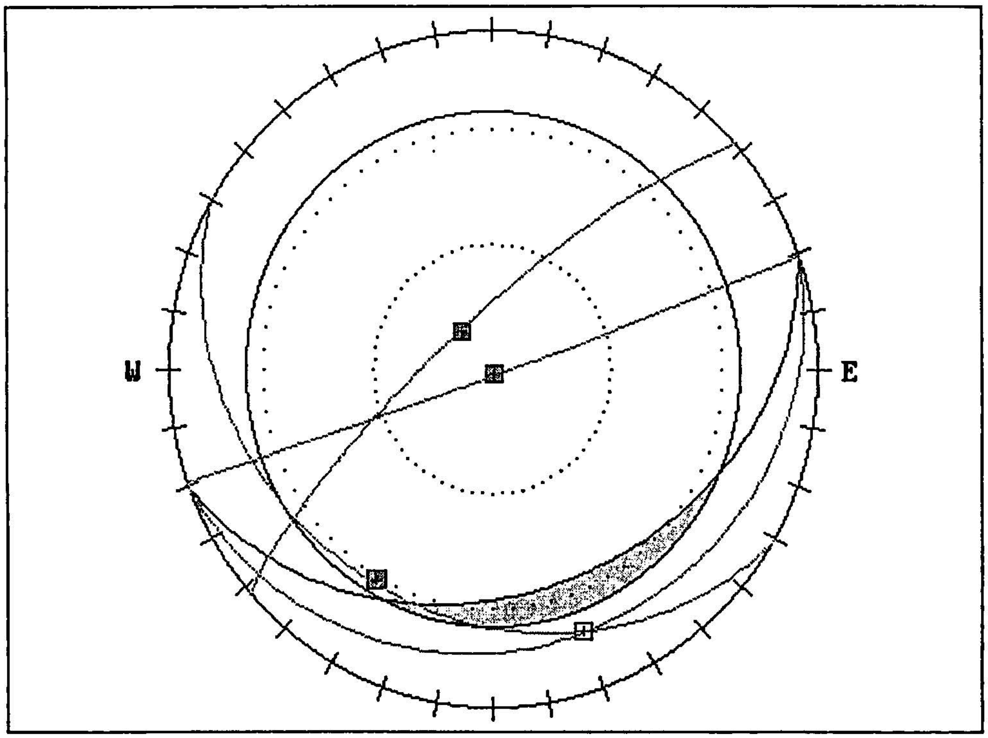
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c3a.DAT
Friction Angle = 25 degrees
Slope dip direction = 160 degrees, Dip = 34 degrees
Number of Stations = 4

CASE 3



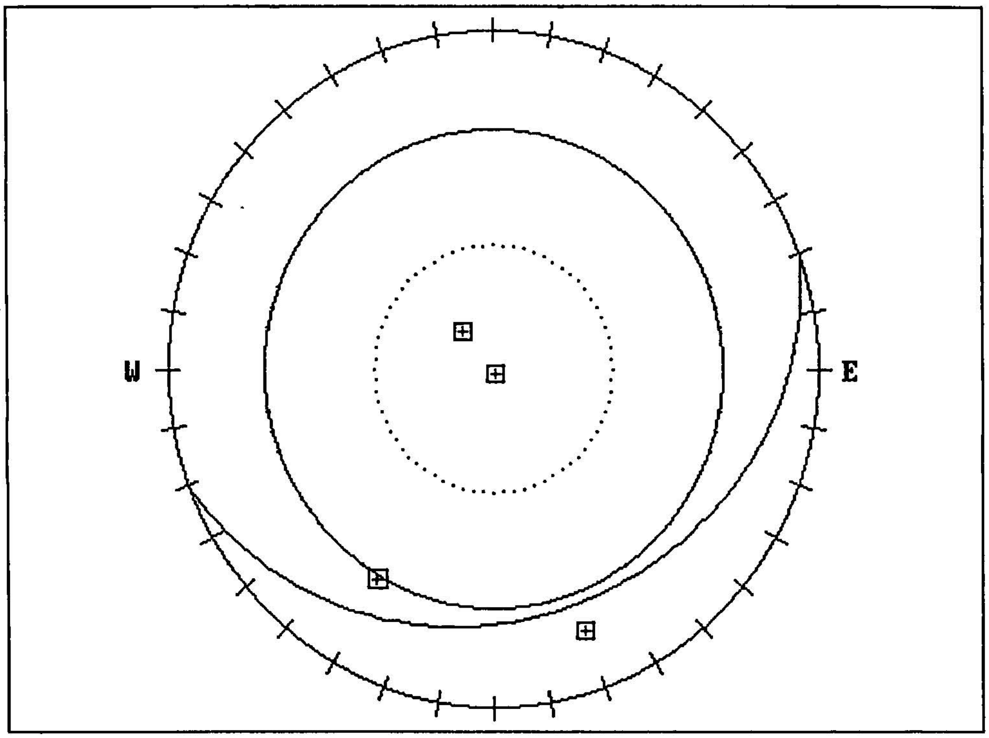
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c3a.DAT
Friction Angle = 25 degrees
Slope dip direction = 160 degrees, Dip = 34 degrees
Number of Stations = 4

CASE 3



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c3a.DAT
Friction Angle = 25 degrees
Slope dip direction = 160 degrees, Dip = 34 degrees
Number of Stations = 4

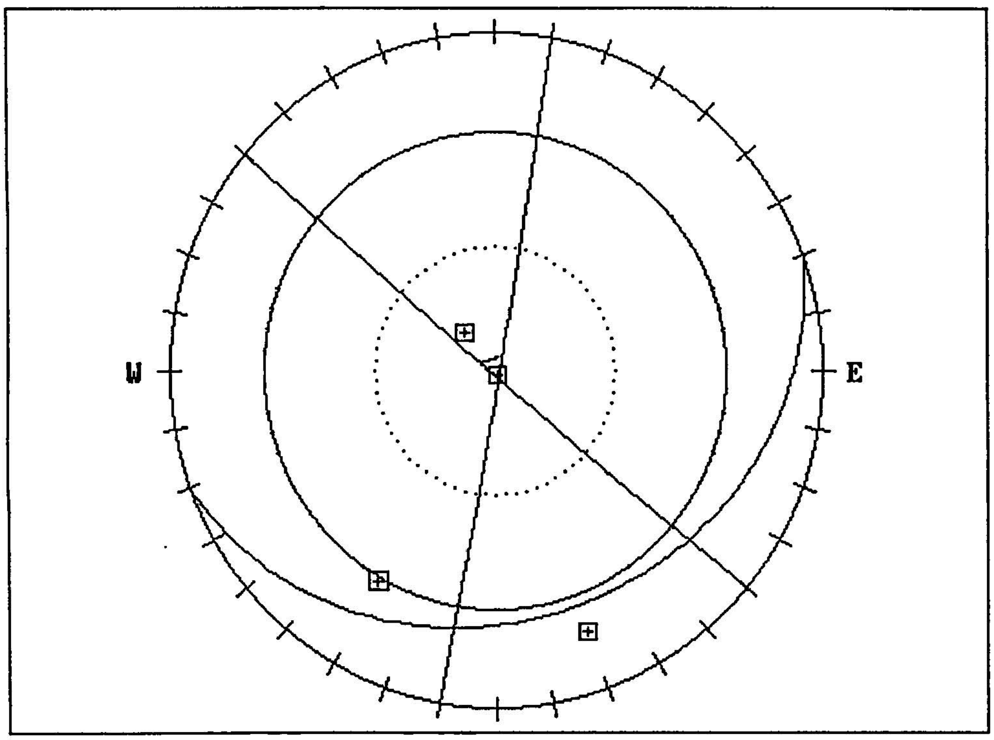
CASE 4



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c4a.DAT
Friction Angle = 30 degrees
Slope dip direction = 160 degrees, Dip = 27 degrees
Number of Stations = 4

Plate F-19

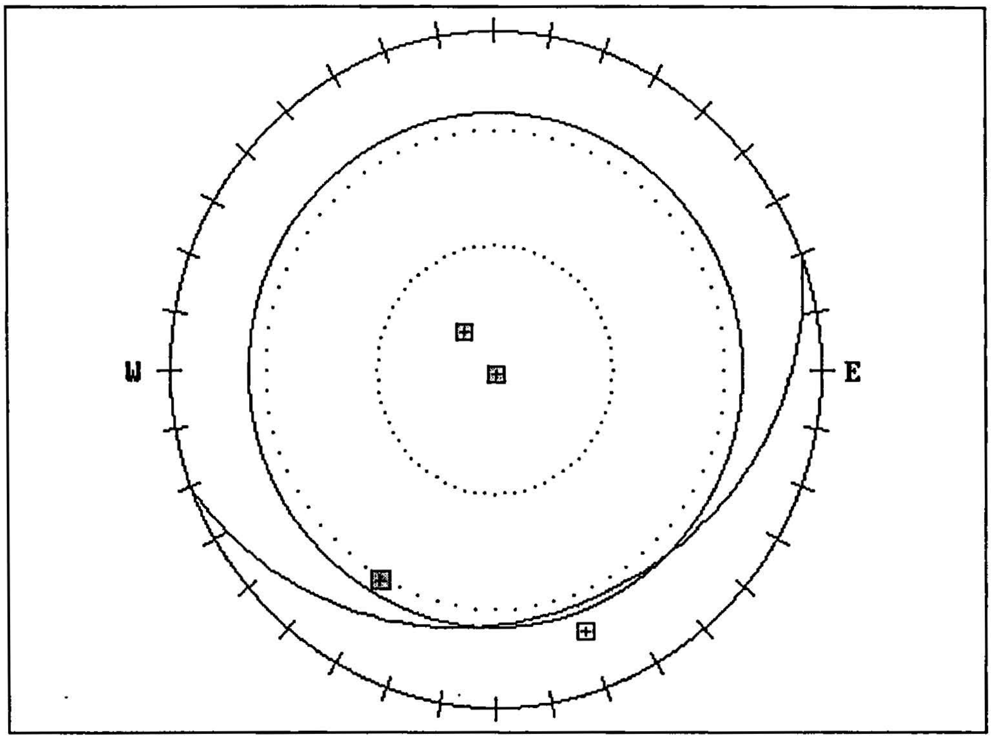
CASE 4



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c4a.DAT
Friction Angle = 30 degrees
Slope dip direction = 160 degrees, Dip = 27 degrees
Number of Stations = 4

Plate F-20

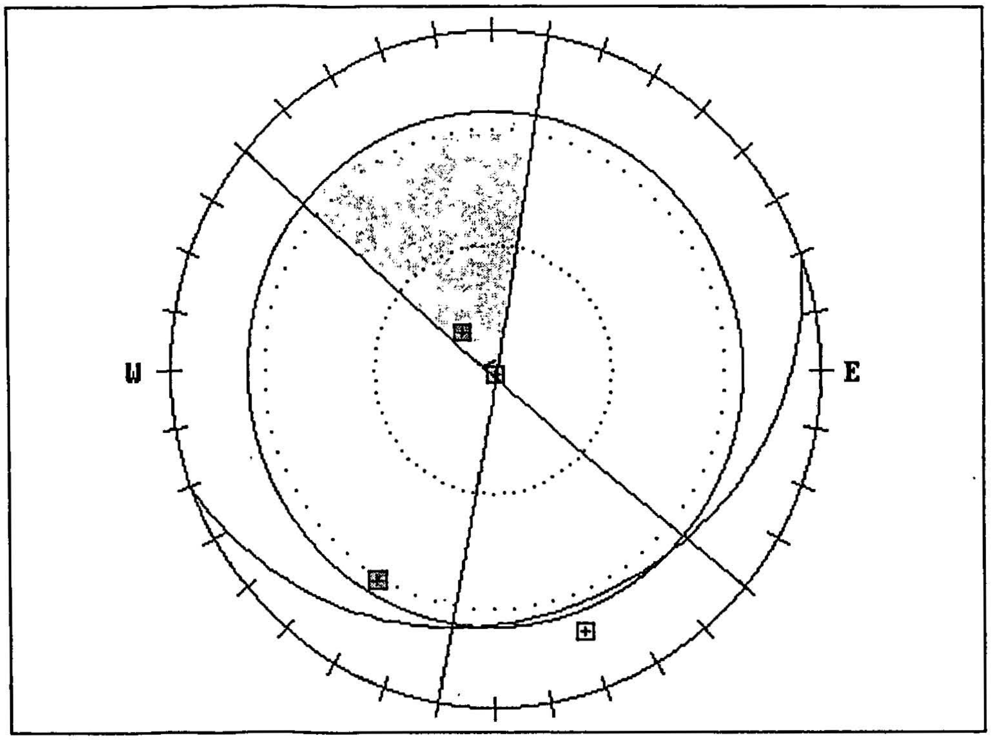
CASE 4



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c4a.DAT
Friction Angle = 25 degrees
Slope dip direction = 160 degrees, Dip = 27 degrees
Number of Stations = 4

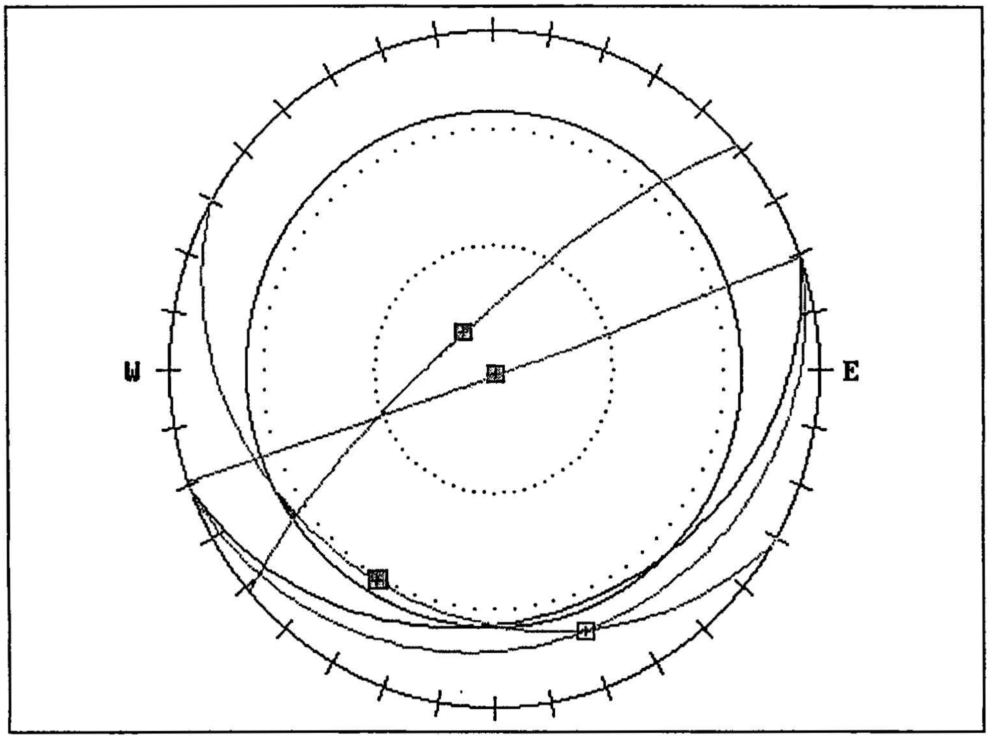
Plate F-22

CASE 4



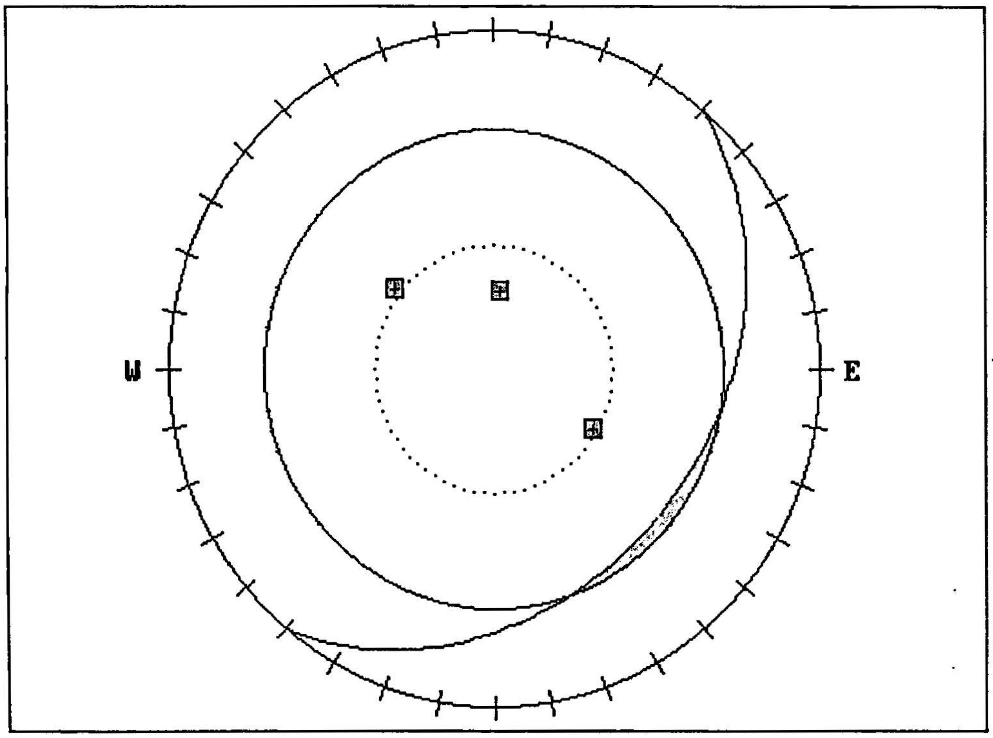
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c4a.DAT
Friction Angle = 25 degrees
Slope dip direction = 160 degrees, Dip = 27 degrees
Number of Stations = 4

CASE 4



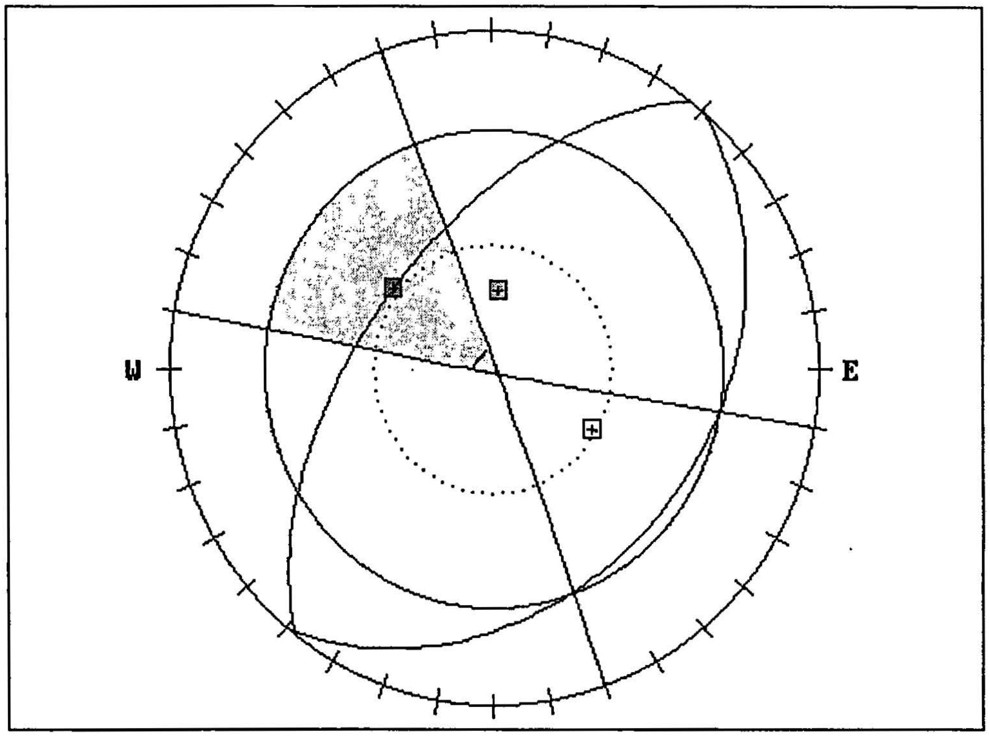
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c4a.DAT
Friction Angle = 25 degrees
Slope dip direction = 160 degrees, Dip = 27 degrees
Number of Stations = 4

CASE 5



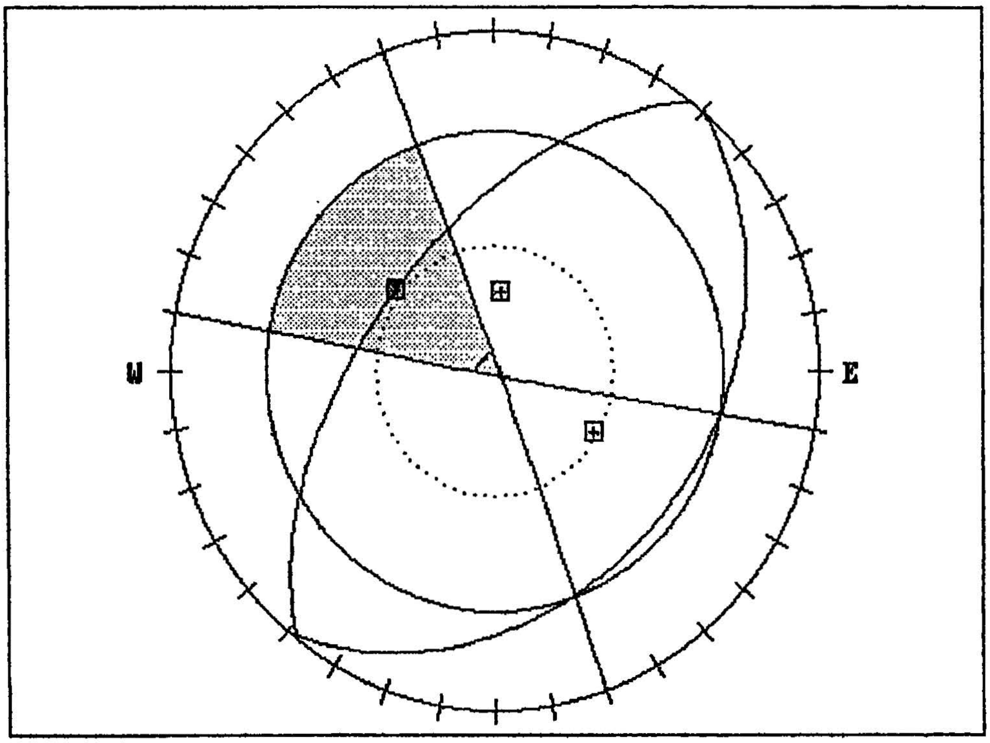
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c5a.DAT
Friction Angle = 30 degrees
Slope dip direction = 130 degrees, Dip = 34 degrees
Number of Stations = 3

CASE 5



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c5a.DAT
Friction Angle = 30 degrees
Slope dip direction = 130 degrees, Dip = 34 degrees
Number of Stations = 3

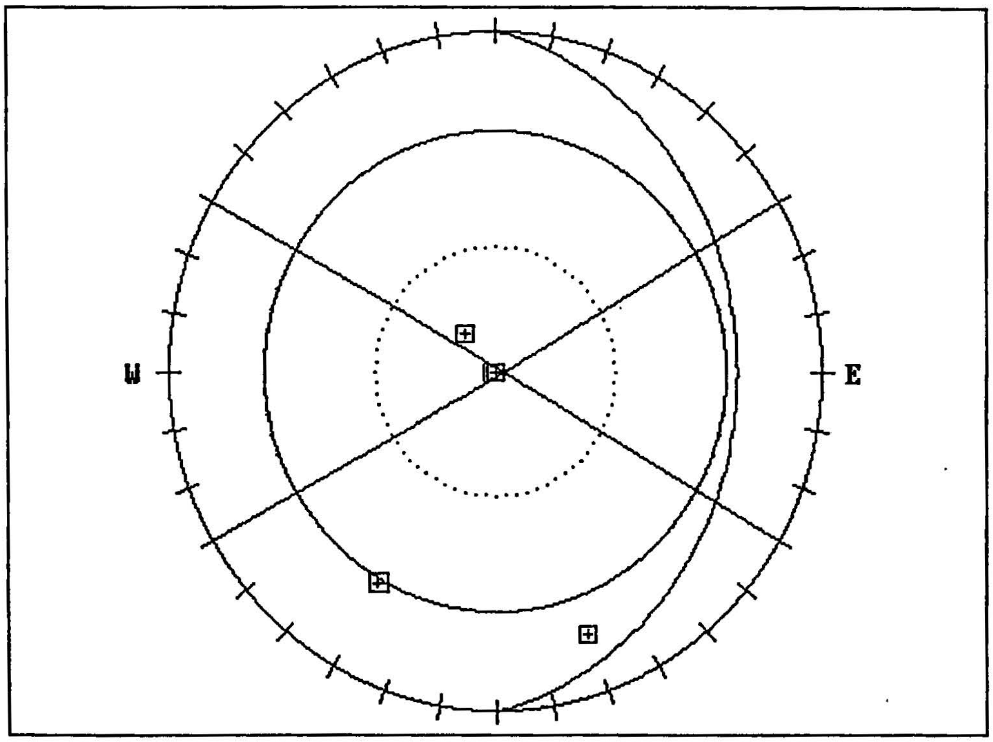
CASE 5



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c5a.DAT
Friction Angle = 30 degrees
Slope dip direction = 130 degrees, Dip = 34 degrees
Number of Stations = 3

Plate F-28

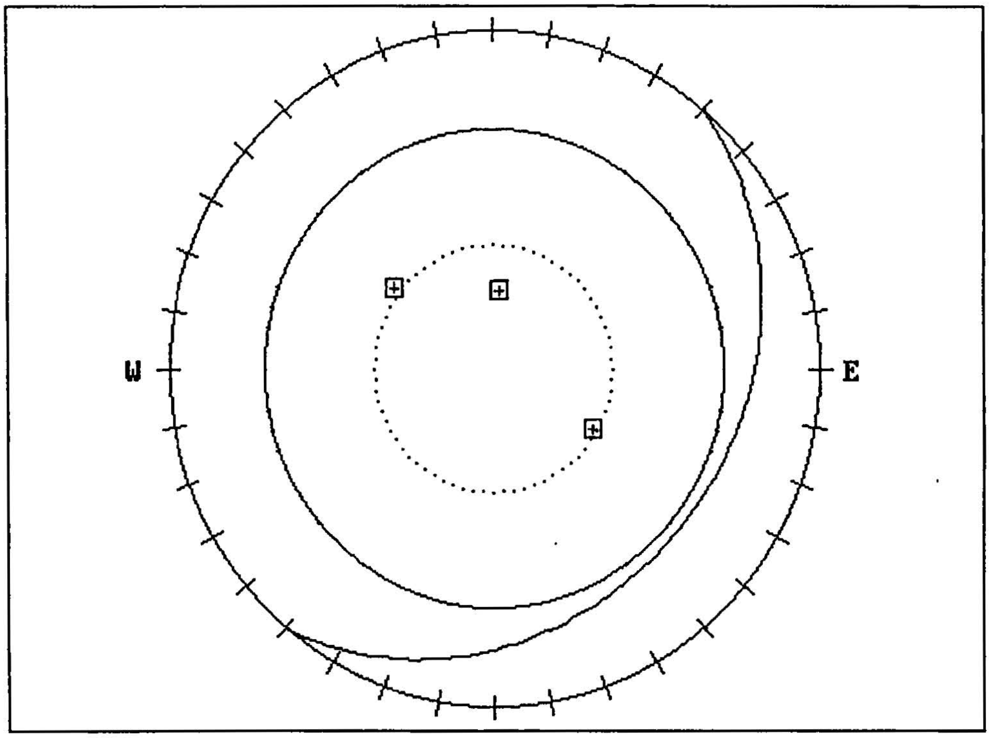
CASE 6



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c2a.DAT
Friction Angle = 30 degrees
Slope dip direction = 90 degrees, Dip = 27 degrees
Number of Stations = 4

Plate F-29

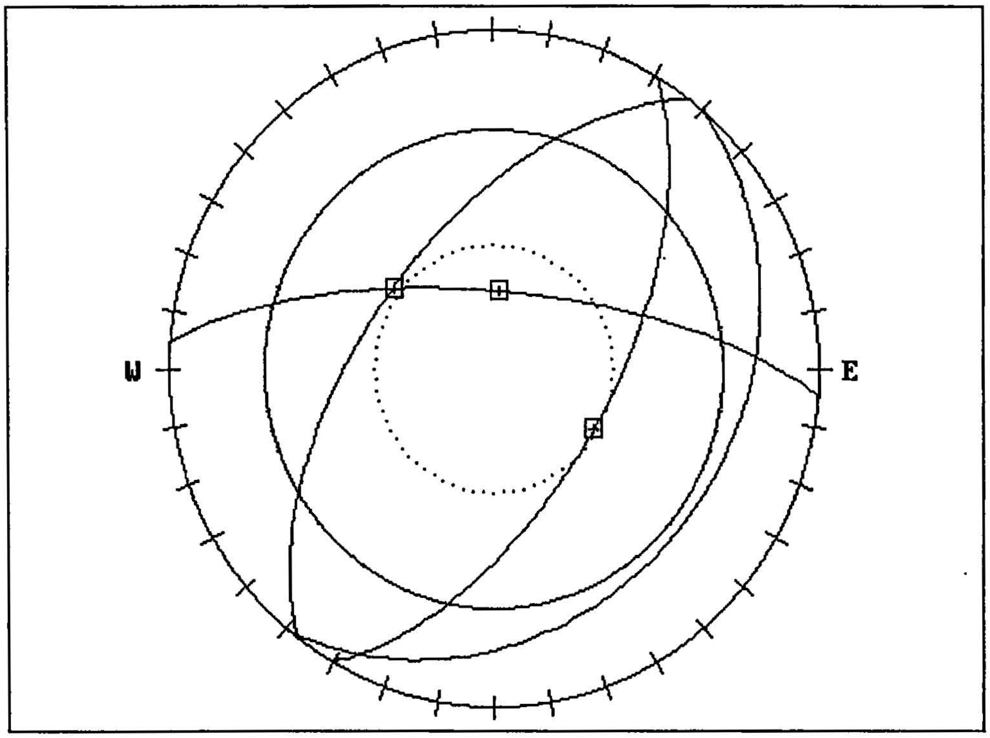
CASE 6



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c6a.DAT
Friction Angle = 30 degrees
Slope dip direction = 130 degrees, Dip = 27 degrees
Number of Stations = 3

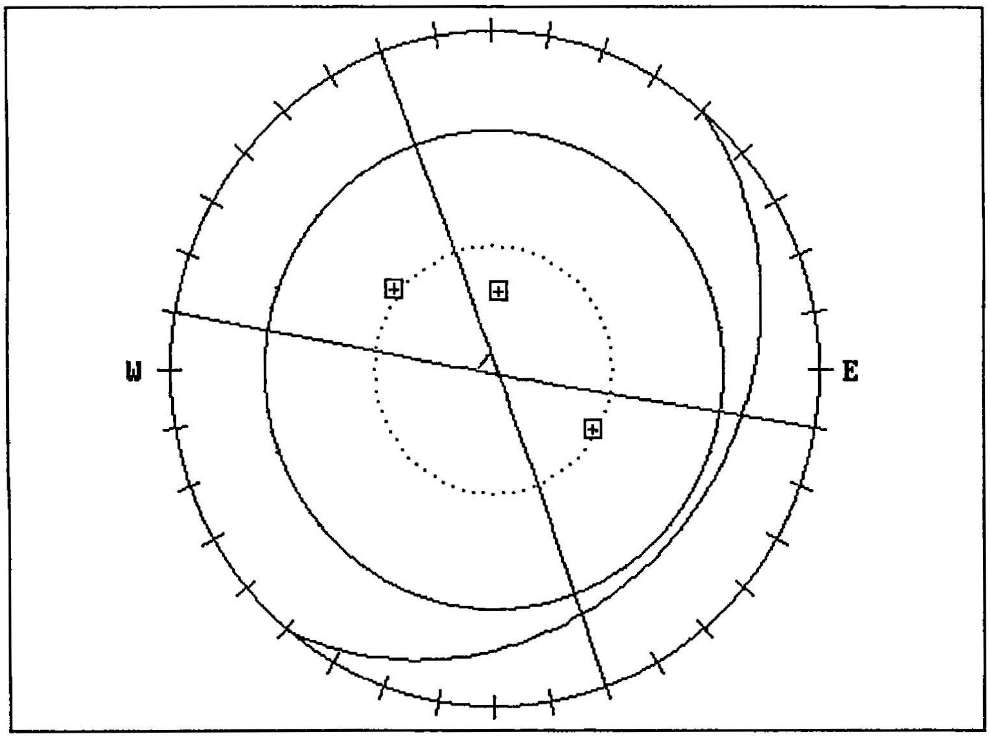
Plate F-30

CASE 6



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c6a.DAT
Friction Angle = 30 degrees
Slope dip direction = 130 degrees, Dip = 27 degrees
Number of Stations = 3

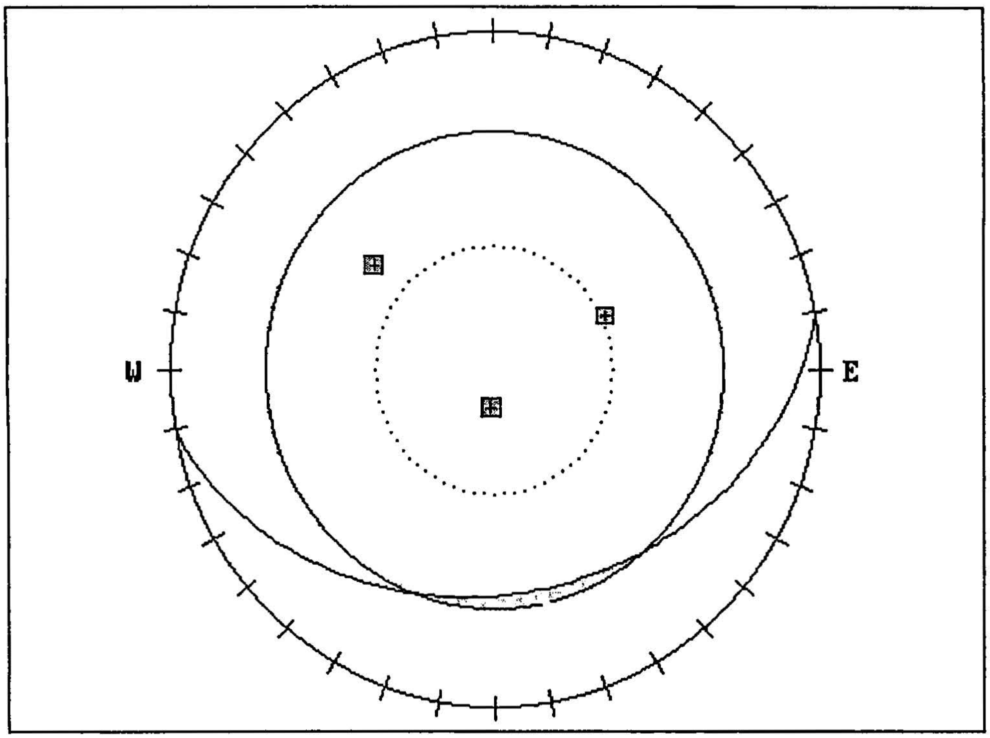
CASE 6



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c6a.DAT
Friction Angle = 30 degrees
Slope dip direction = 130 degrees, Dip = 27 degrees
Number of Stations = 3

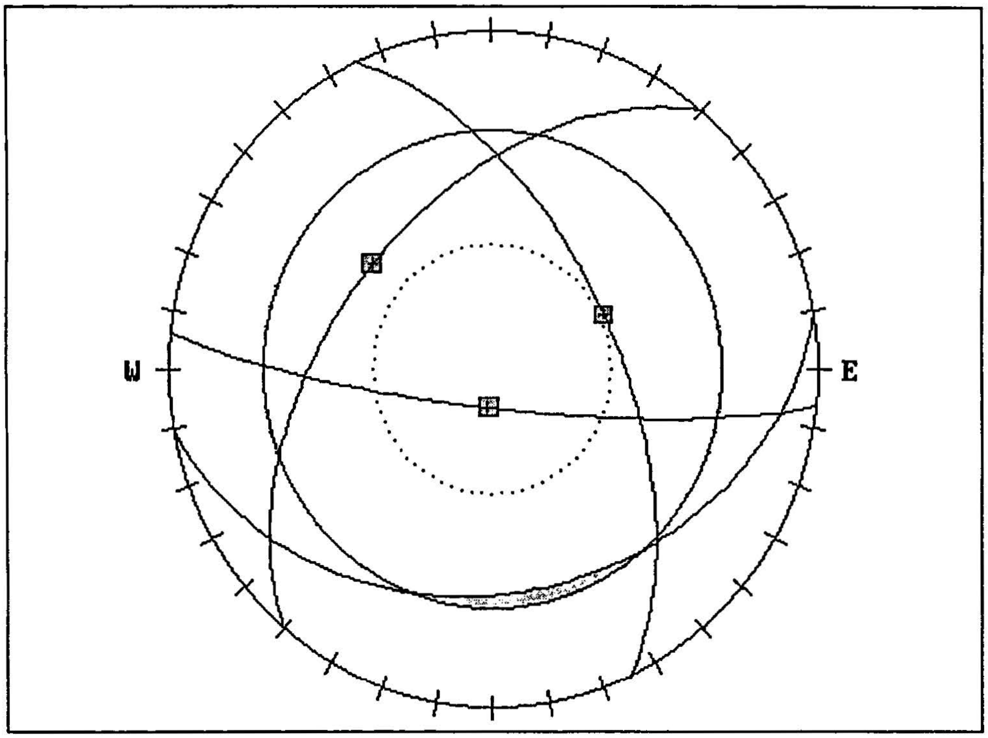
Plate F-32

CASE 7



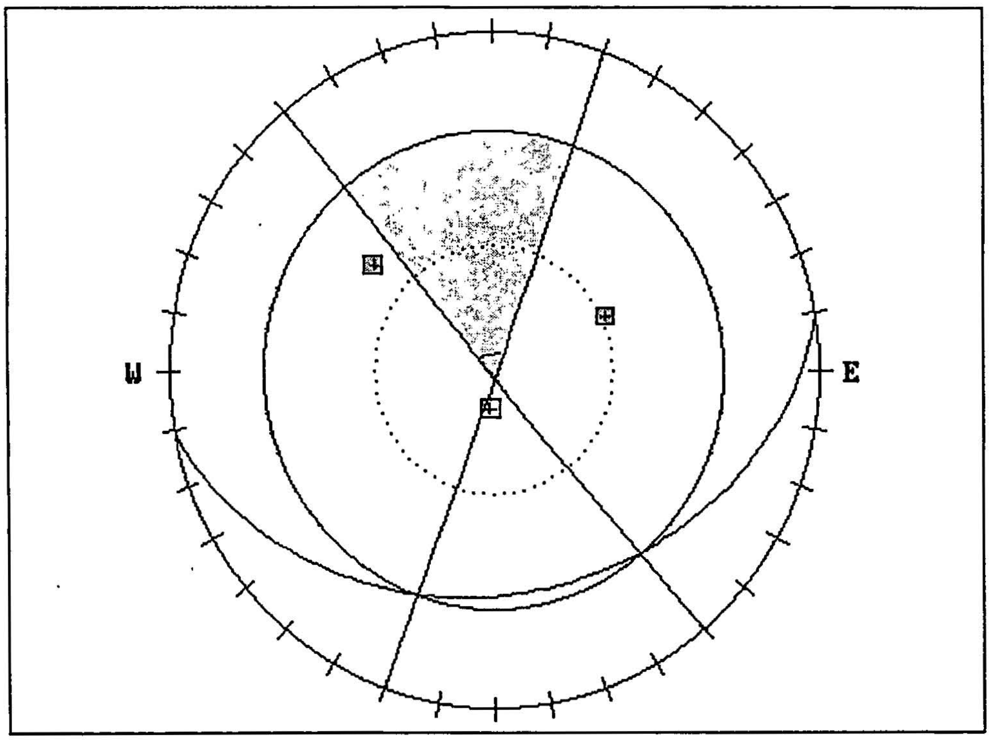
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c7a.DAT
Friction Angle = 30 degrees
Slope dip direction = 170 degrees, Dip = 34 degrees
Number of Stations = 3

CASE 7



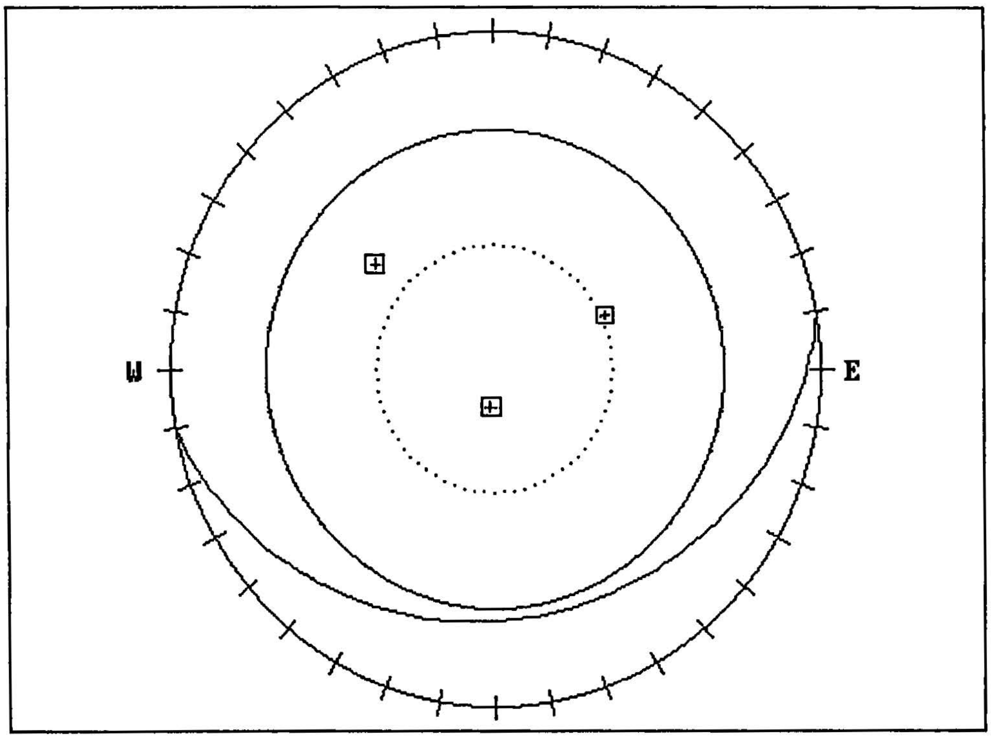
MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c7a.DAT
Friction Angle = 30 degrees
Slope dip direction = 170 degrees, Dip = 34 degrees
Number of Stations = 3

CASE 7



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c7a.DAT
Friction Angle = 30 degrees
Slope dip direction = 170 degrees, Dip = 34 degrees
Number of Stations = 3

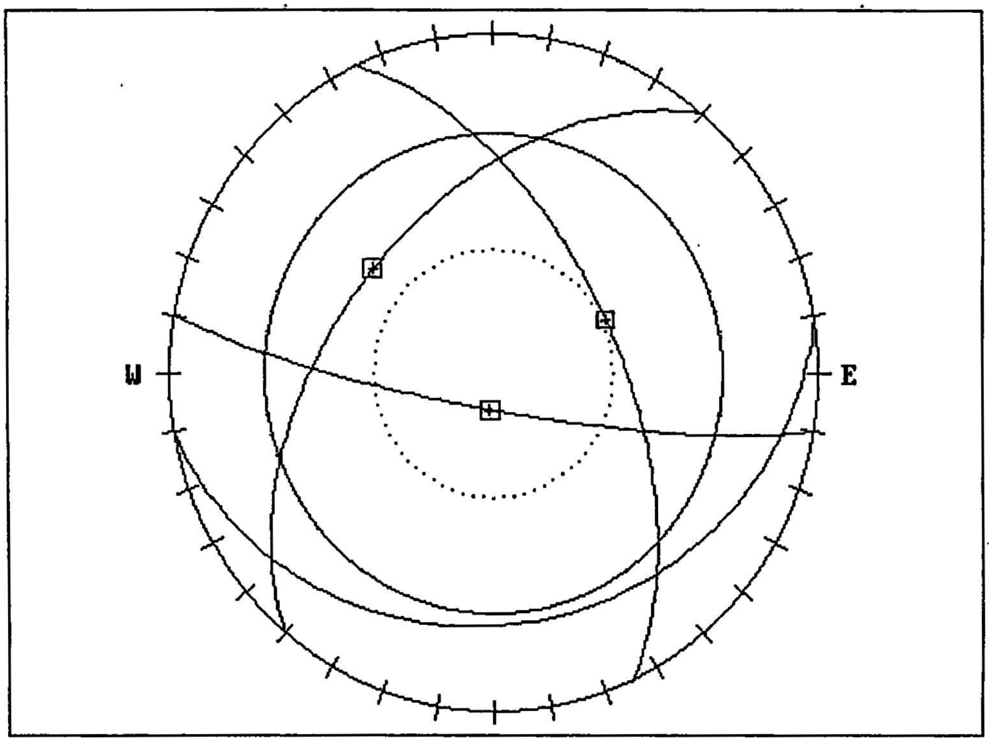
CASE 8



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c8a.DAT
Friction Angle = 30 degrees
Slope dip direction = 170 degrees, Dip = 27 degrees
Number of Stations = 3

Plate F-36

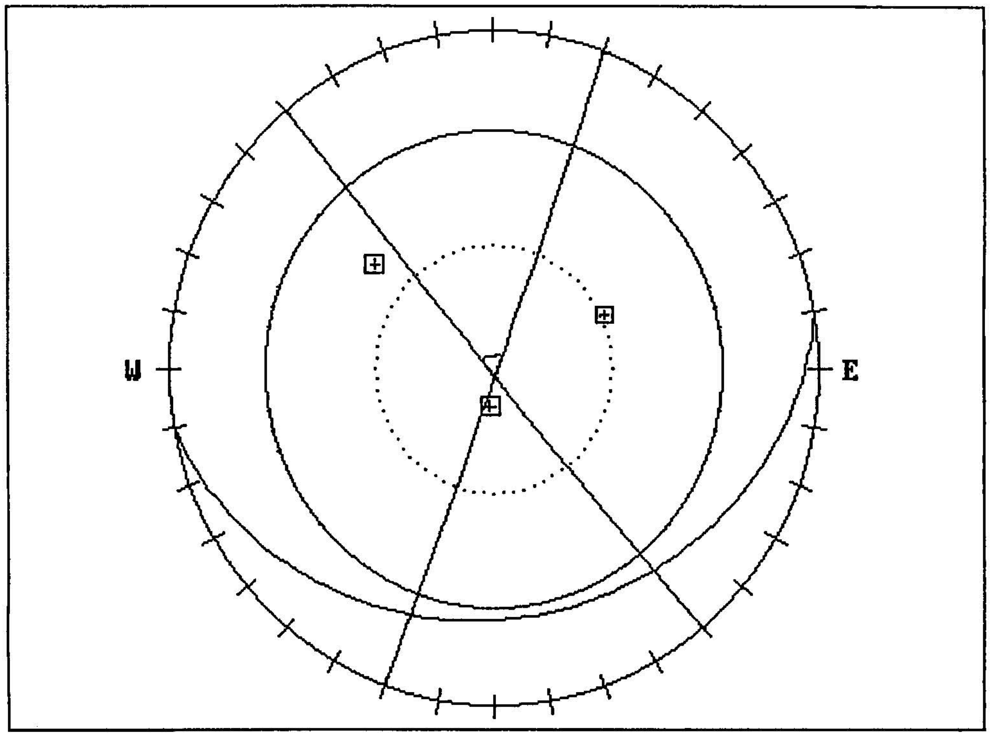
CASE 8



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c8a.DAT
Friction Angle = 30 degrees
Slope dip direction = 170 degrees, Dip = 27 degrees
Number of Stations = 3

Plate F-37

CASE 8



MARKLAND TEST PLOT: c:\rkpk2-04\data\2836c8a.DAT
Friction Angle = 30 degrees
Slope dip direction = 170 degrees, Dip = 27 degrees
Number of Stations = 3

APPENDIX G

GENERAL EARTHWORK AND GRADING GUIDELINES

GENERAL EARTHWORK AND GRADING GUIDELINES

General

These guidelines present general procedures and requirements for earthwork and grading as shown on the approved grading plans, including preparation of areas to filled, placement of fill, installation of subdrains and excavations. The recommendations contained in the geotechnical report are part of the earthwork and grading guidelines and would supersede the provisions contained hereafter in the case of conflict. Evaluations performed by the consultant during the course of grading may result in new recommendations which could supersede these guidelines or the recommendations contained in the geotechnical report.

The contractor is responsible for the satisfactory completion of all earthwork in accordance with provisions of the project plans and specifications. The project soil engineer and engineering geologist (geotechnical consultant) or their representatives should provide observation and testing services, and geotechnical consultation during the duration of the project.

EARTHWORK OBSERVATIONS AND TESTING

Geotechnical Consultant

Prior to the commencement of grading, a qualified geotechnical consultant (soil engineer and engineering geologist) should be employed for the purpose of observing earthwork procedures and testing the fills for conformance with the recommendations of the geotechnical report, the approved grading plans, and applicable grading codes and ordinances.

The geotechnical consultant should provide testing and observation so that determination may be made that the work is being accomplished as specified. It is the responsibility of the contractor to assist the consultants and keep them apprised of anticipated work schedules and changes, so that they may schedule their personnel accordingly.

All clean-outs, prepared ground to receive fill, key excavations, and subdrains should be observed and documented by the project engineering geologist and/or soil engineer prior to placing and fill. It is the contractors's responsibility to notify the engineering geologist and soil engineer when such areas are ready for observation.

Laboratory and Field Tests

Maximum dry density tests to determine the degree of compaction should be performed in accordance with American Standard Testing Materials test method ASTM designation D-1557-78. Random field compaction tests should be performed in accordance with test method ASTM designation D-1556-82, D-2937 or D-2922 and D-3017, at intervals of approximately 2 feet of fill height or every 100 cubic yards of fill placed. These criteria would vary depending on the soil conditions and the size of the project. The location and frequency of testing would be at the discretion of the geotechnical consultant.

Contractor's Responsibility

All clearing, site preparation, and earthwork performed on the project should be conducted by the contractor, with observation by geotechnical consultants and staged approval by the governing agencies, as applicable. It is the contractor's responsibility to prepare the ground surface to receive the fill, to the satisfaction of the soil engineer, and to place, spread, moisture condition, mix and compact the fill in accordance with the recommendations of the soil engineer. The contractor should also remove all major non-earth material considered unsatisfactory by the soil engineer.

It is the sole responsibility of the contractor to provide adequate equipment and methods to accomplish the earthwork in accordance with applicable grading guidelines, codes or agency ordinances, and approved grading plans. Sufficient watering apparatus and compaction equipment should be provided by the contractor with due consideration for the fill material, rate of placement, and climatic conditions. If, in the opinion of the geotechnical consultant, unsatisfactory conditions such as questionable weather, excessive oversized rock, or deleterious material, insufficient support equipment, etc., are resulting in a quality of work that is not acceptable, the consultant will inform the contractor, and the contractor is expected to rectify the conditions, and if necessary, stop work until conditions are satisfactory.

During construction, the contractor shall properly grade all surfaces to maintain good drainage and prevent ponding of water. The contractor shall take remedial measures to control surface water and to prevent erosion of graded areas until such time as permanent drainage and erosion control measures have been installed.

SITE PREPARATION

All major vegetation, including brush, trees, thick grasses, organic debris, and other deleterious material should be removed and disposed of off-site. These removals must be concluded prior to placing fill. Existing fill, soil, alluvium, colluvium, or rock materials determined by the soil engineer or engineering geologist as being unsuitable in-place should be removed prior to fill placement. Depending upon the soil conditions, these materials may be reused as compacted fills. Any materials incorporated as part of the compacted fills should be approved by the soil engineer.

Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipelines, or other structures not located prior to grading are to be removed or treated in a manner recommended by the soil engineer. Soft, dry, spongy, highly fractured, or otherwise unsuitable ground extending to such a depth that surface processing cannot adequately improve the condition should be overexcavated down to firm ground and approved by the soil engineer before compaction and filling operations continue. Overexcavated and processed soils which have been properly mixed and moisture conditioned should be re-compacted to the minimum relative compaction as specified in these guidelines.

Existing ground which is determined to be satisfactory for support of the fills should be scarified to a minimum depth of 6 inches or as directed by the soil engineer. After the scarified ground is brought to optimum moisture content or greater and mixed, the materials should be compacted as specified herein. If the scarified zone is grater that 6 inches in depth, it may be necessary to remove the excess and place the material in lifts restricted to about 6 inches in compacted thickness.

Existing ground which is not satisfactory to support compacted fill should be overexcavated as required in the geotechnical report or by the on-site soils engineer and/or engineering geologist. Scarification, disc harrowing, or other acceptable form of mixing should continue until the soils are broken down and free of large lumps or clods, until the working surface is reasonably uniform and free from ruts, hollow, hummocks, or other uneven features which would inhibit compaction as described previously.

Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical), the ground should be stepped or benched. The lowest bench, which will act as a key, should be a minimum of 15 feet wide and should be at least 2 feet deep into firm material, and approved by the soil engineer and/or engineering geologist. In fill over cut slope conditions, the recommended minimum width of the lowest bench or key is also 15 feet with the key founded on firm material, as designated by the Geotechnical Consultant. As a general rule, unless specifically recommended otherwise by the Soil Engineer, the minimum width of fill keys should be approximately equal to ½ the height of the slope.

Standard benching is generally 4 feet (minimum) vertically, exposing firm, acceptable material. Benching may be used to remove unsuitable materials, although it is understood that the vertical height of the bench may exceed 4 feet. Pre-stripping may be considered for unsuitable materials in excess of 4 feet in thickness.

All areas to receive fill, including processed areas, removal areas, and the toe of fill benches should be observed and approved by the soil engineer and/or engineering geologist prior to placement of fill. Fills may then be properly placed and compacted until design grades (elevations) are attained.

COMPACTED FILLS

Any earth materials imported or excavated on the property may be utilized in the fill provided that each material has been determined to be suitable by the soil engineer. These materials should be free of roots, tree branches, other organic matter or other deleterious materials. All unsuitable materials should be removed from the fill as directed by the soil engineer. Soils of poor gradation, undesirable expansion potential, or substandard strength characteristics may be designated by the consultant as unsuitable and may require blending with other soils to serve as a satisfactory fill material.

Fill materials derived from benching operations should be dispersed throughout the fill area and blended with other bedrock derived material. Benching operations should not result in the benched material being placed only within a single equipment width away from the fill/bedrock contact.

Oversized materials defined as rock or other irreducible materials with a maximum dimension greater than 12 inches should not be buried or placed in fills unless the location of materials and disposal methods are specifically approved by the soil engineer. Oversized material should be taken off-site or placed in accordance with recommendations of the soil engineer in areas designated as suitable for rock disposal. Oversized material should not be placed within 10 feet vertically of finish grade (elevation) or within 20 feet horizontally of slope faces.

To facilitate future trenching, rock should not be placed within the range of foundation excavations, future utilities, or underground construction unless specifically approved by the soil engineer and/or the developers representative.

If import material is required for grading, representative samples of the materials to be utilized as compacted fill should be analyzed in the laboratory by the soil engineer to determine its physical properties. If any material other than that previously tested is encountered during grading, an appropriate analysis of this material should be conducted by the soil engineer as soon as possible.

Approved fill material should be placed in areas prepared to receive fill in near horizontal layers that when compacted should not exceed 6 inches in thickness. The soil engineer may approve thick lifts if testing indicates the grading procedures are such that adequate compaction is being achieved with lifts of greater thickness. Each layer should be spread evenly and blended to attain uniformity of material and moisture suitable for compaction.

Fill layers at a moisture content less than optimum should be watered and mixed, and wet fill layers should be aerated by scarification or should be blended with drier material. Moisture condition, blending, and mixing of the fill layer should continue until the fill materials have a uniform moisture content at or above optimum moisture.

After each layer has been evenly spread, moisture conditioned and mixed, it should be uniformly compacted to a minimum of 90 percent of maximum density as determined by ASTM test designation, D-1557-78, or as otherwise recommended by the soil engineer. Compaction equipment should be adequately sized and should be specifically designed for soil compaction or of proven reliability to efficiently achieve the specified degree of compaction.

Where tests indicate that the density of any layer of fill, or portion thereof, is below the required relative compaction, or improper moisture is in evidence, the particular layer or portion shall be re-worked until the required density and/or moisture content has been attained. No additional fill shall be placed in an area until the last placed lift of fill has been tested and found to meet the density and moisture requirements, and is approved by the soil engineer.

Compaction of slopes should be accomplished by over-building a minimum of 3 feet horizontally, and subsequently trimming back to the design slope configuration. Testing shall be performed as the fill is elevated to evaluate compaction as the fill core is being developed. Special efforts may be necessary to attain the specified compaction in the fill slope zone. Final slope shaping should be performed by trimming and removing loose materials with appropriate equipment. A final determination of fill slope compaction should be based on observation and/or testing of the finished slope face. Where compacted fill slopes are designed steeper than 2:1 (horizontal to vertical), specific material types, a higher minimum relative compaction, and special grading procedures, may be recommended.

If an alternative to over-building and cutting back the compacted fill slopes is selected, then special effort should be made to achieve the required compaction in the outer 10 feet of each lift of fill by undertaking the following:

1. An extra piece of equipment consisting of a heavy short shanked sheepsfoot should be used to roll (horizontal) parallel to the slopes continuously as fill is placed. The sheepsfoot roller should also be used to roll perpendicular to the slopes, and extend out over the slope to provide adequate compaction to the face of the slope.

2. Loose fill should not be spilled out over the face of the slope as each lift is compacted. Any loose fill spilled over a previously completed slope face should be trimmed off or be subject to re-rolling.

3. Field compaction tests will be made in the outer (horizontal) 2 to 8 feet of the slope at appropriate vertical intervals, subsequent to compaction operations.

4. After completion of the slope, the slope face should be shaped with a small tractor and then re-rolled with a sheepsfoot to achieve compaction to near the slope face. Subsequent to testing to verify compaction, the slopes should be grid-rolled to achieve compaction to the slope face. Final testing should be used to confirm compaction after grid rolling.

5. Where testing indicates less than adequate compaction, the contractor will be responsible to rip, water, mix and re-compact the slope material as necessary to achieve compaction. Additional testing should be performed to verify compaction.

6. Erosion control and drainage devices should be designed by the project civil engineer in compliance with ordinances of the controlling governmental agencies, and/or in accordance with the recommendation of the soil engineer or engineering geologist.

SUBDRAIN INSTALLATION

Subdrains should be installed in approved ground in accordance with the approximate alignment and details indicated by the geotechnical consultant. Subdrain locations or materials should not be changed or modified without approval of the geotechnical consultant. The soil engineer and/or engineering geologist may recommend and direct changes in subdrain line, grade and drain material in the field, pending exposed conditions. The location of constructed subdrains should be recorded by the project civil engineer.

EXCAVATIONS

Excavations and cut slopes should be examined during grading by the engineering geologist. If directed by the engineering geologist, further excavations or overexcavation and re-filling of cut areas should be performed and/or remedial grading of cut slopes should be performed. When fill over cut slopes are to be graded, unless otherwise approved, the cut portion of the slope should be observed by the engineering geologist prior to placement of materials for construction of the fill portion of the slope.

The engineering geologist should observe all cut slopes and should be notified by the contractor when cut slopes are started.

If, during the course of grading, unforeseen adverse or potential adverse geologic conditions are encountered, the engineering geologist and soil engineer should investigate, evaluate and make recommendations to treat these problems. The need for cut slope buttressing or stabilizing should be based on in-grading evaluation by the engineering geologist, whether anticipated or not.

Unless otherwise specified in soil and geological reports, no cut slopes should be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies. Additionally, short-term stability of temporary cut slopes is the contractors responsibility.

Erosion control and drainage devices should be designed by the project civil engineer and should be constructed in compliance with the ordinances of the controlling governmental agencies, and/or in accordance with the recommendations of the soil engineer or engineering geologist.

COMPLETION

Observation, testing and consultation by the geotechnical consultant should be conducted during the grading operations in order to state an opinion that all cut and filled areas are graded in accordance with the approved project specifications.

After completion of grading and after the soil engineer and engineering geologist have finished their observations of the work, final reports should be submitted subject to review by the controlling governmental agencies. No further excavation or filling should be undertaken without prior notification of the soil engineer and/or engineering geologist.

All finished cut and fill slopes should be protected from erosion and/or be planted in accordance with the project specifications and/or as recommended by a landscape architect. Such protection and/or planning should be undertaken as soon as practical after completion of grading.

JOB SAFETY

General

At GeoSoils, Inc. (GSI) getting the job done safely is of primary concern. The following is the company's safety considerations for use by all employees on multi-employer construction sites. On ground personnel are at highest risk of injury and possible fatality on grading and construction projects. GSI recognizes that construction activities will vary on each site and that site safety is the prime responsibility of the contractor; however, everyone must be safety conscious and responsible at all times. To achieve our goal of avoiding accidents, cooperation between the client, the contractor and GSI personnel must be maintained.

In an effort to minimize risks associated with geotechnical testing and observation, the following precautions are to be implemented for the safety of field personnel on grading and construction projects:

Safety Meetings: GSI field personnel are directed to attend contractors regularly scheduled and documented safety meetings.

Safety Vests: Safety vests are provided for and are to be worn by GSI personnel at all times when they are working in the field.

Safety Flags: Two safety flags are provided to GSI field technicians; one is to be affixed to the vehicle when on site, the other is to be placed atop the spoil pile on all test pits.

Flashing Lights: All vehicles stationary in the grading area shall use rotating or flashing amber beacon, or strobe lights, on the vehicle during all field testing. While operating a vehicle in the grading area, the emergency flasher on the vehicle shall be activated.

In the event that the contractor's representative observes any of our personnel not following the above, we request that it be brought to the attention of our office.

Test Pits Location, Orientation and Clearance

The technician is responsible for selecting test pit locations. A primary concern should be the technicians's safety. Efforts will be made to coordinate locations with the grading contractors authorized representative, and to select locations following or behind the established traffic pattern, preferably outside of current traffic. The contractors authorized representative (dump man, operator, supervisor, grade checker, etc.) should direct excavation of the pit and safety during the test period. Of paramount concern should be the soil technicians safety and obtaining enough tests to represent the fill.

Test pits should be excavated so that the spoil pile is placed away form oncoming traffic, whenever possible. The technician's vehicle is to be placed next to the test pit, opposite the spoil pile. This necessitates the fill be maintained in a driveable condition. Alternatively, the contractor may wish to park a piece of equipment in front of the test holes, particularly in small fill areas or those with limited access.

A zone of non-encroachment should be established for all test pits. No grading equipment should enter this zone during the testing procedure. The zone should extend approximately 50 feet outward from the center of the test pit. This zone is established for safety and to avoid excessive ground vibration which typically decreased test results.

When taking slope tests the technician should park the vehicle directly above or below the test location. If this is not possible, a prominent flag should be placed at the top of the slope. The contractor's representative should effectively keep all equipment at a safe operation distance (e.g. 50 feet) away from the slope during this testing.

The technician is directed to withdraw from the active portion of the fill as soon as possible following testing. The technician's vehicle should be parked at the perimeter of the fill in a highly visible location, well away from the equipment traffic pattern.

The contractor should inform our personnel of all changes to haul roads, cut and fill areas or other factors that may affect site access and site safety.

In the event that the technicians safety is jeopardized or compromised as a result of the contractors failure to comply with any of the above, the technician is required, by company policy, to immediately withdraw and notify his/her supervisor. The grading contractors representative will eventually be contacted in an effort to effect a solution. However, in the interim, no further testing will be performed until the situation is rectified. Any fill place can be considered unacceptable and subject to reprocessing, recompaction or removal.

In the event that the soil technician does not comply with the above or other established safety guidelines, we request that the contractor brings this to his/her attention and notify this office. Effective communication and coordination between the contractors representative and the soils technician is strongly encouraged in order to implement the above safety plan.

Trench and Vertical Excavation

It is the contractor's responsibility to provide safe access into trenches where compaction testing is needed.

Our personnel are directed not to enter any excavation or vertical cut which 1) is 5 feet or deeper unless shored or laid back, 2) displays any evidence of instability, has any loose rock or other debris which could fall into the trench, or 3) displays any other evidence of any unsafe conditions regardless of depth.

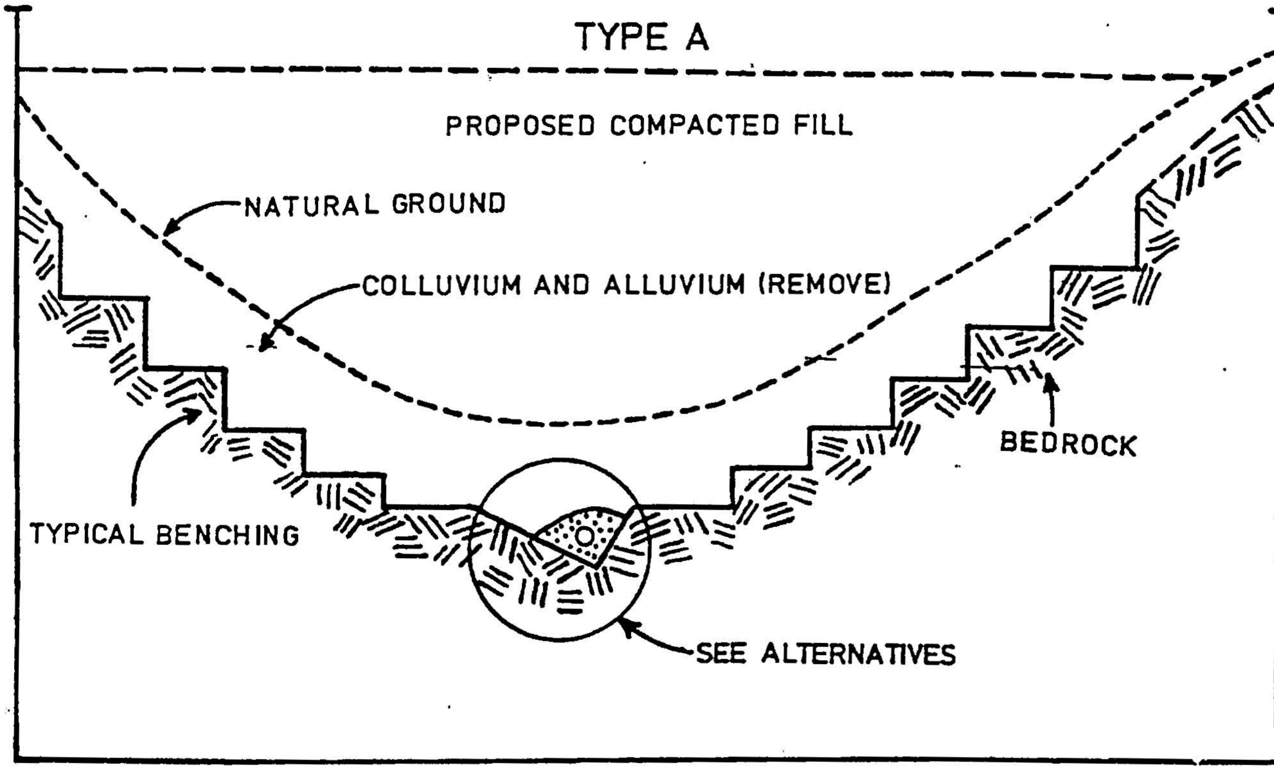
All trench excavations or vertical cuts in excess of 5 feet deep, which any person enters, should be shored or laid back.

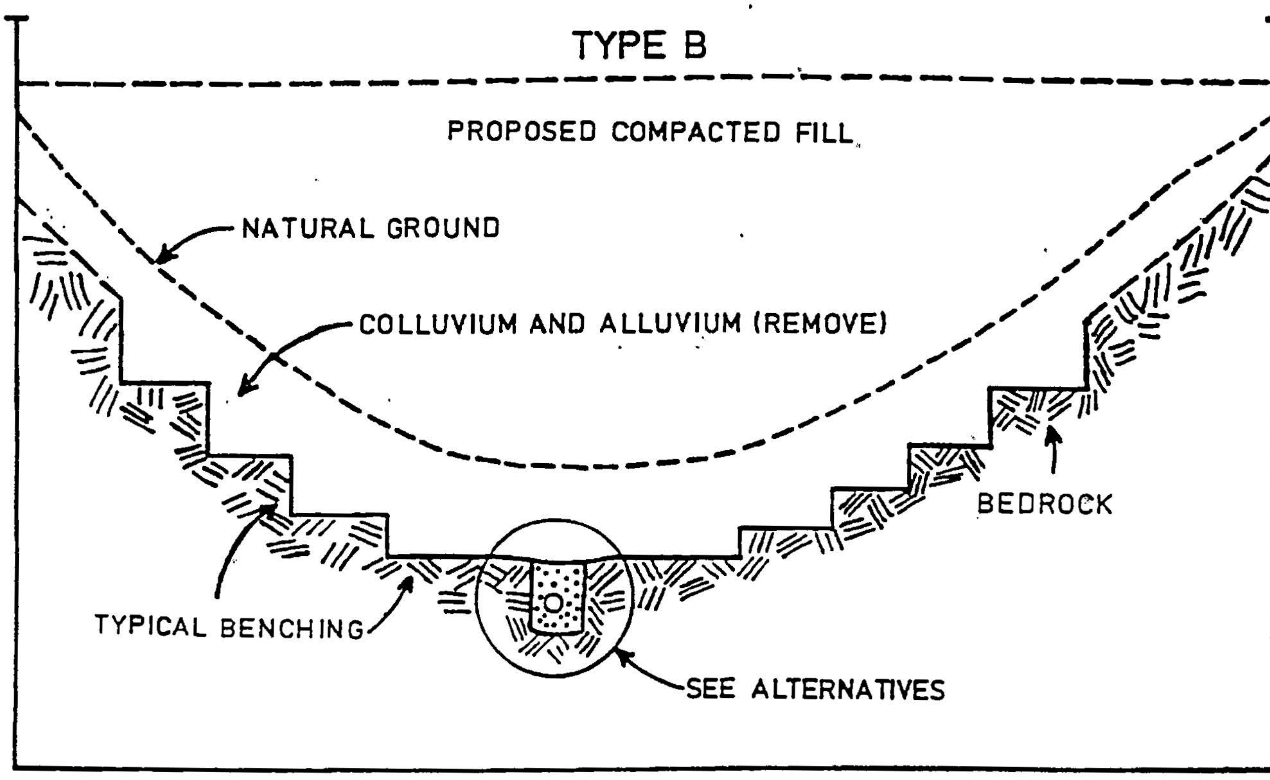
Trench access should be provided in accordance with CAL-OSHA and/or state and local standards. Our personnel are directed not to enter any trench by being lowered or "riding down" on the equipment.

If the contractor fails to provide safe access to trenches for compaction testing, our company policy requires that the soil technician withdraw and notify his/her supervisor. The contractors representative will eventually be contacted in an effort to effect a solution. All backfill not tested due to safety concerns or other reasons could be subject to reprocessing and/or removal.

If GSI personnel become aware of anyone working beneath an unsafe trench wall or vertical excavation, we have a legal obligation to put the contractor and owner/developer on notice to immediately correct the situation. If corrective steps are not taken, GSI then has an obligation to notify CAL-OSHA and/or the proper authorities.

CANYON SUBDRAIN DETAIL

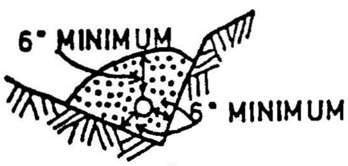




NOTE: ALTERNATIVES, LOCATION AND EXTENT OF SUBDRAINS SHOULD BE DETERMINED BY THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST DURING GRADING.

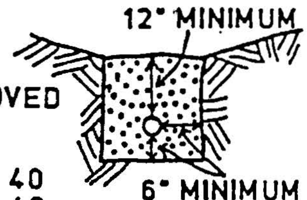
CANYON SUBDRAIN ALTERNATE DETAILS

ALTERNATE 1: PERFORATED PIPE AND FILTER MATERIAL



A-1

FILTER MATERIAL: MINIMUM VOLUME OF 9 FT.³ /LINEAR FT. 6" Ø ABS OR PVC PIPE OR APPROVED SUBSTITUTE WITH MINIMUM 8 (1/4" Ø) PERFS. LINEAR FT. IN BOTTOM HALF OF PIPE.
ASTM D2751, SDR 35 OR ASTM D1527, SCHD. 40
ASTM D3034, SDR 35 OR ASTM D1785, SCHD. 40
FOR CONTINUOUS RUN IN EXCESS OF 500 FT. USE 8" Ø PIPE

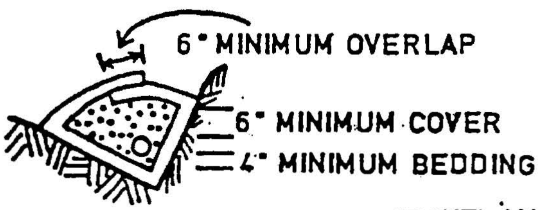


B-1

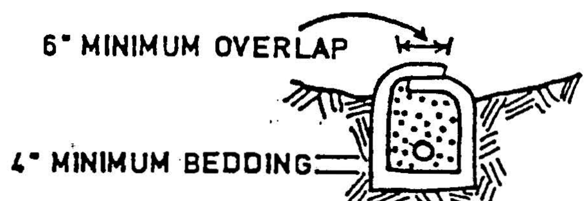
FILTER MATERIAL

SIEVE SIZE	PERCENT PASSING
1 INCH	100
3/4 INCH	90–100
3/8 INCH	40–100
NO. 4	25–40
NO. 8	18–33
NO. 30	5–15
NO. 50	0–7
NO. 200	0–3

ALTERNATE 2: PERFORATED PIPE, GRAVEL AND FILTER FABRIC



A-2



B-2

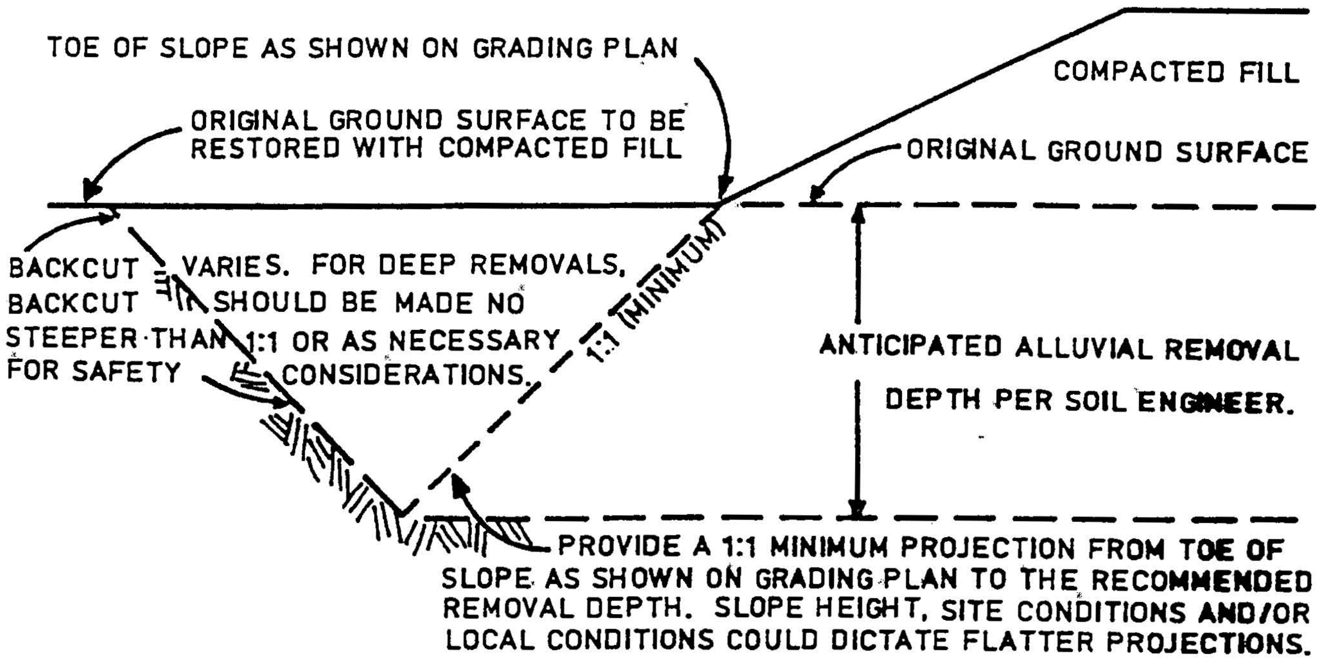
GRAVEL MATERIAL 9 FT³/LINEAR FT.

PERFORATED PIPE: SEE ALTERNATE 1

GRAVEL: CLEAN 3/4 INCH ROCK OR APPROVED SUBSTITUTE

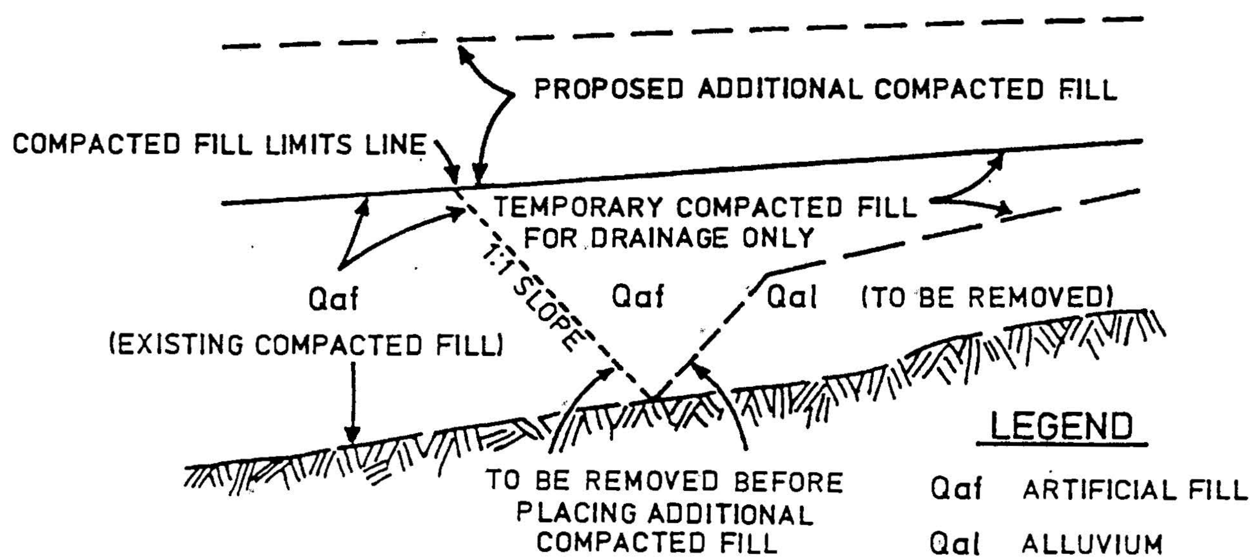
FILTER FABRIC: MIRAFI 140 OR APPROVED SUBSTITUTE

DETAIL FOR FILL SLOPE TOEING OUT ON FLAT ALLUVIATED CANYON



REMOVAL ADJACENT TO EXISTING FILL

ADJOINING CANYON FILL



TYPICAL STABILIZATION / BUTTRESS FILL DETAIL

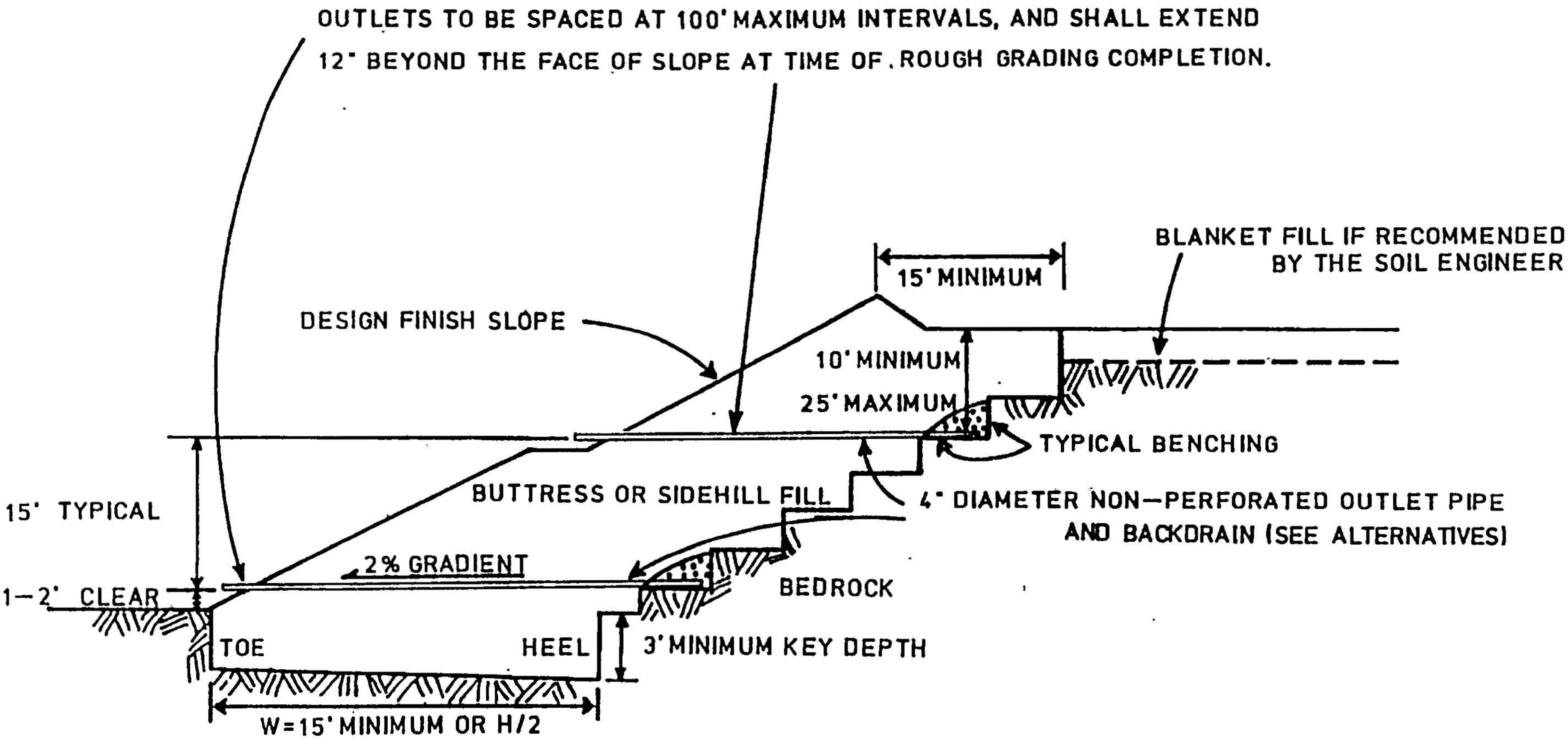
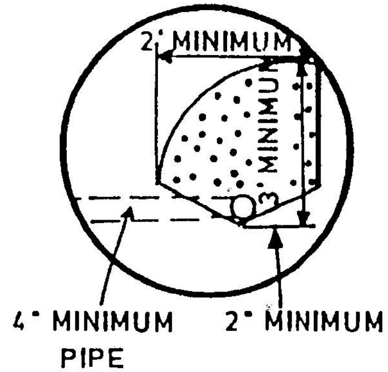


PLATE EG-4

TYPICAL STABILIZATION / BUTTRESS SUBDRAIN DETAIL



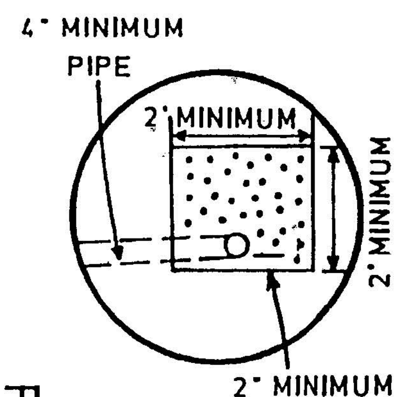


PLATE EG-5

FILTER MATERIAL: MINIMUM OF FIVE Ft^3/LINEAR Ft OF PIPE OR FOUR Ft^3/LINEAR Ft OF PIPE WHEN PLACED IN SQUARE CUT TRENCH.

ALTERNATIVE IN LIEU OF FILTER MATERIAL: GRAVEL MAY BE ENCASED IN APPROVED FILTER FABRIC. FILTER FABRIC SHALL BE MIRAFI 140 OR EQUIVALENT. FILTER FABRIC SHALL BE LAPPED A MINIMUM OF 12" ON ALL JOINTS.

MINIMUM 4" DIAMETER PIPE: ABS—ASTM D—2751, SDR 35 OR ASTM D—1527 SCHEDULE 40 PVC—ASTM D—3034, SDR 35 OR ASTM D—1785 SCHEDULE 40 WITH A CRUSHING STRENGTH OF 1,000 POUNDS MINIMUM, AND A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE INSTALLED WITH PERFORATIONS OF BOTTOM OF PIPE. PROVIDE CAP AT UPSTREAM END OF PIPE. SLOPE AT 2% TO OUTLET PIPE. OUTLET PIPE TO BE CONNECTED TO SUBDRAIN PIPE WITH TEE OR ELBOW.

NOTE: 1. TRENCH FOR OUTLET PIPES TO BE BACKFILLED WITH ON—SITE SOIL.

2. BACKDRAINS AND LATERAL DRAINS SHALL BE LOCATED AT ELEVATION OF EVERY BENCH DRAIN. FIRST DRAIN LOCATED AT ELEVATION JUST ABOVE LOWER LOT GRADE. ADDITIONAL DRAINS MAY BE REQUIRED AT THE DISCRETION OF THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST.

FILTER MATERIAL SHALL BE OF THE FOLLOWING SPECIFICATION OR AN APPROVED EQUIVALENT:

SIEVE SIZE	PERCENT PASSING
1 INCH	100
3/4 INCH	90—100
3/8 INCH	40—100
NO. 4	25—40
NO. 8	18—33
NO. 30	5—15
NO. 50	0—7
NO. 200	0—3

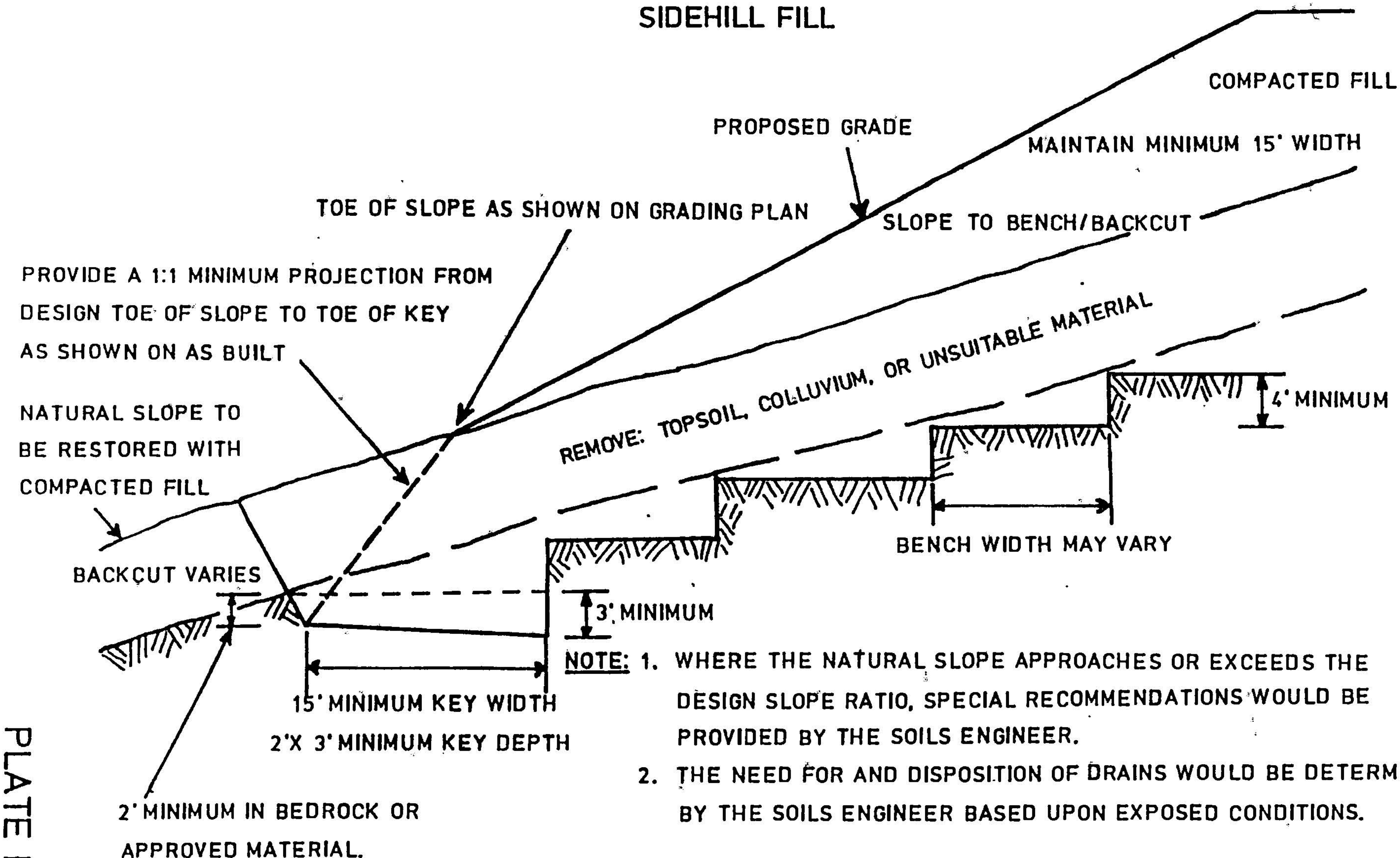
GRAVEL SHALL BE OF THE FOLLOWING SPECIFICATION OR AN APPROVED EQUIVALENT:

SIEVE SIZE	PERCENT PASSING
1 1/2 INCH	100
NO. 4	50
NO. 200	8

SAND EQUIVALENT: MINIMUM OF 50

FILL OVER NATURAL DETAIL

SIDEHILL FILL

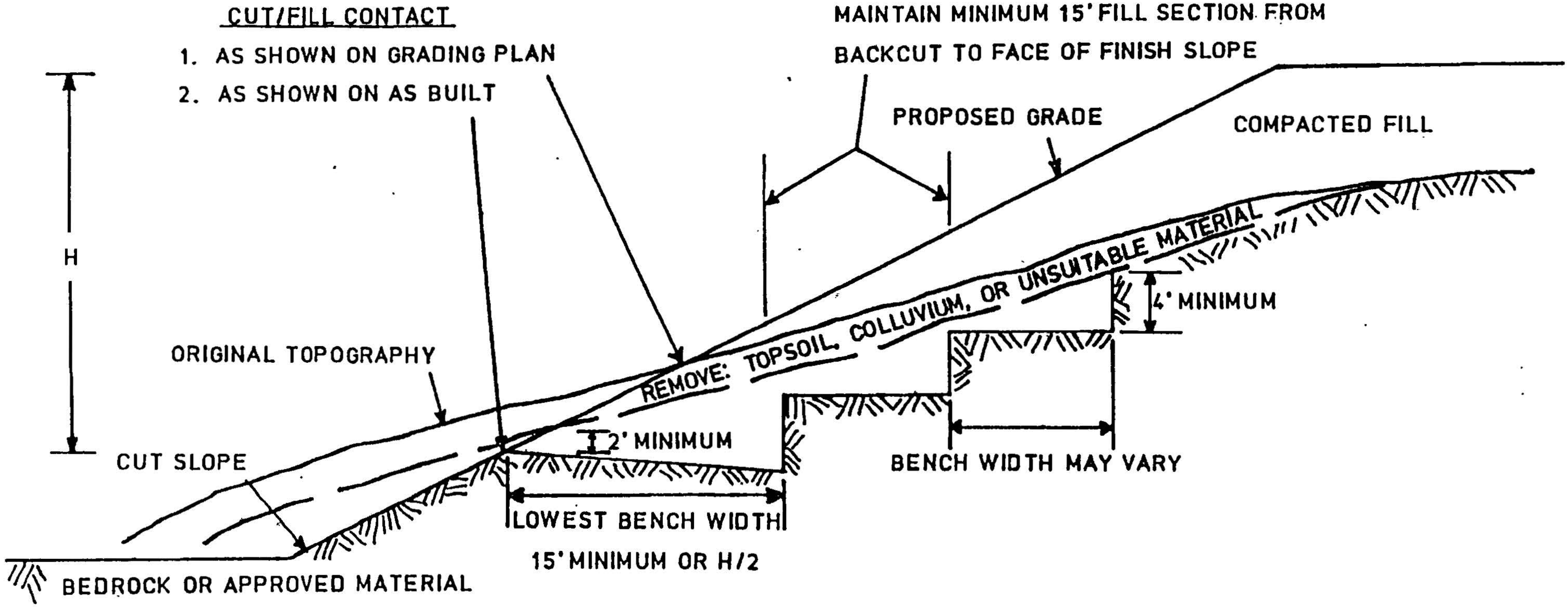


NOTE:

1. WHERE THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN SLOPE RATIO, SPECIAL RECOMMENDATIONS WOULD BE PROVIDED BY THE SOILS ENGINEER.
2. THE NEED FOR AND DISPOSITION OF DRAINS WOULD BE DETERMINED BY THE SOILS ENGINEER BASED UPON EXPOSED CONDITIONS.

PLATE EG-6

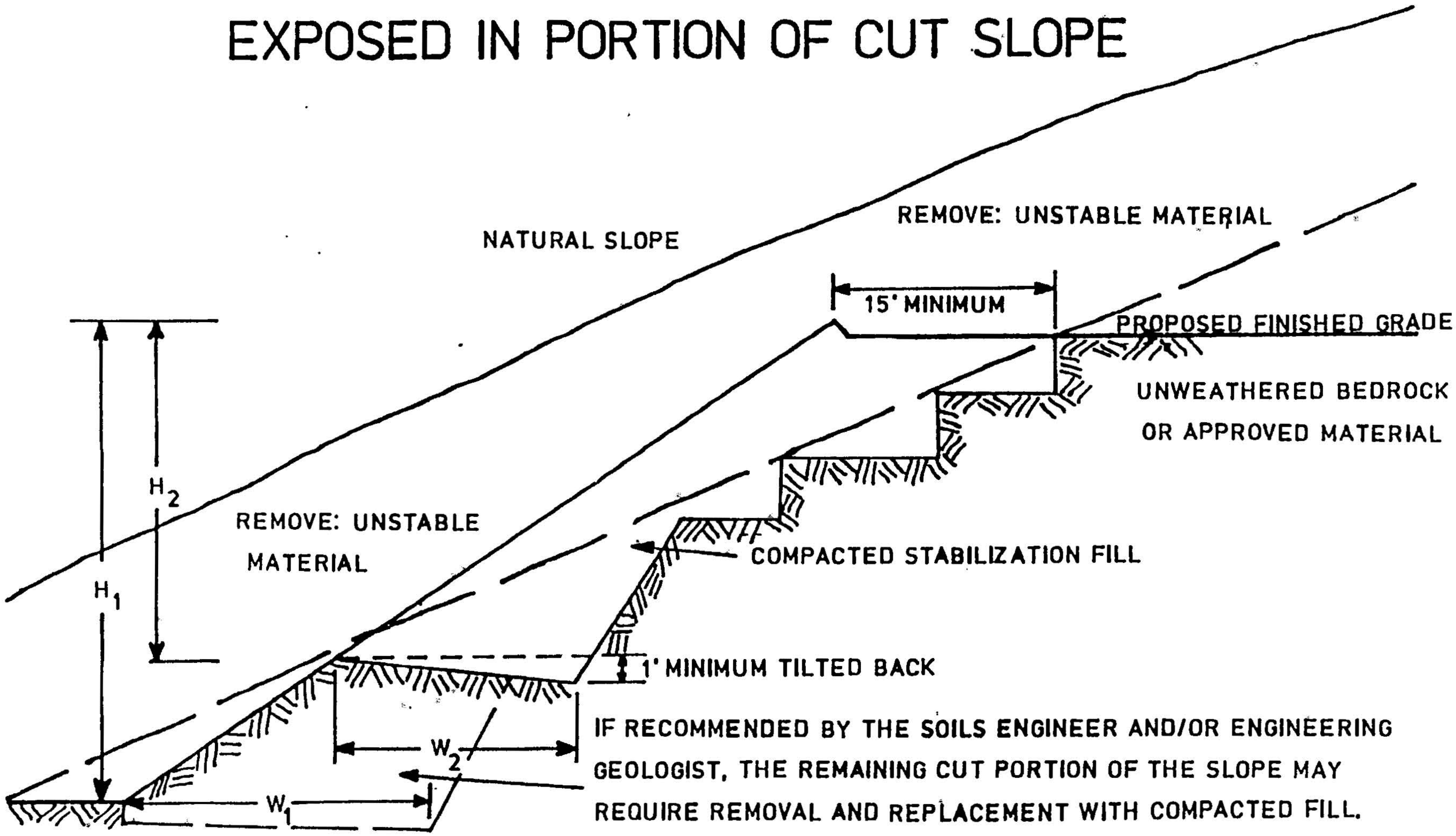
FILL OVER CUT DETAIL



NOTE: THE CUT PORTION OF THE SLOPE SHOULD BE EXCAVATED AND EVALUATED BY THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST PRIOR TO CONSTRUCTING THE FILL PORTION.

PLATE EG-7

STABILIZATION FILL FOR UNSTABLE MATERIAL EXPOSED IN PORTION OF CUT SLOPE

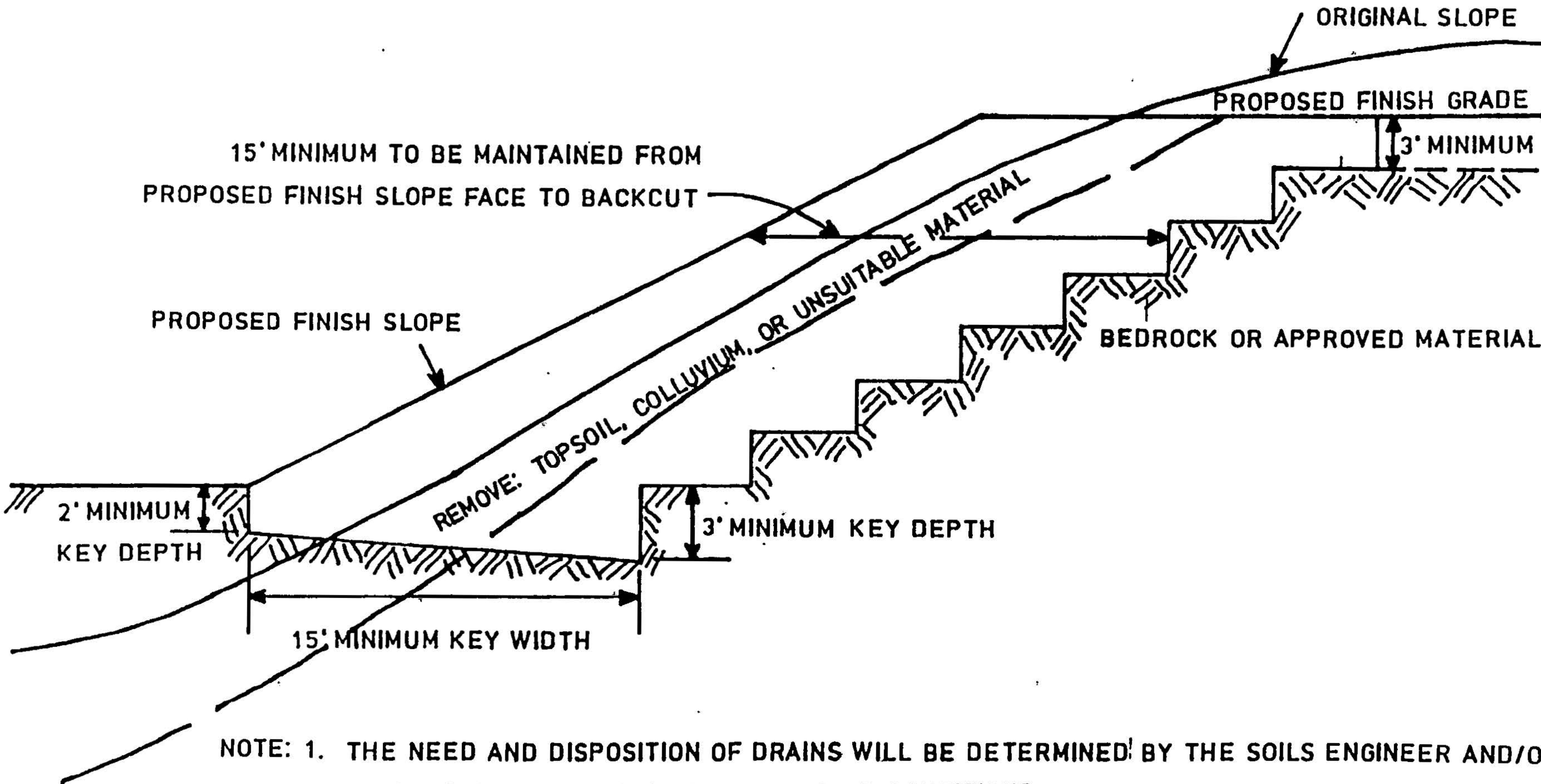


NOTE: 1. SUBDRAINS ARE NOT REQUIRED UNLESS SPECIFIED BY SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST.

2. "W" SHALL BE EQUIPMENT WIDTH (15') FOR SLOPE HEIGHTS LESS THAN 25 FEET. FOR SLOPES GREATER THAN 25 FEET "W" SHALL BE DETERMINED BY THE PROJECT SOILS ENGINEER AND /OR ENGINEERING GEOLOGIST. AT NO TIME SHALL "W" BE LESS THAN H/2.

PLATE EG—8

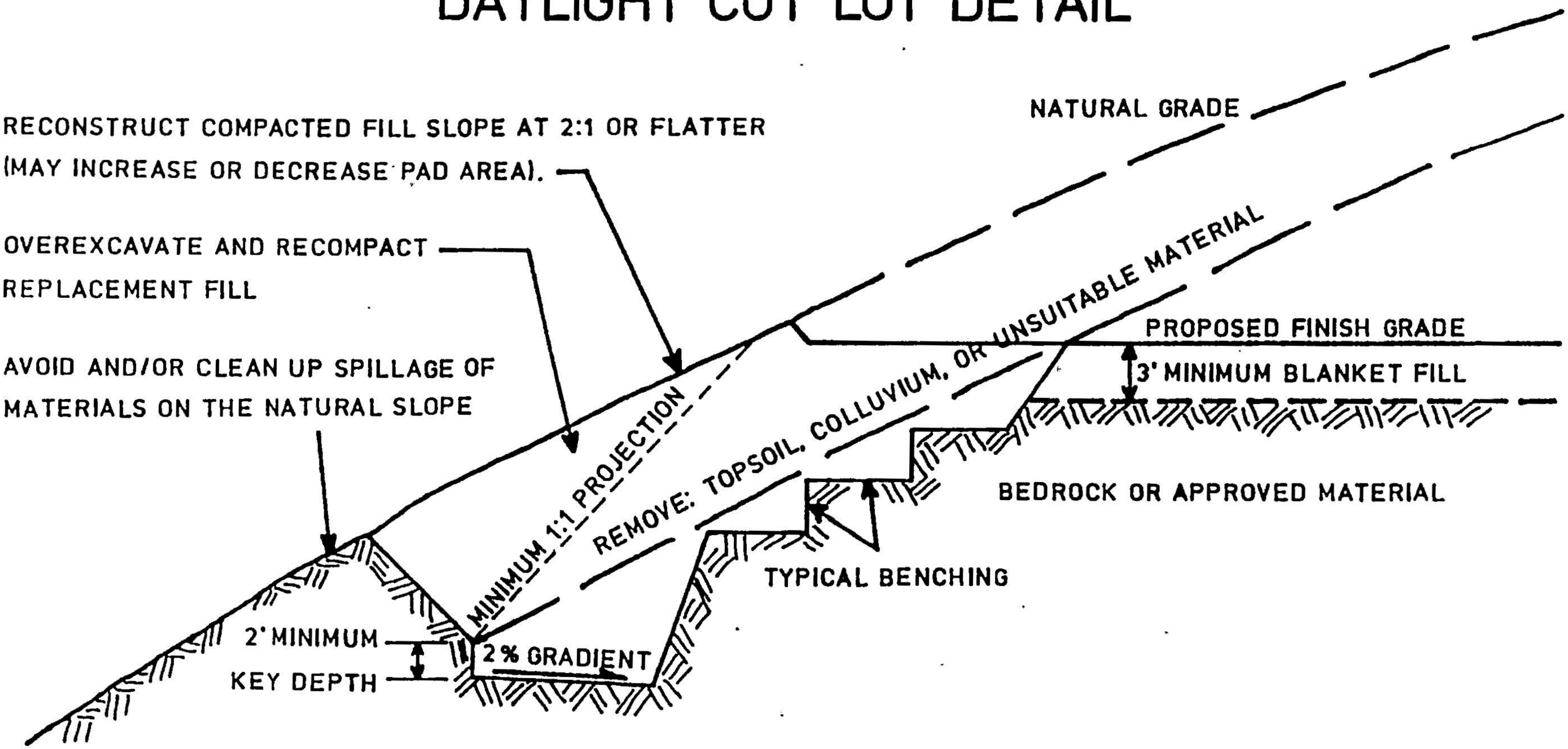
SKIN FILL OF NATURAL GROUND



NOTE: 1. THE NEED AND DISPOSITION OF DRAINS WILL BE DETERMINED BY THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST BASED ON FIELD CONDITIONS.

2. PAD OVEREXCAVATION AND RECOMPACTION SHOULD BE PERFORMED IF DETERMINED TO BE NECESSARY BY THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST.

DAYLIGHT CUT LOT DETAIL



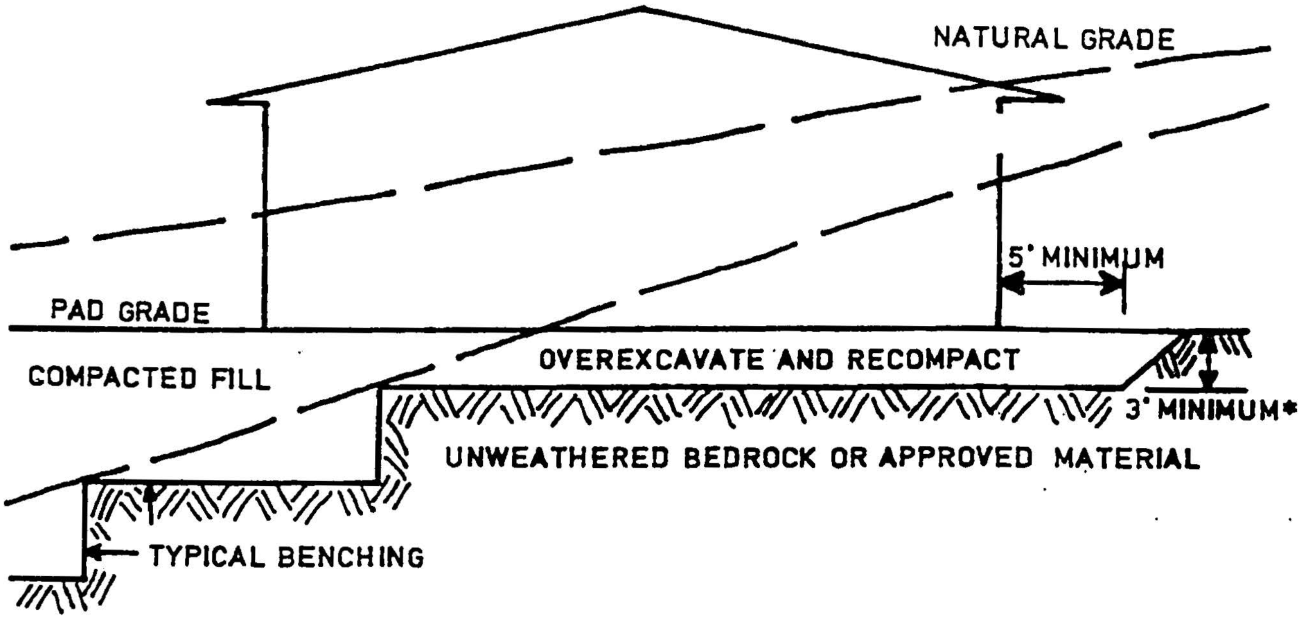
NOTE: 1. SUBDRAIN AND KEY WIDTH REQUIREMENTS WILL BE DETERMINED BASED ON EXPOSED SUBSURFACE CONDITIONS AND THICKNESS OF OVERBURDEN.

2. PAD OVER EXCAVATION AND RECOMPACTION SHOULD BE PERFORMED IF DETERMINED NECESSARY BY THE SOILS ENGINEER AND/OR THE ENGINEERING GEOLOGIST.

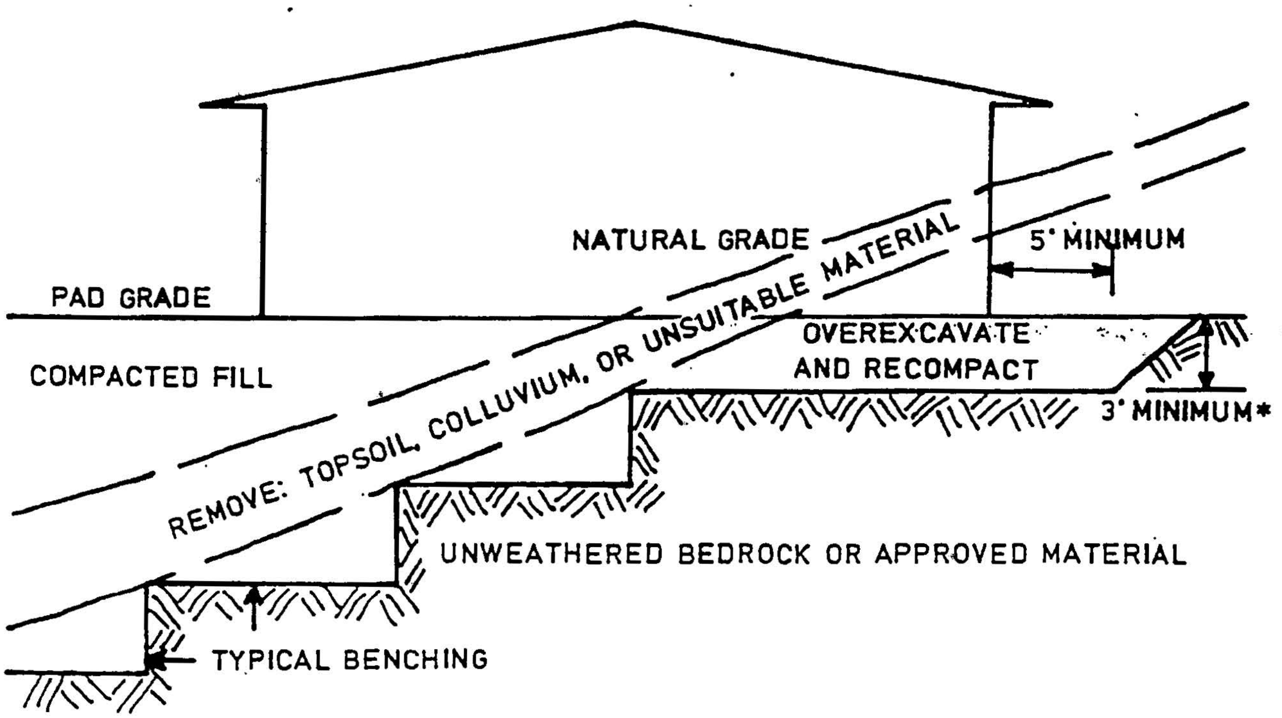
PLATE EG—10

TRANSITION LOT DETAIL

CUT LOT (MATERIAL TYPE TRANSITION)

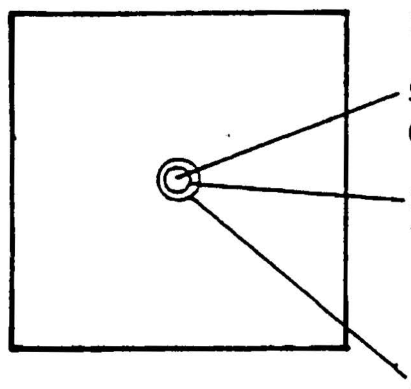


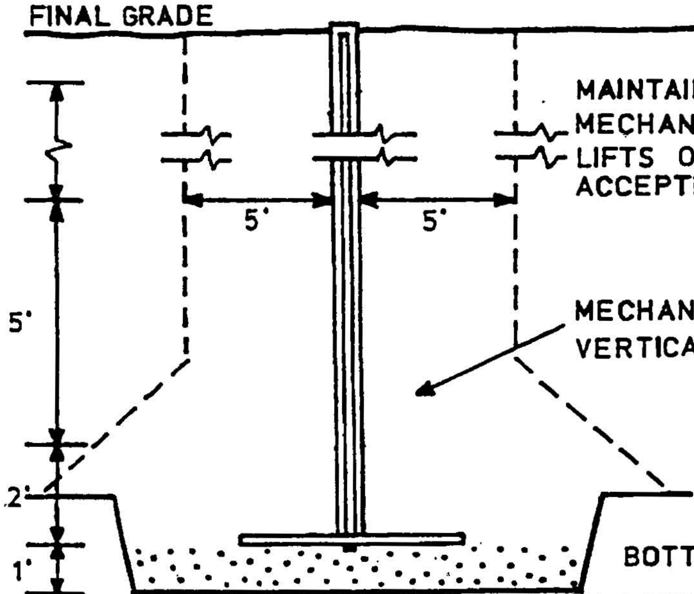
CUT—FILL LOT (DAYLIGHT TRANSITION)



NOTE: * DEEPER OVEREXCAVATION MAY BE RECOMMENDED BY THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST IN STEEP CUT—FILL TRANSITION AREAS.

SETTLEMENT PLATE AND RISER DETAIL

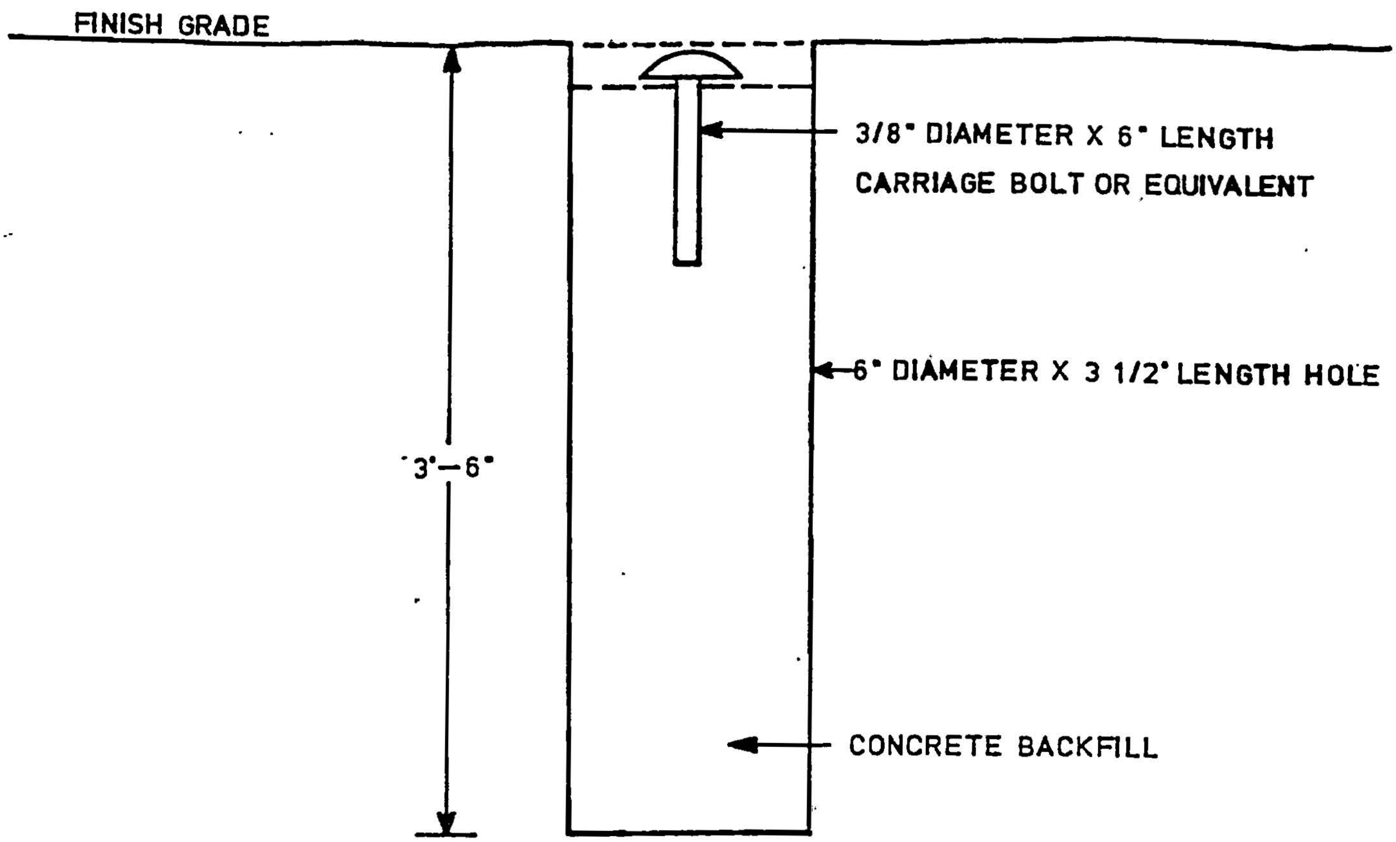




NOTE:

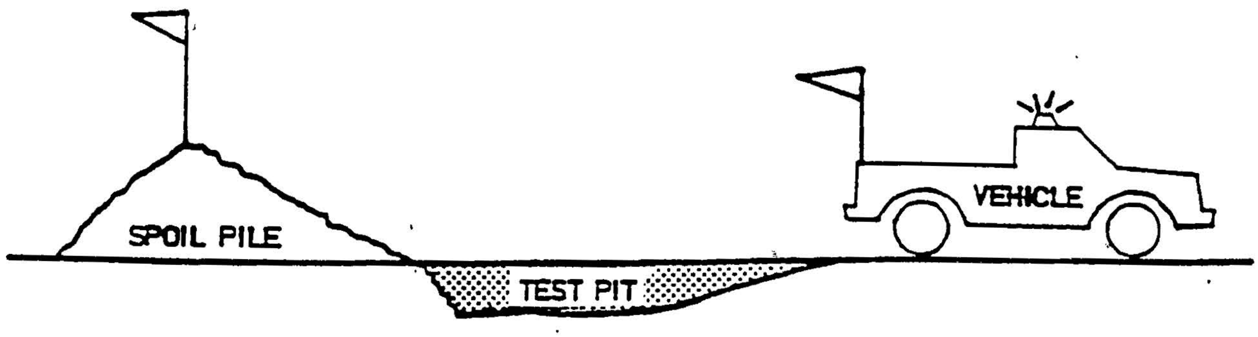
1. LOCATIONS OF SETTLEMENT PLATES SHOULD BE CLEARLY MARKED AND READILY VISIBLE (RED FLAGGED) TO EQUIPMENT OPERATORS.
2. CONTRACTOR SHOULD MAINTAIN CLEARANCE OF A 5' RADIUS OF PLATE BASE AND WITHIN 5' (VERTICAL) FOR HEAVY EQUIPMENT. FILL WITHIN CLEARANCE AREA SHOULD BE HAND COMPACTED TO PROJECT SPECIFICATIONS OR COMPACTED BY ALTERNATIVE APPROVED BY THE SOILS ENGINEER.
3. AFTER 5' (VERTICAL) OF FILL IS IN PLACE, CONTRACTOR SHOULD MAINTAIN A 5' RADIUS EQUIPMENT CLEARANCE FROM RISER.
4. PLACE AND MECHANICALLY HAND COMPACT INITIAL 2' OF FILL PRIOR TO ESTABLISHING THE INITIAL READING.
5. IN THE EVENT OF DAMAGE TO THE SETTLEMENT PLATE OR EXTENSION RESULTING FROM EQUIPMENT OPERATING WITHIN THE SPECIFIED CLEARANCE AREA, CONTRACTOR SHOULD IMMEDIATELY NOTIFY THE SOILS ENGINEER AND SHOULD BE RESPONSIBLE FOR RESTORING THE SETTLEMENT PLATES TO WORKING ORDER.
6. AN ALTERNATE DESIGN AND METHOD OF INSTALLATION MAY BE PROVIDED AT THE DISCRETION OF THE SOILS ENGINEER.

TYPICAL SURFACE SETTLEMENT MONUMENT



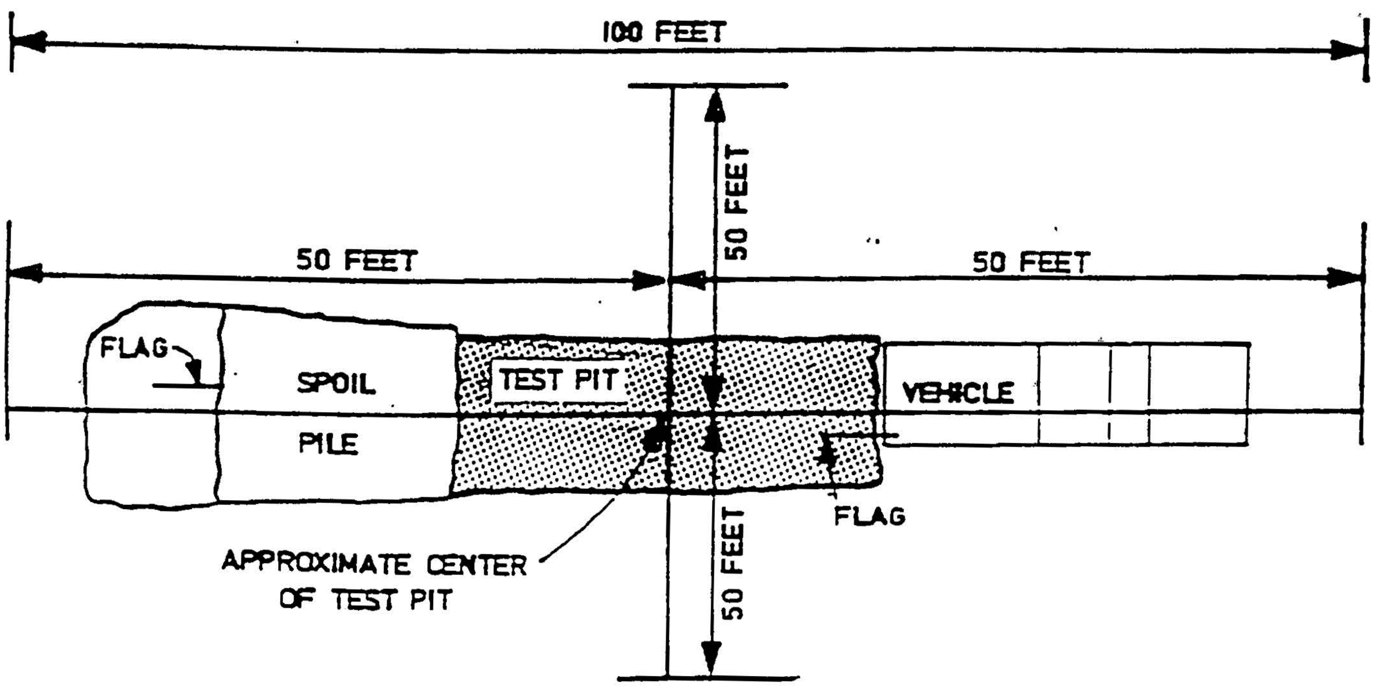
TEST PIT SAFETY DIAGRAM

SIDE VIEW



(NOT TO SCALE)

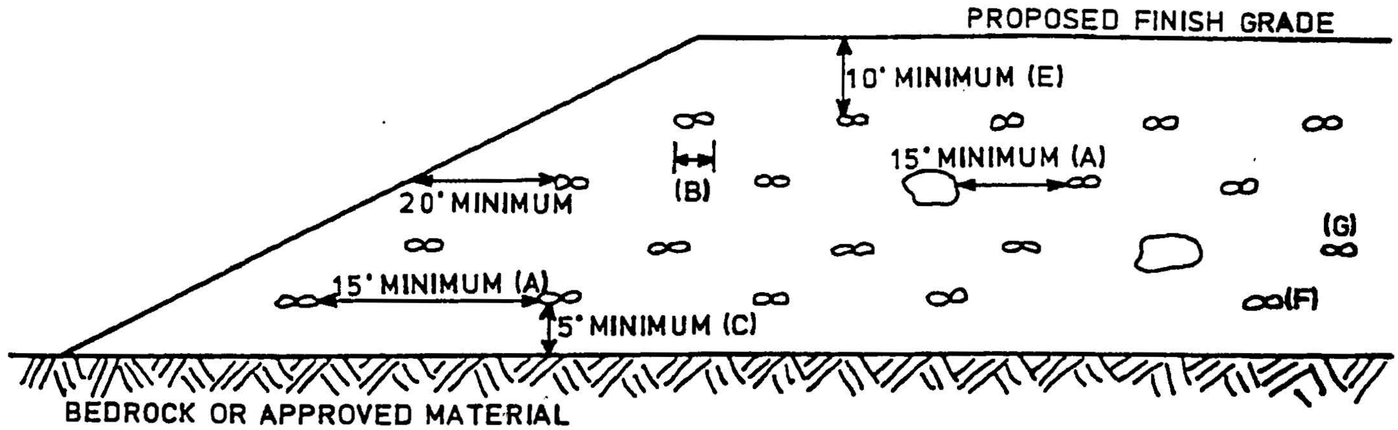
TOP VIEW



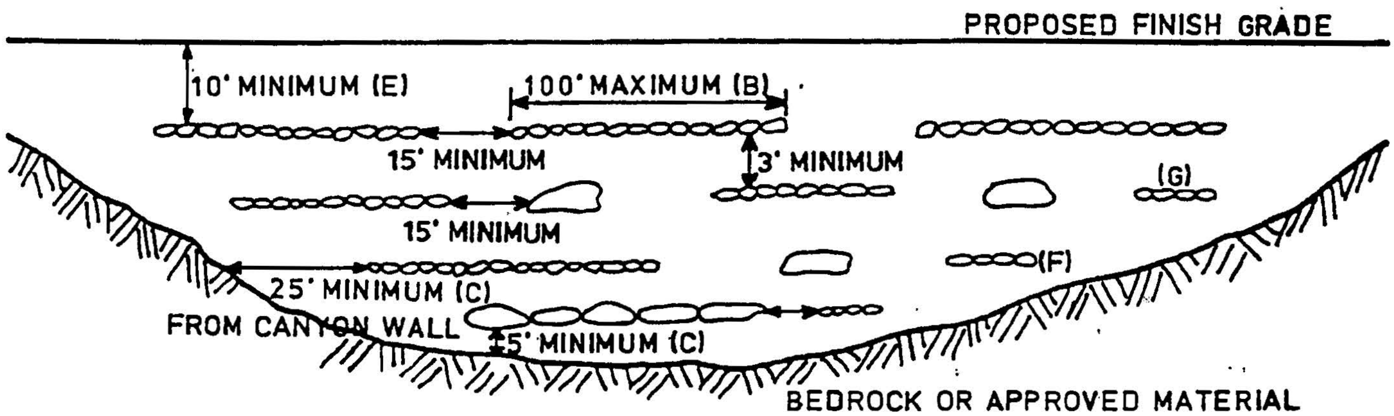
(NOT TO SCALE)

OVERSIZE ROCK DISPOSAL

VIEW NORMAL TO SLOPE FACE



VIEW PARALLEL TO SLOPE FACE



NOTE: (A) ONE EQUIPMENT WIDTH OR A MINIMUM OF 15 FEET.

(B) HEIGHT AND WIDTH MAY VARY DEPENDING ON ROCK SIZE AND TYPE OF EQUIPMENT. LENGTH OF WINDROW SHALL BE NO GREATER THAN 100' MAXIMUM.

(C) IF APPROVED BY THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST, WINDROWS MAY BE PLACED DIRECTLY ON COMPETENT MATERIAL OR BEDROCK PROVIDED ADEQUATE SPACE IS AVAILABLE FOR COMPACTION.

(D) ORIENTATION OF WINDROWS MAY VARY BUT SHOULD BE AS RECOMMENDED BY THE SOILS ENGINEER AND/OR ENGINEERING GEOLOGIST. STAGGERING OF WINDROWS IS NOT NECESSARY UNLESS RECOMMENDED.

(E) CLEAR AREA FOR UTILITY TRENCHES, FOUNDATIONS AND SWIMMING POOLS.

(F) ALL FILL OVER AND AROUND ROCK WINDROW SHALL BE COMPACTED TO 90% RELATIVE COMPACTION OR AS RECOMMENDED.

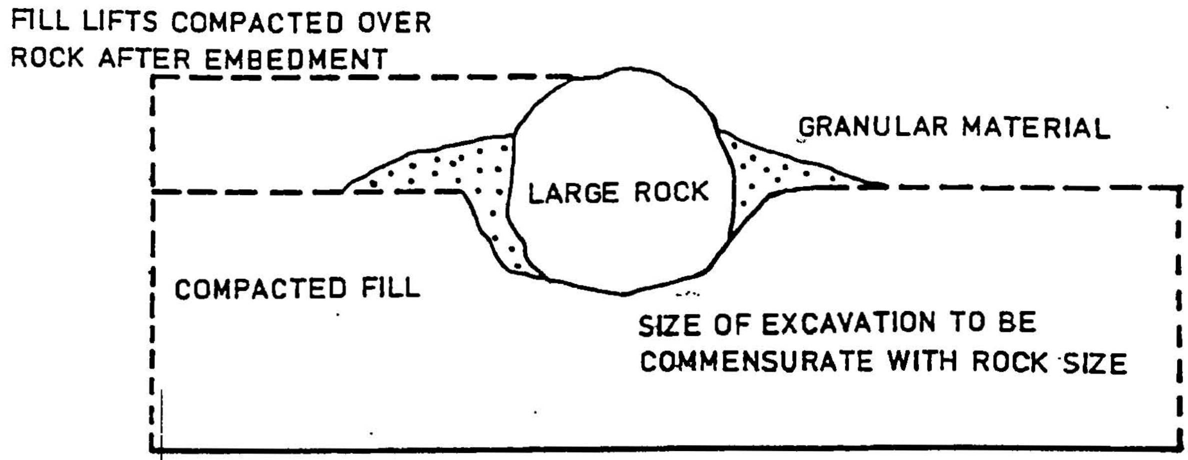
(G) AFTER FILL BETWEEN WINDROWS IS PLACED AND COMPACTED WITH THE LIFT OF FILL COVERING WINDROW, WINDROW SHOULD BE PROOF ROLLED WITH A D-9 DOZER OR EQUIVALENT.

VIEWS ARE DIAGRAMMATIC ONLY. ROCK SHOULD NOT TOUCH AND VOIDS SHOULD BE COMPLETELY FILLED IN.

PLATE RD-1

ROCK DISPOSAL PITS

VIEWS ARE DIAGRAMMATIC ONLY. ROCK SHOULD NOT TOUCH AND VOIDS SHOULD BE COMPLETELY FILLED IN.



ROCK DISPOSAL LAYERS

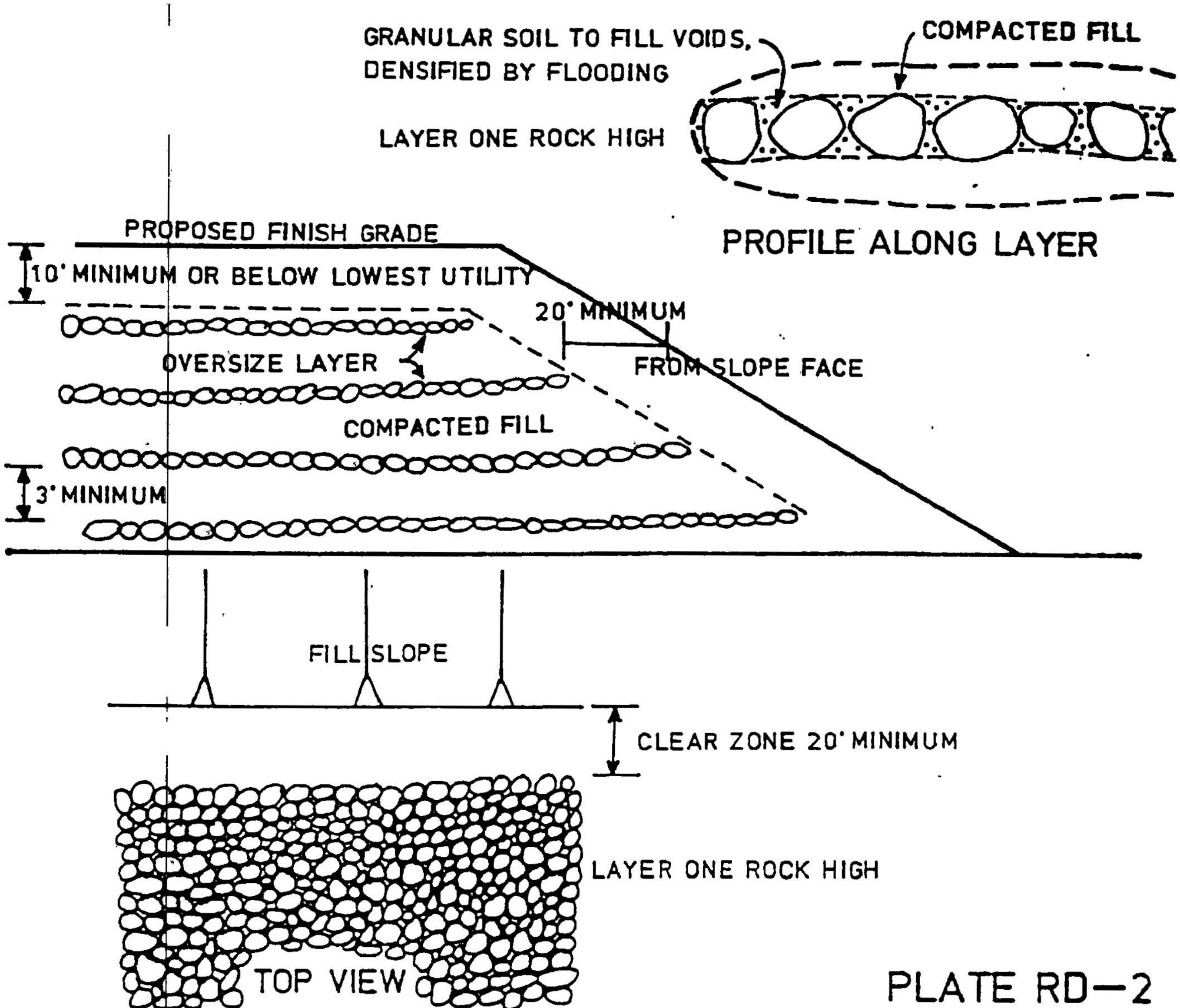


PLATE RD—2

RESPONSE TO COUNTY REVIEW
GEOTECHNICAL UPDATE, AND 40-SCALE GRADING PLAN REVIEW
TENTATIVE TRACT MAP NO. 28920, SUN CITY AREA
RIVERSIDE COUNTY, CALIFORNIA
BGR 020798

FOR

JOHN LAING HOMES, INLAND DIVISION
255 E. RINCON, SUITE 100
CORONA, CALIFORNIA 92879

W.O. 3214-A-SC JANUARY 27, 2003

GeoSoils, Inc.

Geotechnical • Geologic • Environmental

24890 Jefferson Ave. • Murrieta, California 92562 • (909) 677-9651 • FAX (909) 677-9301

January 27, 2003

W.O. 3214-A-SC
BGR 020798

John Laing Homes, Inland Division
255 E. Rincon, Suite 100
Corona, California 92879

Attention: Ms. Linda Valia

Subject: Response to County Review, Geotechnical Update, and 40-scale Grading Plan Review, Tentative Tract Map No. 28920, Sun City area, Riverside County, California

References:
1. "Building and Safety, Grading Division, Geotechnical Engineering Report Check Corrections, BGR 020798," dated July 26, 2002, by Geopacifica Geotechnical Consultants.
2. "Preliminary Geotechnical Investigation, Tentative Tract Map No. 28920, Sun City Area, Riverside County, California," W.O. 2836-A-SC, dated April 17, 2000, by GeoSoils, Inc.
3. "Rough Grading Plan - Tract 28920-1," sheets 2 through 4, 40-scale plans, J.N. 578, dated July 5, 2002, by CSL Engineering, Inc.

Dear Ms. Valia:

In accordance with your request and authorization, GeoSoils, Inc. (GSI), is presenting this response to the review comments by the geotechnical consultant for the County of Riverside. The scope of our work has included a review of the referenced documents, a field review of existing conditions, preparation of geologic cross sections, slope stability analyses, analysis of data, and preparation of this response. Unless specifically superceded herein, the conclusions and recommendations contained in the referenced report by GSI remain pertinent and applicable and should be appropriately implemented during planning, design, and construction.

REVIEW RESPONSE

For ease of review, the consultants comments are repeated below in *itallics*, followed by GSI's response.

Comment No. 1

The document 1 (GSI's report) *is more than 2 years old and requires to be undated.*

Response No. 1

GSI has reviewed our original report for the site (GSI, 2000) and performed a field review of existing site conditions. Based on our review, the site has not changed appreciably since our initial investigation. Accordingly, this response is also an update to GSI (2000). Any necessary revisions to that report are specifically superceded herein.

Comment No. 2

The document 1 (GSI's report) *was using a 100 scale tentative plan. In conformance with document 1 (page 26) please provide an update geotechnical and grading plan review report using document 2 and the 40 scale plans for the update geotechnical and grading plan review report. Please provide the update geotechnical and grading plan review report in conformance with the guidelines of document 3, including soil/geologic cross sections. Please make sure that all test borings, test pits, soil/geologic data is transferred to the 40 scale plans.*

Response No. 2

GSI has reviewed the current 40-scale grading plans for the site (CSL, 2002). Based on our review, the following discussion is presented:

1. The plans indicate that typical cut and fill grading techniques would be utilized to prepare the site for construction of approximately 124 single family residences, with associated infrastructure and underground utilities.

2. Grading will create cut slopes designed at inclinations of 2:1 (horizontal to vertical), or flatter, up to about 44 feet high, and fill slopes designed at inclinations of 2:1 (h:v), up to about 17 feet high. Fill over cut slopes are also proposed. Approximate maximum thicknesses of cuts and fills are on the order of 21 feet and 14 feet, respectively.

3. Based on the shallow fills proposed, and review of the grading plans, it does not appear that there will be sufficient cover (i.e., less than about 10 feet on the pads or streets) for subdrains in canyon clean-out areas, nor sufficient gradient, nor a suitable discharge outlet. As with all grading jobs, this will be further evaluated during grading, based on exposed conditions disclosed during grading. For pre-planning purposes, canyon subdrains should, however, be anticipated, as the recommended removals may increase the cover over any potential subdrains to the accepted minimum cover within the streets and lots.

4. Fill materials greater than 12 inches in diameter should not be placed within 10 feet of finish grade, per the Uniform Building Code and Riverside County criteria. This will result in proposed fill pads, or overexcavated pads, to be constructed with 12-inch diameter and minus materials, during rock fill placement, should fill materials be required within the 10 foot zone outlined above.

5. The geologic data has been transferred to the grading plans, and the plans are included herein as Plates 1 through 3. Geologic cross sections A-A', B-B', and C-C' are also included herein as Figure 1 (attached). The locations of the cross sections are shown on the Plates.

Comment No. 3

Document 1 is a Xerox copy with Xerox stamps and signatures. Please insure that the updated geotechnical and grading plan review report contains wet stamps and wet signatures.

Response No. 3

A wet signed copy of GSI (2000) is included under separate cover. This review response/update/grading plan review contains wet stamps and wet signatures.

Comment No. 4

Please address both cut and fill slopes (heights and inclinations) as depicted in document 2 and provide stability analysis as necessary and if required.

Response No. 4

Current slope stability analyses are included in the Appendix. A discussion of the methods utilized in our analysis, strength parameters, etc., are included in GSI (2000), and are summarized below:

Method of Analysis

Available data concerning the site geology was compiled on three cross-sections: A-A', B-B', and C-C', throughout the site. The cross-sections are presented on the attached Figure 1. Two dimensional slope stability analyses were performed using the "GSTABL7 with STEDWIN" computer program. The Simplified Bishop method was used to model arcuate failure conditions within fill and massive granitic bedrock. The Janbu Block analysis with anisotropic soil conditions was utilized for section B-B', to model weakened planes in the bedrock. Three dimensional analysis were performed by using Markland test plot option of the RockPac2 computer program. The results of slope stability analyses are provided in the Appendix.

Shear Strength

Based on the results of our laboratory testing, experience with the same type of materials, and review of rock slope literature, the following shear strength parameters were considered:

EARTH MATERIAL	FRICTION ANGLE (DEGREES)	COHESION (PSF)
Massive Granitic Bedrock	40	2500
Along Granitic Discontinuities	30	0
Fill (derived from Alluvium)	31	340
Fill (derived from Granitics)	36	320

For massive granitic bedrock, the results of Triaxial tests from various reference sources indicates friction angles typically ranging from 39.5 to 51 degrees, and a cohesion value anywhere from 2,500 psf to 720,000 psf, depending on the particular reference chosen. For our analysis, we have used even more conservative strength parameters than the above lower bound values, specifically, a friction angle of 35 degrees, and a cohesion value of 500 psf.

Design Slope Stability

Slope stability analysis under the final design conditions indicated factors of safety in excess of the required 1.5, and 1.1 for static and seismic conditions, respectively (i.e., static factor of safety is much greater than 1.7).

Three Dimensional Analysis

Three dimensional analysis for the critical slopes at this site were performed and submitted in our previous report dated April 17,2000. No significant design changes have occurred for the planned slopes to necessitate new three dimensional analysis, inasmuch as the discontinuities are regional. The three dimensional analyses referred to herein, were performed using Rockpac2 computer program. The analytical capabilities of this program include stereonet plotting of the rock slope geologic structure, which is used in the Marklands test plots for the interpretation of slope stability. The results of our analysis indicates that no wedges are formed by the planes of discontinuities, that could result in slope failure.

In conclusion, the proposed cut and fill slopes possess an adequate calculated factor of safety against gross (static and seismic) and surficial failure, provided our recommendations are implemented.

Comment No. 5

Document 1 needs to describe and provide the type quantitative/qualitative method to be used during earthquake operations to evaluate an acceptable base of removals. Provide criteria relative to minimum accepted base of removals in conformance with the requirements of Document 3 (III.1H.a, b, .c - pages 38-40).

Response No. 5

As indicated in GSI (2000), all soils susceptible to hydroconsolidation, including topsoil/colluvium, alluvium, and weathered bedrock, should be removed to unweathered bedrock, prior to placing compacted fill in areas proposed for settlement sensitive improvements. For the purposes of this response, removals should proceed until bedrock with a minimum density of 105 pcf and/or 85 percent saturation has been obtained, as indicated by field testing of bottom removal areas. This criteria has been previously demonstrated to the County as satisfactory mitigation (although in this particular case, the 85 percent saturation criterion in bedrock technically has no significance).

Comment No. 6

The Document 1 must provide documentation and analysis or statement to address the minimum County requirements of no more that 1 " in 40 feet differential (static) settlement and no more than 2" in 40 feet dynamic settlement. Refer to Document 3 for specific reporting, analysis, and presentation requirements.

Response No. 6

Given the proposed shallow fills and the dense to very dense nature of the underlying bedrock, the estimated differential settlement for each individual lot should not exceed 1 inch in 40 feet, or 2 inches in 40 feet, from a static or seismic viewpoint respectively, and will likely be much less. The above maximum design conditions should be considered during project planning, design, and construction. Final differential settlement estimates for design purposes will be provided at the conclusion of grading, based on the site specific conditions encountered during grading (i.e., thickness of compacted fill, underlying bedrock geometry, etc.).

Comment No. 7

The consultant should note that, during earthwork and construction operations, in the event that significant changes are encountered in the interpretation of and/or field conditions that *might significantly affect the findings, conclusions, and recommendations within the reviewed and/or subsequent reports and response data, then a supplemental report must be submitted documenting such changes in the findings, conclusions, and recommendations.*

Response No. 7

Noted and agreed to from a geotechnical viewpoint.

Comment No. 8

The geotechnical consultant of record shall provide, in the final as-built grading report, documentation in conformance with Document 3 - Part III - section 2 (pages 51 through 61), to include at least, not nor limited to, the following.

A. *That adequate over-excavation has been performed and that loose disturbed fill/top soil/alluvium soils, and other compressible soils have been removed* *and/or mitigated* *in all areas to receive engineered structures and compacted structural fill soils. The depth, elevations of, and extent of such removals shall be documented in the final compaction grading report. Such documentation shall also include elevations of and test results of the base removals and/or discussion and quantitative/qualitative analysis of alluvial soil materials left in place.*

B. *(No comment)*

C. *That the final compaction grading report shall provide "As-Built Soil/Geology" conditions to include, but not be limited to, depths/elevations of removals, testing of base of removals, elevations of compaction tests, limits of removals, limits of compacted fill, certification of the entire building pads, changed conditions, final and additional building set backs (and mitigation, if necessary) encountered during grading.*

Response No. 8

Noted and agreed to from a geotechnical viewpoint.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to contact our office.

Respectfully submitted,

GeoSoils, Inc.

REGISTERED GEOLOGIST
JOHN P. FRANKLIN
NO. 1340
Certified
Engineering
Geologist
STATE OF CALIFORNIA

John P. Franklin
Engineering Geologist, CEG 1340

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
DAVID W. SKELLY
No. RCE 47857
Exp. 12/31/03
CIVIL
STATE OF CALIFORNIA

David W. Skelly
Civil Engineer, RCE 47857

JPF/DWS/jh

Attachments: Figure 1 - Geologic Cross
Appendix - Slope Stability Analyses
Plates 1 through 3 - Geotechnical Map

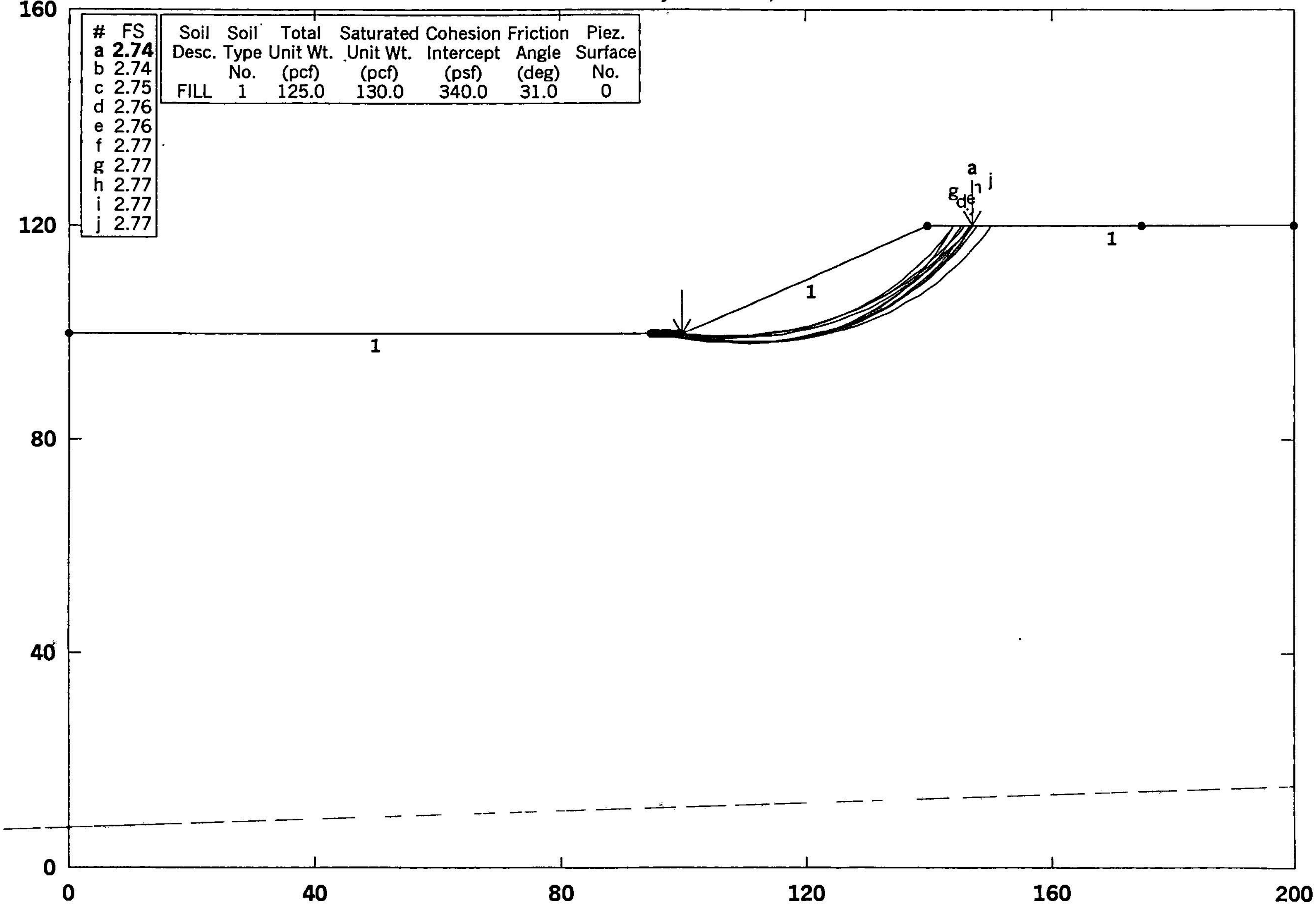
Distribution: (4) Addressee
(2) County of Riverside, Mr. Mack Hakakian (wet signatures)

APPENDIX

SLOPE STABILITY ANALYSES

SECTION A-A' - FILL SLOPE

C:\STEDWIN\3214AS.PL2 Run By: GEOSOILS, INC. 1/24/03 9:48AM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
FILL	1	125.0	130.0	340.0	31.0	0

GSTABL7 v.2 FSmin=2.74

Safety Factors Are Calculated By The Modified Bishop Method

STED

SECTION B-B' - STATIC BLOCK FAILURE

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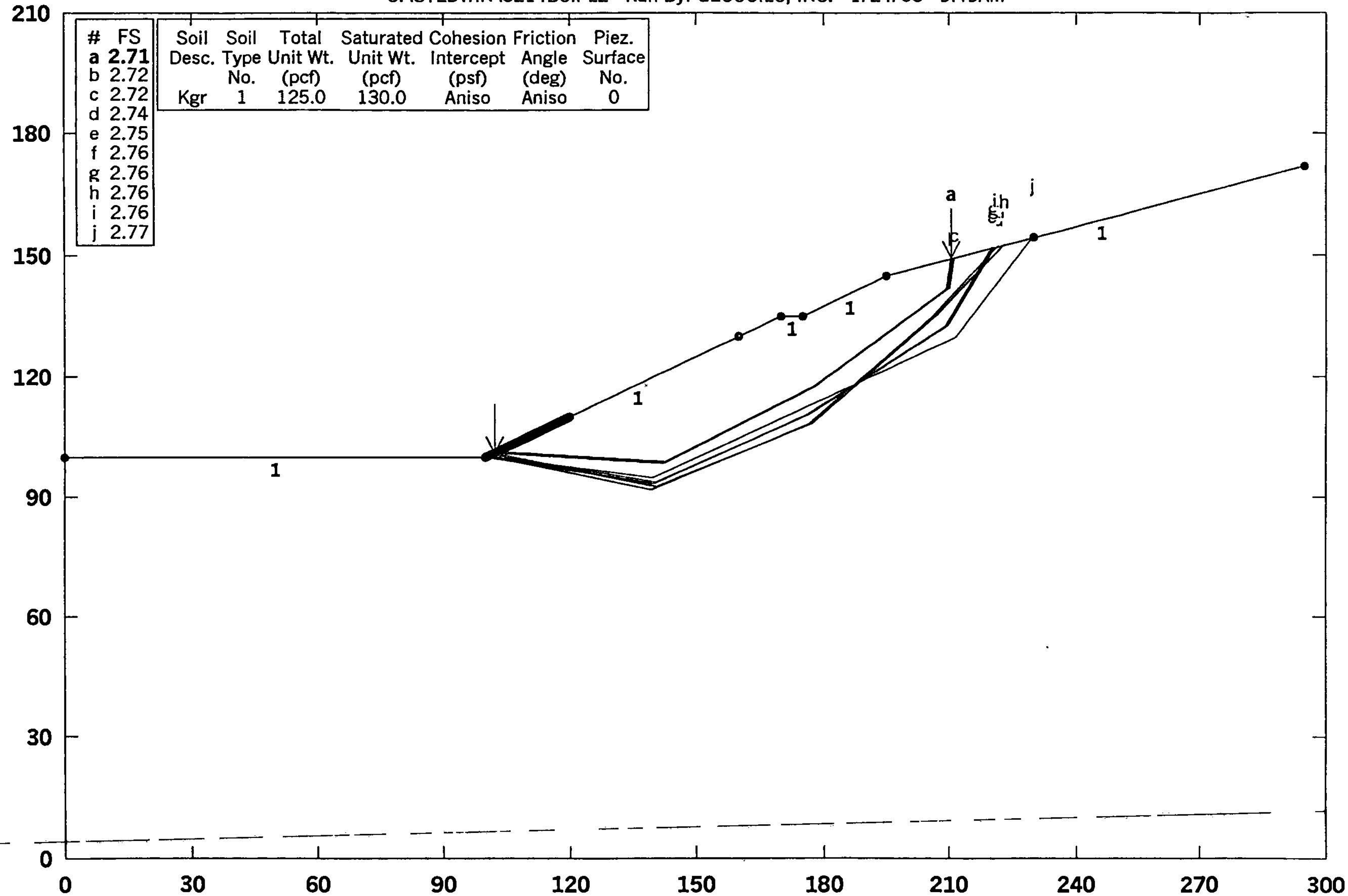


GSTABL7 v.2 FSmin=2,71

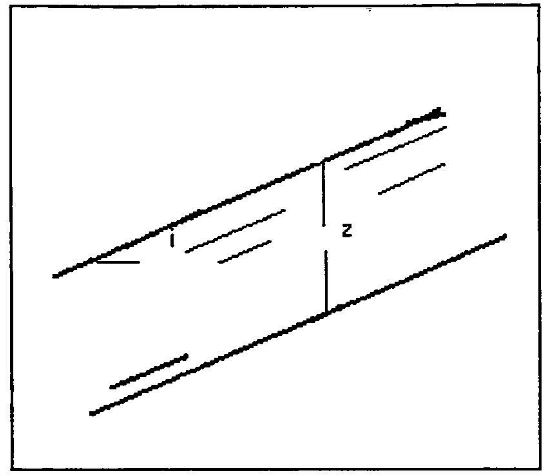
Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

STED

Plate A-2

SURFICIAL SLOPE STABILITY FOR GRANITIC SLOPES

INPUT PARAMETERS

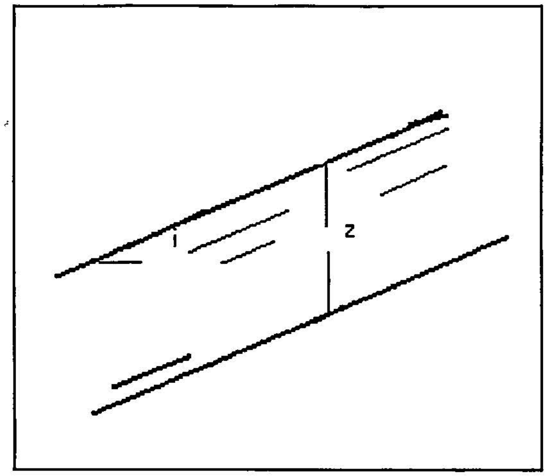


SLOPE ANGLE i (degrees) =	26.6
VERTICAL DEPTH OF SATURATION z (ft) =	4
SATURATED SOIL UNIT WEIGHT γsat (pcf)=	160
UNIT WEIGHT OF WATER $\gamma \omega$ (pcf) =	62.4
EFFECTIVE COHESION C' (psf) =	500
EFFECTIVE FRICTION ANGLE ϕ (degrees)=	35

OUTPUT CALCULATIONS

SLOPE ANGLE IN RADIANS	0.464258
EFFECTIVE FRICTION ANGLE IN RADIANS	0.610865
FACTOR OF SAFETY =	**2.80**

SURFICIAL SLOPE STABILITY FOR FILL SLOPES



INPUT PARAMETERS

SLOPE ANGLE i (degrees) =	26.6
VERTICAL DEPTH OF SATURATION z (ft) =	4
SATURATED SOIL UNIT WEIGHT γsat (pcf)=	130
UNIT WEIGHT OF WATER γω (pcf) =	62.4
EFFECTIVE COHESION C' (psf) =	340
EFFECTIVE FRICTION ANGLE ϕ (degrees)=	31

OUTPUT CALCULATIONS

SLOPE ANGLE IN RADIANS	0.464258
EFFECTIVE FRICTION ANGLE IN RADIANS	0.541052
FACTOR OF SAFETY =	**2.26**

.

NOISE IMPACT ANALYSIS

OAK HILLS WEST TENTATIVE TRACT MAP NO. 38625 RESIDENTIAL PROJECT

CITY OF MENIFEE

Lead Agency:

City of Menifee
Community Development Department
29844 Haun Road
Menifee, CA 92586

Prepared by:

Vista Environmental
1021 Didrickson Way
Laguna Beach, CA 92651
949 510 5355
Greg Tonkovich, INCE

Project No. 23069

August 21, 2024

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Menifee
cmu	concrete masonry unit
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
EPA	Environmental Protection Agency
Hz	Hertz
Ldn	Day-night average noise level
Leq	Equivalent sound level
Lmax	Maximum noise level
OSHA	Occupational Safety and Health Administration
PPV	Peak particle velocity
RMS	Root mean square
SEL	Single Event Level or Sound Exposure Level
STC	Sound Transmission Class
TTM	Tentative Tract Map
VdB	Vibration velocity level in decibels

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared to determine the noise impacts associated with the proposed Oak Hills West Tentative Tract Map (TTM) No. 38652 Residential project (proposed project). The following is provided in this report:

- A description of the study area and the proposed project;
- Information regarding the fundamentals of noise;
- Information regarding the fundamentals of vibration;
- A description of the local noise guidelines and standards;
- An evaluation of the current noise environment;
- An analysis of the potential short-term construction-related noise impacts from the proposed project; and
- An analysis of long-term operations-related noise impacts from the proposed project.

1.2 Site Location and Study Area

The project site is located in the western portion of the City of Menifee (City). The approximately 78-acre project site is currently vacant and is bounded by open space to the north, single-family homes to the east, single-family homes, Boulder Crest Way and open space to the south, and single-family homes to the west. The project study area is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest sensitive receptors to the project site are single-family homes located on Boulder Crest Way and as near as four feet to the south of the project site. There are also single-family homes located as near as 28 feet east of the project site. The nearest school is Ridgemoor Elementary School, which is located as near as 0.4 mile east of the project site.

1.3 Proposed Project Description

The proposed project would consist of developing the project site with 37 residential lots and an associated onsite road system and water detention facilities on approximately 14.4 acres and the remaining approximately 64 acres would be preserved as natural open space that would not be disturbed as part of the proposed project. Each residential lot would be developed with a duplex, which would result in a total of 74 residential units. The proposed site plan is shown in Figure 2.

The Grading Plan for the proposed project shows that approximately 62,800 cubic yards of dirt will be exported from the project site. According to the *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Oak Hills West Tentative Tract Map No. 38652 Residential Project* (Air Quality Analysis), prepared by Vista Environmental, May 9, 2024, the export of dirt will generate an average of 65.4 haul truck trips per day, over 110 working days. Project Design Feature 1 has been incorporated into this analysis, in order to ensure that the average number of daily haul truck trips does not greatly exceed what is analyzed in this report. In addition, Project Design Feature 2 has been incorporated into this analysis that provides the proposed haul truck route for the export of the dirt, which has been designed to spread out the trips on the nearby local roads, in order to minimize the project road noise impacts as much as practical to any specific home along the truck route. The truck route consists of inbound trucks traveling on Murrieta Road, turning west onto Ridgemoor Road, turning right (north) onto Phoenix Way, turning left onto Juno Street that turns into Ganymede Way, and turning right onto Polaris Drive that runs into the east side of the project site. The outbound haul trucks would leave the project site from the south side onto Boulder Crest Way, and then turn left (east) onto Ridgemoor Road to Murrieta Road.

1.4 Executive Summary

Standard Noise Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the City and State of California (State).

<u>City of Menifee Noise Regulations</u>

The following lists the noise and vibration regulations from the City Code that are applicable, but not limited to the proposed project.

- Section 8.010.010 Allowable Hours of Construction;
- Section 9.09.030 Construction-Related Noise Exemptions; and
- Section 9.09.050 General Sound Level Standards.

<u>State of California Noise Regulations</u>

The following lists the State of California noise regulations that are applicable, but not limited to the proposed project.

- California Vehicle Code Section 27200-27207 – On Road Vehicle Noise Limits
- California Vehicle Code Section 38365-38350 – Off-Road Vehicle Noise Limits

Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines noise checklist questions.

<u>Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?</u>

Less than significant impact.

<u>Generation of excessive groundborne vibration or groundborne noise levels?</u>

Potentially significant impact. Mitigation Measure 1 would reduce construction-related vibration impacts to less than significant levels.

For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Less than significant impact.

1.5 Project Design Features Incorporated into the Proposed Project

This analysis was based on implementation of the following project design feature that the project applicant has committed to adhering to during construction of the proposed project.

Project Design Feature 1:
The grading contractor for the project shall require that the duration of the export of dirt is spread over a minimum duration of 110 workdays and shall have an average of 65 haul truck trips per day or less with a maximum not exceed amount of 70 haul truck trips (35 haul truck loads) per day.

Project Design Feature 2:
The grading contractor for the project shall require that all haul trucks follow the haul route to the project site as shown in Figure 3 – Proposed Haul Truck Route. The grading contractor shall also stagger haul truck arrival times to the project site each morning that hauling will occur.

1.6 Mitigation Measures for the Proposed Project

This analysis found that through adherence to the noise and vibration regulations detailed in Section 1.4, through implementation of Project Design Features 1 and 2 detailed in Section 1.5, above and through implementation of the following mitigation all noise and vibration impacts would be reduced to less than significant levels.

Mitigation Measure 1:
The project applicant shall require that all construction contractors restrict the operation of any large bulldozers that is powered by a greater than 150 horse power engine from operating within 10 feet of any off-site structure. The project applicant shall require the use of a small bulldozer (i.e., D1, D2, or D3 dozers) or other type of equipment that is less than 150 horsepower to perform all grading activities that are located within 10 feet of any off-site structure.

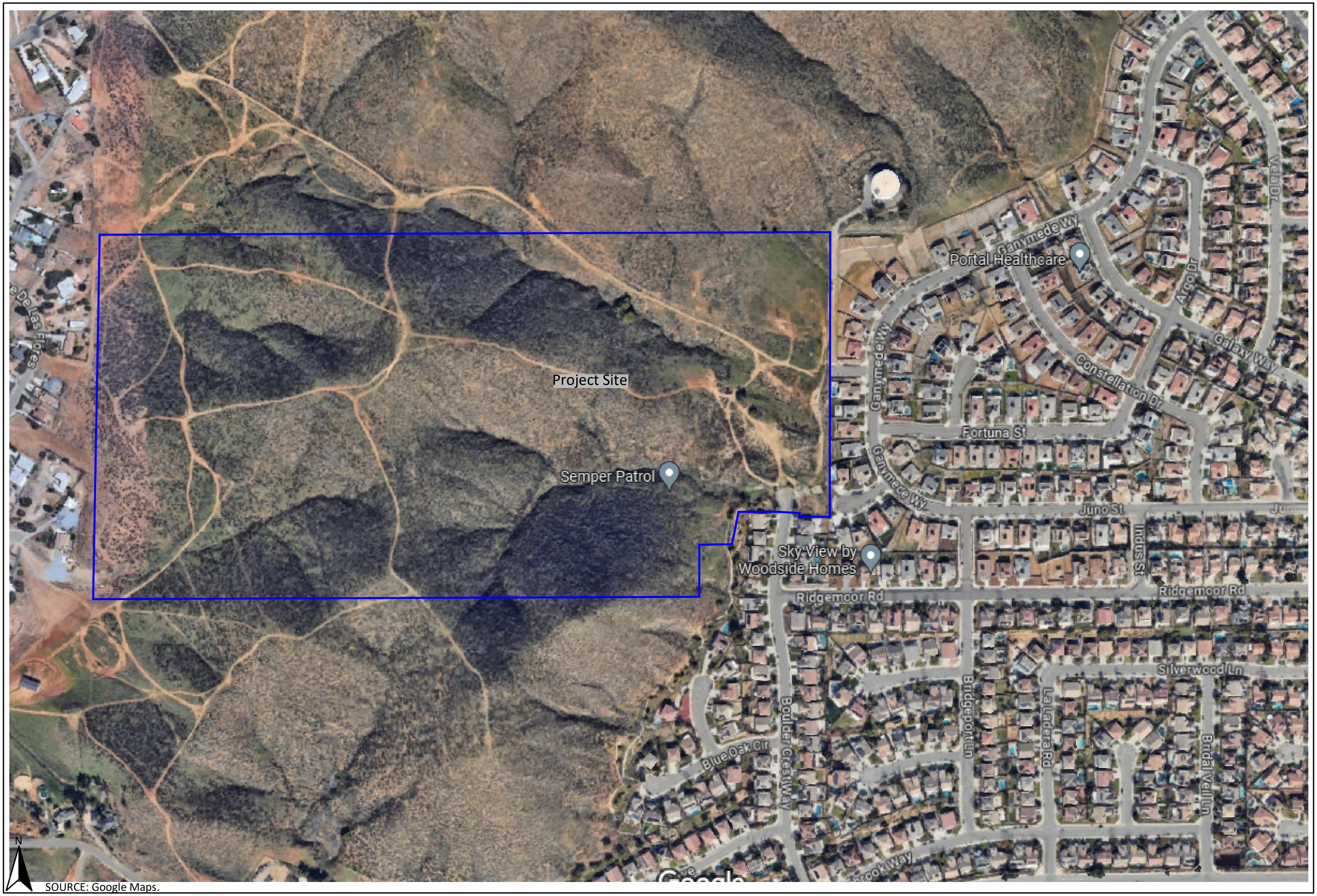
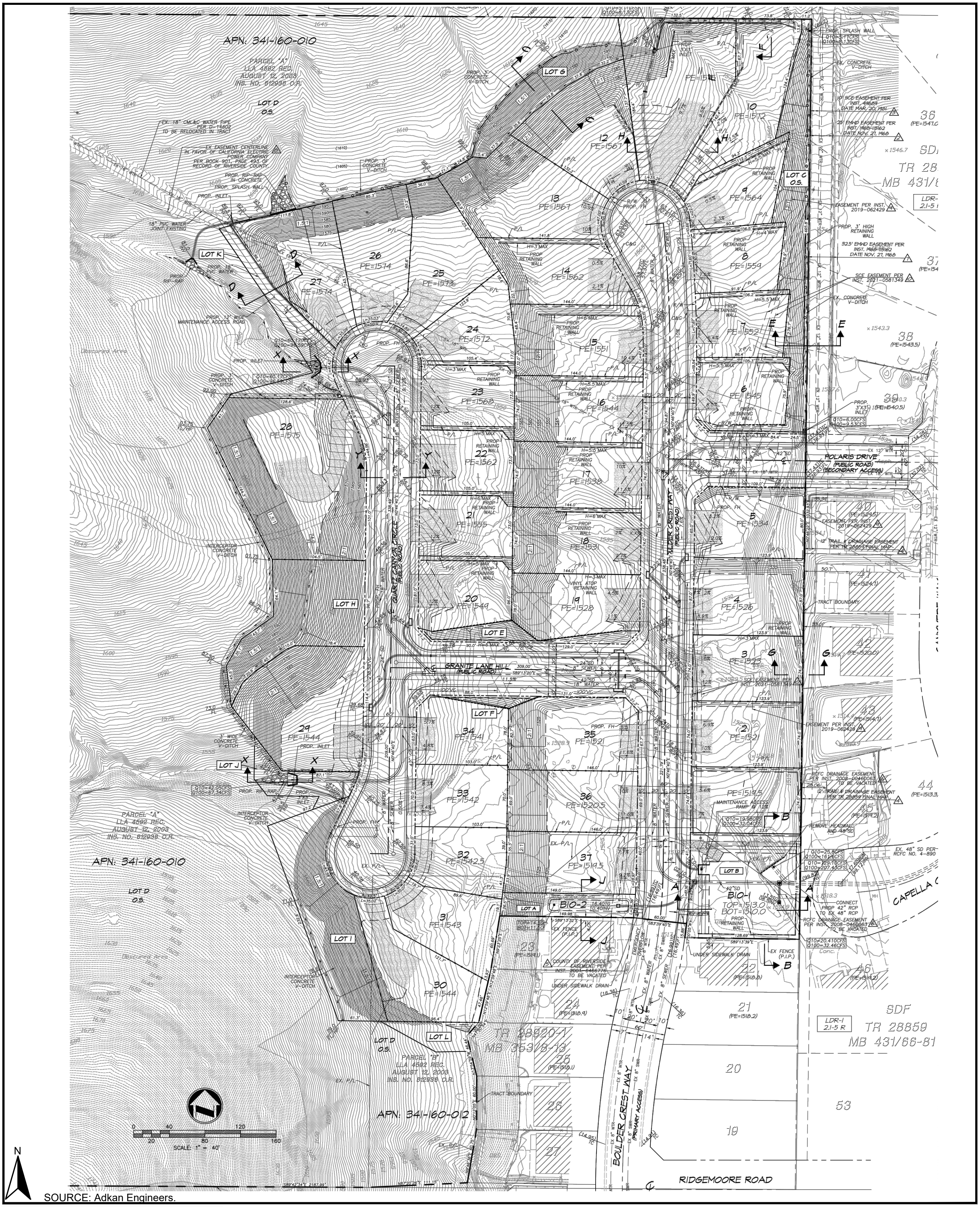


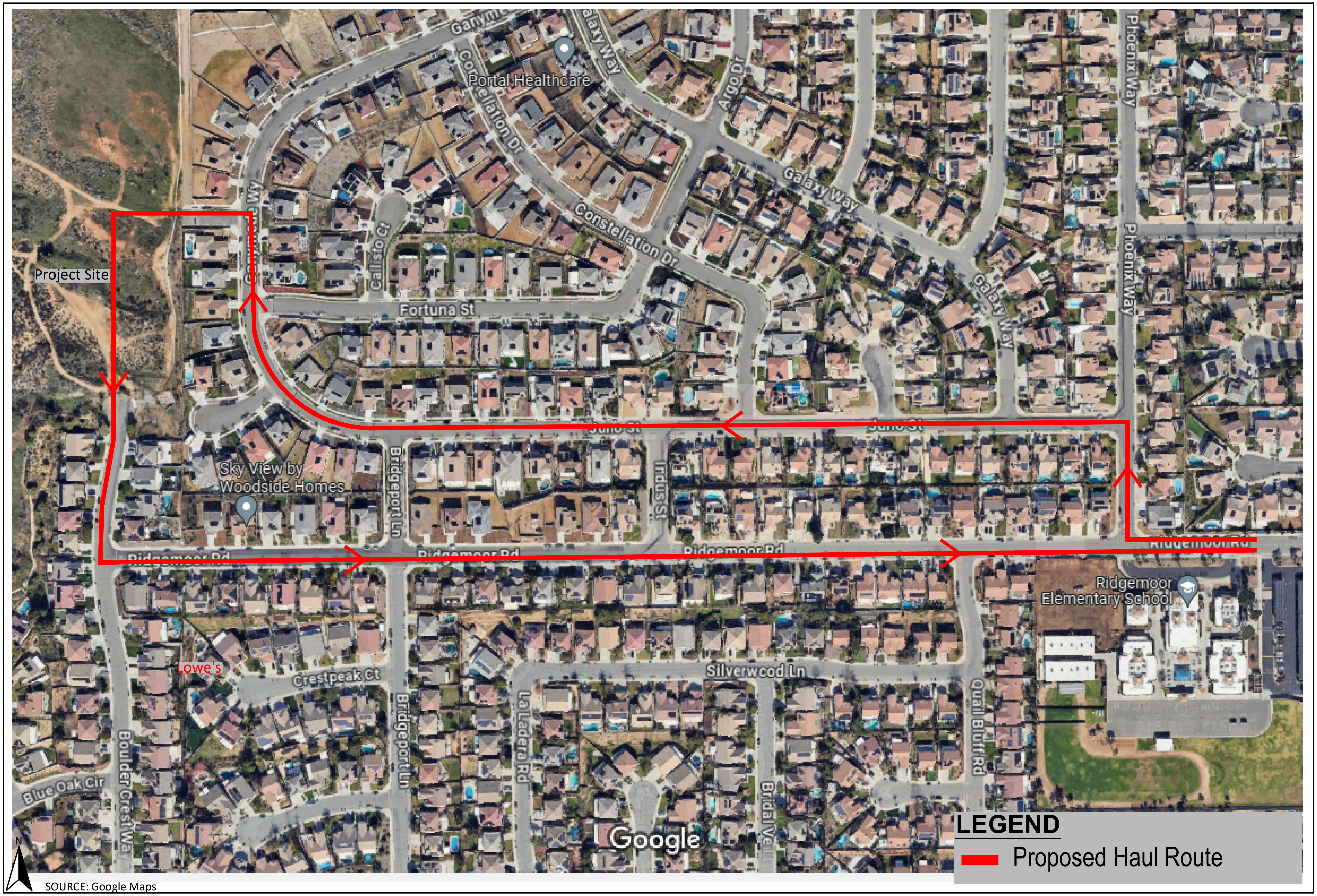
Figure 1
Project Location Map



SOURCE: Adkan Engineers.

VISTA ENVIRONMENTAL

Figure 2
Proposed Site Plan



VISTA ENVIRONMENTAL

Figure 3
Proposed Haul Truck Route

2.0 NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear.

2.1 Noise Descriptors

Noise Equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The worst-hour traffic Leq is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Level (Ldn) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the Ldn, except that it has another addition of 4.77 decibels to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these time periods because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound appears louder in the evening and nighttime hours and is weighted accordingly. The City of Menifee relies on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

2.2 Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a "pure tone," there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to "stand out" against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less

2.3 Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in level of noise as the distance from the source increases. The manner in which the noise level reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD) between source and receiver. Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 Ground Absorption

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. Caltrans research has shown that the use of soft-site conditions is more appropriate for the application of the Federal Highway Administration (FHWA) traffic noise prediction model used in this analysis.

3.0 GROUND-BORNE VIBRATION FUNDAMENTALS

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

3.1 Vibration Descriptors

There are several different methods that are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Due to the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as (L_v) and is based on the rms velocity amplitude. A commonly used abbreviation is "VdB", which in this text, is when L_v is based on the reference quantity of 1 micro inch per second.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration.

3.3 Vibration Propagation

The propagation of ground-borne vibration is not as simple to model as airborne noise. This is due to the fact that noise in the air travels through a relatively uniform medium, while ground-borne vibrations travel through the earth which may contain significant geological differences. There are three main types of vibration propagation; surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 REGULATORY SETTING

The project site is located in the City of Menifee. Noise and vibration regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise and vibration are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA), which regulates transit noise, while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Although the proposed project is not under the jurisdiction of the FTA, the *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual), prepared by the FTA, September 2018, is the only guidance document from a government agency that has defined what constitutes a significant noise impact from implementing a project. The FTA standards are based on extensive studies by the FTA and other governmental agencies on the human effects and reaction to noise and a summary of the FTA findings are provided below in Table A.

Table A – FTA Project Effects on Cumulative Noise Exposure

Existing Noise Exposure (dBA Leq or Ldn)	Allowable Noise Impact Exposure dBA Leq or Ldn		
	Project Only	Combined	Noise Exposure Increase
45	51	52	+7
50	53	55	+5
55	55	58	+3
60	57	62	+2
65	60	66	+1
70	64	71	+1
75	65	75	0

Source: Federal Transit Administration, 2018.

As shown in Table A, the allowable cumulative noise level increase created from a project would range from 0 to 7 dBA, which is based on the existing (ambient) noise levels in the project vicinity. The justification for the sliding scale, is that people already exposed to high levels of noise should be expected to tolerate only a small increase in the amount of noise in their community. In contrast, if the existing noise levels are quite low, it is reasonable to allow a greater change in the community noise for the equivalent difference in annoyance.

The FTA Manual also provides specific guidance for construction noise. The FTA recommends developing construction noise criteria on a project-specific basis that utilizes local noise ordinances if possible. However, local noise ordinances usually relates to nuisance and hours of allowed activity and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the noise impacts of a construction project. Project construction noise criteria should take into account the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land uses. The FTA standards are based on extensive studies by the FTA and other governmental agencies on the human effects and reaction to noise and a summary of the FTA findings for a general construction noise assessment are provided below in Table B.

Table B – FTA Construction Noise Criteria

Land Use	Day (dBA Leq(8-hour))	Night (dBA Leq(8-hour))	30-day Average (dBA Ldn)
Residential	80	70	75
Commercial	85	85	80*
Industrial	90	90	85*

Notes:
* 24-hour Leq not Ldn.
Source: Federal Transit Administration, 2018.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by transportation sources, the City is restricted to regulating noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 State Regulations

Noise Standards

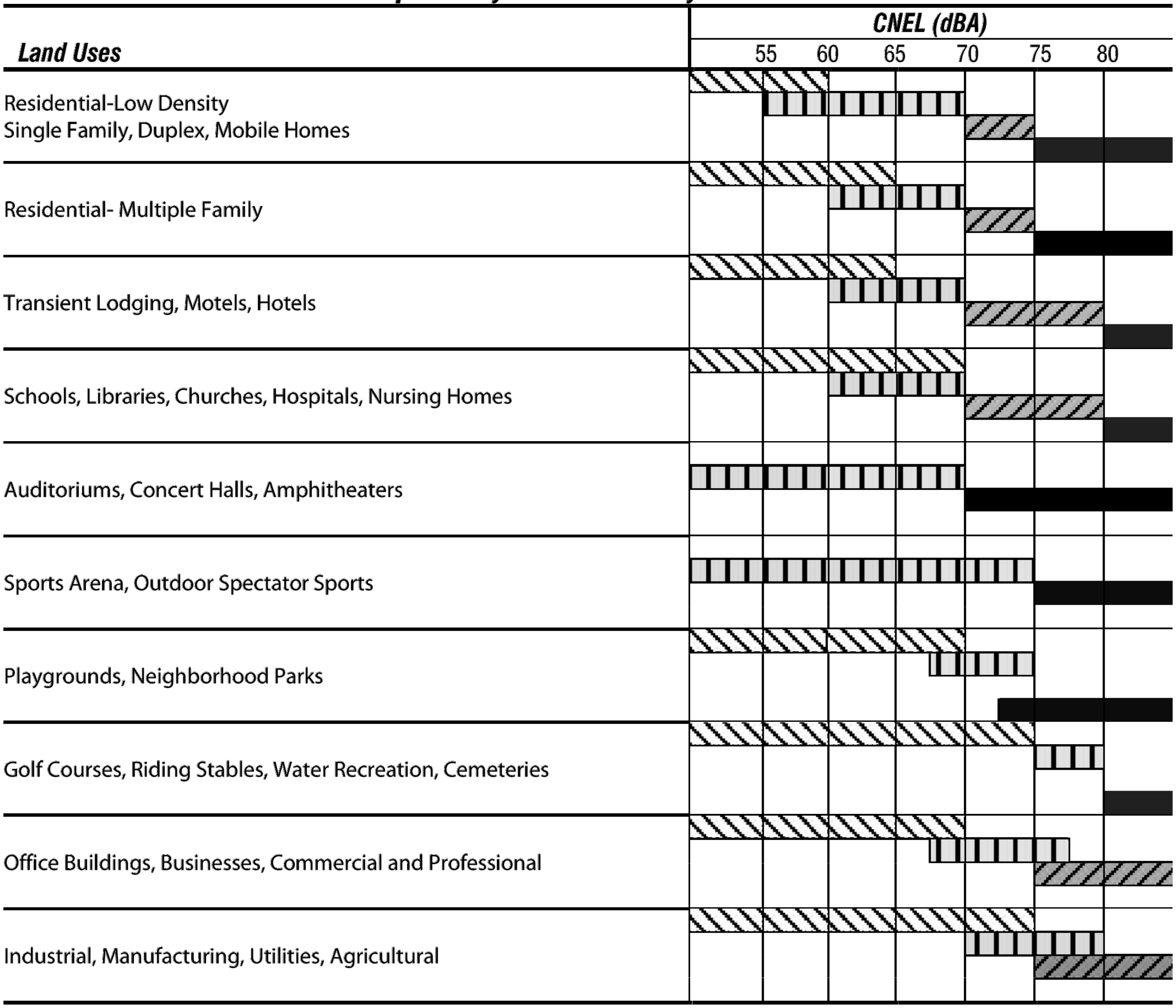
California Department of Health Services Office of Noise Control

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise. The Land Use Compatibility Matrix that was adopted by the City is shown in Figure 4.

California Noise Insulation Standards

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required

Table 5.12-3
Land Use Compatibility for Community Noise Environments



Normally Acceptable:
Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable:
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable:
New construction or development should generally be discouraged. If new construction does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable:
New construction or development generally should not be undertaken.

Source: California Office of Noise Control. Guidelines for the Preparation and Content of Noise Elements of the General Plan. February 1976. Adapted from the US EPA Office of Noise Abatement Control, Washington D.C. Community Noise. Prepared by Wyle Laboratories. December 1971.

Figure 4
City of Menifee Land Use Compatibility Matrix

to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

California Vehicle Code Section 27200-27207 – On-Road Vehicle Noise

California Vehicle Code Section 27200-27207 provides noise limits for vehicles operated in California. For vehicles over 10,000 pounds noise is limited to 88 dB for vehicles manufactured before 1973, 86 dB for vehicles manufactured before 1975, 83 dB for vehicles manufactured before 1988, and 80 dB for vehicles manufactured after 1987. All measurements are based at 50 feet from the vehicle.

California Vehicle Section 38365-38380 – Off-Road Vehicle Noise

California Vehicle Code Section 38365-38380 provides noise limits for off-highway motor vehicles operated in California. 92 dBA for vehicles manufactured before 1973, 88 dBA for vehicles manufactured before 1975, 86 dBA for vehicles manufactured before 1986, and 82 dBA for vehicles manufactured after December 31, 1985. All measurements are based at 50 feet from the vehicle.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

The *Transportation- and Construction Vibration Guidance Manual*, prepared by Caltrans, April 2020, provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are established for continuous (construction-related) and transient (transportation-related) sources of vibration, which found that the human response becomes distinctly perceptible at 0.25 inch per second PPV for transient sources and 0.04 inch per second PPV for continuous sources.

4.3 Local Regulations

The City of Menifee General Plan and Municipal Code establishes the following applicable policies related to noise and vibration.

City of Menifee General Plan

Goal N-1 Noise-sensitive land uses are protected from excessive noise and vibration exposure.

Policy N-1.1 Assess the compatibility of proposed land uses with the noise environment when preparing, revising, or reviewing development project applications.

Policy N-1.3 Require noise abatement measures to enforce compliance with any applicable regulatory mechanisms, including building codes and subdivision and zoning regulations, and ensure that the recommended mitigation measures are implemented.

Policy N-1.7 Mitigate exterior and interior noise to the levels listed in the table below (see Table C) to the extent feasible, for stationary sources adjacent to sensitive receptors:

Table C – City of Menifee Stationary Source Land Use Noise Standards

Land Use	Interior Standards	Exterior Standards
Residential*		
10:00 p.m. to 7:00 a.m.	40 L_{eq} (10 minute)	45 L_{eq} (10 minute)
7:00 a.m. to 10:00 p.m.	55 L_{eq} (10 minute)	65 L_{eq} (10 minute)

* Excepted as permitted under Section 9.09.020 of the City of Menifee Municipal Code.
Source: City of Menifee General Plan, 2013.

Policy N-1.8 Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state, and city noise standards and guidelines as a part of new development review.

Policy N-1.9 Limit the development of new noise-producing uses adjacent to noise-sensitive receptors and require that new noise-producing land be designed with adequate noise abatement measures.

Policy N-1.11 Discourage the siting of noise-sensitive uses in areas in excess of 65 dBA CNEL without appropriate mitigation.

Policy N-1.12 Minimize potential noise impacts associated with the development of mixed-use projects (vertical or horizontal mixed-use) where residential units are located above or adjacent to noise-generating uses.

City of Menifee Municipal Code

The City of Menifee Municipal Code establishes the following applicable standards related to noise.

Section 8.01.010 – Hours of Construction

Any construction within the city located within one-fourth mile from an occupied residence shall be permitted Monday through Saturday, except nationally recognized holidays, 6:30 a.m. to 7:00 p.m. There shall be no construction permitted on Sunday or nationally recognized holidays unless approval is obtained from the City Building Official or City Engineer.

Section 9.09.020 – General Exemptions

Sound emanating from the following sources are exempt from the provisions of this chapter:

H. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of 7:00 a.m. and 8:00 p.m.;

I. Motor vehicles (factory equipped), other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems;

J. Heating and air conditioning equipment in proper repair; and

K. Safety, warning and alarm devices, including but not limited to, house and car alarms, and other warning devices that are designed to protect public health, safety and welfare.

Section 9.09.030 – Construction-Related Exemptions

Exemptions may be requested from the standards set forth in Section 9.09.040 or 9.09.060 of this chapter and may be characterized as construction-related, single event or continuous events exceptions.

A. Private construction projects, with or without a building permit, located one-quarter of a mile or more from an inhabited dwelling.

B. Private construction projects, with or without a building permit, located within one-quarter of a mile from an inhabited dwelling, provided that:

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. the following morning during the months of June through September; and
2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. the following morning during the months of October through May.

C. Construction-related exemptions. A construction-related exemption shall be considered either a minor temporary use or a major temporary use as defined in Chapter 9.06 of this code. An application for a construction-related exception shall be made using the temporary use application provided by the Community Development Director in Chapter 9.06 of this code. For construction activities on Sunday or nationally recognized holidays, Section 8.01.010 shall prevail.

Section 9.09.050 – General Sound Level Standards

No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior and interior sound level on any other occupied property to exceed the sound level standards set forth in Table 1 (see Table C above).

Section 9.09.070 – Special Sound Sources Standards

The general sound level standards set forth in Section 9.09.040 apply to sound emanating from all sources, including the following special sound sources, and the person creating, or allowing the creation of, the sound is subject to the requirements of that section. The following special sound sources are also subject to the following additional standards, the failure to comply with which constitute separate violations of this chapter.

A. *Motor vehicles*

3. *Power tools and equipment.* No person shall operate any power tools or equipment between the hours of 7:00 p.m. and 7:00 a.m. the following morning during the months of June through

September and 6:00 p.m. and 7:00 a.m. the following morning during the months of October through May such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools or equipment are audible to the human ear at a distance greater than 100 feet from the power tools or equipment.

Section 13.01.250 – Park Hours and Closure

(A) *Hours of operation*. All unlighted parks owned by the City of Menifee or to be hereafter owned by the City of Menifee, shall be closed from 30 minutes after sunset of one day and 30 minutes before sunrise of the next day except for those uses noted under division (C) (Exceptions) below. All lighted sports fields shall be closed from 10:00 p.m. of one day and 30 minutes before sunrise of the next day. The City Manager or his/her designee may administratively modify use hours as needed for specific facilities and amenities within parks for the benefit of public health, safety or general well-being; without reestablishment by ordinance or Code amendment.

(B) *Closed parks*. Subject to the exceptions as indicated in division (C) below, it shall be unlawful for any person and/or vehicle to be present in or use any closed park as indicated in division (A) above.

(C) *Exceptions*. The park hours listed above shall not apply to persons:

(1) Attending events sponsored by the City Manager/Community Services Department or the events or activities conducted pursuant to a written permit issued by the City Manager;

(2) Engaged in city business;

(3) Engaged in an authorized city program or activity; or

(4) Engaged in an activity at a city park or community center for which a city facility reservation permit authorizing use during non-daylight hours has been obtained from the City Manager/Community Services Department.

(D) Emergency park closure. Whenever a danger to the public health or safety is created in any public park by such causes as flood, storm, fire, earthquake, explosion, accident or other disaster, or by riot or unlawful assembly, the City Manager or designee may close the area where the danger exists for the duration thereof to any and all person not authorized to enter or remain within such closed area. No unauthorized person shall willfully and knowingly enter an area closed pursuant to this section nor shall willfully remain within such area after receiving notice to evacuate or leave the area.

5.0 EXISTING NOISE CONDITIONS

To determine the existing noise levels, noise measurements have been taken in the vicinity of the project site. The field survey noted that noise within the proposed project area is generally characterized by typical residential community noise sources that include dogs barking, air conditioner units, landscape maintenance activities and vehicle traffic on the nearby roadways. The following describes the measurement procedures, measurement locations, noise measurement results, and the modeling of the existing noise environment.

5.1 Noise Measurements Methodology

The noise measurements were taken using a Larson-Davis Model 831 Type 1 precision sound level meter programmed in "slow" mode to record noise levels in "A" weighted form as well as the frequency spectrum of the noise broken down into 1/3 octaves. The sound level meter and microphone were mounted on a tripod five feet above the ground and were equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (ANSI S1.4-2014 standard).

Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise levels in the vicinity of the project site. Descriptions of the noise monitoring sites are provided below in Table D and are shown in Figure 5. Appendix A includes a photo index of the study area and noise level measurement locations.

Noise Measurement Timing and Climate

The noise measurements were recorded between 1:06 p.m. and 1:40 p.m. on Tuesday, April 23, 2024. During the noise measurements, the sky was partly cloudy, the temperature was 70 degrees Fahrenheit, the humidity was 56 percent, barometric pressure was 28.33 inches of mercury, and the wind was blowing at an average rate of four miles per hour.

5.2 Noise Measurement Results

The results of the noise level measurements are presented in Table D and the noise monitoring data printouts are included in Appendix B.

Table D – Existing (Ambient) Noise Measurement Results

Site No.	Description	Primary Noise Source	Start Time of Measurement	Measured Noise Level	
				dBA Leq	dBA Lmax
1	Located on the south side of the project site, approximately 25 feet east of Boulder Crest Way centerline and 25 feet north of home at 28948 Boulder Crest Way	Vehicles on Boulder Crest Way	1:06 p.m.	43.4	62.0
2	Located on the east side of the project site at west terminus of Polaris Drive.	Vehicles on Ganymede Way	1:25 p.m.	40.1	55.1

Notes: Noise measurements taken with a Larson-Davis Model 831 Type 1 precision sound level meter on Tuesday, April 23, 2024.

VISTA ENVIRONMENTAL

Figure 5
Field Noise Monitoring Locations

6.0 MODELING PARAMETERS AND ASSUMPTIONS

6.1 Off-Road Construction Equipment Noise

The noise impacts from construction of the proposed project have been analyzed through use of the FHWA's Roadway Construction Noise Model (RCNM). The FHWA compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table E below provides a list of the construction equipment anticipated to be used for each phase of construction that was obtained from the *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Oak Hills West Tentative Tract Map No. 38652 Residential Project* (Air Quality Analysis), prepared by Vista Environmental, May 9, 2024.

Table E – Construction Equipment Noise Emissions and Usage Factors

Equipment Description	Number of Equipment	Acoustical Use Factor[1] (percent)	Spec 721.560 Lmax at 50 feet[2] (dBA, slow[3])	Actual Measured Lmax at 50 feet[4] (dBA, slow[3])
Site Preparation				
Rubber Tired Dozers	3	40	85	82
Crawler Tractors	4	40	84	N/A
Grading				
Excavators	2	40	85	81
Grader	1	40	85	83
Rubber Tired Dozer	1	40	85	82
Scrapers	2	40	85	84
Crawler Tractors	2	40	84	N/A
Building Construction				
Crane	1	16	85	81
Forklift (Gradall)	3	40	85	83
Generator	1	50	82	81
Tractor	1	40	84	N/A
Front End Loader	1	40	80	79
Backhoe	1	40	80	78
Welder	1	40	73	74
Paving				
Paver	2	50	85	77
Paving Equipment	2	50	85	77
Roller	2	20	85	80
Architectural Coating				
Air Compressor	1	40	80	78

Notes:
[1] Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.
[2] Spec 721.560 is the equipment noise level utilized by the RCNM program.
[3] The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
[4] Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
Source: Federal Highway Administration, 2006 and CalEEMod default equipment mix.

Table E shows the associated measured noise emissions for each piece of equipment from the RCNM model and measured percentage of typical equipment use per day. Construction noise impacts to the nearby sensitive receptors have been calculated according to the equipment noise levels and usage factors listed in Table E and through use of the RCNM. For each phase of construction, all construction equipment was analyzed based on being placed in the middle of the project site, which is based on the analysis methodology detailed in FTA Manual for a General Assessment. However, in order to provide a conservative analysis, all equipment was analyzed, instead of just the two nosiest pieces of equipment as detailed in the FTA Manual. In addition, 5 dB of shielding was added to the RCNM model for the homes to the east, in order to account for the existing approximately 6 foot high walls located between the project site and homes to the east side of Ganymede Way. The RCNM model printouts are provided in Appendix C.

6.2 FHWA Traffic Noise Model

The proposed project would result in increases in traffic noise to the nearby roadways as well as introduce new sensitive receptors to the project site. The project impacts to the offsite roadways were analyzed through use of the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108 (FHWA Model). The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the reference energy mean emission level to account for: the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT) and the percentage of ADT which flows during the day, evening and night, the travel speed, the vehicle mix on the roadway, which is a percentage of the volume of automobiles, medium trucks and heavy trucks, the roadway grade, the angle of view of the observer exposed to the roadway and site conditions ("hard" or "soft" relates to the absorption of the ground, pavement or landscaping). The following section provides a discussion of the software and modeling input parameters used in this analysis and a discussion of the resultant existing noise model.

<u>FHWA Model Traffic Noise Prediction Model Inputs</u>

The roadway parameters used for this study are presented in Table F. The roadway classifications are based on the City's General Plan Circulation Element. The roadway speeds are based on the posted speed limits. The distance to the nearest sensitive receptor was determined by measuring the distance from the roadway centerline to the noise meter for calibration or nearest residence for the analysis. Since the study area is located in a suburban environment and landscaping or natural vegetation exists along the sides of the analyzed roads, soft site conditions were modeled.

Table F – FHWA Model Roadway Parameters

Roadway	Segment	General Plan Classification	Vehicle Speed (MPH)	Distance to Nearest Receptor[1] (feet)
Boulder Crest Way (Calibration)	North of Ridgemoor Road	Local	25	25
Ganymede Way (Calibration)	At Polaris Drive	Local	25	150
Boulder Crest Way	North of Ridgemoor Road	Local	25	45
Ganymede Way	At Polaris Drive	Local	25	50
Ridgemoor Road	East of Phoenix Way	Local	25	45

Notes:
[1] Distance measured from either noise meter or nearest offsite residential structure to centerline of roadway.
Source: City of Menifee, 2013.

National Data & Surveying Services performed a 24-hour machine vehicle count on Ridgemoor Road, adjacent to Ridgemoor Elementary School, between Phoenix Way and Sequoia Springs Drive and the vehicle count printouts are provided in Appendix D. This location was selected since vehicle trips to and from both of the project access points will likely drive through this road segment. The vehicle counts show that there is currently 2,835 daily vehicle trips, which is segmented into 2,764 auto trips, 63 medium truck trips, and 8 heavy truck trips per day. In order to determine the existing road volumes on Boulder Crest Way and Ganymede Way, in the vicinity of the project site, the noise meter locations were entered into the FHWA model and the necessary traffic volumes required to create the measured noise levels shown above in Table D was calculated, which resulted found the ambient noise level equivalent of 110 daily trips on Boulder Crest Way and 820 daily trips on Ganymede Way. The calibration calculations are shown on the FHWA printouts provided in Appendix D.

The vehicle trips generated by construction and operation of the proposed project were obtained from the CalEEMod model run utilized in the *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Oak Hills West Tentative Tract Map No. 38652 Residential Project* (Air Quality Analysis), prepared by Vista Environmental, May 9, 2024. The Air Quality Analysis found that the worst-case construction traffic would occur during the grading phase, when there would be 20 worker trips per day and 65 haul truck trips per day and that operation of the proposed project would generate up to 602 daily trips. The trip distribution for construction and operational project generated trips were generally based on the Proposed Haul Truck shown in Figure 3, where 50 percent of the trips would utilize Boulder Crest Way, 50 percent of the trips would utilize Ganymede Way and 100 percent of the trips would utilize Ridgemoor Road east of Phoenix Way. The ADT volumes used in this analysis are shown in Table G.

Table G – Average Daily Traffic Volumes

Roadway	Segment	Average Daily Traffic Volumes		
		Existing	Existing + Construction	Existing + Operational
Boulder Crest Way	North of Ridgemoor Road	110	153	411
Ganymede Way	At Polaris Drive	820	863	1,121
Ridgemoor Road	East of Phoenix Way	2,835	2,920	3,437

Source: City of Menifee, 2013; National Data & Surveying Services, 2024 (see Appendix D).

The vehicle mix provides the hourly distribution percentages of automobiles, medium trucks, and heavy trucks for input into the FHWA-RD-77-108 Model. The existing (no haul trucks) was taken directly from the 24 hour machine count printouts shown in Appendix D. The with haul truck vehicle mixes were calculated by adding the construction haul truck trips to the existing vehicle mix ratio. The vehicle mixes utilized in this analysis are shown in Table H.

Table H – Roadway Vehicle Mixes

Vehicle Type	Traffic Flow Distributions			
	Day (7 a.m. to 7 p.m.)	Evening (7 p.m. to 10 p.m.)	Night (10 p.m. to 7 a.m.)	Overall
Existing (No Haul Trucks)				
Automobiles	76.55%	11.38%	9.56%	97.50%
Medium Trucks	1.74%	0.26%	0.22%	2.22%
Heavy Trucks	0.22%	0.03%	0.03%	0.28%
Boulder Crest Way & Ganymede Way (With Haul Trucks)				
Automobiles	66.40%	4.05%	3.31%	73.65%
Medium Trucks	0.87%	0.06%	0.05%	1.10%
Heavy Trucks	25.22%	0.02%	0.01%	25.25%
Ridgemoor Road (With Haul Trucks)				
Automobiles	75.19%	10.98%	9.32%	96.78%
Medium Trucks	1.57%	0.23%	0.20%	0.72%
Heavy Trucks	2.45%	0.03%	0.03%	2.51%

Source: National Data & Surveying Services, 2024 (see Appendix D).

FHWA Model Source Assumptions

To assess the roadway noise generation in a uniform manner, all vehicles are analyzed at the single lane equivalent acoustic center of the roadway being analyzed. In order to determine the height above the road grade where the noise is being emitted from, each type of vehicle has been analyzed independently with autos at road grade, medium trucks at 2.3 feet above road grade, and heavy trucks at 8 feet above road grade. These elevations were determined through a noise-weighted average of the elevation of the exhaust pipe, tires and mechanical parts in the engine, which are the primary noise emitters from a vehicle.

6.3 Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to damage at the highest levels. Table I gives approximate vibration levels for particular construction activities. The data in Table I provides a reasonable estimate for a wide range of soil conditions.

Table I – Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity (inches/second)	Approximate Vibration Level (L_v)at 25 feet
Pile driver (impact)	Upper range	1.518	112
	typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drill		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, 2018.

The construction-related vibration impacts have been calculated through the vibration levels shown above in Table I and through typical vibration propagation rates. The equipment assumptions were based on the equipment lists provided above in Table E.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundborne vibration or groundborne noise levels; or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

7.2 Generation of Noise Levels in Excess of Standards

The proposed project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. The following section calculates the potential noise emissions associated with the temporary construction activities and long-term operations of the proposed project and compares the noise levels to the City standards.

Construction-Related Noise

The construction activities for the proposed project are anticipated to include site preparation and grading of the project site, building construction of the homes, paving of the onsite roads and parking areas, sidewalks and hardscapes, and application of architectural coatings. Construction activities would primarily create noise impacts from haul truck trips on the nearby roadways and from off-road equipment operating on the project site that have been analyzed separately below.

<u>Haul Trucks on Nearby Roads</u>

Vehicle noise is a combination of the noise produced by the engine, exhaust and tires. The level of traffic noise depends on three primary factors (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. The proposed project would not alter the speed limit on any existing roadway so the proposed project's potential offsite noise impacts have been focused on the noise impacts associated with the change of volume of traffic and the change in number of trucks in the traffic flow that would occur during the import of dirt to the project site. The Air Quality Analysis found that the import of dirt would generate up to 287 haul truck trips per day, which would represent 3.4 percent of the 8,500 daily trips that current travel on Simpson Road in the vicinity of the project site.

Neither the General Plan nor the Municipal Code defines what constitutes a "substantial permanent increase to ambient noise levels". As such, this impact analysis has utilized guidance from the Federal Transit Administration for a moderate impact that has been detailed above in Table A that shows that the project contribution to the noise environment can range between 0 and 7 dB, which is dependent on the existing roadway noise levels. The potential offsite haul truck noise impacts created during construction of the proposed project have been analyzed through utilization of the FHWA model and parameters described above in Section 6.2 and the FHWA model traffic noise calculation spreadsheets are provided in Appendix E. The proposed project's potential offsite traffic noise impacts have been calculated through a comparison of the existing scenario to the existing plus construction trips scenario. The results of this comparison are shown in Table J.

Table J – Proposed Construction-Related Traffic Noise Contributions

Roadway	Segment	dBA CNEL at Nearest Receptor[1]			Increase Threshold[2]
		Existing	Existing + Construction	Project Contribution	
Boulder Crest Way	North of Ridgemoor Road	39.3	45.6	+6.3	+7 dBA
Ganymede Way	At Polaris Drive	47.4	52.5	+5.1	+7 dBA
Ridgemoor Road	East of Phoenix Way	53.5	53.5	+0.0	+5 dBA

Notes:
[1] Distance to nearest existing homes shown in Table F, does not take into account existing noise barriers.
[2] Increase Threshold obtained from the FTA's allowable noise impact exposures detailed above in Table A.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table J shows that the proposed project's construction-related noise increases to the nearby homes created from the haul trucks exporting dirt from the project site would not exceed the FTA's allowable increase thresholds detailed above. Therefore, the vehicular traffic generated by construction of the proposed project would not result in a substantial permanent increase in ambient noise levels. Impacts would be less than significant.

Off-Road Construction Equipment Operating Onsite

Noise impacts from off-road construction equipment associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptors to the project site are residents at the single-family homes located on Boulder Crest Way and as near as four feet to the south of the project site. There are also single-family homes located as near as 28 feet east of the project site.

Section 9.09.030(B) of the City's Municipal Code exempts noise sources associated with new, private construction projects located within one-quarter of a mile from an inhabited dwelling from the City's noise standards provided construction activities do not occur either: (1) Between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September; or (2) Between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May. However, the City construction noise standards do not provide any limits to the noise levels that may be created from construction activities and even with adherence to the City standards, the resultant construction noise levels may result in a significant substantial temporary noise increase to the nearby residents.

In order to determine if the proposed construction activities would create a significant substantial temporary noise increase, the FTA construction noise criteria thresholds detailed above in Section 4.1 have been utilized, which shows that a significant construction noise impact would occur if construction noise exceeds 80 dBA during the daytime at any of the nearby homes.

Construction noise levels to the nearby sensitive receptors have been calculated through use of the RCNM and the parameters and assumptions detailed in Section 6.1 of this report including Table E – Construction

Equipment Noise Emissions and Usage Factors. The results are shown below in Table K and the RCNM printouts are provided in Appendix C.

Table K – Construction Noise Levels at the Nearby Sensitive Receptors

Construction Phase	Construction Noise Level (dBA Leq) at: Homes to South[1]	Homes to East[2]
Site Preparation	68	68
Grading	68	68
Building Construction	67	67
Paving	62	62
Painting	54	54
FTA Construction Noise Threshold[3]	**80**	**80**
Exceed Thresholds?	**No**	**No**

[1] The homes to the south are located as near as 500 feet from center of project site.
[2] The homes to the east are located as near as 280 feet from center of project site. 5 dB of shielding was added to RCNM in order to account for the existing 6-foot wall on the east side of project site.
[3] The FTA Construction noise thresholds are detailed above in Table B.
Source: RCNM, Federal Highway Administration, 2006

Table K shows that the greatest noise impacts would occur during the site preparation and grading phases, with noise levels as high as 68 dBA Leq at the nearest homes to the south and east. All calculated construction noise levels shown in Table K are within the FTA daytime construction noise standard of 80 dBA averaged over eight hours. Therefore, through adherence to the allowable construction times provided in Section 9.09.030(B) of the City's Municipal Code, the construction activities for the proposed project would not create a substantial temporary increase in ambient noise levels that are in excess of applicable noise standards. Impacts would be less than significant.

Operational-Related Noise

The proposed project would consist of the development of 37 residential lots of which each residential lot would be developed with a duplex, which would result in a total of 74 residential units. Potential noise impacts associated with the operations of the proposed project would be from project-generated vehicular traffic on the nearby roadways. The onsite operations of the proposed project would not introduce any new noise sources (i.e., air conditioning equipment, landscape maintenance activities, trash trucks, etc.) that do not already exist in the vicinity of the project site. As such, less than significant onsite noise impacts are anticipated to occur from operation of the proposed project.

Roadway Vehicular Noise Impacts to Nearby Existing Homes

Vehicle noise is a combination of the noise produced by the engine, exhaust and tires. The level of traffic noise depends on three primary factors (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. The proposed project does not propose any uses that would require a substantial number of truck trips and the proposed project would not alter the speed limit on any existing roadway so the proposed project's potential offsite noise impacts have been focused on the noise impacts associated with the change of volume of traffic that would occur with development of the proposed project.

Neither the General Plan nor the Municipal Code defines what constitutes a "substantial permanent increase to ambient noise levels". As such, this impact analysis has utilized guidance from the Federal

Transit Administration for a moderate impact that has been detailed above in Table A that shows that the project contribution to the noise environment can range between 0 and 7 dB, which is dependent on the existing roadway noise levels.

The potential offsite traffic noise impacts created by the on-going operations of the proposed project have been analyzed through utilization of the FHWA model and parameters described above in Section 6.2 and the FHWA model traffic noise calculation spreadsheets are provided in Appendix E. The proposed project's potential offsite traffic noise impacts have been calculated through a comparison of the existing scenario to the existing plus project operations scenario. The results of this comparison are shown in Table L.

Table L – Project Operational Traffic Noise Contributions

		dBA CNEL at Nearest Receptor[1]			
Roadway	**Segment**	**Existing**	**Existing Plus Operations**	**Project Contribution**	**Increase Threshold[2]**
Boulder Crest Way	North of Ridgemoor Road	39.3	45.1	+5.8	+7 dBA
Ganymede Way	At Polaris Drive	47.4	48.7	+1.3	+7 dBA
Ridgemoor Road	East of Phoenix Way	53.5	54.3	+0.8	+5 dBA

Notes:
[1] Distance to nearest sensitive receptors shown in Table F, does not take into account existing noise barriers.
[2] Increase Threshold obtained from the FTA's allowable noise impact exposures detailed above in Table A.
Source: FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

Table L shows that the proposed project's permanent noise increases to the nearby homes from the generation of additional vehicular traffic would not exceed the traffic noise increase thresholds detailed above. Therefore, the proposed project would not result in a substantial permanent increase in ambient noise levels for the existing conditions. Impacts would be less than significant.

Level of Significance

Less than significant impact.

7.3 Generation of Excessive Groundborne Vibration

The proposed project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. The following section analyzes the potential vibration impacts associated with the construction and operations of the proposed project.

Construction-Related Vibration Impacts

The construction activities for the proposed project are anticipated to include site preparation and grading of the project site, building construction of the homes, paving of the onsite roads and parking areas, sidewalks and hardscapes, and application of architectural coatings. Vibration impacts from construction activities associated with the proposed project would typically be created from the operation of heavy off-road equipment. The nearest sensitive receptors to the project site are residents at the single-family homes located on Boulder Crest Way and as near as four feet to the south of the project site.

Since neither the Municipal nor the General Plan provide a quantifiable vibration threshold for temporary construction activities, guidance from the *Transportation and Construction-Induced Vibration Guidance Manual*, prepared by Caltrans, April 2020, has been utilized, which defines the threshold of perception from transient sources such as off-road construction equipment at 0.25 inch per second peak particle velocity (PPV).

The primary source of vibration during construction would be from the operation of a bulldozer. From Table I above a large bulldozer would create a vibration level of 0.089 inch per second PPV at 25 feet. Based on typical propagation rates, the vibration level at the nearest offsite home (4 feet to the south) would be 0.67 inch per second PPV. The vibration level at the nearest structure would exceed the 0.25 inch per second PPV threshold, described above. This would be considered a significant impact.

Mitigation Measure 1 is provided that would require that the applicant to restrict the use of a large dozer or any other large earthmoving equipment within 10 feet of any offsite structure. For all grading activities that occur within 10 feet of any offsite structure, the applicant shall require the use of a small dozer or other type of equipment that is less than 150 horsepower. From Table I above a small bulldozer would create a vibration level of 0.003 inch-per-second PPV at 25 feet. With application of Mitigation Measure 1, the vibration level at the nearest structure would be reduced to 0.24 inch per second PPV from large dozers and 0.02 inch per second PPV from small dozers, which would both be below the 0.25 inch per second PPV threshold detailed above. Therefore, with implementation of Mitigation Measure 1, a less than significant vibration impact is anticipated from construction of the proposed project.

Operations-Related Vibration Impacts

The proposed project would consist of the development of a residential community. The on-going operation of the proposed project would not include the operation of any known vibration sources other than typical onsite vehicle operations for a residential development. Therefore, a less than significant vibration impact is anticipated from operation of the proposed project.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Mitigation Measure 1:

The project applicant shall require that all construction contractors restrict the operation of any large bulldozers that is powered by a greater than 150 horse power engine from operating within 10 feet of any off-site structure. The project applicant shall require the use of a small bulldozer (i.e., D1, D2, or D3 dozers) or other type of equipment that is less than 150 horsepower to perform all demolition and grading activities that are located within 10 feet of any off-site structure.

Level of Significance after Mitigation

Less than significant impact.

7.4 Aircraft Noise

The proposed project may expose people residing in the project area to excessive noise levels from aircraft. The nearest airport is the Perris Valley Airport that is located as near as 3.8 miles north of the project site. The project site is located outside of the 60 dBA CNEL noise contours of this Airport.

Therefore, the proposed homes would not be exposed to excessive aircraft noise. Impacts would be less than significant.

Level of Significance

Less than significant impact.

8.0 REFERENCES

California Department of Transportation, *2016 Annual Average Daily Truck Traffic on the California State Highway System*, 2018.

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analytics Protocol*, September 2013.

California Department of Transportation, *Transportation- and Construction Vibration Guidance Manual*, April 2020.

City of Menifee, *City of Menifee General Plan,* 2013.

City of Menifee, *Menifee General Plan Draft Environmental Impact Report,* September 2013.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018.

U.S. Department of Transportation, *FHWA Roadway Construction Noise Model User's Guide,* January, 2006.

U.S. Department of Transportation, *Highway Traffic Noise: Analysis and Abatement Guidance,* December, 2011.

Vista Environmental, *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Oak Hills West Tentative Tract Map No. 38652 Residential Project*, May 9, 2024.

APPENDIX A

Field Noise Measurements Photo Index


Noise Measurement Site 1 - looking north


Noise Measurement Site 1 - looking northeast


Noise Measurement Site 1 - looking east


Noise Measurement Site 1 - looking southeast


Noise Measurement Site 1 - looking south


Noise Measurement Site 1 - looking southwest


Noise Measurement Site 1 - looking west


Noise Measurement Site 1 - looking northwest

Noise Measurement Site 2 - looking north

Noise Measurement Site 2 - looking northeast

Noise Measurement Site 2 - looking east

Noise Measurement Site 2 - looking southeast

Noise Measurement Site 2 - looking south

Noise Measurement Site 2 - looking southwest

Noise Measurement Site 2 - looking west

Noise Measurement Site 2 - looking northwest

APPENDIX B

Field Noise Measurements Printouts

Measurement Report

Report Summary

Meter's File Name	831_Data.001	Computer's File Name	SLM_0002509_831_Data_001.33.ldbin
Meter	831		
Firmware	2.403		
User	GT	Location	
Description	Menifee Oak Hills West TTM 38652		
Note	On South Side of Project site adjacent to home at 28948 Boulder Crest Way		

Start Time	2024-04-23 13:06:38	Duration	0:15:00.0		
End Time	2024-04-23 13:21:38	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	43.4 dB		
LAE	73.0 dB	SEA	--- dB
EA	2.2 µPa²h		
LZ_{peak}	100.3 dB	2024-04-23 13:06:38	
LAS_{max}	62.0 dB	2024-04-23 13:09:21	
LAS_{min}	29.5 dB	2024-04-23 13:20:01	
LA_{eq}	43.4 dB		
LC_{eq}	59.4 dB	LC_{eq} - LA_{eq}	16.0 dB
LAI_{eq}	48.6 dB	LAI_{eq} - LA_{eq}	5.1 dB

Exceedances

Exceedances	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
43.4 dB	43.4 dB	0.0 dB

LDEN	LDay	LEve	LNight
43.4 dB	43.4 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	43.4 dB		59.4 dB		74.7 dB	
$Ls_{(max)}$	62.0 dB	2024-04-23 13:09:21	75.4 dB	2024-04-23 13:09:21	90.2 dB	2024-04-23 13:06:38
$LF_{(max)}$	65.6 dB	2024-04-23 13:09:21	78.6 dB	2024-04-23 13:09:21	96.1 dB	2024-04-23 13:06:38
$LI_{(max)}$	68.5 dB	2024-04-23 13:09:21	81.5 dB	2024-04-23 13:13:32	98.7 dB	2024-04-23 13:06:38
$LS_{(min)}$	29.5 dB	2024-04-23 13:20:01	42.9 dB	2024-04-23 13:19:31	48.7 dB	2024-04-23 13:19:47
$LF_{(min)}$	28.7 dB	2024-04-23 13:19:58	41.5 dB	2024-04-23 13:19:46	45.3 dB	2024-04-23 13:19:25
$LI_{(min)}$	29.2 dB	2024-04-23 13:19:48	44.0 dB	2024-04-23 13:19:30	51.3 dB	2024-04-23 13:19:47
$L_{Peak(max)}$	83.4 dB	2024-04-23 13:09:33	88.8 dB	2024-04-23 13:09:21	100.3 dB	2024-04-23 13:06:38

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	47.7 dB
LAS 10.0	45.4 dB
LAS 33.3	40.9 dB
LAS 50.0	38.6 dB
LAS 66.6	36.6 dB
LAS 90.0	33.2 dB

Measurement Report

Report Summary

Meter's File Name	831_Data.002	Computer's File Name	SLM_0002509_831_Data_002.27.ldbin
Meter	831		
Firmware	2.403		
User	GT	Location	
Description	Menifee Oak Hills West TTM 38652		
Note	On East Side of Project Site at west terminus of Polaris Dr		

Start Time	2024-04-23 13:25:21	Duration	0:15:00.0		
End Time	2024-04-23 13:40:21	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	40.1 dB			
LAE	69.7 dB		SEA	--- dB
EA	1.0 µPa²h			
LZ_{peak}	99.5 dB	2024-04-23 13:35:53		
LAS_{max}	55.1 dB	2024-04-23 13:37:19		
LAS_{min}	30.9 dB	2024-04-23 13:29:50		
LA_{eq}	40.1 dB			
LC_{eq}	55.9 dB		LC_{eq} - LA_{eq}	15.8 dB
LAI_{eq}	45.2 dB		LAI_{eq} - LA_{eq}	5.1 dB

Exceedances

Exceedances	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
40.1 dB	40.1 dB	0.0 dB

LDEN	LDay	LEve	LNight
40.1 dB	40.1 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	40.1 dB		55.9 dB		73.0 dB	
$LS_{(max)}$	55.1 dB	2024-04-23 13:37:19	68.4 dB	2024-04-23 13:37:19	92.4 dB	2024-04-23 13:25:21
$LF_{(max)}$	62.8 dB	2024-04-23 13:37:19	75.6 dB	2024-04-23 13:37:19	96.3 dB	2024-04-23 13:35:53
$LI_{(max)}$	66.9 dB	2024-04-23 13:37:19	79.4 dB	2024-04-23 13:37:19	97.8 dB	2024-04-23 13:35:53
$LS_{(min)}$	30.9 dB	2024-04-23 13:29:50	42.7 dB	2024-04-23 13:29:49	49.6 dB	2024-04-23 13:26:21
$LF_{(min)}$	30.1 dB	2024-04-23 13:30:28	40.7 dB	2024-04-23 13:29:54	44.7 dB	2024-04-23 13:29:55
$LI_{(min)}$	30.6 dB	2024-04-23 13:30:18	43.7 dB	2024-04-23 13:29:55	50.4 dB	2024-04-23 13:26:21
$L_{Peak(max)}$	83.8 dB	2024-04-23 13:37:19	86.4 dB	2024-04-23 13:37:19	99.5 dB	2024-04-23 13:35:53

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	45.5 dB
LAS 10.0	43.9 dB
LAS 33.3	39.8 dB
LAS 50.0	37.4 dB
LAS 66.6	35.4 dB
LAS 90.0	32.8 dB

APPENDIX C

RCNM Model Construction Noise Calculation Printouts

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/20/2024
Case Description: Oak Hills West - Site Preparation

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Homes to South	Residential	43.4	43.4	43.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	500	0
Dozer	No	40		81.7	500	0
Dozer	No	40		81.7	500	0
Tractor	No	40	84		500	0
Tractor	No	40	84		500	0
Tractor	No	40	84		500	0
Tractor	No	40	84		500	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Dozer		61.7	57.7	N/A	N/A	N/A	N/A
Dozer		61.7	57.7	N/A	N/A	N/A	N/A
Dozer		61.7	57.7	N/A	N/A	N/A	N/A
Tractor		64.0	60.0	N/A	N/A	N/A	N/A
Tractor		64.0	60.0	N/A	N/A	N/A	N/A
Tractor		64.0	60.0	N/A	N/A	N/A	N/A
Tractor		64.0	60.0	N/A	N/A	N/A	N/A
	Total	**64**	**68**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/20/2024
Case Description: Oak Hills West - Site Preparation

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Homes to East	Residential	40.1	40.1	40.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	280	5
Dozer	No	40		81.7	280	5
Dozer	No	40		81.7	280	5
Tractor	No	40	84		280	5
Tractor	No	40	84		280	5
Tractor	No	40	84		280	5
Tractor	No	40	84		280	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Dozer		61.7	58	N/A	N/A	N/A	N/A
Dozer		61.7	57.7	N/A	N/A	N/A	N/A
Dozer		61.7	57.7	N/A	N/A	N/A	N/A
Tractor		64.0	60.1	N/A	N/A	N/A	N/A
Tractor		64.0	60.1	N/A	N/A	N/A	N/A
Tractor		64.0	60.1	N/A	N/A	N/A	N/A
Tractor		64.0	60.1	N/A	N/A	N/A	N/A
	Total	**64**	**68**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date:	8/20/2024
Case Description:	Oak Hills West - Grading

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Homes to South	Residential	43.4	43.4	43.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	500	0
Excavator	No	40		80.7	500	0
Grader	No	40	85		500	0
Dozer	No	40		81.7	500	0
Tractor	No	40	84		500	0
Tractor	No	40	84		500	0
Scraper	No	40		83.6	500	0
Scraper	No	40		83.6	500	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Excavator		60.7	56.7	N/A	N/A	N/A	N/A
Excavator		60.7	56.7	N/A	N/A	N/A	N/A
Grader		65.0	61.0	N/A	N/A	N/A	N/A
Dozer		61.7	57.7	N/A	N/A	N/A	N/A
Tractor		64.0	60.0	N/A	N/A	N/A	N/A
Tractor		64.0	60.0	N/A	N/A	N/A	N/A
Scraper		63.6	59.6	N/A	N/A	N/A	N/A
Scraper		63.6	59.6	N/A	N/A	N/A	N/A
	Total	**65**	**68**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/20/2024
Case Description: Oak Hills West - Grading

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Homes to East	Residential	40.1	40.1	40.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	280	5
Excavator	No	40		80.7	280	5
Grader	No	40	85		280	5
Dozer	No	40		81.7	280	5
Tractor	No	40	84		280	5
Tractor	No	40	84		280	5
Scraper	No	40		83.6	280	5
Scraper	No	40		83.6	280	5

Results

Equipment		Calculated (dBA) ***Lmax**	**Leq**	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Excavator		60.7	56.8	N/A	N/A	N/A	N/A
Excavator		60.7	56.8	N/A	N/A	N/A	N/A
Grader		65.0	61.1	N/A	N/A	N/A	N/A
Dozer		61.7	57.7	N/A	N/A	N/A	N/A
Tractor		64.0	60.1	N/A	N/A	N/A	N/A
Tractor		64.0	60.1	N/A	N/A	N/A	N/A
Scraper		63.6	59.6	N/A	N/A	N/A	N/A
Scraper		63.6	59.6	N/A	N/A	N/A	N/A
	Total	**65**	**68**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/20/2024
Case Description: Oak Hills West - Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Homes to South	Residential	43.4	43.4	43.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	500	0
Gradall	No	40		83.4	500	0
Gradall	No	40		83.4	500	0
Gradall	No	40		83.4	500	0
Generator	No	50		80.6	500	0
Backhoe	No	40		77.6	500	0
Front End Loader	No	40		79.1	500	0
Tractor	No	40	84		500	0
Welder / Torch	No	40		74	500	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Crane		60.6	52.6	N/A	N/A	N/A	N/A
Gradall		63.4	59.4	N/A	N/A	N/A	N/A
Gradall		63.4	59.4	N/A	N/A	N/A	N/A
Gradall		63.4	59.4	N/A	N/A	N/A	N/A
Generator		60.6	57.6	N/A	N/A	N/A	N/A
Backhoe		57.6	53.6	N/A	N/A	N/A	N/A
Front End Loader		59.1	55.1	N/A	N/A	N/A	N/A
Tractor		64.0	60.0	N/A	N/A	N/A	N/A
Welder / Torch		54.0	50.0	N/A	N/A	N/A	N/A
	Total	**64**	**67**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/20/2024
Case Description: Oak Hills West - Building Construction

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Homes to East	Residential	40.1	40.1	40.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	280	5
Gradall	No	40		83.4	280	5
Gradall	No	40		83.4	280	5
Gradall	No	40		83.4	280	5
Generator	No	50		80.6	280	5
Backhoe	No	40		77.6	280	5
Front End Loader	No	40		79.1	280	5
Tractor	No	40	84		280	5
Welder / Torch	No	40		74	280	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Crane		60.6	52.6	N/A	N/A	N/A	N/A
Gradall		63.4	59.5	N/A	N/A	N/A	N/A
Gradall		63.4	59.5	N/A	N/A	N/A	N/A
Gradall		63.4	59.5	N/A	N/A	N/A	N/A
Generator		60.7	57.7	N/A	N/A	N/A	N/A
Backhoe		57.6	53.6	N/A	N/A	N/A	N/A
Front End Loader		59.1	55.2	N/A	N/A	N/A	N/A
Tractor		64.0	60.1	N/A	N/A	N/A	N/A
Welder / Torch		54.0	50.1	N/A	N/A	N/A	N/A
	Total	**64**	**67**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/20/2024
Case Description: Oak Hills West - Paving

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Homes to South	Residential	43.4	43.4	43.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	500	0
Paver	No	50		77.2	500	0
Paver	No	50		77.2	500	0
Paver	No	50		77.2	500	0
Roller	No	20		80	500	0
Roller	No	20		80	500	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Paver		57.2	54.2	N/A	N/A	N/A	N/A
Paver		57.2	54.2	N/A	N/A	N/A	N/A
Paver		57.2	54.2	N/A	N/A	N/A	N/A
Paver		57.2	54.2	N/A	N/A	N/A	N/A
Roller		60.0	53.0	N/A	N/A	N/A	N/A
Roller		60.0	53.0	N/A	N/A	N/A	N/A
	Total	**60**	**62**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/20/2024
Case Description: Oak Hills West - Paving

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Homes to East	Residential	40.1	40.1	40.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	280	5
Paver	No	50		77.2	280	5
Paver	No	50		77.2	280	5
Paver	No	50		77.2	280	5
Roller	No	20		80	280	5
Roller	No	20		80	280	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Paver		57.3	54	N/A	N/A	N/A	N/A
Paver		57.3	54.2	N/A	N/A	N/A	N/A
Paver		57.3	54.2	N/A	N/A	N/A	N/A
Paver		57.3	54.2	N/A	N/A	N/A	N/A
Roller		60.0	53.0	N/A	N/A	N/A	N/A
Roller		60.0	53.0	N/A	N/A	N/A	N/A
	Total	**60**	**62**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/20/2024
Case Description: Oak Hills West - Painting

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Homes to South	Residential	43.4	43.4	43.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	500	0

				Results			
		Calculated (dBA)			Noise Limits (dBA)		
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Compressor (air)		57.7	53.7	N/A	N/A	N/A	N/A
	Total	**58**	**54**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Homes to East	Residential	40.1	40.1	40.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	280	5

				Results			
		Calculated (dBA)			Noise Limits (dBA)		
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Compressor (air)		57.7	53.7	N/A	N/A	N/A	N/A
	Total	**58**	**54**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX D

National Data & Surveying Services 24-Hour Machine Traffic Counts Printouts

Prepared by National Data & Surveying Services

CLASSIFICATION

Ridgemoor Rd Bet Phoenix Way & Sequoia Springs Dr

Day: Tuesday
Date: 6/4/2024

City: Menifee
Project #: CA24_030019_001

HOURLY BREAKDOWN

EASTBOUND

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
1:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
2:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
3:00	0	7	0	0	1	0	0	0	0	0	0	0	0	8
4:00	0	13	6	0	3	0	0	0	0	0	0	0	0	22
5:00	2	24	5	0	2	0	0	0	0	0	0	0	0	33
6:00	2	41	16	0	3	0	0	0	0	0	0	0	0	62
7:00	1	138	23	0	1	0	0	0	0	0	0	0	0	163
8:00	0	105	25	1	2	1	0	0	0	0	0	0	0	134
9:00	1	68	19	0	0	0	0	1	0	0	0	0	0	89
10:00	1	94	22	0	3	1	1	0	0	0	0	0	0	122
11:00	0	72	18	1	0	0	0	0	0	0	0	0	0	91
12:00	2	58	12	0	2	0	0	1	0	0	0	0	0	75
13:00	0	75	15	0	6	0	0	0	0	0	0	0	0	96
14:00	1	104	13	0	3	0	0	0	0	0	0	0	0	121
15:00	0	45	9	0	5	0	0	1	0	0	0	0	0	60
16:00	0	47	9	0	1	0	0	0	0	0	0	0	0	57
17:00	1	67	10	0	1	0	0	0	0	0	0	0	0	79
18:00	0	51	8	0	2	0	0	0	0	0	0	0	0	61
19:00	1	40	9	0	1	0	0	0	0	0	0	0	0	51
20:00	0	39	5	0	2	0	0	0	0	0	0	0	0	46
21:00	0	27	1	0	0	0	0	0	0	0	0	0	0	28
22:00	0	13	0	0	0	0	0	0	0	0	0	0	0	13
23:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
Totals	12	1,144	225	2	38	2	1	3	0	0	0	0	0	1,427
% of Totals	1%	80%	16%	0%	3%	0%	0%	0%						100%

WESTBOUND

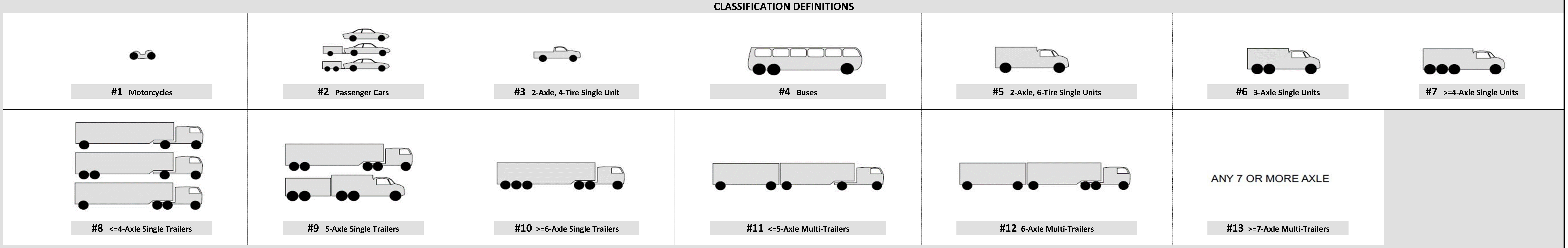
Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
1:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
2:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
3:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
4:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
5:00	0	13	4	0	0	0	0	0	0	0	0	0	0	17
6:00	0	23	4	1	1	0	0	0	0	0	0	0	0	29
7:00	0	90	19	0	0	0	0	0	0	0	0	0	0	109
8:00	0	61	11	0	0	0	0	0	1	0	0	0	0	73
9:00	0	58	21	0	1	0	0	0	0	0	0	0	0	80
10:00	0	81	15	1	2	1	0	0	0	0	0	0	0	100
11:00	0	75	15	0	1	0	0	0	0	0	0	0	0	91
12:00	0	52	14	0	0	0	0	1	1	0	0	0	0	68
13:00	0	73	18	0	2	1	0	0	0	0	0	0	0	94
14:00	1	85	19	0	4	1	0	0	0	0	0	0	0	110
15:00	0	73	11	0	0	0	0	0	0	0	0	0	0	84
16:00	2	73	11	0	1	0	0	0	0	0	0	0	0	87
17:00	0	79	15	0	2	0	0	0	1	0	0	0	0	97
18:00	0	71	13	0	1	0	0	0	0	0	0	0	0	85
19:00	0	68	16	0	0	0	0	0	0	0	0	0	0	84
20:00	0	54	12	0	1	0	0	0	0	0	0	0	0	67
21:00	1	49	5	0	0	0	0	0	0	0	0	0	0	55
22:00	0	29	1	0	0	0	0	0	0	0	0	0	0	30
23:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
Totals	4	1,150	229	2	16	3	0	1	3	0	0	0	0	1,408
% of Totals	0%	82%	16%	0%	1%	0%		0%	0%					100%

TOTALS

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	12	0	0	0	0	0	0	0	0	0	0	0	12
1:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
2:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
3:00	0	10	1	0	1	0	0	0	0	0	0	0	0	12
4:00	0	18	7	0	3	0	0	0	0	0	0	0	0	28
5:00	2	37	9	0	2	0	0	0	0	0	0	0	0	50
6:00	2	64	20	1	4	0	0	0	0	0	0	0	0	91
7:00	1	228	42	0	1	0	0	0	0	0	0	0	0	272
8:00	0	166	36	1	2	1	0	0	1	0	0	0	0	207
9:00	1	126	40	0	1	0	0	1	0	0	0	0	0	169
10:00	1	175	37	1	5	2	1	0	0	0	0	0	0	222
11:00	0	147	33	1	1	0	0	0	0	0	0	0	0	182
12:00	2	110	26	0	2	0	0	2	1	0	0	0	0	143
13:00	0	148	33	0	8	1	0	0	0	0	0	0	0	190
14:00	2	189	32	0	7	1	0	0	0	0	0	0	0	231
15:00	0	118	20	0	5	0	0	1	0	0	0	0	0	144
16:00	2	120	20	0	2	0	0	0	0	0	0	0	0	144
17:00	1	146	25	0	3	0	0	0	1	0	0	0	0	176
18:00	0	122	21	0	3	0	0	0	0	0	0	0	0	146
19:00	1	108	25	0	1	0	0	0	0	0	0	0	0	135
20:00	0	93	17	0	3	0	0	0	0	0	0	0	0	113
21:00	1	76	6	0	0	0	0	0	0	0	0	0	0	83
22:00	0	42	1	0	0	0	0	0	0	0	0	0	0	43
23:00	0	19	3	0	0	0	0	0	0	0	0	0	0	22
Totals	16	2,294	454	4	54	5	1	4	3	0	0	0	0	2,835
% of Totals	1%	81%	16%	0%	2%	0%	0%	0%	0%					100%

FHWA

CLASSIFICATION DEFINITIONS



STATISTICS

EASTBOUND

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 - 12:00	7	573	134	2	15	2	1	1	0	0	0	0	0	735
%	0%	40%	9%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	52%
Peak Hour	5:30	7:30	7:30	7:45	4:00	7:15	9:15	8:45	0:00	0:00	0:00	0:00	0:00	7:30
Peak Volume	4	151	35	1	3	1	1	1	0	0	0	0	0	191
12:00 - 24:00	5	571	91	0	23	0	0	2	0	0	0	0	0	692
%	0%	40%	6%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	48%
Peak Hour	12:00	13:45	12:30	12:00	12:45	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	13:45
Peak Volume	2	109	15	0	6	0	0	1	0	0	0	0	0	127
07:00 - 09:00	1	243	48	1	3	1	0	0	0	0	0	0	0	297
%	0%	17%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	21%
Peak Hour	7:00	7:30	7:30	7:45	7:30	7:15	7:00	7:00	7:00	7:00	7:00	7:00	7:00	7:30
Peak Volume	1	151	35	1	3	1	0	0	0	0	0	0	0	191
16:00 - 18:00	1	114	19	0	2	0	0	0	0	0	0	0	0	136
%	0%	8%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%
Peak Hour	16:30	17:00	16:45	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	17:00
Peak Volume	1	67	10	0	1	0	0	0	0	0	0	0	0	79

WESTBOUND

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 - 12:00	0	430	91	2	5	1	0	0	1	0	0	0	0	530
%	0%	31%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%
Peak Hour	0:00	7:15	9:00	5:45	10:00	9:15	0:00	11:15	8:00	0:00	0:00	0:00	0:00	7:15
Peak Volume	0	94	21	1	2	1	0	1	1	0	0	0	0	114
12:00 - 24:00	4	720	138	0	11	2	0	1	2	0	0	0	0	878
%	0%	51%	10%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	62%
Peak Hour	16:00	13:30	13:30	12:00	14:00	12:45	12:00	12:00	12:00	12:00	12:00	12:00	12:00	13:30
Peak Volume	2	90	28	0	4	1	0	1	1	0	0	0	0	122
07:00 - 09:00	0	151	30	0	0	0	0	0	1	0	0	0	0	182
%	0%	11%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%
Peak Hour	7:00	7:15	7:15	7:00	7:00	7:00	7:00	7:00	8:00	7:00	7:00	7:00	7:00	7:15
Peak Volume	0	94	20	0	0	0	0	0	1	0	0	0	0	114
16:00 - 18:00	2	152	26	0	3	0	0	0	1	0	0	0	0	184
%	0%	11%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%
Peak Hour	16:00	16:45	16:30	16:00	16:15	16:00	16:00	16:00	16:30	16:00	16:00	16:00	16:00	16:45
Peak Volume	2	86	19	0	2	0	0	0	1	0	0	0	0	105

TOTALS

	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 - 12:00	7	1003	225	4	20	3	1	1	1	0	0	0	0	1265
%	0%	35%	8%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	45%
Peak Hour	5:30	7:15	7:30	5:45	10:00	10:00	9:15	8:45	8:00	0:00	0:00	0:00	0:00	7:30
Peak Volume	4	242	53	1	5	2	1	1	1	0	0	0	0	298
12:00 - 24:00	9	1291	229	0	34	2	0	3	2	0	0	0	0	1570
%	0%	46%	8%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	55%
Peak Hour	12:00	13:30	13:30	12:00	13:15	12:45	12:00	12:00	12:00	12:00	12:00	12:00	12:00	13:30
Peak Volume	2	194	38	0	9	1	0	2	1	0	0	0	0	241
07:00 - 09:00	1	394	78	1	3	1	0	0	1	0	0	0	0	479
%	0%	14%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%
Peak Hour	7:00	7:15	7:30	7:45	7:30	7:15	7:00	7:00	8:00	7:00	7:00	7:00	7:00	7:30
Peak Volume	1	242	53	1	3	1	0	0	1	0	0	0	0	298
16:00 - 18:00	3	266	45	0	5	0	0	0	1	0	0	0	0	320
%	0%	9%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%
Peak Hour	16:00	16:45	16:30	16:00	16:15	16:00	16:00	16:00	16:30	16:00	16:00	16:00	16:00	16:45
Peak Volume	2	146	27	0	3	0	0	0	1	0	0	0	0	177

Prepared by National Data & Surveying Services

CLASSIFICATION

Ridgemoor Rd Bet Phoenix Way & Sequoia Springs Dr

Day: Tuesday
Date: 6/4/2024

City: Menifee
Project #: CA24_030019_001

15-MINUTE BREAKDOWN

EASTBOUND

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2
0:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
0:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2
2:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:15	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3:30	0	3	0	0	0	0	0	0	0	0	0	0	0	3
3:45	0	3	0	0	0	0	0	0	0	0	0	0	0	3
4:00	0	4	1	0	1	0	0	0	0	0	0	0	0	6
4:15	0	2	1	0	1	0	0	0	0	0	0	0	0	4
4:30	0	6	3	0	0	0	0	0	0	0	0	0	0	9
4:45	0	1	1	0	1	0	0	0	0	0	0	0	0	3
5:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
5:15	0	6	0	0	1	0	0	0	0	0	0	0	0	7
5:30	0	7	1	0	1	0	0	0	0	0	0	0	0	9
5:45	2	7	3	0	0	0	0	0	0	0	0	0	0	12
6:00	0	12	2	0	1	0	0	0	0	0	0	0	0	15
6:15	2	6	7	0	0	0	0	0	0	0	0	0	0	15
6:30	0	11	4	0	0	0	0	0	0	0	0	0	0	15
6:45	0	12	3	0	2	0	0	0	0	0	0	0	0	17
7:00	0	15	2	0	0	0	0	0	0	0	0	0	0	17
7:15	0	29	3	0	0	0	0	0	0	0	0	0	0	32
7:30	1	57	11	0	0	0	0	0	0	0	0	0	0	69
7:45	0	37	7	0	1	0	0	0	0	0	0	0	0	45
8:00	0	25	9	0	1	1	0	0	0	0	0	0	0	36
8:15	0	32	8	0	1	0	0	0	0	0	0	0	0	41
8:30	0	18	4	1	0	0	0	0	0	0	0	0	0	23
8:45	0	30	4	0	0	0	0	0	0	0	0	0	0	34
9:00	0	13	4	0	0	0	0	0	0	0	0	0	0	17
9:15	1	15	10	0	0	0	0	0	0	0	0	0	0	26
9:30	0	13	4	0	0	0	0	1	0	0	0	0	0	18
9:45	0	27	1	0	0	0	0	0	0	0	0	0	0	28
10:00	0	24	6	0	1	0	1	0	0	0	0	0	0	32
10:15	0	25	9	0	0	0	0	0	0	0	0	0	0	34
10:30	1	32	3	0	1	0	0	0	0	0	0	0	0	37
10:45	0	13	4	0	1	1	0	0	0	0	0	0	0	19
11:00	0	11	2	1	0	0	0	0	0	0	0	0	0	14
11:15	0	21	7	0	0	0	0	0	0	0	0	0	0	28
11:30	0	23	4	0	0	0	0	0	0	0	0	0	0	27
11:45	0	17	5	0	0	0	0	0	0	0	0	0	0	22

WESTBOUND

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
0:15	0	5	0	0	0	0	0	0	0	0	0	0	0	5
0:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
0:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
1:15	0	3	0	0	0	0	0	0	0	0	0	0	0	3
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
2:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
3:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	2	1	0	0	0	0	0	0	0	0	0	0	3
4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
5:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2
5:30	0	4	0	0	0	0	0	0	0	0	0	0	0	4
5:45	0	6	3	0	0	0	0	0	0	0	0	0	0	9
6:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
6:15	0	11	1	0	0	0	0	0	0	0	0	0	0	12
6:30	0	3	1	1	0	0	0	0	0	0	0	0	0	5
6:45	0	5	2	0	0	0	0	0	0	0	0	0	0	7
7:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
7:15	0	18	5	0	0	0	0	0	0	0	0	0	0	23
7:30	0	34	7	0	0	0	0	0	0	0	0	0	0	41
7:45	0	26	5	0	0	0	0	0	0	0	0	0	0	31
8:00	0	16	3	0	0	0	0	0	0	0	0	0	0	19
8:15	0	13	3	0	0	0	0	0	0	0	0	0	0	16
8:30	0	16	3	0	0	0	0	0	0	0	0	0	0	19
8:45	0	16	2	0	0	0	0	0	1	0	0	0	0	19
9:00	0	11	6	0	1	0	0	0	0	0	0	0	0	18
9:15	0	11	5	0	0	0	0	0	0	0	0	0	0	16
9:30	0	19	6	0	0	0	0	0	0	0	0	0	0	25
9:45	0	17	4	0	0	0	0	0	0	0	0	0	0	21
10:00	0	19	4	1	1	1	0	0	0	0	0	0	0	26
10:15	0	26	3	0	0	0	0	0	0	0	0	0	0	29
10:30	0	22	5	0	0	0	0	0	0	0	0	0	0	27
10:45	0	14	3	0	1	0	0	0	0	0	0	0	0	18
11:00	0	14	9	0	0	0	0	0	0	0	0	0	0	23
11:15	0	30	4	0	1	0	0	0	0	0	0	0	0	35
11:30	0	17	2	0	0	0	0	0	0	0	0	0	0	19
11:45	0	14	0	0	0	0	0	0	0	0	0	0	0	14

TOTALS

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
0:15	0	7	0	0	0	0	0	0	0	0	0	0	0	7
0:30	0	2	0	0	0	0	0	0	0	0	0	0	0	2
0:45	0	2	0	0	0	0	0	0	0	0	0	0	0	2
1:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
1:15	0	4	0	0	0	0	0	0	0	0	0	0	0	4
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	0	2	0	0	0	0	0	0	0	0	0	0	0	2
2:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
2:15	0	3	0	0	0	0	0	0	0	0	0	0	0	3
2:30	0	2	0	0	0	0	0	0	0	0	0	0	0	2
2:45	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
3:15	0	1	0	0	1	0	0	0	0	0	0	0	0	2
3:30	0	3	0	0	0	0	0	0	0	0	0	0	0	3
3:45	0	3	1	0	0	0	0	0	0	0	0	0	0	4
4:00	0	7	1	0	1	0	0	0	0	0	0	0	0	9
4:15	0	2	1	0	1	0	0	0	0	0	0	0	0	4
4:30	0	8	4	0	0	0	0	0	0	0	0	0	0	12
4:45	0	1	1	0	1	0	0	0	0	0	0	0	0	3
5:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
5:15	0	8	0	0	1	0	0	0	0	0	0	0	0	9
5:30	0	11	1	0	1	0	0	0	0	0	0	0	0	13
5:45	2	13	6	0	0	0	0	0	0	0	0	0	0	21
6:00	0	16	2	0	2	0	0	0	0	0	0	0	0	20
6:15	2	17	8	0	0	0	0	0	0	0	0	0	0	27
6:30	0	14	5	1	0	0	0	0	0	0	0	0	0	20
6:45	0	17	5	0	2	0	0	0	0	0	0	0	0	24
7:00	0	27	4	0	0	0	0	0	0	0	0	0	0	31
7:15	0	47	8	0	0	0	0	0	0	0	0	0	0	55
7:30	1	91	18	0	0	0	0	0	0	0	0	0	0	110
7:45	0	63	12	0	1	0	0	0	0	0	0	0	0	76
8:00	0	41	12	0	1	1	0	0	0	0	0	0	0	55
8:15	0	45	11	0	1	0	0	0	0	0	0	0	0	57
8:30	0	34	7	1	0	0	0	0	0	0	0	0	0	42
8:45	0	46	6	0	0	0	0	0	1	0	0	0	0	53
9:00	0	24	10	0	1	0	0	0	0	0	0	0	0	35
9:15	1	26	15	0	0	0	0	0	0	0	0	0	0	42
9:30	0	32	10	0	0	0	0	1	0	0	0	0	0	43
9:45	0	44	5	0	0	0	0	0	0	0	0	0	0	49
10:00	0	43	10	1	2	1	1	0	0	0	0	0	0	58
10:15	0	51	12	0	0	0	0	0	0	0	0	0	0	63
10:30	1	54	8	0	1	0	0	0	0	0	0	0	0	64
10:45	0	27	7	0	2	1	0	0	0	0	0	0	0	37
11:00	0	25	11	1	0	0	0	0	0	0	0	0	0	37
11:15	0	51	11	0	1	0	0	0	0	0	0	0	0	63
11:30	0	40	6	0	0	0	0	0	0	0	0	0	0	46
11:45	0	31	5	0	0	0	0	0	0	0	0	0	0	36

Prepared by National Data & Surveying Services

CLASSIFICATION

Ridgemoor Rd Bet Phoenix Way & Sequoia Springs Dr

Day: Tuesday
Date: 6/4/2024

City: Menifee
Project #: CA24_030019_001

15-MINUTE BREAKDOWN

EASTBOUND

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
12:00	2	11	4	0	1	0	0	0	0	0	0	0	0	18
12:15	0	10	3	0	0	0	0	0	0	0	0	0	0	13
12:30	0	23	3	0	0	0	0	0	0	0	0	0	0	26
12:45	0	14	2	0	1	0	0	1	0	0	0	0	0	18
13:00	0	23	6	0	1	0	0	0	0	0	0	0	0	30
13:15	0	14	4	0	2	0	0	0	0	0	0	0	0	20
13:30	0	17	2	0	2	0	0	0	0	0	0	0	0	21
13:45	0	21	3	0	1	0	0	0	0	0	0	0	0	25
14:00	0	20	1	0	1	0	0	0	0	0	0	0	0	22
14:15	1	46	4	0	0	0	0	0	0	0	0	0	0	51
14:30	0	22	6	0	1	0	0	0	0	0	0	0	0	29
14:45	0	16	2	0	1	0	0	0	0	0	0	0	0	19
15:00	0	10	3	0	0	0	0	1	0	0	0	0	0	14
15:15	0	12	4	0	0	0	0	0	0	0	0	0	0	16
15:30	0	10	2	0	4	0	0	0	0	0	0	0	0	16
15:45	0	13	0	0	1	0	0	0	0	0	0	0	0	14
16:00	0	10	4	0	1	0	0	0	0	0	0	0	0	15
16:15	0	14	2	0	0	0	0	0	0	0	0	0	0	16
16:30	0	13	1	0	0	0	0	0	0	0	0	0	0	14
16:45	0	10	2	0	0	0	0	0	0	0	0	0	0	12
17:00	0	17	3	0	1	0	0	0	0	0	0	0	0	21
17:15	1	18	2	0	0	0	0	0	0	0	0	0	0	21
17:30	0	15	3	0	0	0	0	0	0	0	0	0	0	18
17:45	0	17	2	0	0	0	0	0	0	0	0	0	0	19
18:00	0	14	1	0	0	0	0	0	0	0	0	0	0	15
18:15	0	14	2	0	0	0	0	0	0	0	0	0	0	16
18:30	0	9	3	0	2	0	0	0	0	0	0	0	0	14
18:45	0	14	2	0	0	0	0	0	0	0	0	0	0	16
19:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
19:15	0	9	3	0	0	0	0	0	0	0	0	0	0	12
19:30	0	10	3	0	1	0	0	0	0	0	0	0	0	14
19:45	1	9	1	0	0	0	0	0	0	0	0	0	0	11
20:00	0	8	0	0	2	0	0	0	0	0	0	0	0	10
20:15	0	13	0	0	0	0	0	0	0	0	0	0	0	13
20:30	0	9	4	0	0	0	0	0	0	0	0	0	0	13
20:45	0	9	1	0	0	0	0	0	0	0	0	0	0	10
21:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
21:15	0	9	0	0	0	0	0	0	0	0	0	0	0	9
21:30	0	6	1	0	0	0	0	0	0	0	0	0	0	7
21:45	0	5	0	0	0	0	0	0	0	0	0	0	0	5
22:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
22:15	0	4	0	0	0	0	0	0	0	0	0	0	0	4
22:30	0	3	0	0	0	0	0	0	0	0	0	0	0	3
22:45	0	2	0	0	0	0	0	0	0	0	0	0	0	2
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
23:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23:30	0	1	0	0	0	0	0	0	0	0	0	0	0	1
23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	12	1,144	225	2	38	2	1	3	0	0	0	0	0	1,427
% of Totals	1%	80%	16%	0%	3%	0%	0%	0%						100%

WESTBOUND

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
12:00	0	15	1	0	0	0	0	1	0	0	0	0	0	17
12:15	0	13	8	0	0	0	0	0	0	0	0	0	0	21
12:30	0	12	4	0	0	0	0	0	1	0	0	0	0	17
12:45	0	12	1	0	0	0	0	0	0	0	0	0	0	13
13:00	0	20	5	0	0	0	0	0	0	0	0	0	0	25
13:15	0	12	3	0	1	0	0	0	0	0	0	0	0	16
13:30	0	26	7	0	0	1	0	0	0	0	0	0	0	34
13:45	0	15	3	0	1	0	0	0	0	0	0	0	0	19
14:00	0	21	9	0	1	0	0	0	0	0	0	0	0	31
14:15	1	28	9	0	0	0	0	0	0	0	0	0	0	38
14:30	0	21	0	0	0	1	0	0	0	0	0	0	0	22
14:45	0	15	1	0	3	0	0	0	0	0	0	0	0	19
15:00	0	15	2	0	0	0	0	0	0	0	0	0	0	17
15:15	0	21	2	0	0	0	0	0	0	0	0	0	0	23
15:30	0	21	3	0	0	0	0	0	0	0	0	0	0	24
15:45	0	16	4	0	0	0	0	0	0	0	0	0	0	20
16:00	0	20	2	0	0	0	0	0	0	0	0	0	0	22
16:15	1	16	1	0	1	0	0	0	0	0	0	0	0	19
16:30	0	15	4	0	0	0	0	0	0	0	0	0	0	19
16:45	1	22	4	0	0	0	0	0	0	0	0	0	0	27
17:00	0	18	6	0	1	0	0	0	0	0	0	0	0	25
17:15	0	26	5	0	0	0	0	0	1	0	0	0	0	32
17:30	0	20	1	0	0	0	0	0	0	0	0	0	0	21
17:45	0	15	3	0	1	0	0	0	0	0	0	0	0	19
18:00	0	19	3	0	0	0	0	0	0	0	0	0	0	22
18:15	0	19	3	0	0	0	0	0	0	0	0	0	0	22
18:30	0	16	5	0	0	0	0	0	0	0	0	0	0	21
18:45	0	17	2	0	1	0	0	0	0	0	0	0	0	20
19:00	0	16	7	0	0	0	0	0	0	0	0	0	0	23
19:15	0	19	5	0	0	0	0	0	0	0	0	0	0	24
19:30	0	18	0	0	0	0	0	0	0	0	0	0	0	18
19:45	0	15	4	0	0	0	0	0	0	0	0	0	0	19
20:00	0	15	1	0	1	0	0	0	0	0	0	0	0	17
20:15	0	13	4	0	0	0	0	0	0	0	0	0	0	17
20:30	0	13	3	0	0	0	0	0	0	0	0	0	0	16
20:45	0	13	4	0	0	0	0	0	0	0	0	0	0	17
21:00	1	15	0	0	0	0	0	0	0	0	0	0	0	16
21:15	0	9	2	0	0	0	0	0	0	0	0	0	0	11
21:30	0	16	2	0	0	0	0	0	0	0	0	0	0	18
21:45	0	9	1	0	0	0	0	0	0	0	0	0	0	10
22:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
22:15	0	12	0	0	0	0	0	0	0	0	0	0	0	12
22:30	0	5	0	0	0	0	0	0	0	0	0	0	0	5
22:45	0	4	1	0	0	0	0	0	0	0	0	0	0	5
23:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
23:15	0	3	1	0	0	0	0	0	0	0	0	0	0	4
23:30	0	2	0	0	0	0	0	0	0	0	0	0	0	2
23:45	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Totals	4	1,150	229	2	16	3	0	1	3	0	0	0	0	1,408
% of Totals	0%	82%	16%	0%	1%	0%		0%	0%					100%

TOTALS

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
12:00	2	26	5	0	1	0	0	1	0	0	0	0	0	35
12:15	0	23	11	0	0	0	0	0	0	0	0	0	0	34
12:30	0	35	7	0	0	0	0	0	1	0	0	0	0	43
12:45	0	26	3	0	1	0	0	1	0	0	0	0	0	31
13:00	0	43	11	0	1	0	0	0	0	0	0	0	0	55
13:15	0	26	7	0	3	0	0	0	0	0	0	0	0	36
13:30	0	43	9	0	2	1	0	0	0	0	0	0	0	55
13:45	0	36	6	0	2	0	0	0	0	0	0	0	0	44
14:00	0	41	10	0	2	0	0	0	0	0	0	0	0	53
14:15	2	74	13	0	0	0	0	0	0	0	0	0	0	89
14:30	0	43	6	0	1	1	0	0	0	0	0	0	0	51
14:45	0	31	3	0	4	0	0	0	0	0	0	0	0	38
15:00	0	25	5	0	0	0	0	1	0	0	0	0	0	31
15:15	0	33	6	0	0	0	0	0	0	0	0	0	0	39
15:30	0	31	5	0	4	0	0	0	0	0	0	0	0	40
15:45	0	29	4	0	1	0	0	0	0	0	0	0	0	34
16:00	0	30	6	0	1	0	0	0	0	0	0	0	0	37
16:15	1	30	3	0	1	0	0	0	0	0	0	0	0	35
16:30	0	28	5	0	0	0	0	0	0	0	0	0	0	33
16:45	1	32	6	0	0	0	0	0	0	0	0	0	0	39
17:00	0	35	9	0	2	0	0	0	0	0	0	0	0	46
17:15	1	44	7	0	0	0	0	0	1	0	0	0	0	53
17:30	0	35	4	0	0	0	0	0	0	0	0	0	0	39
17:45	0	32	5	0	1	0	0	0	0	0	0	0	0	38
18:00	0	33	4	0	0	0	0	0	0	0	0	0	0	37
18:15	0	33	5	0	0	0	0	0	0	0	0	0	0	38
18:30	0	25	8	0	2	0	0	0	0	0	0	0	0	35
18:45	0	31	4	0	1	0	0	0	0	0	0	0	0	36
19:00	0	28	9	0	0	0	0	0	0	0	0	0	0	37
19:15	0	28	8	0	0	0	0	0	0	0	0	0	0	36
19:30	0	28	3	0	1	0	0	0	0	0	0	0	0	32
19:45	1	24	5	0	0	0	0	0	0	0	0	0	0	30
20:00	0	23	1	0	3	0	0	0	0	0	0	0	0	27
20:15	0	26	4	0	0	0	0	0	0	0	0	0	0	30
20:30	0	22	7	0	0	0	0	0	0	0	0	0	0	29
20:45	0	22	5	0	0	0	0	0	0	0	0	0	0	27
21:00	1	22	0	0	0	0	0	0	0	0	0	0	0	23
21:15	0	18	2	0	0	0	0	0	0	0	0	0	0	20
21:30	0	22	3	0	0	0	0	0	0	0	0	0	0	25
21:45	0	14	1	0	0	0	0	0	0	0	0	0	0	15
22:00	0	12	0	0	0	0	0	0	0	0	0	0	0	12
22:15	0	16	0	0	0	0	0	0	0	0	0	0	0	16
22:30	0	8	0	0	0	0	0	0	0	0	0	0	0	8
22:45	0	6	1	0	0	0	0	0	0	0	0	0	0	7
23:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
23:15	0	4	1	0	0	0	0	0	0	0	0	0	0	5
23:30	0	3	0	0	0	0	0	0	0	0	0	0	0	3
23:45	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Totals	16	2,294	454	4	54	5	1	4	3	0	0	0	0	2,835
% of Totals	1%	81%	16%	0%	2%	0%	0%	0%	0%					100%

Prepared by National Data & Surveying Services

VOLUME

Ridgemoor Rd Bet Phoenix Way & Sequoia Springs Dr

Day: Tuesday
Date: 6/4/2024

City: Menifee
Project #: CA24_030019_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	1,427	1,408	2,835

15-Minutes Interval

TIME	NB	SB	EB	WB	TOTAL	TIME	NB	SB	EB	WB	TOTAL
0:00			0	1	1	12:00			18	17	35
0:15			2	5	7	12:15			13	21	34
0:30			1	1	2	12:30			26	17	43
0:45			1	1	2	12:45			18	13	31
1:00			1	3	4	13:00			30	25	55
1:15			1	3	4	13:15			20	16	36
1:30			0	0	0	13:30			21	34	55
1:45			1	1	2	13:45			25	19	44
2:00			1	3	4	14:00			22	31	53
2:15			2	1	3	14:15			51	38	89
2:30			1	1	2	14:30			29	22	51
2:45			0	1	1	14:45			19	19	38
3:00			1	2	3	15:00			14	17	31
3:15			1	1	2	15:15			16	23	39
3:30			3	0	3	15:30			16	24	40
3:45			3	1	4	15:45			14	20	34
4:00			6	3	9	16:00			15	22	37
4:15			4	0	4	16:15			16	19	35
4:30			9	3	12	16:30			14	19	33
4:45			3	0	3	16:45			12	27	39
5:00			5	2	7	17:00			21	25	46
5:15			7	2	9	17:15			21	32	53
5:30			9	4	13	17:30			18	21	39
5:45			12	9	21	17:45			19	19	38
6:00			15	5	20	18:00			15	22	37
6:15			15	12	27	18:15			16	22	38
6:30			15	5	20	18:30			14	21	35
6:45			17	7	24	18:45			16	20	36
7:00			17	14	31	19:00			14	23	37
7:15			32	23	55	19:15			12	24	36
7:30			69	41	110	19:30			14	18	32
7:45			45	31	76	19:45			11	19	30
8:00			36	19	55	20:00			10	17	27
8:15			41	16	57	20:15			13	17	30
8:30			23	19	42	20:30			13	16	29
8:45			34	19	53	20:45			10	17	27
9:00			17	18	35	21:00			7	16	23
9:15			26	16	42	21:15			9	11	20
9:30			18	25	43	21:30			7	18	25
9:45			28	21	49	21:45			5	10	15
10:00			32	26	58	22:00			4	8	12
10:15			34	29	63	22:15			4	12	16
10:30			37	27	64	22:30			3	5	8
10:45			19	18	37	22:45			2	5	7
11:00			14	23	37	23:00			3	9	12
11:15			28	35	63	23:15			1	4	5
11:30			27	19	46	23:30			1	2	3
11:45			22	14	36	23:45			0	2	2
TOTALS	0	0	735	530	1265	TOTALS	0	0	692	878	1570
SPLIT %	0%	0%	58%	42%	45%	SPLIT %	0%	0%	44%	56%	55%

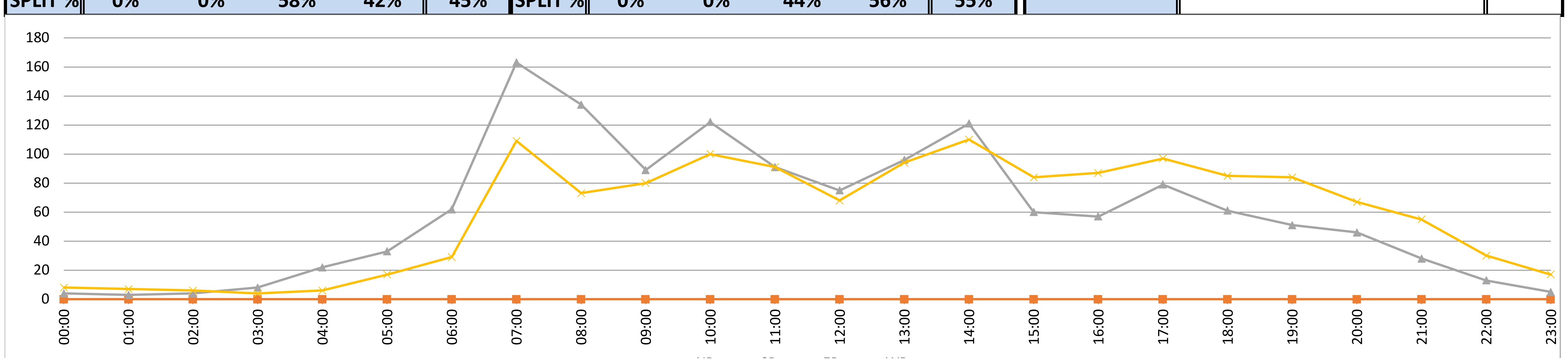
DAILY TOTALS

Hourly Intervals

TIME		NB	SB	EB	WB	TOTAL
00:00	01:00			4	8	12
01:00	02:00			3	7	10
02:00	03:00			4	6	10
03:00	04:00			8	4	12
04:00	05:00			22	6	28
05:00	06:00			33	17	50
06:00	07:00			62	29	91
07:00	08:00			163	109	272
08:00	09:00			134	73	207
09:00	10:00			89	80	169
10:00	11:00			122	100	222
11:00	12:00			91	91	182
12:00	13:00			75	68	143
13:00	14:00			96	94	190
14:00	15:00			121	110	231
15:00	16:00			60	84	144
16:00	17:00			57	87	144
17:00	18:00			79	97	176
18:00	19:00			61	85	146
19:00	20:00			51	84	135
20:00	21:00			46	67	113
21:00	22:00			28	55	83
22:00	23:00			13	30	43
23:00	00:00			5	17	22

STATISTICS

	NB	SB	EB	WB	TOTAL
Peak Period	00:00	to	12:00		
Volume			735	530	1265
Peak Hour			7:30	7:15	7:30
Peak Volume			191	114	298
Peak Hour Factor			0.692	0.695	0.677
Peak Period	12:00	to	00:00		
Volume			692	878	1570
Peak Hour			13:45	13:30	13:30
Peak Volume			127	122	241
Peak Hour Factor			0.623	0.803	0.677
Peak Period	07:00	to	09:00		
Volume			297	182	479
Peak Hour			7:30	7:15	7:30
Peak Volume			191	114	298
Peak Hour Factor			0.692	0.695	0.677
Peak Period	16:00	to	18:00		
Volume			136	184	320
Peak Hour			17:00	16:45	16:45
Peak Volume			79	105	177
Peak Hour Factor			0.940	0.820	0.835



APPENDIX E

FHWA Model Offsite Traffic Noise Calculation Printouts

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Oak Hills West TTM No. 38652
Site Conditions: Soft

	Vehicle Mix 1 (No Haul Trucks)				Vehicle Mix 2 (Bouldercrest W Trucks)				Vehicle Mix 3 (Ridgemoor W Trucks)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evenin	Night	Daily
Automobiles	76.55%	11.38%	9.56%	97.50%	66.40%	4.05%	3.31%	73.65%	75.19%	10.98%	9.32%	96.78%
Medium Trucks	1.74%	0.26%	0.22%	2.22%	0.87%	0.06%	0.05%	1.10%	1.57%	0.23%	0.20%	0.72%
Heavy Trucks	0.22%	0.03%	0.03%	0.28%	25.22%	0.02%	0.01%	25.25%	2.45%	0.03%	0.03%	2.51%

Road Name: **Boulder Crest Way (Calibration)** **Segment:** **North of Ridgemoor Road**

Average Daily Traffic: 110 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 25 FEET FROM CENTERLINE (Equiv. Lane Dist: 24 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-18.98	4.68	-1.20	43.94	41.98	39.73	34.20	42.77	43.32	70 dBA:	**0**	**0**
Medium Trucks	71.09	-35.40	4.68	-1.20	39.16	20.79	18.53	13.00	21.58	22.12	65 dBA:	**1**	**1**
Heavy Trucks	78.74	-44.37	4.68	-1.20	37.85	10.52	8.26	2.73	11.30	11.85	60 dBA:	**2**	**2**
				Total:	**45.92**	**42.02**	**39.76**	**34.24**	**42.81**	**43.35**	55 dBA:	**4**	**4**

Road Name: **Ganymede Way (Calibration)** **Segment:** **At Polaris Drive**

Average Daily Traffic: 820 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 150 FEET FROM CENTERLINE (Equiv. Lane Dist: 149.84 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-10.26	-7.25	-1.20	40.73	38.78	36.52	30.99	39.57	40.11	70 dBA:	**1**	**2**
Medium Trucks	71.09	-26.68	-7.25	-1.20	35.96	17.58	15.32	9.80	18.37	18.92	65 dBA:	**3**	**3**
Heavy Trucks	78.74	-35.64	-7.25	-1.20	34.65	7.31	5.05	-0.48	8.10	8.64	60 dBA:	**7**	**7**
				Total:	**42.72**	**38.81**	**36.56**	**31.03**	**39.60**	**40.15**	55 dBA:	**14**	**15**

Road Name: **Boulder Crest Way** **Segment:** **North of Ridgemoor Road**

Average Daily Traffic: 110 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-18.98	0.66	-1.20	39.92	37.97	35.71	30.18	38.76	39.30	70 dBA:	**0**	**0**
Medium Trucks	71.09	-35.40	0.66	-1.20	35.15	16.77	14.52	8.99	17.56	18.11	65 dBA:	**1**	**1**
Heavy Trucks	78.74	-44.37	0.66	-1.20	33.84	6.50	4.24	-1.28	7.29	7.83	60 dBA:	**2**	**2**
				Total:	**41.91**	**38.01**	**35.75**	**30.22**	**38.79**	**39.34**	55 dBA:	**4**	**4**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS — **Project: Oak Hills West TTM No. 38652**
Site Conditions: Soft

Road Name: Ganymede Way — **Segment: At Polaris Drive**
Average Daily Traffic: 820 Vehicles — Vehicle Speed: 25 MPH — Vehicle Mix: 1 — Roadway Classification: Local

NOISE PARAMETERS AT 50 FEET FROM CENTERLINE (Equiv. Lane Dist: 49.51 ft)

	Noise Adjustments				Unmitigated Noise Levels						Centerline Distance to Noise Contour (in feet)		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-10.26	-0.04	-1.20	47.94	45.99	43.74	38.21	46.78	47.33	70 dBA:	**1**	**2**
Medium Trucks	71.09	-26.68	-0.04	-1.20	43.17	24.80	22.54	17.01	25.58	26.13	65 dBA:	**3**	**3**
Heavy Trucks	78.74	-35.64	-0.04	-1.20	41.86	14.52	12.27	6.74	15.31	15.86	60 dBA:	**7**	**7**
				Total:	**49.93**	**46.03**	**43.77**	**38.24**	**46.82**	**47.36**	55 dBA:	**14**	**15**

Road Name: Ridgemoor Road — **Segment: East of Phoenix Way**
Average Daily Traffic: 2835 Vehicles — Vehicle Speed: 25 MPH — Vehicle Mix: 1 — Roadway Classification: Local

NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)

	Noise Adjustments				Unmitigated Noise Levels						Centerline Distance to Noise Contour (in feet)		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.87	0.66	-1.20	54.03	52.08	49.82	44.30	52.87	53.42	70 dBA:	**3**	**4**
Medium Trucks	71.09	-21.29	0.66	-1.20	49.26	30.88	28.63	23.10	31.67	32.22	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-30.25	0.66	-1.20	47.95	20.61	18.36	12.83	21.40	21.95	60 dBA:	**15**	**16**
				Total:	**56.02**	**52.12**	**49.86**	**44.33**	**52.90**	**53.45**	55 dBA:	**33**	**35**

Road Name: Boulder Crest Way (Haul Trucks) — **Segment: North of Ridgemoor Road**
Average Daily Traffic: 1 Vehicles — Vehicle Speed: 25 MPH — Vehicle Mix: 2 — Roadway Classification: Local

NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)

	Noise Adjustments				Unmitigated Noise Levels						Centerline Distance to Noise Contour (in feet)		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-40.61	0.66	-1.20	18.29	15.72	9.59	3.95	14.64	14.99	70 dBA:	**0**	**0**
Medium Trucks	71.09	-58.87	0.66	-1.20	11.68	-9.71	-15.27	-20.92	-10.58	-10.20	65 dBA:	**0**	**0**
Heavy Trucks	78.74	-45.26	0.66	-1.20	32.94	26.17	0.34	-5.19	23.18	23.19	60 dBA:	**0**	**0**
				Total:	**33.12**	**26.54**	**10.09**	**4.46**	**23.75**	**23.80**	55 dBA:	**0**	**0**

Road Name: Ganymede Way (Haul Trucks) — **Segment: At Polaris Drive**
Average Daily Traffic: 1 Vehicles — Vehicle Speed: 25 MPH — Vehicle Mix: 2 — Roadway Classification: Local

NOISE PARAMETERS AT 50 FEET FROM CENTERLINE (Equiv. Lane Dist: 49.51 ft)

	Noise Adjustments				Unmitigated Noise Levels						Centerline Distance to Noise Contour (in feet)		
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-40.61	-0.04	-1.20	17.59	15.02	8.89	3.25	13.94	14.29	70 dBA:	**0**	**0**
Medium Trucks	71.09	-58.87	-0.04	-1.20	10.98	-10.41	-15.98	-21.62	-11.28	-10.90	65 dBA:	**0**	**0**
Heavy Trucks	78.74	-45.26	-0.04	-1.20	32.24	25.47	-0.36	-5.89	22.48	22.49	60 dBA:	**0**	**0**
				Total:	**32.42**	**25.84**	**9.39**	**3.76**	**23.05**	**23.10**	55 dBA:	**0**	**0**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING CONDITIONS

Project: Oak Hills West TTM No. 38652
Site Conditions: Soft

Road Name: **Ridgemoor Road (Haul Trucks)** **Segment:** **East of Phoenix Way**

Average Daily Traffic: 1 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 3 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE							(Equiv. Lane Dist: 44.45 ft)			**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-39.43	0.66	-1.20	19.48	17.45	15.11	9.63	18.21	18.75	70 dBA:	**0**	**0**
Medium Trucks	71.09	-60.74	0.66	-1.20	9.81	-9.01	-11.35	-16.83	-8.25	-7.71	65 dBA:	**0**	**0**
Heavy Trucks	78.74	-55.29	0.66	-1.20	22.91	6.01	-6.90	-12.43	3.49	3.60	60 dBA:	**0**	**0**
				Total:	**24.68**	**17.76**	**15.15**	**9.66**	**18.36**	**18.89**	55 dBA:	**0**	**0**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH PROJECT CONSTRUCTION CONDITIONS

Project: Oak Hills West TTM No. 38652
Site Conditions: Soft

	Vehicle Mix 1 (No Haul Trucks)				Vehicle Mix 2 (Bouldercrest W Trucks)				Vehicle Mix 3 (Ridgemoor W Trucks)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	76.55%	11.38%	9.56%	97.50%	66.40%	4.05%	3.31%	73.65%	75.19%	10.98%	9.32%	96.78%
Medium Trucks	1.74%	0.26%	0.22%	2.22%	0.87%	0.06%	0.05%	1.10%	1.57%	0.23%	0.20%	0.72%
Heavy Trucks	0.22%	0.03%	0.03%	0.28%	25.22%	0.02%	0.01%	25.25%	2.45%	0.03%	0.03%	2.51%

Road Name: **Boulder Crest Way (Haul Trucks)** **Segment:** **North of Ridgemoor Road**
Average Daily Traffic: 153 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 2 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-18.78	0.66	-1.20	40.12	37.55	31.43	25.78	36.47	36.83	70 dBA:	**1**	**1**
Medium Trucks	71.09	-37.04	0.66	-1.20	33.51	12.13	6.56	0.92	11.26	11.64	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-23.43	0.66	-1.20	54.77	48.00	22.17	16.64	45.02	45.02	60 dBA:	**5**	**5**
				Total:	**54.95**	**48.38**	**31.93**	**26.30**	**45.59**	**45.64**	55 dBA:	**11**	**11**

Road Name: **Ganymede Way (Haul Trucks)** **Segment:** **At Polaris Drive**
Average Daily Traffic: 863 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 2 Roadway Classification: Local

	NOISE PARAMETERS AT 50 FEET FROM CENTERLINE (Equiv. Lane Dist: 49.51 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-11.26	-0.04	-1.20	46.95	44.38	38.25	32.61	43.30	43.65	70 dBA:	**3**	**3**
Medium Trucks	71.09	-29.51	-0.04	-1.20	40.34	18.95	13.38	7.74	18.08	18.46	65 dBA:	**7**	**7**
Heavy Trucks	78.74	-15.90	-0.04	-1.20	61.60	54.82	28.99	23.46	51.84	51.85	60 dBA:	**16**	**16**
				Total:	**61.77**	**55.20**	**38.75**	**33.12**	**52.41**	**52.46**	55 dBA:	**34**	**34**

Road Name: **Ridgemoor Road (Haul Trucks)** **Segment:** **East of Phoenix Way**
Average Daily Traffic: 2920 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 3 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.77	0.66	-1.20	54.13	52.10	49.77	44.28	52.86	53.40	70 dBA:	**3**	**4**
Medium Trucks	71.09	-26.09	0.66	-1.20	44.46	25.64	23.31	17.82	26.41	26.95	65 dBA:	**7**	**8**
Heavy Trucks	78.74	-20.64	0.66	-1.20	57.56	40.66	27.75	22.22	38.15	38.25	60 dBA:	**15**	**17**
				Total:	**59.33**	**52.41**	**49.80**	**44.32**	**53.02**	**53.54**	55 dBA:	**33**	**36**

FHWA-RD-77-108 HIGHWAY TRAFFIC NOISE PREDICTION MODEL

Scenario: EXISTING WITH OPERATIONAL PROJECT CONDITIONS

Project: Oak Hills West TTM No. 38652
Site Conditions: Soft

	Vehicle Mix 1 (No Haul Trucks)				Vehicle Mix 2 (Bouldercrest W Trucks)				Vehicle Mix 3 (Ridgemoor W Trucks)			
Vehicle Type	Day	Evening	Night	Daily	Day	Evening	Night	Daily	Day	Evening	Night	Daily
Automobiles	76.55%	11.38%	9.56%	97.50%	66.40%	4.05%	3.31%	73.65%	75.19%	10.98%	9.32%	96.78%
Medium Trucks	1.74%	0.26%	0.22%	2.22%	0.87%	0.06%	0.05%	1.10%	1.57%	0.23%	0.20%	0.72%
Heavy Trucks	0.22%	0.03%	0.03%	0.28%	25.22%	0.02%	0.01%	25.25%	2.45%	0.03%	0.03%	2.51%

Road Name: Boulder Crest Way **Segment: North of Ridgemoor Road**
Average Daily Traffic: 411 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-13.26	0.66	-1.20	45.65	43.69	41.44	35.91	44.48	45.03	70 dBA:	**1**	**1**
Medium Trucks	71.09	-29.68	0.66	-1.20	40.87	22.50	20.24	14.71	23.28	23.83	65 dBA:	**2**	**2**
Heavy Trucks	78.74	-38.64	0.66	-1.20	39.56	12.23	9.97	4.44	13.01	13.56	60 dBA:	**4**	**5**
				Total:	**47.63**	**43.73**	**41.47**	**35.94**	**44.52**	**45.06**	55 dBA:	**9**	**10**

Road Name: Ganymede Way **Segment: At Polaris Drive**
Average Daily Traffic: 1121 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 50 FEET FROM CENTERLINE (Equiv. Lane Dist: 49.51 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-8.90	-0.04	-1.20	49.30	47.35	45.09	39.56	48.14	48.68	70 dBA:	**2**	**2**
Medium Trucks	71.09	-25.32	-0.04	-1.20	44.53	26.15	23.90	18.37	26.94	27.49	65 dBA:	**4**	**4**
Heavy Trucks	78.74	-34.28	-0.04	-1.20	43.22	15.88	13.63	8.10	16.67	17.22	60 dBA:	**8**	**9**
				Total:	**51.29**	**47.39**	**45.13**	**39.60**	**48.17**	**48.72**	55 dBA:	**18**	**19**

Road Name: Ridgemoor Road **Segment: East of Phoenix Way**
Average Daily Traffic: 3437 Vehicles Vehicle Speed: 25 MPH Vehicle Mix: 1 Roadway Classification: Local

	NOISE PARAMETERS AT 45 FEET FROM CENTERLINE (Equiv. Lane Dist: 44.45 ft)										**Centerline Distance to Noise Contour (in feet)**		
	Noise Adjustments				**Unmitigated Noise Levels**								
Vehicle Type	REMEL	Traffic Adj.	Dist Adj.	Finite Adj	Leq Peak	Leq Day	Leq Eve.	Leq Night	Ldn	CNEL		Ldn	CNEL
Automobiles	59.44	-4.03	0.66	-1.20	54.87	52.92	50.66	45.13	53.70	54.25	70 dBA:	**4**	**4**
Medium Trucks	71.09	-20.46	0.66	-1.20	50.09	31.72	29.46	23.94	32.51	33.05	65 dBA:	**8**	**9**
Heavy Trucks	78.74	-29.42	0.66	-1.20	48.79	21.45	19.19	13.66	22.24	22.78	60 dBA:	**17**	**19**
				Total:	**56.85**	**52.95**	**50.70**	**45.17**	**53.74**	**54.29**	55 dBA:	**37**	**40**

Level of Service Traffic Study

OAK HILLS WEST PROJECT

BOULDER CREST WAY

MENIFEE, CA

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July 2024

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Table of Contents

List of Exhibits

1. Executive Summary

The Oak Hills West Project proposes a residential development located west of the endpoint of Polaris Drive and north of the cul-de-sac end of Boulder Crest Way. The project site is currently vacant; the General Plan and Zoning Designation for the site is 2.1-5 R and LDR-1. This Level of Service (LOS) Traffic Study evaluates the impact of the additional traffic generated by the proposed development and identifies mitigation measures that can alleviate the impact of traffic.

The traffic volume forecasts in this LOS Traffic Study are based on existing traffic volume data collected in June 2024; analysis using Synchro software; and projected traffic volumes obtained from the Southern California Council of Governments (SCAG) Regional Transportation Demand Model.

Existing traffic volumes were counted at the following intersections:

1. TMC1: Ganymede Way at Polaris Drive
2. TMC2: Ridgemoor Road at Boulder Crest Way

The following analysis scenarios are examined in this Traffic Impact Study:

a) Existing Conditions (2024)
b) Existing Conditions (2024) With Project Conditions
c) Opening Year Cumulative (2026) Without Project Conditions
d) Opening Year Cumulative (2026) With Project Conditions

No intersections were found to have a failing Level of Service (LOS) and no other intersection deficiencies were identified.

Due to the study intersections operating at LOS A during all scenarios, no mitigations are required to improve LOS.

2. Introduction

a. Purpose of the TIS and study objective

The purpose of a LOS Traffic Study is to assess the impact of the additional traffic generated by a new development on the surrounding road network; and to identify mitigation measures that can alleviate the impact of traffic.

The objective of this LOS Traffic Study is to assess the impact of the proposed Oak Hills West Project on the surrounding road network in the City of Menifee.

b. Project location

Oak Hills West is proposed to be constructed on a vacant 78-acre parcel on the western side of the City of Menifee. The proposed location is west of the endpoint of Polaris Drive and north of the cul-de-sac end of Boulder Crest Way. The project location is shown in Exhibit 1. An aerial view of the existing site is shown in Exhibit 2. A drawing of the site plan is shown in Exhibit 3.

Exhibit 1. Project location within the City of Menifee

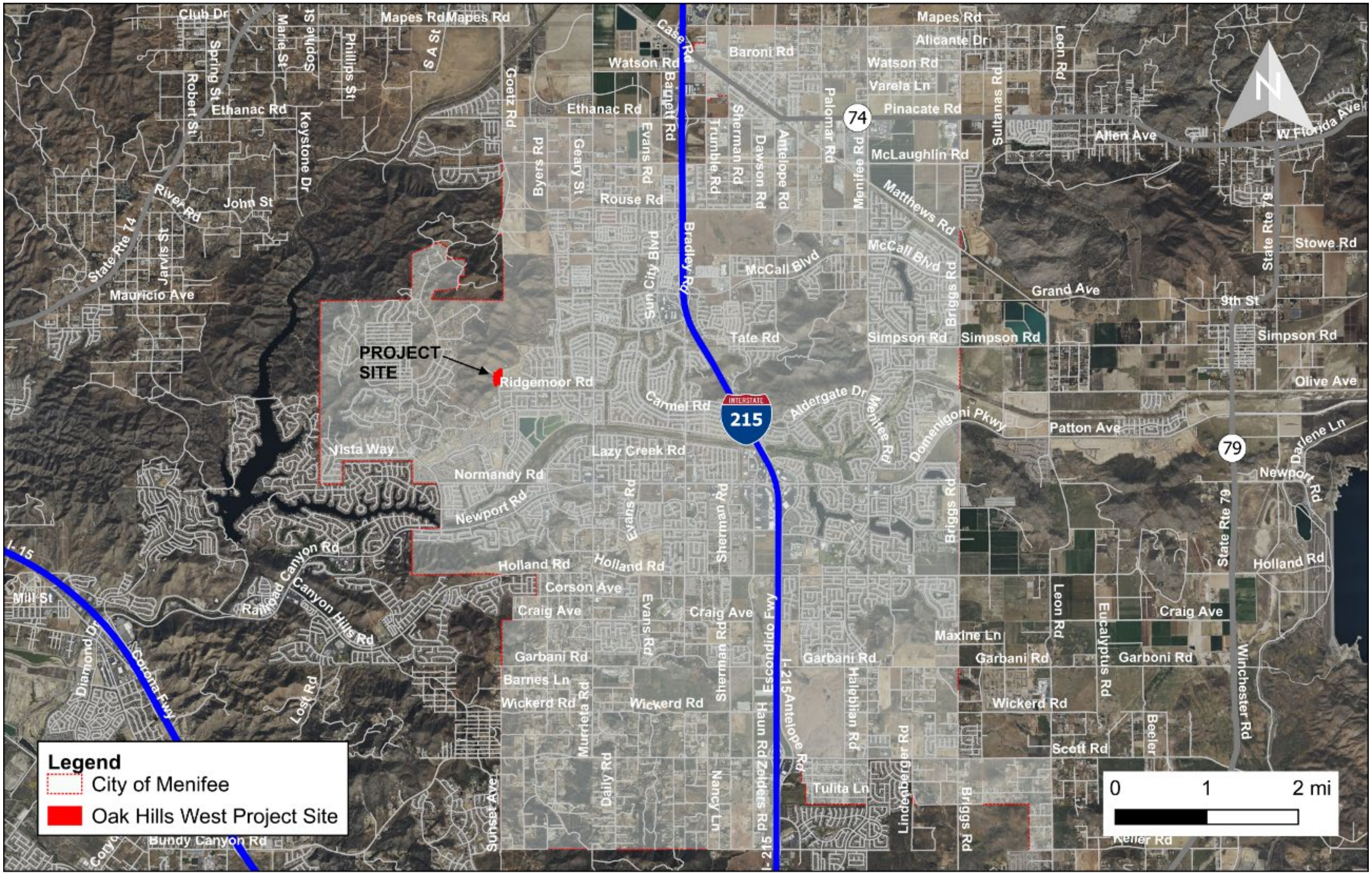
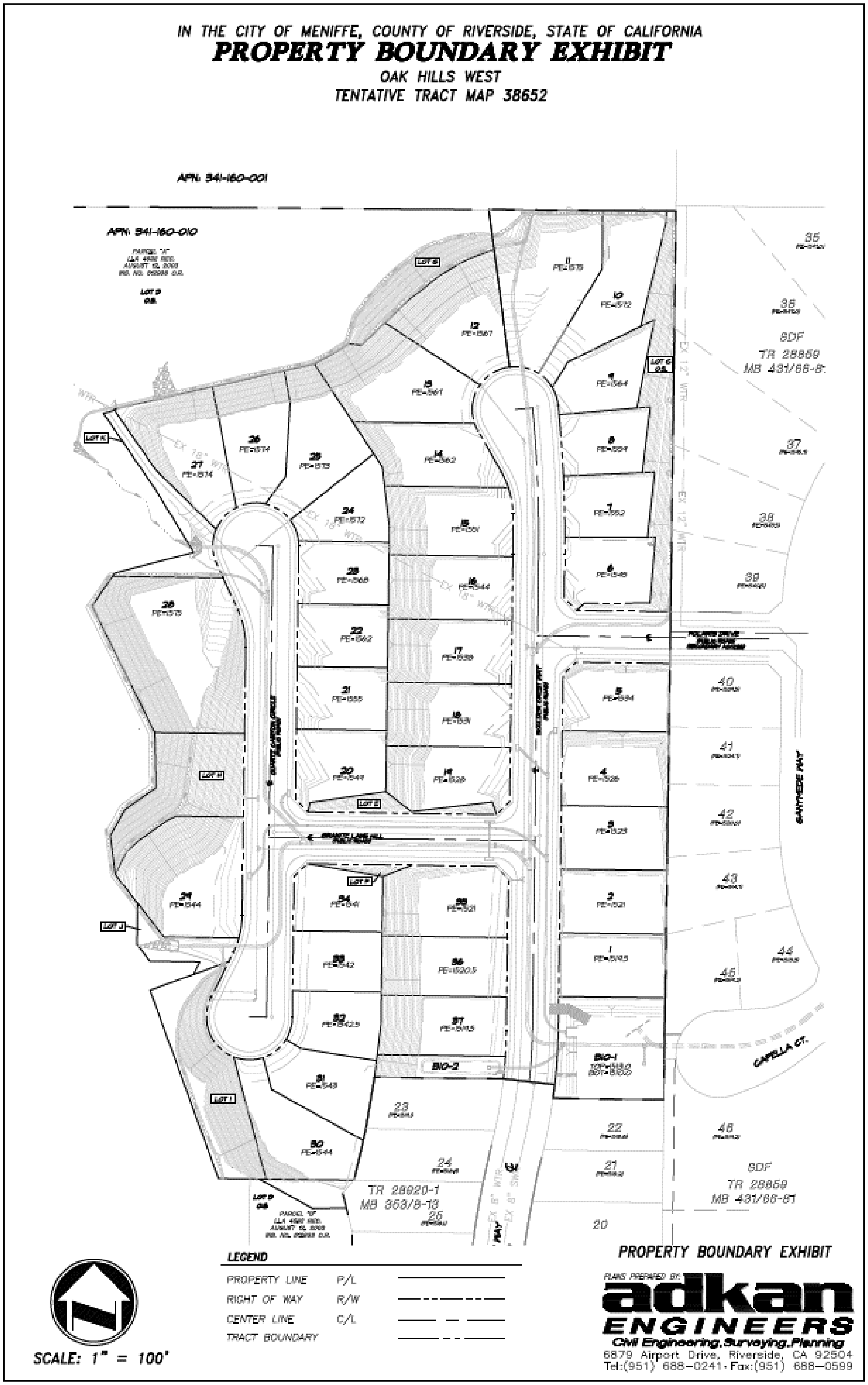


Exhibit 2. Aerial view of the existing site

Exhibit 3. Site plan



c. Project size and description

The Oak Hills West project site will comprise a 78-acre parcel of vacant land in the City of Menifee. The project will construct a 37-lot subdivision with duplexes for a total of 74 dwelling units.

This project will utilize the cluster development provisions of the municipal code to reduce the minimum lot size to 7,200 square feet and preserve 64 acres (roughly 80%) of the site as natural open space to prevent future development of sloped areas. The lot sizes will range from 7,210 to 32,382 square feet. The project site will receive access off Boulder Crest Way and Polaris Drive.

d. Existing and proposed land use and zoning

The subject parcel currently consists of vacant land with no existing improvements or utilization. The adjacent land uses consist of vacant land to the north and west, and single-family residential to the south and east. The General Plan and Zoning Designation for the site is 2.1-5 R and LDR-1. The Oak Hills West project proposes changing the land use and rezoning the project site to residential.

e. Site plan and proposed project

The site plan is shown on the following page.

f. Proposed project opening year and phase opening

The opening year is assumed to be 2026.

3. Methodology and Impact Thresholds

This LOS Traffic Study has been prepared in accordance with the City of Menifee's *LOS Traffic Study Guidelines* (October 2020). This TIS applies the methodology described in said guidelines.

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled (VMT).

However, this change in CEQA analysis does not diminish the City's ability to require a LOS analysis to confirm accessibility to a project site and conformance with General Plan policies.

For travel demand forecasting, the Southern California Association of Governments (SCAG) Regional Travel Demand Model (RTDM). The SCAG RTDM is focused on Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial Counties.

As per the City's guidelines, the following analysis scenarios are examined in this LOS Traffic Study:

a) Existing Conditions (2024)
b) Existing Conditions (2024) with Project Conditions
c) Opening Year Cumulative (2026) without Project Conditions
d) Opening Year Cumulative (2026) with Project Conditions

Per the City's guidelines for unsignalized intersections, all intersections are analyzed using the Highway Capacity Manual (HCM) methodology. In this analysis, the HCM 6th Edition methodology was used. The HCM method measures the delay in seconds per vehicle at an intersection and assigns a numerical value called delay-per-vehicle (measured in seconds/vehicle) and a corresponding letter value to the intersection.

The degree of congestion at an intersection is described by the level of service, which ranges from LOS A to LOS F, with LOS A representing free-flow conditions with little delay and LOS F representing over-saturated traffic flow throughout the peak hour. Per the City's guidelines, intersections operating at LOS A through LOS D are considered acceptable, while those at LOS E or F are deficient. A complete description of the meaning of level of service can be found in the Highway Research Board, *Highway Capacity Manual*. Brief descriptions of the six levels of service for unsignalized intersections based on the HCM methodology and LOS definitions are shown in Exhibit 4.

Exhibit 4. Level of Service Definitions

Level of Service	Delay per Vehicle (Seconds/Vehicle)	Description
A	0.0 – 10.0 seconds	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.
B	10.1 – 20.0 seconds	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	20.1 – 35.0 seconds	GOOD. Occasionally, drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	35.1 – 55.0 seconds	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	55.1 – 80.0 seconds	POOR. Represents the most vehicles that intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	80.1 seconds or greater	FAILURE. Backups from nearby intersections or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

4. Existing Conditions

a. Existing roadway network

The project site is located at the existing termini of two unclassified local residential roads, as shown in the City of Menifee General Plan Circulation Element.

Boulder Creek Way is a local residential street that is 40 feet wide curb-to-curb. There are 2-foot-wide curb gutters on each side of the road, and on-street parking is permitted on both sides. There are 6-foot-wide sidewalks on both sides with curb ramps at each intersection. While there are no speed limit signs on the road, the speed limit is 25 miles per hour. Boulder Creek Way terminates at a cul-de-sac north of the intersection with Ridgemoor Drive.

Polaris Drive is a local residential street that is 40 feet wide curb-to-curb. There are 2-foot-wide curb gutters on each side of the road, and on-street parking is permitted on both sides. There are 5-foot-wide sidewalks with 5-foot tree-lined buffers on both sides, with curb ramps at the intersection with Ganymede Way. The posted speed limit is 25 miles per hour. Polaris Drive is approximately 140 feet in length and terminates abruptly at the eastern boundary of the project site. There is a driveway on the north side of the road that serves an 18-foot road leading to a water tank behind the houses on Ganymede Way.

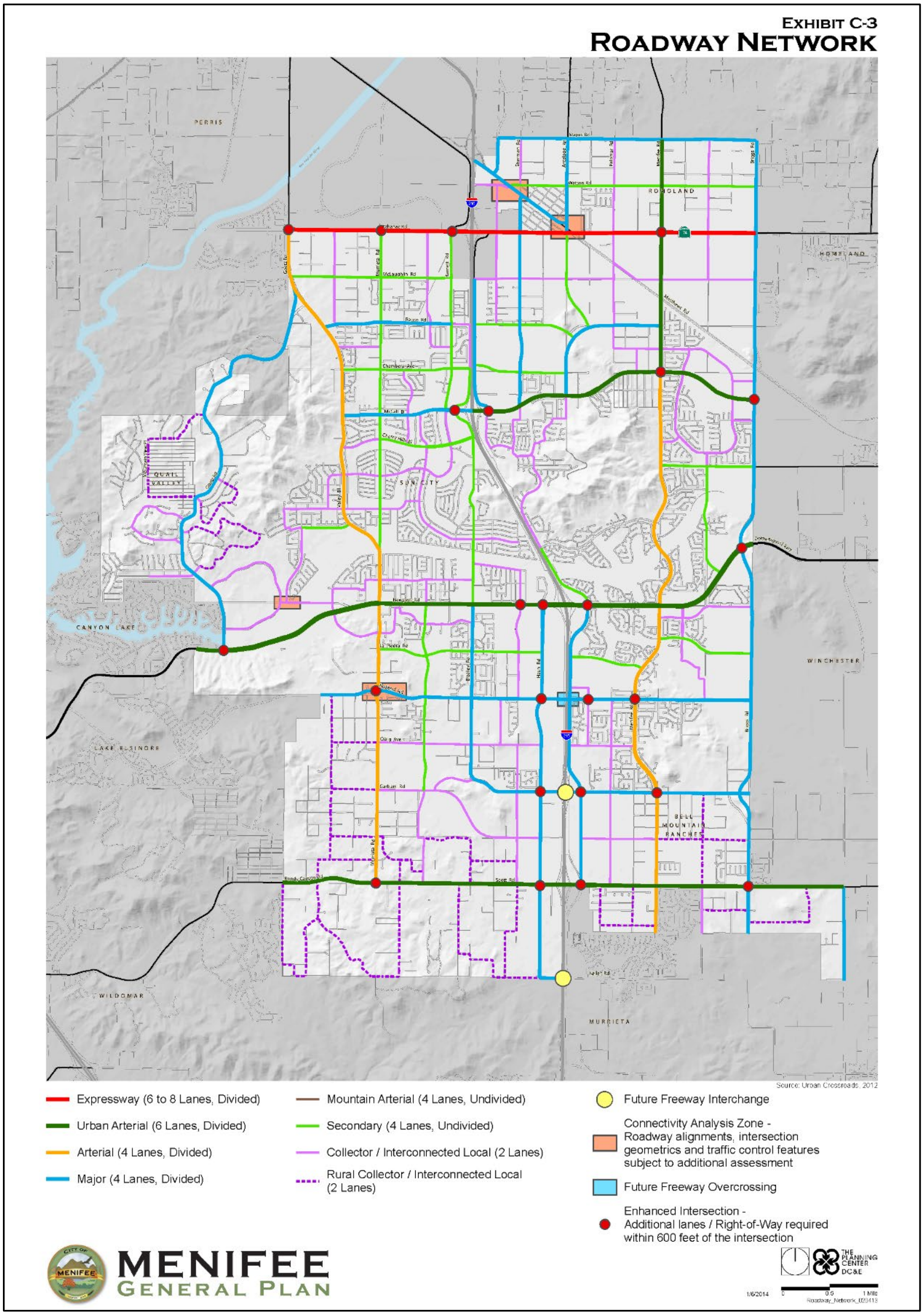
Ganymede Way is a local residential street that is 40 feet wide curb-to-curb. There are 2-foot-wide curb gutters on each side of the road, and on-street parking is permitted on both sides. There are 6-foot-wide sidewalks on both sides with curb ramps at each intersection. The roadway stretches between the eastern leg of its intersection with Bridgeport Lane, where it becomes Juno Street, and the western leg of its intersection with Velo Drive, where it becomes Milky Way. The posted speed limit is 25 miles per hour.

Ridgemoor Road is classified as a collector/interconnected local 2-lane road and is 45 feet wide curb-to-curb. There are 2-foot-wide curb gutters on each side of the road, and on-street parking is permitted on both sides in the direct vicinity of the project site between Boulder Crest Way and Phoenix Way. There are 6-foot-wide sidewalks on both sides with curb ramps at each intersection. The posted speed limit is 25 miles per hour in the development. The roadway terminates on its western end at Boulder Crest Way.

In terms of the connectivity of the surrounding road network, Boulder Crest Way connects to Ridgemoor Road, which connects to Valley Boulevard, a 4-lane divided arterial road, and Murietta Road, a secondary 4-lane undivided road, east of the project site

A map showing an overview of the surrounding road network (adapted from the City's general plan) is shown in Exhibit 5.

Exhibit 5. Roadway network



b. Existing traffic control and intersection geometrics

Both study intersections are T-junctions. The intersection of Boulder Crest Way and Ridgemoor Drive is two-way-STOP-controlled and contains a stop bar. The intersection serves as the western end of Ridgemoor Drive, with houses on the opposite side of the street. The intersection of Polaris Drive and Ganymede Way contains no intersection controls and serves as the eastern end of Polaris Drive, with houses on the opposite side of the street. There are no dedicated turn lanes at either intersection.

c. Existing traffic volumes

Existing traffic volumes were counted at the following intersections:

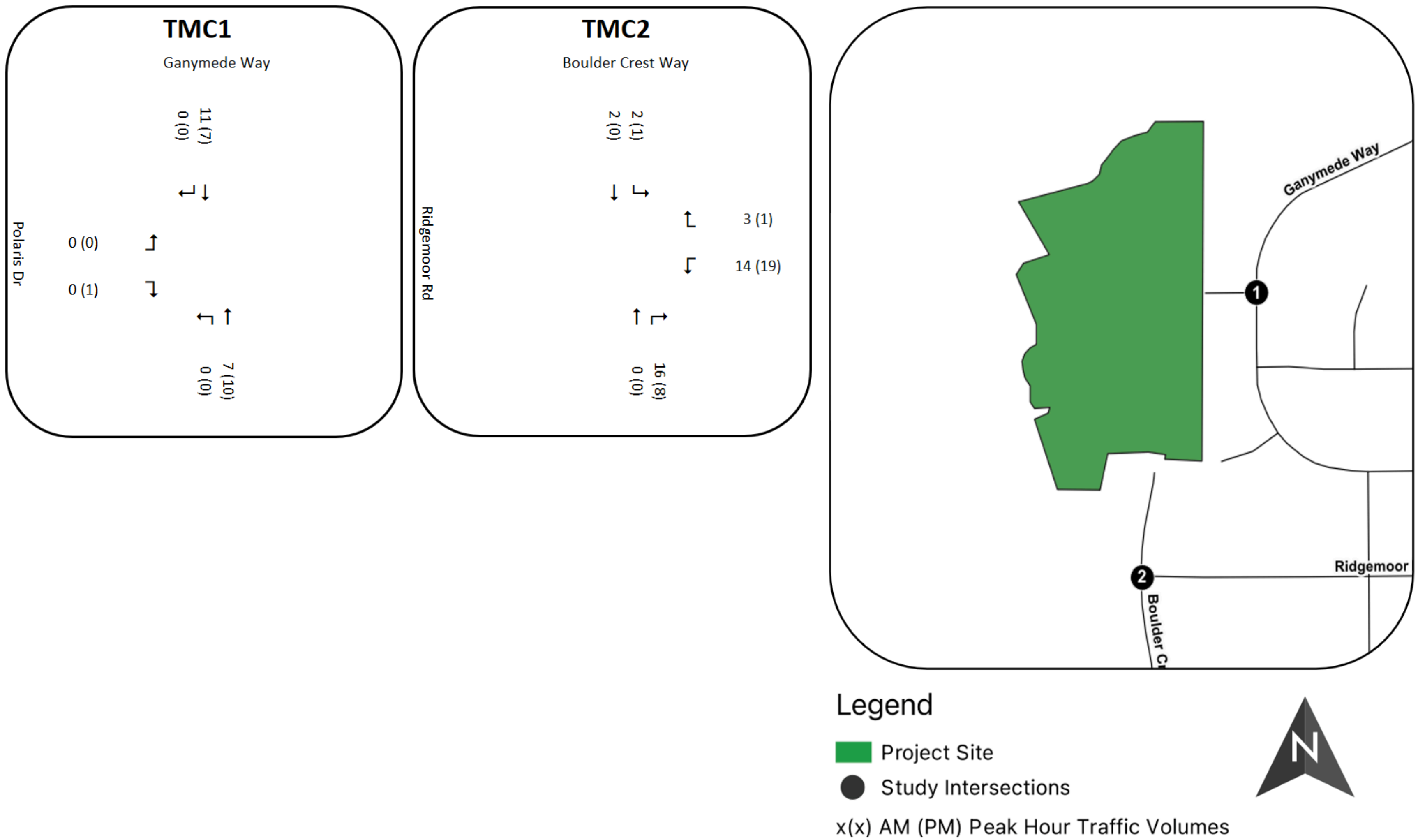
TMC1: Ganymede Way at Polaris Drive

TMC2: Ridgemoor Road at Boulder Crest Way

Turning movement counts (TMC) were collected on a weekday (Thursday, June 6, 2024) from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM at the above locations. The AM peak hour was 7:15 for TMC1 and 7:00 for TMC2; the PM peak hour was 5:00 for TMC1 and 4:45 for TMC2.

Turning movement diagrams showing the results of the data collection are shown in Exhibit 6.

Exhibit 6. Existing conditions turning movement diagrams for the study intersections



d. Existing level of service

The existing AM and PM peak hour level of service and delay at the study intersections is shown in Exhibit 7. All intersections have an existing level of service of A. Detailed worksheets from the level of service calculation are provided in Appendix E.

Exhibit 7. Existing conditions peak hour levels of service

		AM Peak		PM Peak	
Intersection	**Control Type**	**Delay**	**LOS**	**Delay**	**LOS**
TMC1: Ganymede Way at Polaris Drive	TWSC	0.0	A	8.4	A
TMC2: Ridgemoor Road at Boulder Crest Way	TWSC	8.7	A	8.7	A

TWSC = Two-Way Stop Control
Delay Reported in Seconds per Vehicle
LOS = Level of Service

e. Existing bicycle facilities

There are no existing bicycle facilities in the vicinity of the project site. Bicyclists are required to share the road with other vehicles.

f. Existing transit facilities

There is no transit service in the vicinity of the project site. The nearest transit stops are approximately 1.25 miles from the site on Murietta Road.

g. Existing pedestrian facilities

The subject parcel is vacant and contains no roads, and therefore no pedestrian facilities exist. However, the roads in the vicinity of the site contain continuous sidewalks that connect the entire development.

Boulder Crest Way and Ridgemoor Road both contain six-foot-wide sidewalks on both sides of the roads, with curb ramps on the eastern side of the intersection. The sidewalk on Boulder Crest Way ends after the last properties before the cul-de-sac.

On Polaris Drive, there are existing 5-foot-wide sidewalks on both sides, with curb ramps at the intersection with Ganymede Way. Ganymede Way contains 6-foot-wide sidewalks on both sides.

5. Project Traffic

a. Trip Generation

Trip generation was calculated using the rates of the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition (2021). As shown in Exhibit 8, the project is expected to generate 36 AM peak hour trips (11 inbound and 25 outbound) and 42 PM peak hour trips (24 inbound and 18 outbound).

Exhibit 8. Project trip generation

			Daily	AM Peak Hour			PM Peak Hour		
Land Use	**Quantity**	**Units**		**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
Single-family Attached Housing (LUC 215)	74	Dwelling Units	7.2	0.15	0.33	**0.48**	0.32	0.25	**0.57**
Project Trip Generation									
Single-family Attached Housing (LUC 215)	74	Dwelling Units	533	11	25	36	24	18	42
Total Trip Generation			**533**	11	25	**36**	24	18	**42**

Source: Institute of Transportation Engineers (ITE), Trip Generation, 11th Edition, 2021.

b. Trip Distribution

The distribution of project trips reflects the potential travel patterns and is based on land use patterns, population density, and the existing roadway network. Due to the direct connectivity of Ridgemoor Road (a collector which joins with Valley Boulevard, an arterial, and Murietta Road, a secondary road), it is expected that a large proportion of trips will use Ridgemoor Road via the Boulder Crest Way access rather than the Polaris Drive access which leads into a more convoluted network of neighborhood streets. A map of the project's estimated trip peak hour distribution levels is shown in Exhibit 9.

c. Project Trip Assignment

Exhibit 10 shows project-only trips at the study intersections by turning movement.

d. Existing level of service with project

The existing conditions AM and PM peak turning movements, with the project, are shown in Exhibit 11. The existing AM and PM peak hour with project traffic level of service and delay at the study intersections is shown in Exhibit 12. All intersections have a level of service of A. Detailed worksheets from the level of service calculation are provided in Appendix E.

Exhibit 9. Trip distribution overview

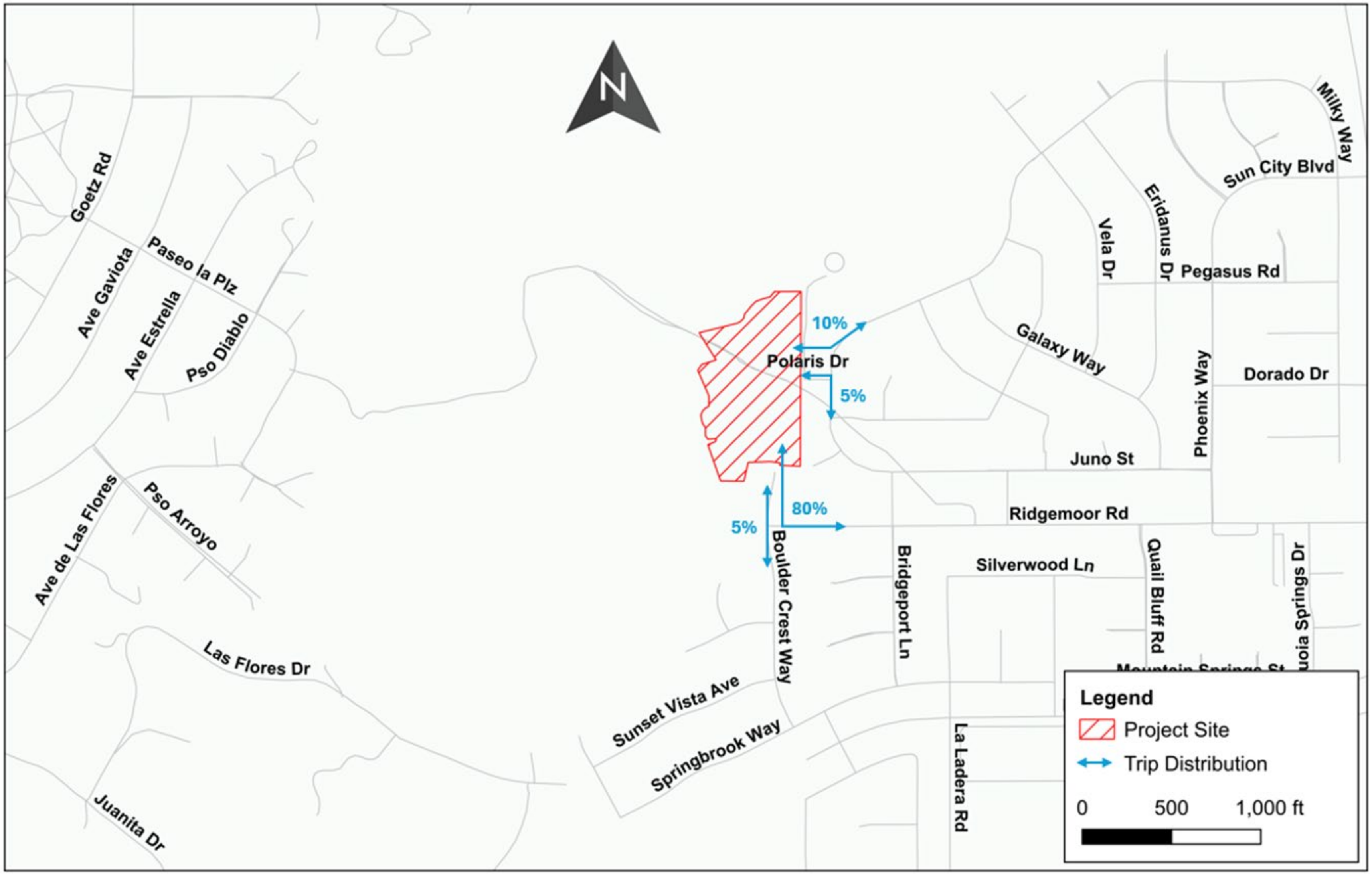


Exhibit 10. Project-only trips at study intersections by turning movement

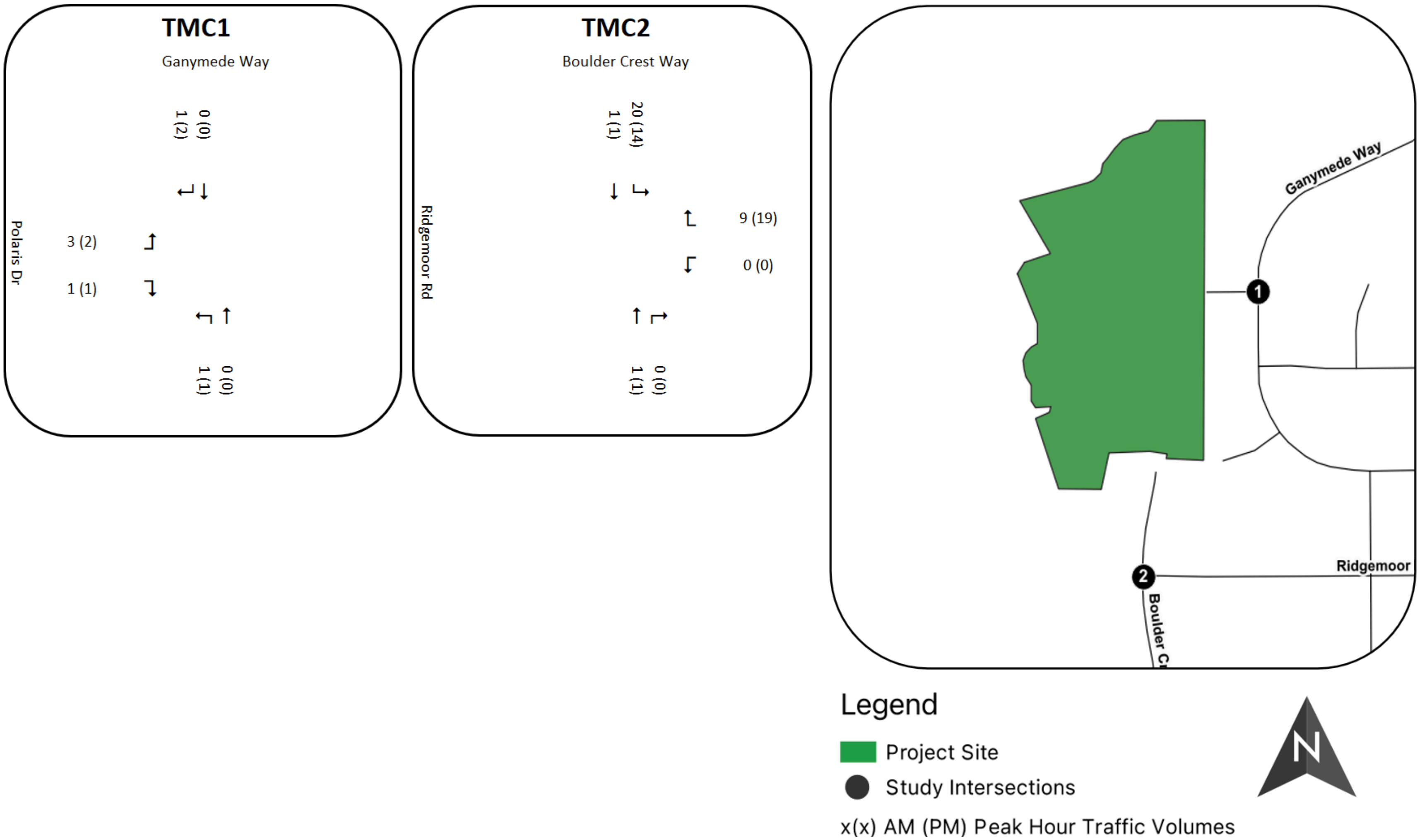


Exhibit 11. Existing conditions with project turning movement diagrams for the study intersections

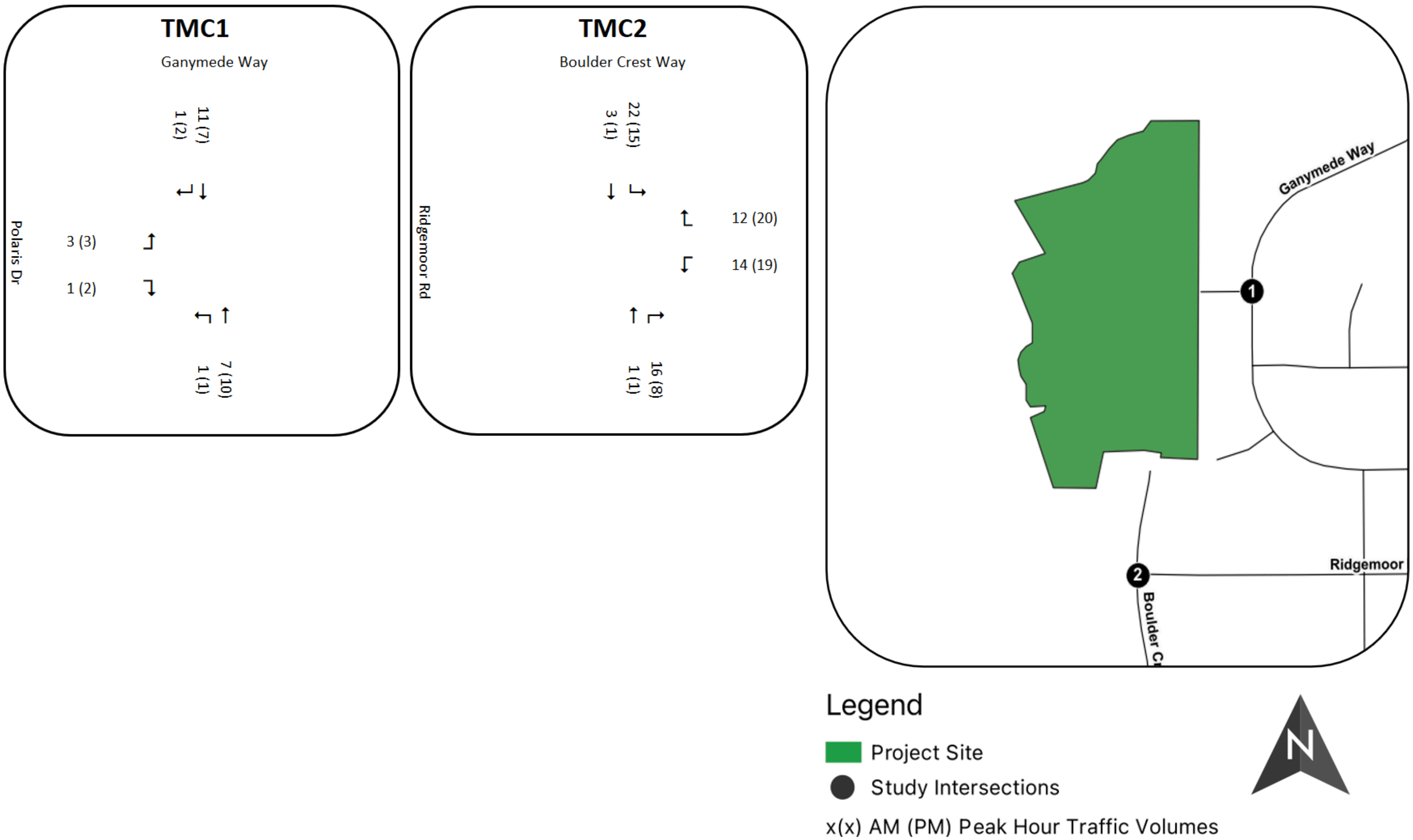


Exhibit 12. Existing conditions with project peak hour level of service

Existing Conditions Plus Project Peak Hour Levels of Service

		Existing Conditions				Existing Conditions Plus Project					
		AM Peak		PM Peak		AM Peak			PM Peak		
Intersection	Control Type	Delay	LOS	Delay	LOS	Delay	LOS	Increase in Delay	Delay	LOS	Increase in Delay
TMC1: Ganymede Way at Polaris Drive	TWSC	0.0	A	8.4	A	8.7	A	8.7	8.5	A	0.1
TMC2: Ridgemoor Road at Boulder Crest Way	TWSC	8.7	A	8.7	A	8.9	A	0.2	8.8	A	0.1

TWSC = Two-Way Stop Control

Delay Reported in Seconds per Vehicle

LOS = Level of Service

6. Opening Year Cumulative (2026) LOS Analysis

This section presents the analysis for the opening year (2026).

a. Without Project analysis

This section presents the analysis of the opening year cumulative (2026) conditions without the addition of the proposed project. Based on the City's guidelines and outputs from the Southern California Council of Governments (SCAG) Regional Transportation Demand Model, the annual growth rate between the baseline year (2024) and the opening year (2026) is 2%.

i. Cumulative Projects

Within a 3-mile radius of the project site, there are no approved projects that are expected to generate traffic that would significantly affect the road network surrounding the Oak Hills West development. In addition, when the Planning Department for the City of Perris was contacted in July 2024, they stated that there were no projects in the vicinity of the project site. A map and list of cumulative projects provided by the City of Menifee are shown in Exhibit 13 and Exhibit 14.

ii. Opening year without-project peak turning movements

The opening year cumulative (2026) AM and PM peak turning movements, without the project, are shown in Exhibit 15. These are obtained by applying the 2% annual growth rate to existing traffic volumes obtained from the counts. As discussed above, cumulative projects within a 3-mile radius are not anticipated to add any traffic to the study area. Therefore, no additional trips have been added beyond the growth rate and project trips.

.

Exhibit 13. Map of cumulative projects as of Q3 2023-24

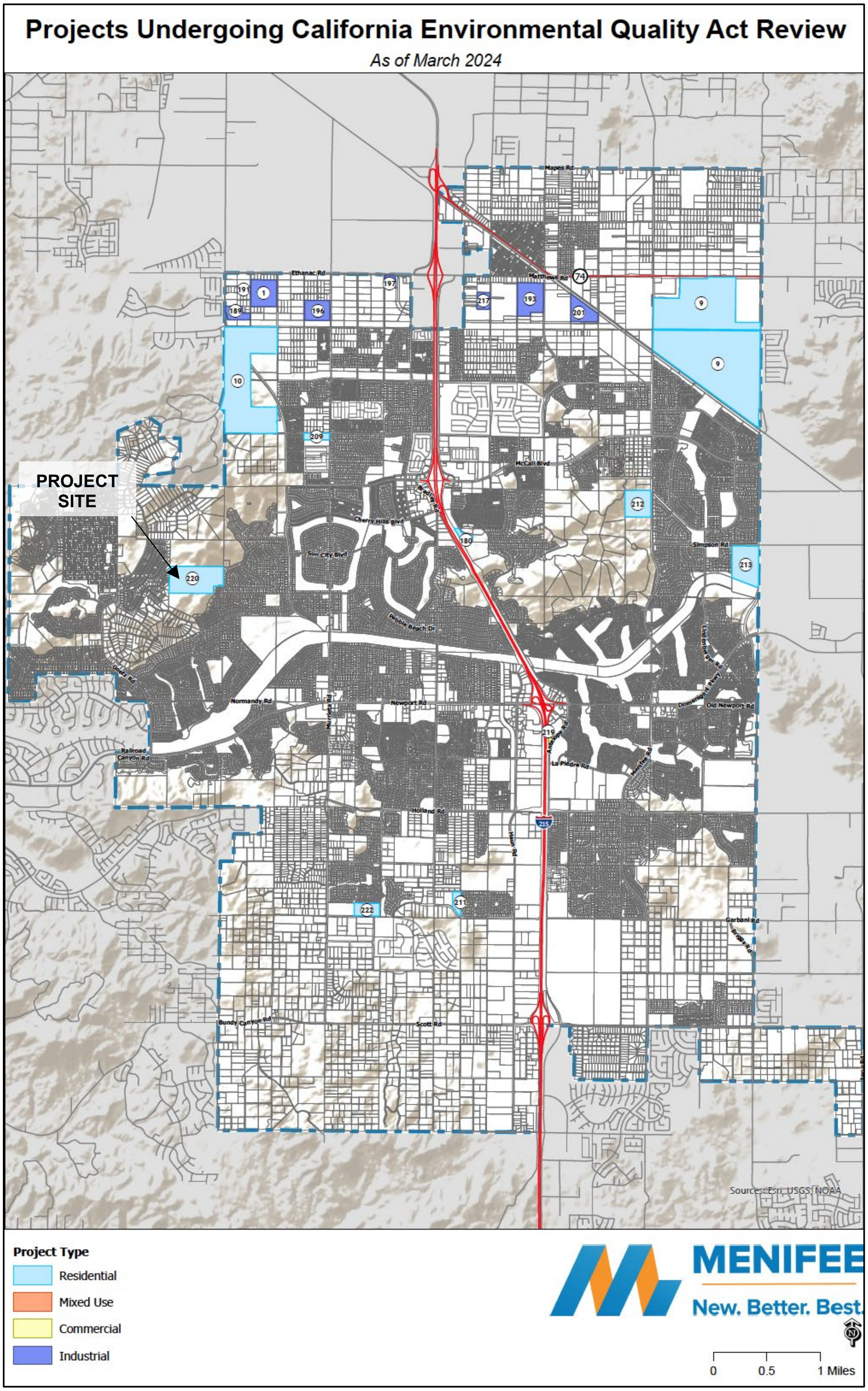


Exhibit 14. List of cumulative projects for Q3 2023-24

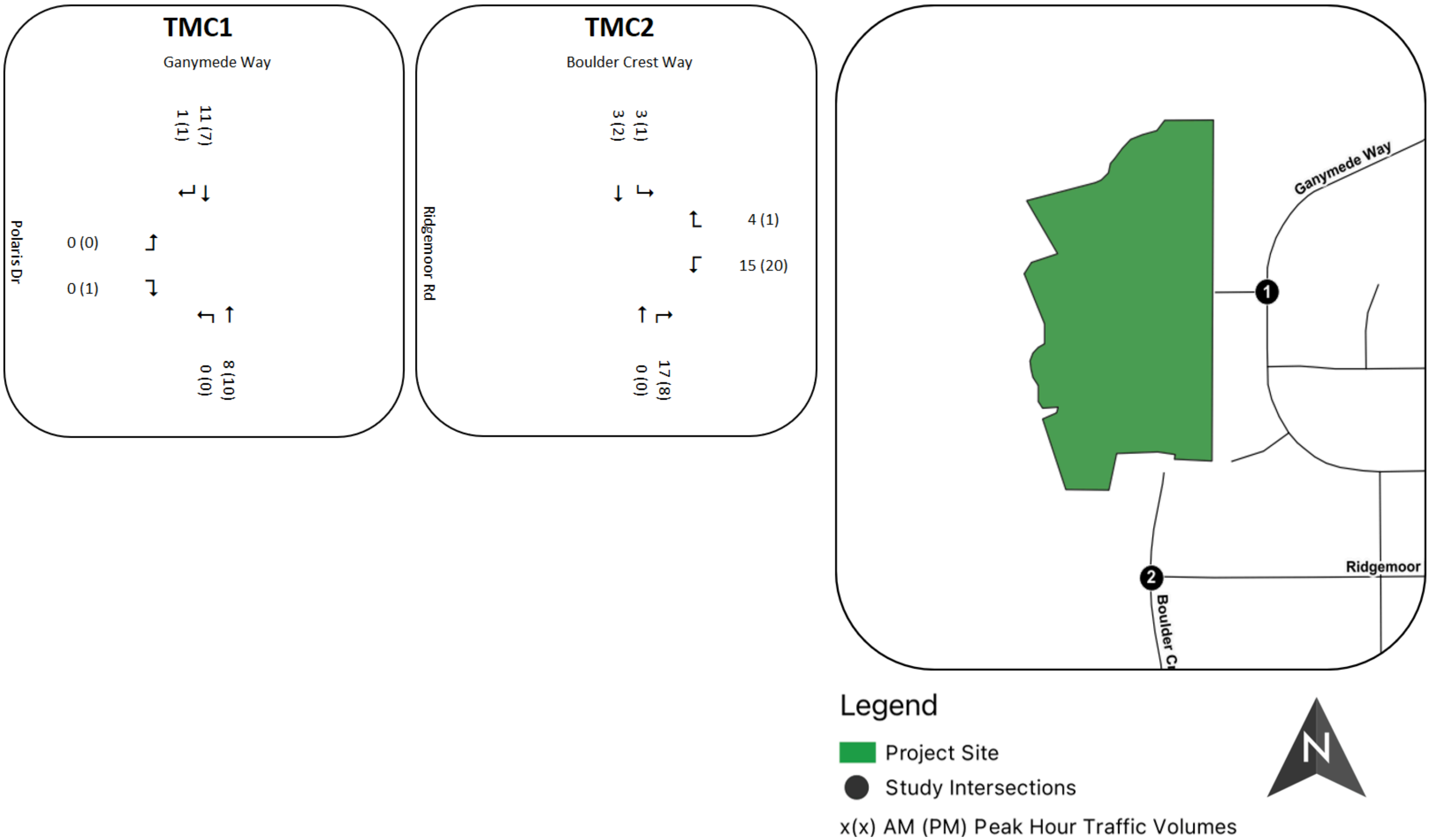
Quarter 3 Update for FY 2023-2024

MAP NUMBER	PROJECT NAME	PROJECT DESCRIPTION	PROJECT TYPE	CONSULTANT	FISCAL YEAR TOTAL	CONTRACT TOTAL	PROJECT STATUS
209	DiCapri Condos	61 condo units	IS/MND	MIG, Inc	$83,184	$83,184	Complete
219	Home2Suites hotel	106 rooms	IS/MND + amendment	Rick Engineering	$80,200	$80,200	In Review
10	Cimarron Ridge SP	756 residential units	EIR Addendum	Kimley-Horn & Associates, Inc	$65,800	$65,800	Complete
189, 191, 197	Compass Northern Gateway	5 warehouses	EIR Amendment	Kimley-Horn & Associates, Inc	$79,850	$546,415*	In Review
213	Salt Creek TTM 38625	319 residential units	IS/MND Amendments	FirstCarbon Solutions	$62,490	$198,020*	In Review
9	Menifee Valley SP	Mixed use, 1,711 residential units	EIR Amendments	LSA Associates, Inc	$289,000	$1,143,754*	Complete
180	Villagio Apartments	24 apartment units	IS/MND Amendment	Matthew Fagan Consulting, Inc	$2,000	$63,450*	In Review
196	ARES Warehouse	Warehouse	EIR Amendment	EPD Solutions, Inc	$20,500	$356,558*	In Review
201	Double Butte	Utility-scale BESS	IS/MND Amendments	Dudek	$5,750	$86,745*	In Review
1	Capstone Industrial	Warehouse	EIR Amendment	Kimley-Horn & Associates, Inc	$8,700	$407,370*	In Review
193	Menifee Commerce Center	Warehouse	EIR Amendment	Kimley-Horn & Associates, Inc	$13,900	$430,225*	In Review
217	Ethanac Business Center	Warehouse	IS/MND	Kimley-Horn & Associates, Inc	$182,500	$182,500	In Review
211	Garbani North TTM 38683	40 residential units	IS/MND	Ascent	$71,450	$71,450	In Review
212	Coastline TTM 38525	52 residential units	IS/MND	Rincon Consultants, Inc	$74,785	$74,785	In Review
220	Oak Hills West TTM 38652	37 residential units	IS/MND	Chambers Group	$61,675	$61,675	In Review
222	Garbani & Evans TTM 38766	66 residential units	IS/MND	Michael Baker International Corp	$112,860	$112,860	In Review
-	Economic Development Corridor – Northern Gateway**	Trucking access analysis	Master Circulation Plan Study	Kimley-Horn & Associates, Inc	$124,750	$124,750	In Review
				Total:	$1,339,394		

*Denotes contract totals with funds rolled from previous fiscal years.

** City-initiated traffic analysis study in agreement with City of Perris

Exhibit 15. Opening year (2026) AM and PM peak turning movements without the project



iii. Opening year cumulative without-project level of service

The opening year (2026) AM and PM peak level of service, without the project, is shown in Exhibit 16. All intersections have a level of service of A. Detailed worksheets from the level of service calculation are provided in Appendix E.

Exhibit 16. Opening year without project peak hour levels of service

		AM Peak		PM Peak	
Intersection	**Control Type**	**Delay**	**LOS**	**Delay**	**LOS**
TMC1: Ganymede Way at Polaris Drive	TWSC	0	A	8.4	A
TMC2: Ridgemoor Road at Boulder Crest Way	TWSC	8.7	A	8.7	A

TWSC = Two-Way Stop Control

Delay Reported in Seconds per Vehicle

LOS = Level of Service

b. With Project analysis

This section presents the analysis of the opening year cumulative (2026) conditions with the addition of the proposed project.

i. Opening year cumulative with project peak turning movements

The opening year (2026) AM and PM peak turning movements, with the project, are shown in Exhibit 17. These were obtained by adding project-generated traffic to the opening year without-project traffic volumes. As discussed above, cumulative projects within a 3-mile radius are not anticipated to add any traffic to the study area. Therefore, no additional trips have been added beyond the growth rate and project trips.

ii. Opening year cumulative with project level of service

The opening year cumulative (2026) AM and PM peak level of service, with the project, is shown in Exhibit 18. All intersections still have a level of service of A. Detailed worksheets from the level of service calculation are provided in Appendix E.

iii. Identification of intersection deficiencies

No deficiencies have been identified in the opening year with project analysis.

Exhibit 17. Opening year cumulative (2026) AM and PM peak turning movements with the project

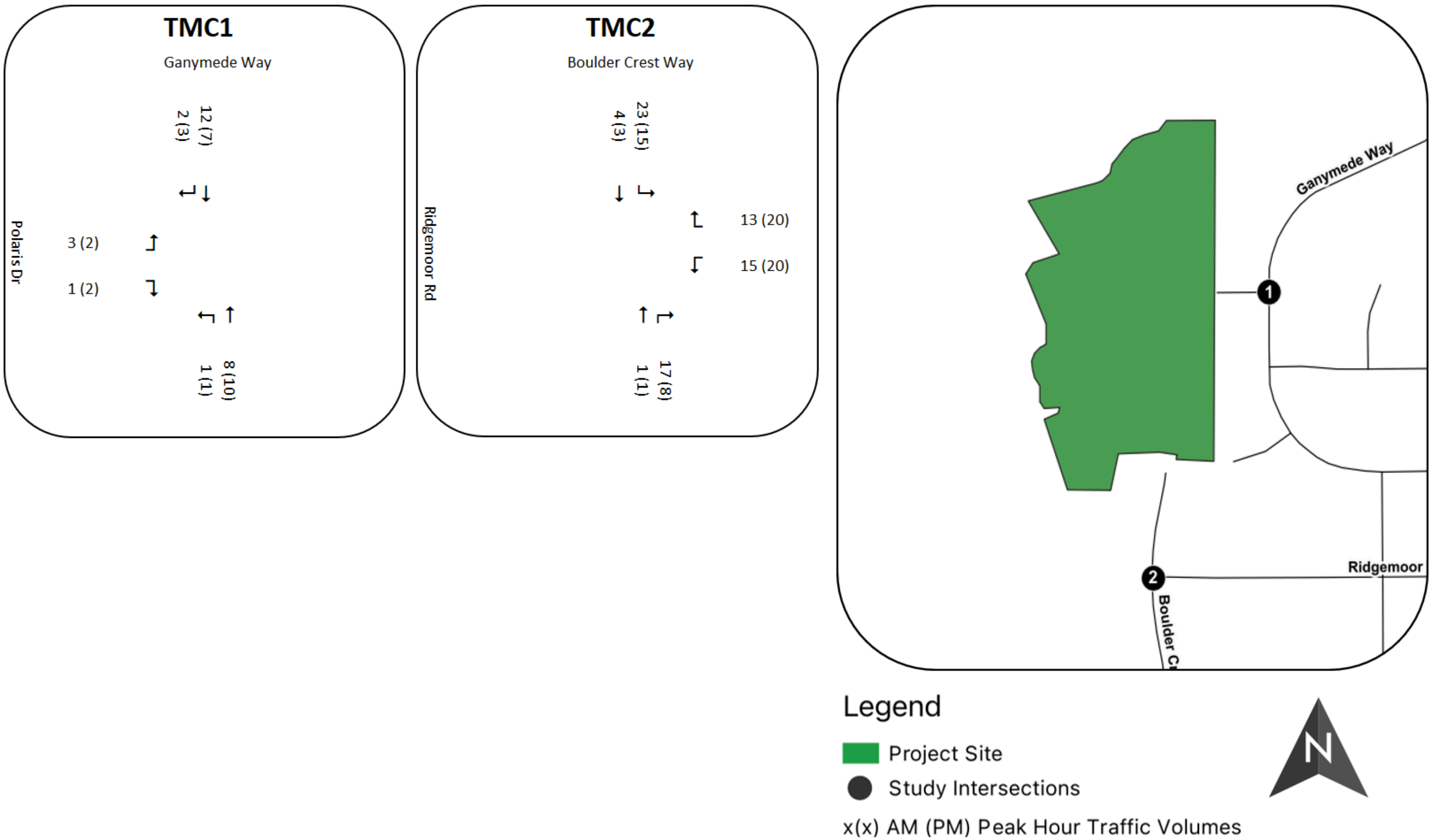


Exhibit 18. Opening year cumulative with project peak hour levels of service

		Opening Year				Opening Year Plus Project					
		AM Peak		PM Peak		AM Peak			PM Peak		
Intersection	**Control Type**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Increase in Delay**	**Delay**	**LOS**	**Increase in Delay**
TMC1: Ganymede Way at Polaris Drive	TWSC	0.0	A	8.4	A	8.7	A	8.7	8.5	A	0.1
TMC2: Ridgemoor Road at Boulder Crest Way	TWSC	8.7	A	8.7	A	8.9	A	0.2	8.8	A	0.1

TWSC = Two-Way Stop Control

Delay Reported in Seconds per Vehicle

LOS = Level of Service

8. Traffic Signal Warrant Analysis

Due to the project intersections operating at LOS A, a signal warrant analysis was deemed unnecessary and was not completed.

9. On-site Circulation Analysis

The site will be accessed via two roadways: Boulder Crest Way on the southern boundary, and Polaris Drive on the western boundary. As explained in the trip distribution section above, it is assumed that 85% of project trips will access the site through Boulder Crest Way and 15% of trips will access the site through Polaris Drive. This is due to the road directly connecting to Ridgemoor Road, (which joins with Valley Boulevard, an arterial, and Murietta Road, a secondary road) while Polaris Drive leads into a complicated network of neighborhood streets.

Vehicles in the project area will be able to park in driveways in front of each home or on the sides of the streets.

10. Multimodal Analysis

For pedestrian access, the entire surrounding development contains 5- to 6-foot sidewalks with curb ramps at intersections and no sidewalk gaps, making the area walkable.

Public transit access is inadequate, with the nearest transit stops located approximately 1.25 miles from the project site on Murietta Road. These stops are served by Riverside Transit Route 61, which operates between Promenade Mall in Temecula and Perris Station Transit Center in Perris. The stops are not included on the official schedule as time/transfer points.

Bicycle and other micromobility options for accessing the project site are adequate due to the 25 miles per hour speed limit and residential zoning of the project site making bicycling more comfortable than on major thoroughfares. However, there are no dedicated bicycle facilities or protected bicycle lanes.

11. Safety and Operational Improvements

Due to the study intersections operating at LOS A during all scenarios, no mitigations are required to improve LOS.

12. Vehicle Miles Traveled (VMT) Analysis

Per the City of Menifee Traffic Impact Analysis Guidelines for Vehicle Miles Traveled (adopted June 3, 2020), projects may be presumed to have a less than significant impact if they meet any of the following criteria:

Step 1: Transit Priority Area (TPA) Screening

- The project is not within a TPA. Therefore, this criterion is not met.

Step 2: Low VMT Area Screening

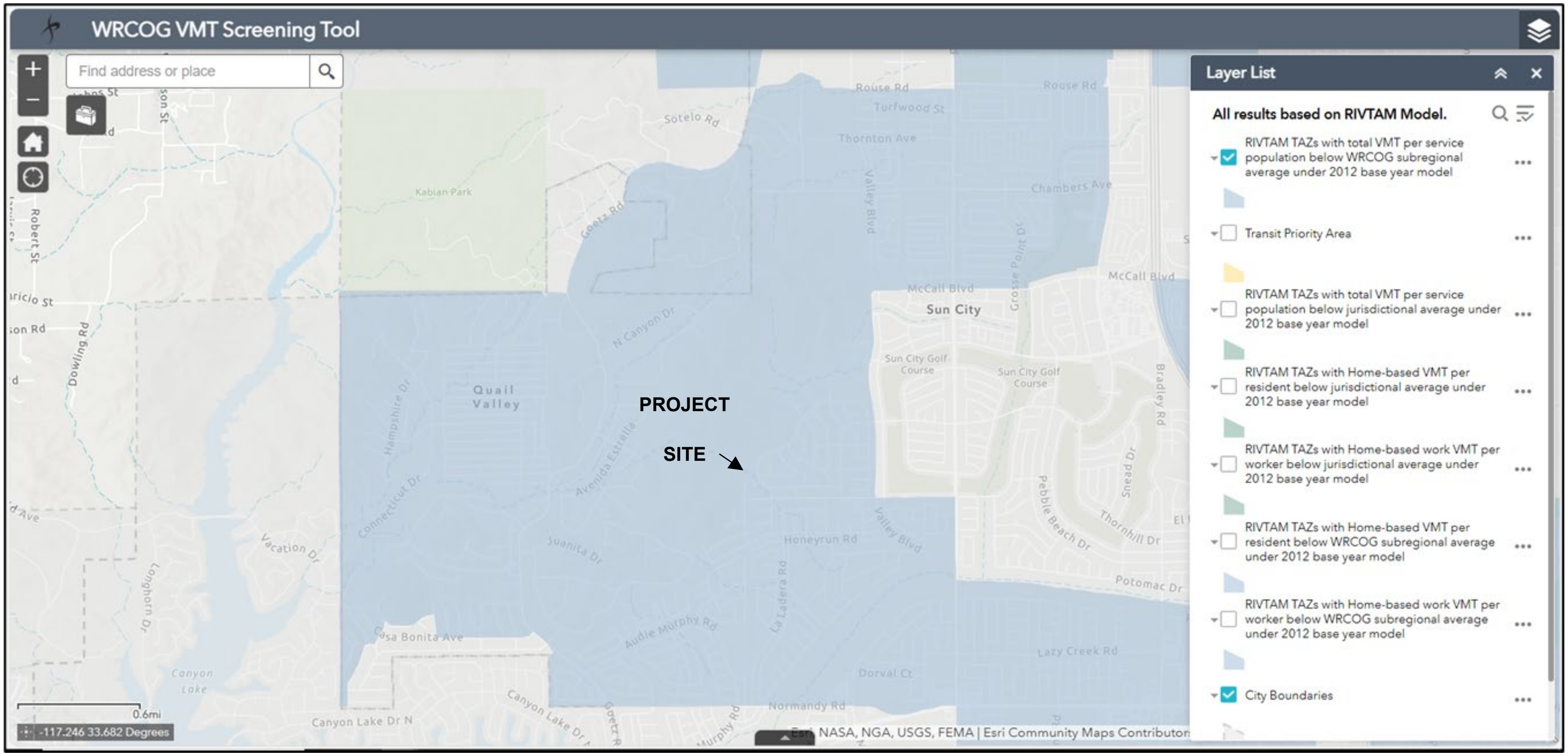
- The project is within a low-VMT area per the WRCOG VMT Screening Tool, as shown in Exhibit 2. **Therefore, this criterion is met.**

Step 3: Project Type Screening

- The project is not one of the types that are presumed to have a less than significant impact per the City's *Traffic Impact Analysis Guidelines for Vehicle Miles Traveled*. Therefore, this criterion is not met.

Therefore, the project is expected to screen out for VMT analysis. The full screening memo can be found in Appendix B

Exhibit 19. Low-VMT areas per service population, with the project site indicated



Source: WRCOG VMT Screening Tool, available online at https://apps.fehrandpeers.com/WRCOGVMT/

13. Appendix

a. Traffic Study Application

B. VMT Scoping Memorandum

C. Project Site Drawings

D. Traffic Counts

E. Intersection Analysis Worksheets

Appendix A

Traffic Study Application

CITY OF MENIFEE

ENGINEERING DEPARTMENT

FOR USE BY STAFF

Permit#: ______________________________

Received Date: __________________________

TRAFFIC SCOPING/STUDY

APPLICATION

SUBMITTAL REQUIREMENTS

THIS FORM MUST BE SUBMITTED WITH FIRST PLAN CHECK:

Project No: 21473-001-2.3.1 Schedule: ________________ (if applicable)

Project Description: Oak Hills West Tract 38652

Name of Owner: ____

Signature: ______________________________ Phone #: ______________________________

Mailing Address: ______________________________ FAX number: ______________________________

______________________________ Email Address: ______________________________

Name of Applicant: GTS Contact: Rawad Hani

Authorized Signature: Rawad Hani Phone #: (213) 267-2332

Mailing Address: 11900 W Olympic Blvd., Ste 450 FAX number: ______________________________

Los Angeles, CA 90064 Email Address: rawad.hani@gentecsol.com

Submittal Requirements

1.	________	2 Sets	Site Plan
2.	________	2 Sets	Traffic/Scoping Study
3.	________	1	$1,000.00 – Deposit

FIRST SUBMITTAL REQUIRMENTS

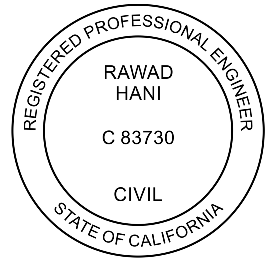
A. The City reserves the right to reject the submitted plan package without performing any plan checks if any of the required plans or information items are missing.

I, the undersigned engineer, do verify that all the items necessary for this project and checked above are attached.

Signature

6/20/2024
Date

Civil Engineer's Stamp



Rawad Hani
Printed Name

GTS (General Technologies and Solutions)
Firm Name

11900 W Olympic Blvd., Ste 450, Los Angeles, CA 90064
Address

(213) 267-2332
Phone Number

Fax

rawad.hani@gentecsol.com
Email Address

ATTACHMENT A

SCOPING AGREEMENT FOR TRAFFIC STUDY

This letter acknowledges the City Menifee Engineering Department requirements for the traffic study of the following project. The analysis must follow the latest City Traffic Study Guidelines dated October 2020

Case No. -
Related Cases -
SP No. -
EIR No. -
GPA No. -
CZ No. -
Project Name:
Project Location: -
Project Description: -

	Consultant	Developer
Name:	GTS (General Technologies and Solutions)	
Address:	11900 W Olympic Park Blvd, Suite 450 Los Angeles, CA 90064 (213) 267-2332	
Telephone:		

A. Trip Generation Source: ITE *Trip Generation Manual,* most recent edition

Existing Land Use	Vacant	Proposed Land Use	Residential
Existing Zoning	2.1-5 R and LDR-1	Proposed Zoning	Residential
Total Daily Trips			

	In	Out	Total
AM Trips	11	25	36
PM Trips	24	18	42

Internal Trip Allowance ☐ Yes ☑ No (% Trip Discount)

Pass-By Trip Allowance ☐ Yes ☑ No (% Trip Discount)

(Attach additional sheet if this is a multi-use site with a breakdown of trips generated)

B. Trip Geographic Distribution: N 10 % S 85 % E 5 % W %

(See attached exhibit for detailed assignment)

C. Background Traffic

Project Completion Year: 2026 Annual Ambient Growth Rate: 2 %

Other area projects to be included: -

Please contact the Engineering Department or use the most recently provided data

Model/Forecast methodology if required SCAG Regional Travel Demand Model

D. Horizon Year Analysis: Does this project require a Horizon Year Analysis? ☐ Yes ☑ No

E. Study intersections: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

1. Ganymede Way at Polaris Drive
2. Ridgemoor Road at Boulder Crest Way
3.
4.
5.
6.
7.
8.

F. Study Roadway Segments:

1.
2.
3.
4.
5.
6.
7.
8.

G. Other Jurisdictional Impacts

Is this project within any other Agency's Sphere of Influence or one-mile radius of boundaries? ☑ Y

es

☐ No

If so, name of Jurisdiction: City of Perris

H. Site Plan (please attach a legible 11'X17' copy)

I. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by Engineering Department)

Recommended by:

Rawad Hani
Consultant's Representative Date

5/1/2024
Scoping Agreement Submitted on Date

Scoping Agreement Resubmitted on Date

Approved Scoping Agreement:

City of Menifee Date

Appendix B

VMT Scoping Memorandum

t +1 213 267 2332 | **f** +1 213 318 0744
info@gentecsol.com | www.gentecsol.com
11900 W Olympic Blvd #450, Los Angeles, CA 90064
GTS | General Technologies and Solutions

TRIP GENERATION & SCOPING MEMORANDUM

Date:	April 10, 2024	**GTS:**	240309
From:	Ariel Godwin and Rawad Hani, GTS		
To:	City of Menifee		
Cc:	Chambers Group		
Subject:	**Trip Generation and Scoping – Oak Hills West Tract 38652 (Project Number 21473-001-2.3.1)**		

General Technologies and Solutions (GTS) is pleased to present the Trip Generation and Scoping memorandum for the purposes of the above-mentioned project in the City of Menifee (City). The project involves the construction of a 37-lot subdivision with duplexes (74 units total) on a currently vacant site.

This scoping memorandum consists of a description of the project, estimates of trip generation, trip distribution and assignment, and the proposed intersections and scenarios to be analyzed.

We seek your review and confirmation on behalf of the City to proceed with the traffic impact study.

PROJECT INFORMATION

The Oak Hills West Project (Tract 38652, APN: 341-160-010) proposes the construction of a 37-lot subdivision with duplexes (74 units total) on a 78-acre site at the end of the existing cul-de-sac on Boulder Crest Way, west of Ganymede Way in the City of Menifee. The General Plan and Zoning Designation for the site is 2.1-5 R and LDR-1.

This project will utilize the cluster development provisions of the municipal code to reduce the minimum lot size to 7,200 square feet and preserve 64 acres (roughly 80%) of the site as natural open space to prevent future development of sloped areas. The lot sizes will range from 7,210 to 32,382 square feet. The project site will receive access off Boulder Crest Way and Polaris Drive.

Access to the existing trail system will be preserved as part of the project. Two basins will be located at the southern end of the tract along Boulder Crest Way, directly adjacent to existing residential.

The project location is shown in Exhibit 1.

TRIP GENERATION

Trip generation was calculated using the rates of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition (2021). As shown in Table 1, the project is expected to generate 36 AM peak hour trips (11 inbound and 25 outbound) and 42 PM peak hour trips (24 inbound and 18 outbound).

Table 1. Project Trip Generation

			Daily	AM Peak Hour			PM Peak Hour		
Land Use	**Quantity**	**Units**		**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
Single-family Attached Housing (LUC 215)	74	Dwelling Units	7.2	0.15	0.33	**0.48**	0.32	0.25	**0.57**
Project Trip Generation									
Single-family Attached Housing (LUC 215)	74	Dwelling Units	533	11	25	36	24	18	42
Total Trip Generation			**533**	11	25	**36**	24	18	**42**

Source: Institute of Transportation Engineers (ITE), Trip Generation, 11th Edition, 2021.

TRIP DISTRIBUTION

The distribution of project trips reflects the potential travel patterns and is based on land use patterns, population density, and the existing roadway network. Due to the direct connectivity of Ridgemoor Road (a collector which joins with Valley Boulevard, an arterial, and Murietta Road, a secondary road), it is expected that a large proportion of trips will use Ridgemoor Road via the Boulder Crest Way access rather than the Polaris Drive access which leads into a more convoluted network of neighborhood streets. A map of the project's estimated trip peak hour distribution levels is shown in Exhibit 3. Road classifications are from the City's General Plan, Exhibit C-3.

STUDY INTERSECTIONS

It should be noted that per the City of Menifee *LOS Traffic Study Guidelines* (revised October 2020), the area to be studied "shall generally include streets on which the proposed project will add 50 or more peak hour trips up to a 5-mile radius of the project location." As shown in Table 1, the proposed project adds less than 50 peak hour trips to the surrounding road network.

The study intersections are those that are expected to see the greatest impact from project-generated trips. The following intersections are proposed to be included and are displayed on the map in Exhibit 2.

TMC1: Ganymede Way at Polaris Drive
TMC2: Ridgemoor Road at Boulder Crest Way

TRAFFIC STUDY SCENARIOS

The analysis scenarios included in this scope of work (listed below) conform to the required scenarios in the City of Menifee *LOS Traffic Study Guidelines*.

1) **Existing Conditions** - Existing traffic will be counted to determine current conditions.
2) **Existing Plus Project Conditions** - The "existing plus project" conditions scenario is required to determine the impact of project-generated traffic added to the existing traffic volumes.
3) **Opening Year Cumulative Without Project Conditions** - Traffic conditions at the time the proposed development would be completed.
4) **Opening Year Cumulative With Project Conditions** - Traffic conditions with the completion of the proposed development, with project-related trips added to the Opening Year Without Project traffic volumes.
5) **Phased Projects** – The proposed project is not phased, so this is not applicable.
6) **Horizon Year Conditions** – the proposed project does not include a General Plan Amendment (GPA), Specific Plan (SP), or Specific Plan Amendment (SPA), therefore this is not applicable.

EXHIBITS

Exhibit 1. Project location within the City of Menifee
Exhibit 2. Project vicinity and study intersections
Exhibit 3. Trip Distribution

Exhibit 1. Project location within the City of Menifee

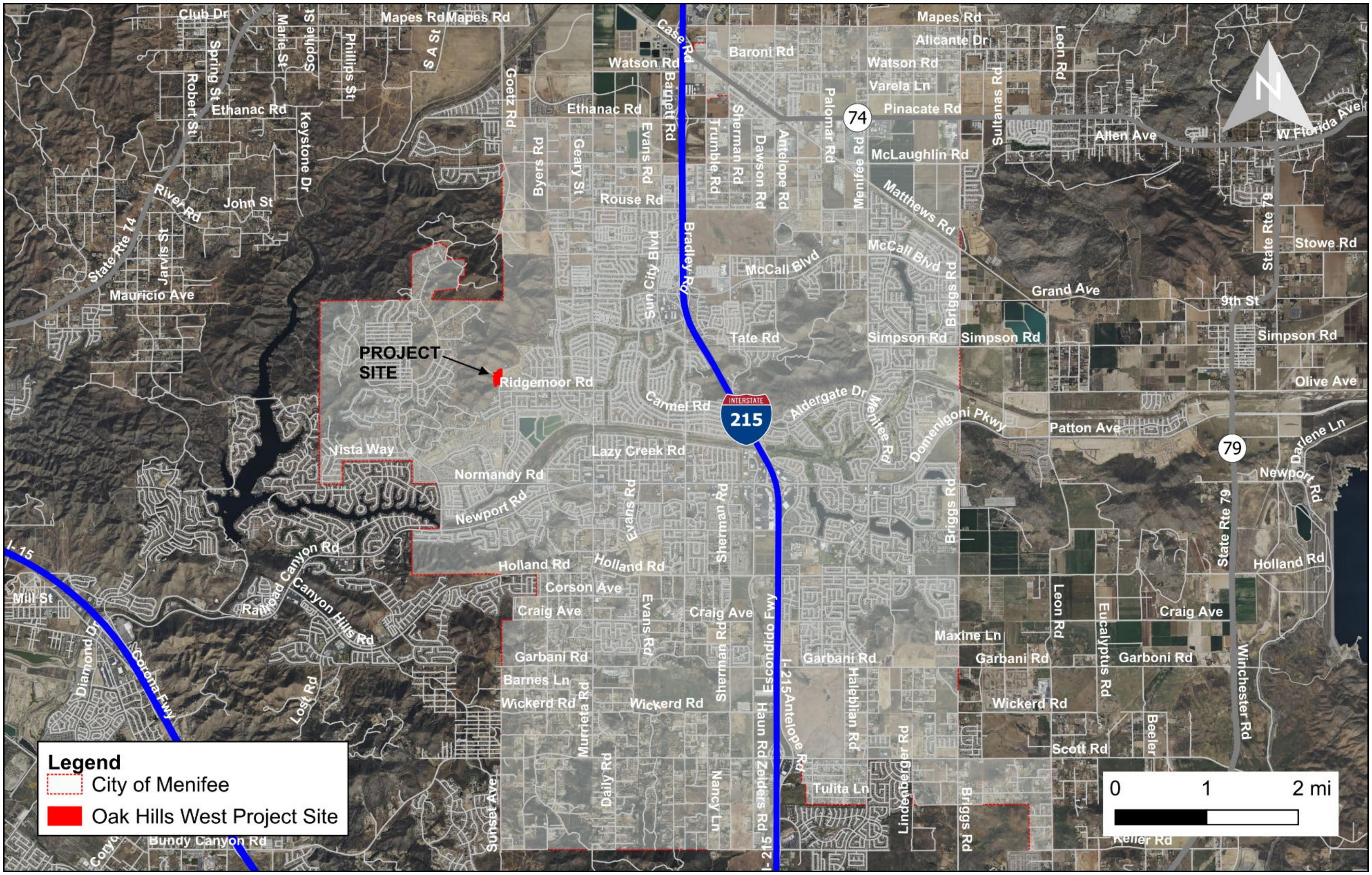


Exhibit 2. Project vicinity and study intersections

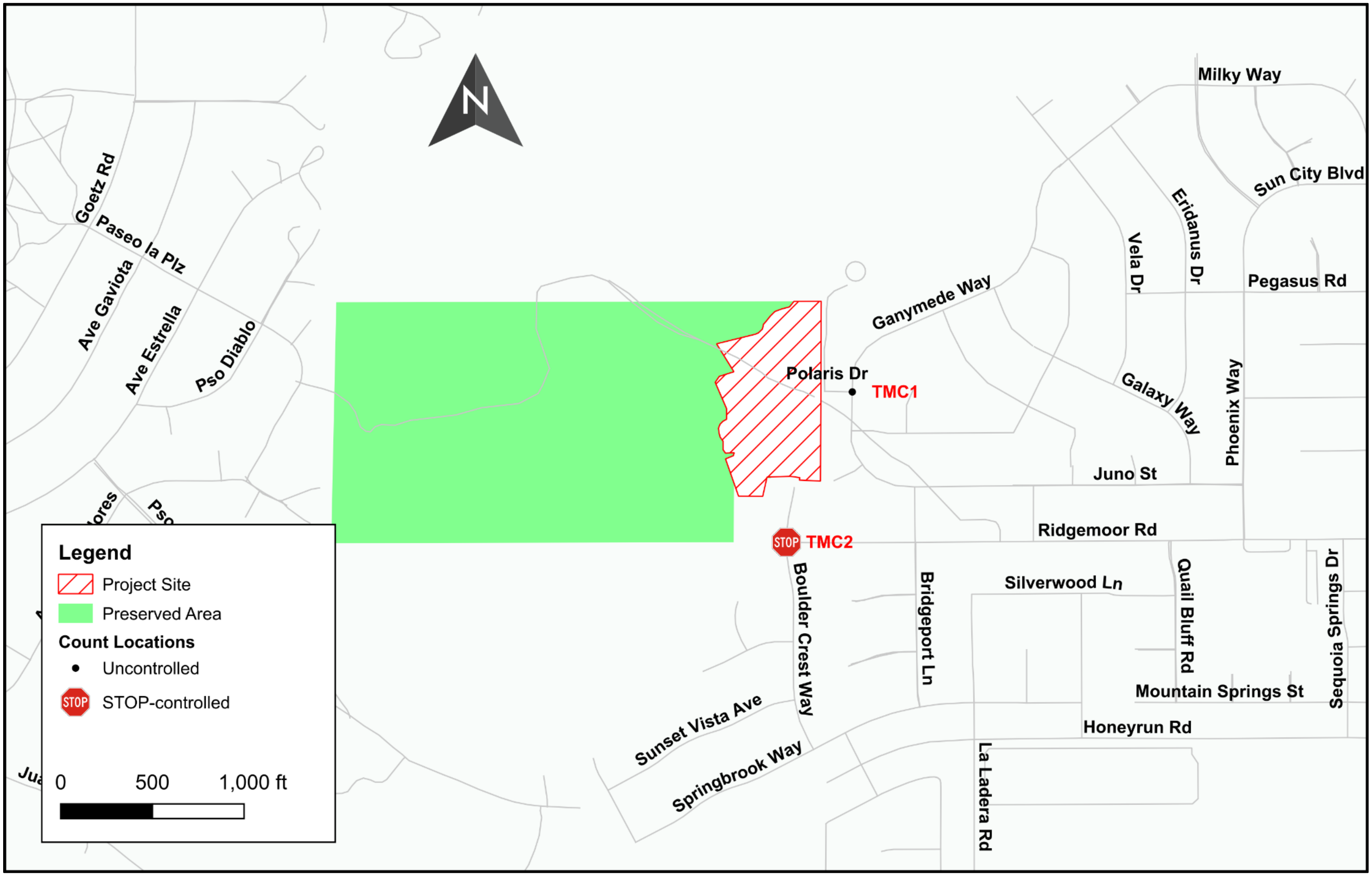
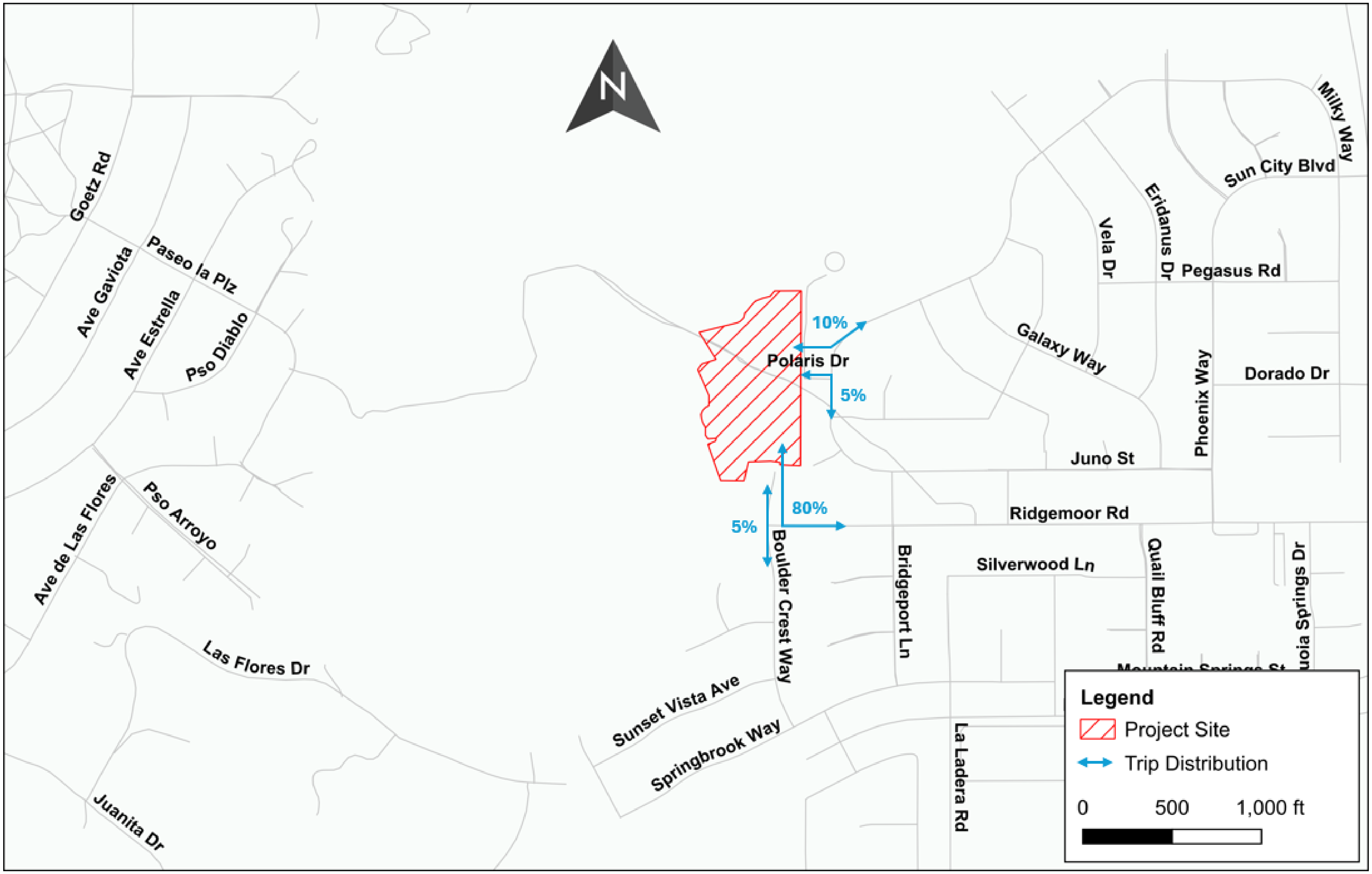


Exhibit 3. Trip Distribution



Appendix C

Project Site Drawings

IN THE CITY OF MENIFFE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

PROPERTY BOUNDARY EXHIBIT

OAK HILLS WEST

TENTATIVE TRACT MAP 38652

LEGEND

PROPERTY LINE	P/L	———
RIGHT OF WAY	R/W	— - — - —
CENTER LINE	C/L	—— — ——
TRACT BOUNDARY		—— - - ——

SCALE: 1" = 100'

PROPERTY BOUNDARY EXHIBIT

PLANS PREPARED BY:

adkan ENGINEERS

Civil Engineering.Surveying.Planning

6879 Airport Drive, Riverside, CA 92504

Tel:(951) 688-0241 · Fax:(951) 688-0599

Plot Date: 11/15/2023

U:\Projects\WD Land\10340\exhibits\PL EXHIBIT.dwg

IN THE CITY OF MENIFEE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

TENTATIVE TRACT NO 38652 & CONCEPTUAL GRADING

LOT SUMMARY TABLE		
LOT NUMBER	LOT AREA (SF)	NET USABLE PAD AREA (SF)
1	9,172	9,173
2	9,172	9,173
3	9,172	9,173
4	8,015	8,016
5	8,572	8,573
6	8,589	5,187
7	7,458	5,993
8	7,279	5,582
9	7,746	6,532
10	12,370	9,200
11	17,971	6,930
12	12,702	6,030
13	14,344	8,385
14	10,597	6,595
15	11,603	6,020
16	10,656	5,570
17	10,656	5,292
18	10,656	5,440
19	9,895	5,340
20	8,376	5,880
21	7,665	5,390
22	7,665	5,690
23	7,665	6,090
24	7,377	6,855
25	11,295	8,985
26	10,484	6,670
27	12,273	5,970
28	25,738	8,425
29	16,969	4,858
30	10,192	7,993
31	11,061	6,950
32	8,918	6,282
33	7,210	6,100
34	7,316	6,070
35	11,733	6,140
36	10,074	5,500
37	10,128	5,410

EASEMENT NOTES

EXISTING EASEMENTS:

1. EXISTING EASEMENT FOR ROAD AND TRAIL PURPOSES PER BOOK 1855, PAGE 201, 1-30-1956 CANNOT BE LOCATED FROM THE RECORD.
2. EXISTING 25' EASEMENT IN FAVOR OF EMWD PER INST. NO. 115162 RECORDED NOV. 27, 1968
3. EXISTING 10' EASEMENT IN FAVOR OF SCE PER INST. NO. 49689 RECORDED MAR. 20, 1981
4. EXISTING 12' EASEMENT FOR TRAIL AND DRAINAGE PER RECORDED TR 28859 FINAL MAP.
5. EXISTING DRAINAGE EASEMENT PER INST. NO. 2001-6466T16 RECORDED DEC. 28, 2001
6. EXISTING DRAINAGE EASEMENT PER INST. NO. 2008-0460063 RECORDED AUG. 20, 2008
7. EXISTING EMWD EASEMENT PER INST. NO. 1968-115162 RECORDED NOV. 27, 1968.
8. EXISTING EASEMENT CENTERLINE IN FAVOR OF CALIFORNIA ELECTRIC POWER COMPANY PER BOOK 901, PAGE 493 OF RECORD OF RIVERSIDE COUNTY
9. EXISTING DRAINAGE EASEMENT PER INST. 2019-062429 RECORDED MAY 09, 2019.
10. EXISTING EASEMENT IN FAVOR SCE PER INST. NO. 2021-0581349 RECORDED SEP. 30, 2021

RESIDENTIAL UNITS: 74 (DUPLEX)
PROPOSED BELOW MARKETS UNITS: 0

OPEN SPACE LOTS			
LOT NUMBER	LOT AREA (SF)	MAINTENANCE / USE	
A	3,933	WATER QUALITY	HOA
B	14,745	WATER QUALITY	HOA
C	12,541	SLOPE	HOA
D	2,761,276	OPEN SPACE	CFD
E	2,821	OPEN SPACE	HOA
F	847	OPEN SPACE	HOA
G	6,327	OPEN SPACE	HOA
H	12,600	OPEN SPACE	HOA
I	14,504	OPEN SPACE	HOA
J	3,858	DRAINAGE	HOA
K	6,218	DRAINAGE	HOA
L	2,341	OPEN SPACE	HOA

LEGEND

PROP DOMESTIC WATER	DW
PROPOSED RECLAIMED WATER	RW
PROPOSED SEWER	S
PROPOSED STORM DRAIN	
EXISTING EDGE OF PAVEMENT	
PROPOSED PADS	
PROPOSED LOT LINES	
PROPOSED EASEMENTS	
TRACT BOUNDARY	
RIGHT OF WAY	
RETAINING WALL	
PRIVACY BLOCK WALL	
PRIVACY VINYL FENCE	
TUBULAR STEEL VIEW FENCE	
STREETLIGHT	

SD = STORM DRAIN
TC = TOP OF CURB
FS = FINISH SURFACE
SWR = SEWER
TF= TOP OF FOOTING
TW= TOP OF WALL
CL = CENTER LINE
FG = FINISHED GROUND
WTR= WATER
E/P = EDGE OF PAVEMENT
P/L = PROPERTY LINE
R/W = RIGHT OF WAY
O.S.= OPEN SPACE
EX.= EXISTING

PROP.= PROPOSED
EVC=END OF VERTICAL CURVE
BVC = BEGINNING OF VERTICAL CURVE
A.R = A.D.A ACCESS RAMP
SW = SIDEWALK
( ) = EXISTING ELEVATION
C&G = CURB AND GUTTER
S.F. = SQUARE FEET
FS = FINISH SURFACE
FH = FIRE HYDRANT
CFD = HOME OWNERS ASSOCIATION

LEGAL DESCRIPTION

PROJECT IS LOCATED IN WITHIN A VERY HIGH FIRE SEVERITY ZONE - LRA

REAL PROPERTY IN THE CITY OF MENIFEE, COUNTY OF RIVERSIDE, STATE OF CALIFRONIA, DESCRIBED AS FOLLOWS:

PARCEL 1:
PARCEL A AS SHOWN ON LOT LINE ADJUSTMENT NO. 4592, AS EVIDENCED BY DOCUMENT RECORDED AUGUST 12, 2003 AS INSTRUMENT NO. 2003-612936 OF OFFICIAL RECORDS, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

THE SOUTH 1/2 OF THE SOUTHEAST 1/4 OF SECTION 30, TOWNSHIP 5 SOUTH, RANGE 3 WEST, SAN BERNARDINO BASE AND MERIDIAN.

EXCEPTING THAT PORTION DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 30;

THENCE ALONG THE SOUTH LINE OF SAID SECTION 30 NORTH 89°42'34" WEST A DISTANCE OF 480.00 FEET;

THENCE NORTH 00°46'22" EAST A DISTANCE OF 350.00 FEET;

THENCE ON A LINE PARALLEL WITH AND 349.99 FEET DISTANT FROM THE SOUTHERLY LINE OF SAID SECTION 30 SOUTH 89°42'34" EAST A DISTANCE OF 200.00 FEET;

THENCE LEAVING SAID PARALLEL LINE NORTH 50°02'07" EAST A DISTANCE OF 86.00 FEET;

THENCE ON A LINE PARALLEL WITH AND 405.56 FEET DISTANT FROM THE SOUTHERLY LINE OF SAID SECTION 30 SOUTH 89°42'34" EAST A DISTANCE OF 97.00 FEET;

THENCE LEAVING SAID PARALLEL LINE SOUTH 54°08'17" EAST A DISTANCE OF 144.00 FEET TO A POINT ON THE EAST LINE OF SAID SECTION 30;

THENCE ALONG THE EAST LINE OF SAID SECTION 30 SOUTH 00°46'22" WEST A DISTANCE OF 321.80 FEET TO THE "POINT OF BEGINNING".

TOGETHER WITH A PARCEL OF LAND BEING A PORTION OF THE SOUTH 1/2 OF THE SOUTHEAST 1/4 OF SECTION 30, TOWNSHIP 5 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 30;

THENCE ALONG THE SOUTH LINE OF SAID SECTION 30 NORTH 89° 42' 34" WEST A DISTANCE OF 480.00 FEET;

THENCE NORTH 00° 46' 22" EAST A DISTANCE OF 350.00 FEET;

THENCE ON A LINE PARALLEL WITH AND 349.99 FEET DISTANT FROM THE SOUTHERLY LINE OF SAID SECTION 30 SOUTH 89° 42' 34" EAST A DISTANCE OF 200.00 FEET;

THENCE LEAVING SAID PARALLEL LINE NORTH 50° 02' 07" EAST A DISTANCE OF 86.00 FEET;

THENCE ON A LINE PARALLEL WITH AND 405.56 FEET DISTANT FROM THE SOUTHERLY LINE OF SAID SECTION 30 SOUTH 89° 42' 34" EAST A DISTANCE OF 97.00 FEET;

THENCE LEAVING SAID PARALLEL LINE SOUTH 54° 08' 17" EAST A DISTANCE OF 144.00 FEET TO A POINT ON THE EAST LINE OF SAID SECTION 30;

THENCE ALONG THE EAST LINE OF SAID SECTION 30 SOUTH 00° 46' 22" WEST A DISTANCE OF 321.80 FEET TO THE "POINT OF BEGINNING".

PURSUANT TO LOT LINE ADJUSTMENT NO. 4592 RECORDED AUGUST 12, 2003 AS INSTRUMENT NO. 612936, OFFICIAL RECORDS.

EXCEPT THEREFROM ALL THAT PROPERTY LYING WITHIN THE BOUNDARIES OF TRACT 28920-1, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 353, PAGES 8 THROUGH 13, INCLUSIVE OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL 2:
AN EASEMENT FOR ROADWAY PURPOSES AS PER THAT CERTAIN AGREEMENT RECORDED NOVEMBER 21, 1969 AS INSTRUMENT NO. 120107 OF OFFICIAL RECORDS.

PROJECT NOTES

ALL STREETS HEREON SHALL BE PUBLIC
STREET GRADES AT A MINIMUM OF 0.5%
ALL CONCRETE GUTTERS AND SWALES SHALL HAVE A MINIMUM GRADE OF 0.5%
CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, HE/SHE WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

MINIMUM LOT STANDARDS AND SETBACKS

MINIMUM LOT SIZE: 7200 S.F., MODIFIED FROM 10,000 S.F. PER CLUSTER ORDINANCE
MINIMUM LOT WIDTH: 60'
MINIMUM LOT DEPTH: 100'
MINIMUM FRONTAGE: 40' STANDARD, 35' ON CUL DE SACS AND KNUCKLES, 20' FOR FLAG LOTS
FRONT YARD SETBACK: 15'
GARAGE SETBACK: 20'
CORNER LOT SIDEYARD SETBACK: 15'
INTERIOR LOT SIDEYARD SETBACK: 5'
REAR YARD: 10'
BUILDING HEIGHT: 40'
BUILDING COVERAGE: 50%
OPEN SPACE: 30%

FEMA FLOOD ZONE

AREA IS NOT LOCATED ON A FLOOD ZONE

RIVERSIDE COUNTY CALFIRE

FIRE HAZARD CLASSIFICATION (ORD. 787): VERY HIGH
CALFIRE LRA: LOCAL RESPONSIBILITY AREA

PLANNING

PROJECT SITE NOT LOCATED IN A SPECIFIC PLAN AREA.
PROJECT SITE NOT LOCATED IN A HAZARDOUS WASTE SITE

HYDROLOGY

PROJECT SITE LOCATED OUTSIDE FLOODPLAIN
WATERSHED: SAN JACINTO VALLEY

GEOLOGY*

FAULT ZONE: PROJECT SITE NOT LOCATED IN A FAULT ZONE
LIQUEFACTION: VERY LOW POTENTIAL
*SEE SOIL REPORT FOR ADDITIONAL INFORMATION

PERMIT HISTORY

ROUGH GRADE TR 28920-1	BGR020798	FINAL
ROUGH GRADE TR 28920 LOTS 1-40	BGR041995	EXPIRED

OWNER

OAK HILLS WEST, LLC.
2922 DAIMIER STREET
SANTA ANA, CA 92705

APPLICANT

OAK HILLS WEST, LLC.
2922 DAIMIER STREET
SANTA ANA, CA 92705

ENGINEER

ADKAN ENGINEERS
6879 AIRPORT DRIVE
RIVERSIDE, CA. 92504
951-688-0241

GEOTECHNICAL

GEOSOILS, INC.
18451 COLLIER AVE, SUITE A
LAKE ELSINORE, CA 92530
951-471-0700
REPORT: W.O. 8482-A-SC

UTILITY PURVEYORS

WATER:	EASTERN MUNICIPAL WATER DISTRICT
SEWER:	EASTERN MUNICIPAL WATER DISTRICT
GAS:	SOUTHERN CALIFORNIA GAS COMPANY
ELECTRICITY:	SOUTHERN CALIFORNIA EDISON
TELEPHONE:	VERIZON
SCHOOL:	MENIFEE UNION & PERRIS UNION HIGH
CATV:	TIME WARNER CABLE

EARTHWORK QUANTITIES

CUT: **108,500 CY** FILL: **45,700 CY** NET: **62,800 CY EXPORT**
THE QUANTITY SHOWN ABOVE IS FOR DISCUSSION PURPOSES ONLY.

ASSESSORS PARCEL NUMBERS

341-160-010 AND 341-160-012
LISTED PARCELS OWNED BY OAK HILLS WEST, LLC
PROJECT IS LOCATED WITHIN A VERY HIGH FIRE SEVERITY ZONE - LRA

TENTATIVE TRACT SUMMARY

TOTAL GROSS AREA:	78.00+/- ACRES
TOTAL NET AREA:	14.416+/- ACRES
EXISTING ZONING:	LDR-1 (10,000 S.F.)
PROPOSE ZONING:	LDR-1 (10,000 S.F.
EXISTING GENERAL PLAN LAND USE:	2.1-5 R
PROPOSED GENERAL PLAN LAND USE:	2.1-5 R
MINIMUM LOT SIZE:	7,200 SF PER CLUSTERING ORDINANCE OVER 25% OF SITE IS PRESERVED.
MAXIMUM LOT SIZE:	15,807 SF
AVERAGE LOT SIZE:	10,650 SF
ALLOWABLE DENSITY PER NET ACREAGE:	2.1 - 5 R
PROPOSED DENSITY PER NET ACREAGE:	2.75 DU/AC
NO. OF RESIDENTIAL LOTS:	37

BASIS OF BEARINGS:

THE CENTERLINE OF RIDGEMOOR ROAD BEING NORTH 89°58'52" WEST PER TRACT NO. 28920-1, FILED IN BOOK 353 OF MAPS, AT PAGES 8 THROUGH 13, INCLUSIVE, RECORDS OF RIVERSIDE COUNTY, WAS HELD AS THE BASIS OF BEARINGS FOR THIS MAP.

BENCHMARK:

M-18-63
BRASS DISK MARKED "M-18-63" SET IN 8"X36" CONCRETE HEADWALL AT THE SOUTH END OF THE WALL 175' NORTH OF THE CENTERLINE OF RIDGEMOOR ROAD AND 42' WEST OF THE CENTERLINE OF MURRIETA ROAD.
ELEVATION: 1413.272' NGVD 1929

PROPOSED IMPROVEMENT SCHEDULE

ROUGH GRADING
SEWER AND WATER IMPROVEMENTS
STREET AND STORM DRAIN IMPROVEMENTS
PRECISE GRADING

HILLSIDE DEVELOPMENT STANDARDS

THIS DEVELOPMENT MAINTAINS A MINIMUM O 50 FEET FROM THE TOP OF ANY STEEP SLOPE OR HILLSIDE AND IS NO CLOSET THAN 200 FEET HORIZONTALLY AND 50 FEET VERTICALLY FROM PROMINENT RIDGELINES. ORDINANCE 9.190

REVISIONS	
DELTA	DESCRIPTION

TENTATIVE TRACT NO. 38652
& CONCEPTUAL GRADING
PREPARATION DATE : MARCH 2023

adkan ENGINEERS
Civil Engineering · Surveying · Planning
6879 Airport Drive, Riverside, CA 92504
Tel:(951) 688-0241 · Fax:(951) 688-0599

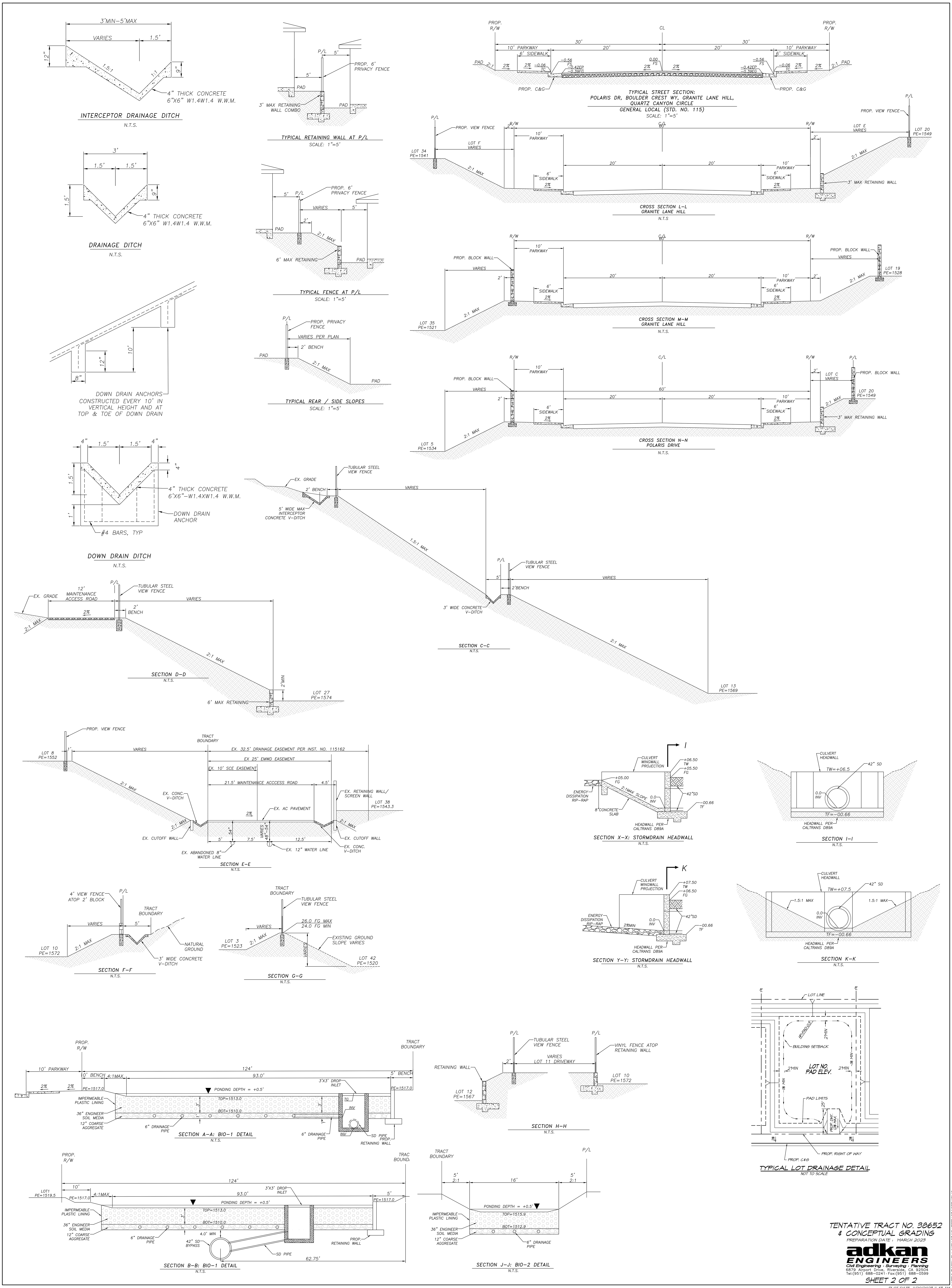
SHEET 1 OF 2

PLOT DATE: 11/20/2023 11:43 AM

U:\PROJECTS\WD LAND\10340\XREF\10340TTM.DWG

Appendix D

Traffic Counts



INTERCEPTOR DRAINAGE DITCH
N.T.S.
3'MIN-5'MAX
VARIES
1.5'
4" THICK CONCRETE
6"X6" W1.4W1.4 W.W.M.
DRAINAGE DITCH
N.T.S.
DOWN DRAIN ANCHORS CONSTRUCTED EVERY 10' IN VERTICAL HEIGHT AND AT TOP & TOE OF DOWN DRAIN
DOWN DRAIN DITCH
N.T.S.
4" THICK CONCRETE
6"X6"-W1.4XW1.4 W.W.M.
DOWN DRAIN ANCHOR
#4 BARS, TYP
TYPICAL RETAINING WALL AT P/L
SCALE: 1"=5'
PROP. 6' PRIVACY FENCE
3' MAX RETAINING WALL COMBO
TYPICAL FENCE AT P/L
SCALE: 1"=5'
6' MAX RETAINING
TYPICAL REAR / SIDE SLOPES
SCALE: 1"=5'
PROP. PRIVACY FENCE
VARIES PER PLAN
2' BENCH
TYPICAL STREET SECTION:
POLARIS DR, BOULDER CREST WY, GRANITE LANE HILL, QUARTZ CANYON CIRCLE
GENERAL LOCAL (STD. NO. 115)
SCALE: 1"=5'
PROP. R/W
10' PARKWAY
6' SIDEWALK
PROP. C&G
CROSS SECTION L-L
GRANITE LANE HILL
N.T.S.
LOT 34 PE=1541
LOT 20 PE=1549
PROP. VIEW FENCE
3' MAX RETAINING WALL
CROSS SECTION M-M
GRANITE LANE HILL
N.T.S.
LOT 35 PE=1521
LOT 19 PE=1528
PROP. BLOCK WALL
CROSS SECTION N-N
POLARIS DRIVE
N.T.S.
LOT 5 PE=1534
LOT 20 PE=1549
SECTION C-C
N.T.S.
TUBULAR STEEL VIEW FENCE
EX. GRADE
5' WIDE MAX INTERCEPTOR CONCRETE V-DITCH
3' WIDE CONCRETE V-DITCH
LOT 13 PE=1569
SECTION D-D
N.T.S.
12' MAINTENANCE ACCESS ROAD
LOT 27 PE=1574
6' MAX RETAINING
SECTION E-E
N.T.S.
LOT 8 PE=1552
TRACT BOUNDARY
EX. 32.5' DRAINAGE EASEMENT PER INST. NO. 115162
EX 25' EMWD EASEMENT
EX. 10' SCE EASEMENT
21.5' MAINTENANCE ACCCESS ROAD
EX. RETAINING WALL/ SCREEN WALL
LOT 38 PE=1543.3
EX. CONC. V-DITCH
EX. AC PAVEMENT
EX. CUTOFF WALL
EX. ABANDONED 8" WATER LINE
EX. 12" WATER LINE
SECTION F-F
N.T.S.
4' VIEW FENCE ATOP 2' BLOCK
LOT 10 PE=1572
NATURAL GROUND
3' WIDE CONCRETE V-DITCH
SECTION G-G
N.T.S.
LOT 3 PE=1523
26.0 FG MAX
24.0 FG MIN
EXISTING GROUND SLOPE VARIES
LOT 42 PE=1520
SECTION X-X: STORMDRAIN HEADWALL
N.T.S.
SECTION I-I
N.T.S.
SECTION Y-Y: STORMDRAIN HEADWALL
N.T.S.
SECTION K-K
N.T.S.
HEADWALL PER CALTRANS D89A
ENERGY DISSIPATION RIP-RAP
CULVERT WINGWALL PROJECTION
42" SD
SECTION A-A: BIO-1 DETAIL
N.T.S.
PONDING DEPTH = +0.5'
IMPERMEABLE PLASTIC LINING
36" ENGINEER SOIL MEDIA
12" COARSE AGGREGATE
6" DRAINAGE PIPE
3'X3' DROP INLET
PROP. RETAINING WALL
SECTION H-H
N.T.S.
LOT 12 PE=1567
LOT 11 DRIVEWAY
VINYL FENCE ATOP RETAINING WALL
LOT 10 PE=1572
TYPICAL LOT DRAINAGE DETAIL
NOT TO SCALE
LOT NO. PAD ELEV.
BUILDING SETBACK
PAD LIMITS
PROP. RIGHT OF WAY
SECTION B-B: BIO-1 DETAIL
N.T.S.
42" SD BYPASS
SECTION J-J: BIO-2 DETAIL
N.T.S.
TENTATIVE TRACT NO. 38652
& CONCEPTUAL GRADING
PREPARATION DATE : MARCH 2023
adkan ENGINEERS
Civil Engineering · Surveying · Planning
6879 Airport Drive, Riverside, CA 92504
Tel:(951) 688-0241 · Fax:(951) 688-0599
SHEET 2 OF 2
PLOT DATE: 11/20/2023 11:43 AM

INTERSECTION TURNING MOVEMENT COUNTS

T012524

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Menifee	PROJECT #:	SC4755
Thu, Jun 6, 24	NORTH & SOUTH:	Ganymede Way	LOCATION #:	1
	EAST & WEST:	Polaris Dr	CONTROL:	STOP E

NOTES:

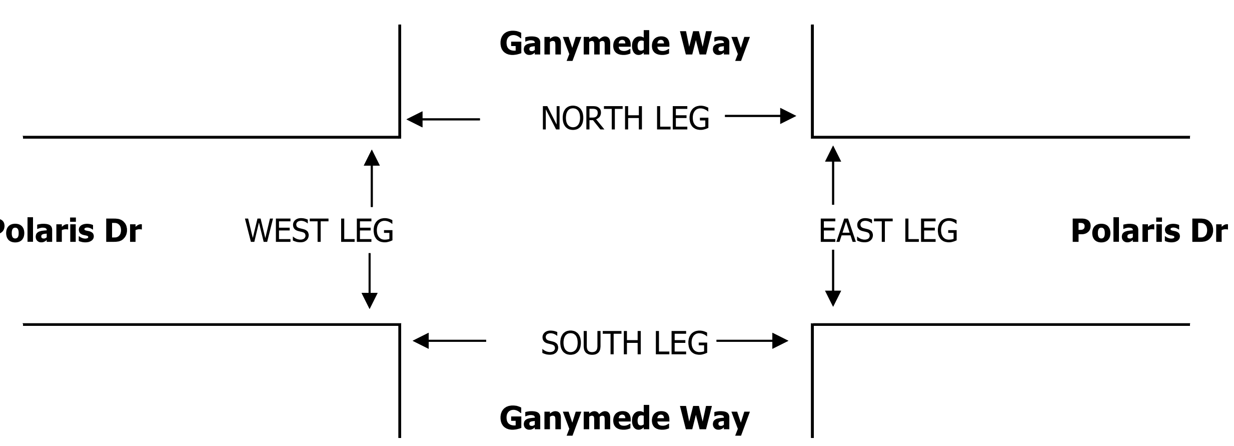
AM
PM
MD
OTHER
OTHER

▲ N
◄ W E ►
S ▼

		NORTHBOUND Ganymede Way			SOUTHBOUND Ganymede Way			EASTBOUND Polaris Dr			WESTBOUND Polaris Dr			
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	LANES:	0	1	X	X	1	0	0	X	0	X	X	X	
AM	7:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
AM	7:15 AM	0	1	0	0	2	0	0	0	0	0	0	0	3
AM	7:30 AM	0	2	0	0	7	0	0	0	0	0	0	0	9
AM	7:45 AM	0	2	0	0	1	0	0	0	0	0	0	0	3
AM	8:00 AM	0	2	0	0	1	0	0	0	0	0	0	0	3
AM	8:15 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
AM	8:30 AM	0	1	0	0	2	0	0	0	0	0	0	0	3
AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
AM	VOLUMES	0	8	0	0	17	0	0	0	0	0	0	0	26
AM	APPROACH %	0%	100%	0%	0%	94%	0%	0%	0%	0%	0%	0%	0%	
AM	APP/DEPART	8	/	9	18	/	17	0	/	0	0	/	0	0
AM	BEGIN PEAK HR		7:15 AM											
AM	VOLUMES	0	7	0	0	11	0	0	0	0	0	0	0	19
AM	APPROACH %	0%	100%	0%	0%	92%	0%	0%	0%	0%	0%	0%	0%	
AM	PEAK HR FACTOR		0.875			0.429			0.000			0.000		0.528
AM	APP/DEPART	7	/	8	12	/	11	0	/	0	0	/	0	0
PM	4:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
PM	4:15 PM	0	0	0	0	3	0	0	0	0	0	0	0	3
PM	4:30 PM	0	0	0	0	2	1	0	0	0	0	0	0	3
PM	4:45 PM	1	1	0	0	3	0	0	0	0	0	0	0	5
PM	5:00 PM	0	3	0	0	1	0	0	0	1	0	0	0	5
PM	5:15 PM	0	2	0	0	3	0	0	0	0	0	0	0	5
PM	5:30 PM	0	2	0	0	1	0	0	0	0	0	0	0	3
PM	5:45 PM	0	3	0	0	2	0	0	0	0	0	0	0	5
PM	VOLUMES	1	14	0	0	15	1	0	0	1	0	0	0	32
PM	APPROACH %	7%	93%	0%	0%	94%	6%	0%	0%	100%	0%	0%	0%	
PM	APP/DEPART	15	/	14	16	/	16	1	/	0	0	/	2	0
PM	BEGIN PEAK HR		5:00 PM											
PM	VOLUMES	0	10	0	0	7	0	0	0	1	0	0	0	18
PM	APPROACH %	0%	100%	0%	0%	100%	0%	0%	0%	100%	0%	0%	0%	
PM	PEAK HR FACTOR		0.833			0.583			0.250			0.000		0.900
PM	APP/DEPART	10	/	10	7	/	8	1	/	0	0	/	0	0

U-TURNS

	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	1	0	0	1
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	1	0	0	1
PEAK HR VOLUMES	0	1	0	0	
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	0	0	0	0	0
PEAK HR VOLUMES	0	0	0	0	



		ALL PED + BIKE & SCOOTER					PEDESTRIAN CROSSINGS					BICYCLE & SCOOTER CROSSINGS				
		N LEG	S LEG	E LEG	W LEG	TOTAL	N LEG	S LEG	E LEG	W LEG	TOTAL	NL	SL	EL	WL	TOTAL
AM	7:00 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
AM	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM	7:30 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1
AM	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM	8:00 AM	0	2	0	0	2	0	2	0	0	2	0	0	0	0	0
AM	8:15 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
AM	8:30 AM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
AM	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM	TOTAL	0	2	0	4	6	0	2	0	3	5	0	0	0	1	1
	BEGIN PEAK HR			7:15 AM			0	2	0	0	2					
PM	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	5:00 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
PM	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	5:30 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0
PM	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	TOTAL	0	0	0	2	2	0	0	0	2	2	0	0	0	0	0
	BEGIN PEAK HR			5:00 PM			0	0	0	2	2					

AimTD LLC

TURNING MOVEMENT COUNTS

Menifee

SC4755

ALL HOURS

Ganymede Way (north)

34	**1**	**32**	**0**	**TOTAL**
16	1	15	0	**PM**
18	0	17	0	**AM**

TOTAL	**23**
PM	14
AM	9

Polaris Dr (west)

TOTAL	**PM**	**AM**
2	2	0
0	0	0
0	0	0
1	1	0
1	**1**	**0**

Polaris Dr (east)

AM	**PM**	**TOTAL**
0	**0**	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**

Ganymede Way (south)

AM	17
PM	16
TOTAL	**33**

AM	0	8	0	**8**
PM	1	14	0	**15**
TOTAL	**1**	**22**	**0**	**23**

PEAK HOUR

AM 7:15 AM

PM 5:00 PM

Ganymede Way (north)

19	**0**	**18**	**0**	**TOTAL**
7	0	7	0	**PM**
12	0	11	0	**AM**

TOTAL	**18**
PM	10
AM	8

Polaris Dr (west)

TOTAL	**PM**	**AM**
0	0	0
0	0	0
0	0	0
1	1	0
1	**1**	**0**

Polaris Dr (east)

AM	**PM**	**TOTAL**
0	**0**	**0**
0	0	**0**
0	0	**0**
0	0	**0**
0	0	**0**

Ganymede Way (south)

AM	11
PM	8
Total	**19**

AM	0	7	0	**7**
PM	0	10	0	**10**
Total	**0**	**17**	**0**	**17**

INTERSECTION TURNING MOVEMENT COUNTS

T012524

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Menifee	PROJECT #:	SC4755
Thu, Jun 6, 24	NORTH & SOUTH:	Boulder Crest Way	LOCATION #:	2
	EAST & WEST:	Ridgemoor Rd	CONTROL:	STOP W

NOTES:

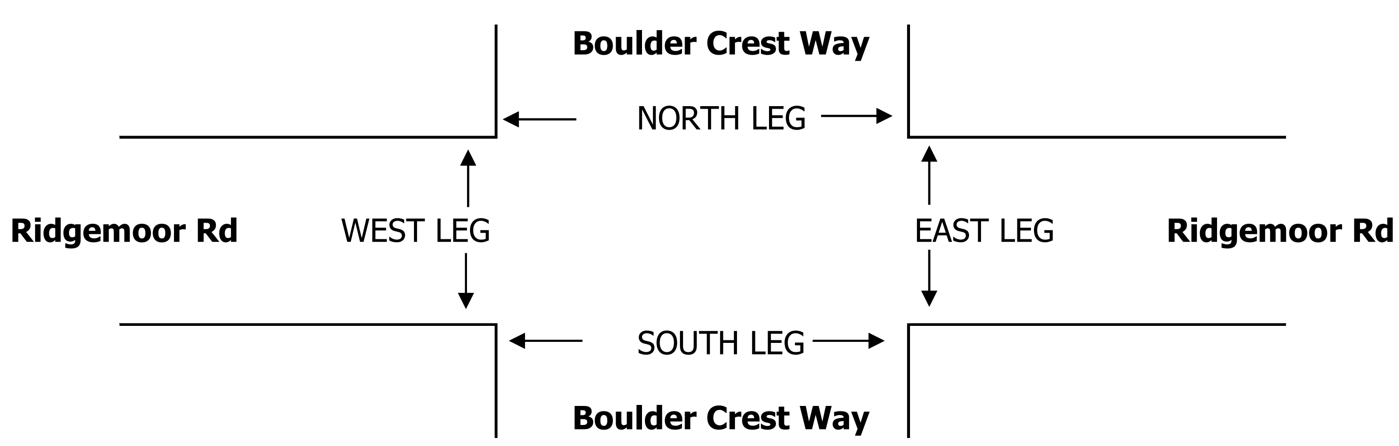
AM
PM
MD
OTHER
OTHER

▲ N
◄ W E ►
S ▼

	NORTHBOUND Boulder Crest Way			SOUTHBOUND Boulder Crest Way			EASTBOUND Ridgemoor Rd			WESTBOUND Ridgemoor Rd			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	X	1	0	0	1	X	X	X	X	0	X	0	
AM 7:00 AM	0	0	2	0	0	0	0	0	0	3	0	0	5
7:15 AM	0	0	4	0	0	0	0	0	0	1	0	1	6
7:30 AM	0	0	7	2	1	0	0	0	0	4	0	1	15
7:45 AM	0	0	3	0	1	0	0	0	0	6	0	1	11
8:00 AM	0	1	1	0	0	0	0	0	0	1	0	1	4
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
8:30 AM	0	0	2	0	0	0	0	0	0	1	0	0	3
8:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
VOLUMES	0	1	20	2	2	0	0	0	0	17	0	4	46
APPROACH %	0%	5%	95%	50%	50%	0%	0%	0%	0%	81%	0%	19%	
APP/DEPART	21	/	5	4	/	19	0	/	22	21	/	0	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	0	0	16	2	2	0	0	0	0	14	0	3	37
APPROACH %	0%	0%	100%	50%	50%	0%	0%	0%	0%	82%	0%	18%	
PEAK HR FACTOR		0.571			0.333			0.000			0.607		0.617
APP/DEPART	16	/	3	4	/	16	0	/	18	17	/	0	0
PM 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	1	0	0	0	0	1	0	1	4
4:30 PM	0	1	2	0	1	0	0	0	0	2	0	0	6
4:45 PM	0	0	1	0	0	0	0	0	0	7	0	0	8
5:00 PM	0	0	3	0	0	0	0	0	0	3	0	0	6
5:15 PM	0	0	0	0	0	0	0	0	0	4	0	0	4
5:30 PM	0	0	4	1	0	0	0	0	0	5	0	1	11
5:45 PM	0	0	3	0	0	0	0	0	0	0	0	0	3
VOLUMES	0	1	14	1	2	0	0	0	0	22	0	2	43
APPROACH %	0%	7%	93%	33%	67%	0%	0%	0%	0%	88%	0%	8%	
APP/DEPART	15	/	3	3	/	24	0	/	16	25	/	0	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	0	0	8	1	0	0	0	0	0	19	0	1	29
APPROACH %	0%	0%	100%	100%	0%	0%	0%	0%	0%	95%	0%	5%	
PEAK HR FACTOR		0.500			0.250			0.000			0.714		0.659
APP/DEPART	8	/	1	1	/	19	0	/	9	20	/	0	0

U-TURNS

	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
VOLUMES	0	0	0	0	0
PEAK HR VOLUMES	0	0	0	0	
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	1	1
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
VOLUMES	0	0	0	1	1
PEAK HR VOLUMES	0	0	0	0	



ALL PED + BIKE & SCOOTER

	N LEG	S LEG	E LEG	W LEG	TOTAL
AM 7:00 AM	0	0	0	0	0
7:15 AM	0	0	2	0	2
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	1	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL	0	0	3	0	3
BEGIN PEAK HR			7:00 AM		
PM 4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	2	0	4	0	6
5:45 PM	0	0	0	0	0
TOTAL	2	0	4	0	6
BEGIN PEAK HR			4:45 PM		

PEDESTRIAN CROSSINGS

	N LEG	S LEG	E LEG	W LEG	TOTAL
AM 7:00 AM	0	0	0	0	0
7:15 AM	0	0	2	0	2
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL	0	0	2	0	2
BEGIN PEAK HR	0	0	2	0	2
PM 4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	2	0	4	0	6
5:45 PM	0	0	0	0	0
TOTAL	2	0	4	0	6
BEGIN PEAK HR	2	0	4	0	6

BICYCLE & SCOOTER CROSSINGS

	NL	SL	EL	WL	TOTAL
AM 7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	1	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL	0	0	1	0	1
BEGIN PEAK HR					
PM 4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL	0	0	0	0	0

AimTD LLC

TURNING MOVEMENT COUNTS

Menifee — SC4755 — ALL HOURS

Boulder Crest Way (north leg)

					Departing
TOTAL	7	0	4	3	8
PM	3	0	2	1	3
AM	4	0	2	2	5

Ridgemoor Rd (west leg)

	TOTAL	PM	AM
Departing	0	0	0
Approach total	0	0	0
Left	0	0	0
Through	0	0	0
Right	0	0	0

Ridgemoor Rd (east leg)

	AM	PM	TOTAL
Approach total	21	25	46
	4	2	6
	0	0	0
	17	22	39
Departing	22	16	38

Boulder Crest Way (south leg)

	Departing					
AM	19		0	1	20	21
PM	24		0	1	14	15
TOTAL	43		0	2	34	36

PEAK HOUR

AM 7:00 AM

PM 4:45 PM

Boulder Crest Way (north leg)

					Departing
TOTAL	5	0	2	3	4
PM	1	0	0	1	1
AM	4	0	2	2	3

Ridgemoor Rd (west leg)

	TOTAL	PM	AM
Departing	0	0	0
Approach total	0	0	0
Left	0	0	0
Through	0	0	0
Right	0	0	0

Ridgemoor Rd (east leg)

	AM	PM	TOTAL
Approach total	17	20	37
	3	1	4
	0	0	0
	14	19	33
Departing	18	9	27

Boulder Crest Way (south leg)

	Departing					
AM	16		0	0	16	16
PM	19		0	0	8	8
Total	35		0	0	24	24

Appendix E

Intersection Analysis Worksheets

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	7	11	0
Future Vol, veh/h	0	0	0	7	11	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	53	53	53	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	13	21	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	34	21	21	0	-	0
Stage 1	21	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	979	1056	1595	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	979	1056	1595	-	-	-
Mov Cap-2 Maneuver	979	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1595	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	3	0	16	2	2
Future Vol, veh/h	14	3	0	16	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	62	62	62	62	62	62
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	5	0	26	3	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	22	13	0	0	26	0
Stage 1	13	-	-	-	-	-
Stage 2	9	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	995	1067	-	-	1588	-
Stage 1	1010	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	993	1067	-	-	1588	-
Mov Cap-2 Maneuver	993	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	1012	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	3.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1005	1588	-
HCM Lane V/C Ratio	-	-	0.027	0.002	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	10	7	0
Future Vol, veh/h	0	1	0	10	7	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	0	11	8	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	19	8	8	0	-	0
Stage 1	8	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	998	1074	1612	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1012	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	998	1074	1612	-	-	-
Mov Cap-2 Maneuver	998	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1012	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1612	-	1074	-	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	0	-	8.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	5.8					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	1	0	8	1	2
Future Vol, veh/h	19	1	0	8	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	66	66	66	66	66	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	2	0	12	2	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	13	6	0	0	12	0
Stage 1	6	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1006	1077	-	-	1607	-
Stage 1	1017	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1005	1077	-	-	1607	-
Mov Cap-2 Maneuver	1005	-	-	-	-	-
Stage 1	1017	-	-	-	-	-
Stage 2	1015	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	2.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1008	1607	-
HCM Lane V/C Ratio	-	-	0.03	0.001	-
HCM Control Delay (s)	-	-	8.7	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	1.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1	1	7	11	1
Future Vol, veh/h	3	1	1	7	11	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	53	53	53	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	2	2	13	21	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	39	22	23	0	-	0
Stage 1	22	-	-	-	-	-
Stage 2	17	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	973	1055	1592	-	-	-
Stage 1	1001	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	972	1055	1592	-	-	-
Mov Cap-2 Maneuver	972	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	1006	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1592	-	992	-	-
HCM Lane V/C Ratio	0.001	-	0.008	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	12	1	16	22	3
Future Vol, veh/h	14	12	1	16	22	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	62	62	62	62	62	62
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	19	2	26	35	5

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	90	15	0	0	28	0
Stage 1	15	-	-	-	-	-
Stage 2	75	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	910	1065	-	-	1585	-
Stage 1	1008	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	890	1065	-	-	1585	-
Mov Cap-2 Maneuver	890	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	927	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	6.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	963	1585	-
HCM Lane V/C Ratio	-	-	0.044	0.022	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	2	1	10	7	2
Future Vol, veh/h	3	2	1	10	7	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	2	1	11	8	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	22	9	10	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	995	1073	1610	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	994	1073	1610	-	-	-
Mov Cap-2 Maneuver	994	-	-	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1610	-	1024	-	-
HCM Lane V/C Ratio	0.001	-	0.005	-	-
HCM Control Delay (s)	7.2	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	7.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	20	1	8	15	1
Future Vol, veh/h	19	20	1	8	15	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	66	66	66	66	66	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	30	2	12	23	2

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	56	8	0	0	14	0
Stage 1	8	-	-	-	-	-
Stage 2	48	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	952	1074	-	-	1604	-
Stage 1	1015	-	-	-	-	-
Stage 2	974	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	939	1074	-	-	1604	-
Mov Cap-2 Maneuver	939	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	960	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	6.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1004	1604	-
HCM Lane V/C Ratio	-	-	0.059	0.014	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	8	12	0
Future Vol, veh/h	0	0	0	8	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	53	53	53	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	15	23	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	38	23	23	0	-	0
Stage 1	23	-	-	-	-	-
Stage 2	15	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	974	1054	1592	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	974	1054	1592	-	-	-
Mov Cap-2 Maneuver	974	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	1008	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1592	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	4	0	17	3	3
Future Vol, veh/h	15	4	0	17	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	62	62	62	62	62	62
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	6	0	27	5	5

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	29	14	0	0	27	0
Stage 1	14	-	-	-	-	-
Stage 2	15	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	986	1066	-	-	1587	-
Stage 1	1009	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	983	1066	-	-	1587	-
Mov Cap-2 Maneuver	983	-	-	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	1005	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	3.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	999	1587	-
HCM Lane V/C Ratio	-	-	0.031	0.003	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	10	7	0
Future Vol, veh/h	0	1	0	10	7	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	0	11	8	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	19	8	8	0	-	0
Stage 1	8	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	998	1074	1612	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1012	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	998	1074	1612	-	-	-
Mov Cap-2 Maneuver	998	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1012	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1612	-	1074	-	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	0	-	8.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	1	0	8	1	2
Future Vol, veh/h	20	1	0	8	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	66	66	66	66	66	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	2	0	12	2	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	13	6	0	0	12	0
Stage 1	6	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1006	1077	-	-	1607	-
Stage 1	1017	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1005	1077	-	-	1607	-
Mov Cap-2 Maneuver	1005	-	-	-	-	-
Stage 1	1017	-	-	-	-	-
Stage 2	1015	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	8.7		0		2.4	
HCM LOS	A					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1008	1607	-
HCM Lane V/C Ratio	-	-	0.032	0.001	-
HCM Control Delay (s)	-	-	8.7	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1	1	8	12	2
Future Vol, veh/h	3	1	1	8	12	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	53	53	53	53	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	2	2	15	23	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	44	25	27	0	-	0
Stage 1	25	-	-	-	-	-
Stage 2	19	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	967	1051	1587	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	966	1051	1587	-	-	-
Mov Cap-2 Maneuver	966	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	1004	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1587	-	986	-	-
HCM Lane V/C Ratio	0.001	-	0.008	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	5.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	13	1	17	23	4
Future Vol, veh/h	15	13	1	17	23	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	62	62	62	62	62	62
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	21	2	27	37	6

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	96	16	0	0	29	0
Stage 1	16	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	903	1063	-	-	1584	-
Stage 1	1007	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	882	1063	-	-	1584	-
Mov Cap-2 Maneuver	882	-	-	-	-	-
Stage 1	1007	-	-	-	-	-
Stage 2	921	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	6.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	958	1584	-
HCM Lane V/C Ratio	-	-	0.047	0.023	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	1	10	7	3
Future Vol, veh/h	2	2	1	10	7	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	2	1	11	8	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	23	10	11	0	-	0
Stage 1	10	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	993	1071	1608	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	992	1071	1608	-	-	-
Mov Cap-2 Maneuver	992	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1608	-	1030	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s)	7.2	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	6.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	20	1	8	15	3
Future Vol, veh/h	20	20	1	8	15	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	66	66	66	66	66	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	30	2	12	23	5

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	59	8	0	0	14	0
Stage 1	8	-	-	-	-	-
Stage 2	51	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	948	1074	-	-	1604	-
Stage 1	1015	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	935	1074	-	-	1604	-
Mov Cap-2 Maneuver	935	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	957	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	8.8		0		6.1	
HCM LOS	A					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1000	1604	-
HCM Lane V/C Ratio	-	-	0.061	0.014	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-