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Madera at Citrus Trail Residential Project

Air Quality and Health Risk Assessment Report

June 2023

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List of Acronyms, Abbreviations, and Symbols	
Acronym / Abbreviation	**Full Phrase or Description**
AB	Assembly Bill
ACC	Advanced Clean Cars
AMSL	Above Mean Sea Level
APN	Assessor Parcel Number
AQ	Air Quality
AQMP	Air Quality Management Plan
AREA	Area Source
ARLN	Area Line Source
Basin	South Coast Air Basin
CAA	Clean Air Act
Cal-EPA	California Environmental Protection Agency
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CAFE	Corporate Average Fuel Economy
CAS	Chemical Abstract Service
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CERP	Community Emissions Reduction Plan
CO	Carbon Monoxide
DPM	Diesel Particulate Matter
GHG	Greenhouse Gas(es)
GVWR	Gross Vehicle Weight Rating
H_2S	Hydrogen Sulfide
HAP	Hazardous Air Pollutants
HI	Hazard Index
HHDT	Heavy Heavy-Duty Truck
HR	Hour
HRA	Health Risk Assessment
HVAC	Heating, Ventilation, and Air Conditioning
IPCC	Intergovernmental Panel on Climate Change
KBtu	Thousand British Thermal Units
LDA	Light Duty Auto

List of Acronyms, Abbreviations, and Symbols	
Acronym / Abbreviation	**Full Phrase or Description**
LDT	Light Duty Truck
LHDT	Light Heavy-Duty Truck
LST	Localized Significance Threshold
m^3	Cubic Meter
MATES IV	Multiple Air Toxics Exposure Study in the South Coast Air Basin
MEIR	Maximally Exposed Individual Resident
MESR	Maximally Exposed Student Receptor
MG	Milligrams
MHDT	Medium Heavy-Duty Truck
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NO	Nitric Oxide
NOx	Oxides of Nitrogen
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
PPB	Parts Per Billion
PPM	Parts Per Million
PM	Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
PM_{10}	Coarse Particulate Matter
PMI	Point of Maximum Impact
PRC	Public Resources Code
Q_{tpy}	Emissions Rate (tons per year)
ROG	Reactive Organic Gases
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_x	Sulfates
SRA	Source Receptor Area

List of Acronyms, Abbreviations, and Symbols	
Acronym / Abbreviation	**Full Phrase or Description**
TAC	Toxic Air Contaminants
U.S.	United States
U.S. EPA	United States Environmental Protection Agency
V.	Version
VMT	Vehicle Miles Travelled
VOC	Volatile Organic Compounds
VOL	Volume Source
µg	Micrograms
§	Section
° F	Degrees Fahrenheit

EXECUTIVE SUMMARY

This Air Quality and Health Risk Assessment Report (Report) evaluates and documents the potential air quality and health risk impacts associated with the construction and operation of the proposed Madera at Citrus Trail Project (proposed Project) located at the northwest corner of the Colton Avenue / Wabash Avenue intersection in the City of Redlands, California.

This Report is consistent with the guidance and recommendations contained in the South Coast Air Quality Management District's (SCAQMD) California Environmental Quality Act (CEQA) *Air Quality Handbook*, as amended and supplemented (SCAQMD, 2018). This Report is intended to assist the CEQA Lead Agency (City of Redlands) with its review of potential Project-related air quality and health risk impacts in compliance with the State CEQA Statutes and Guidelines, particularly in respect to the air quality issues identified in Appendix G of the State CEQA Guidelines. This Report does not make determinations of significance pursuant to CEQA because such determinations are solely the purview of the CEQA Lead Agency.

S.1 PROPOSED PROJECT DESCRIPTION

Soni 2012 Irrevocable Trusts is proposing to construct 103 new single-family residential buildings with approximately 216,567 square feet of gross building space, on approximately 9.01 acres in the City of Redlands. The proposed residential buildings would be located on a rectangular property at Colton Avenue and Wabash Avenue, approximately 1.4 miles northeast of Interstate 10 (I-10) and approximately 1.3 miles south of Redlands Municipal Airport.

The Project site is currently undeveloped, there are no active operations at the site.

S.2 POTENTIAL CONSTRUCTION AIR QUALITY IMPACTS

The proposed Project's construction emissions were estimated using the California Emissions Estimator Model (CalEEMod), Version (V.) 2022.1.1. CalEEMod is a computer program recommended for use by the SCAQMD for use in preparing emission estimates for land use and development projects. The modeling indicates maximum daily emissions during construction activities would be below all applicable SCAQMD regional and local thresholds for regulated air pollutants.

S.3 POTENTIAL OPERATIONAL AIR QUALITY IMPACTS

The proposed Project would generate criteria air pollutant and fugitive dust from a variety of sources during operation, including area, energy, and mobile sources. The emissions from these sources were quantified using CalEEMod. The operational air quality impact analysis indicates the proposed Project would not generate criteria air pollutant or fugitive dust emissions that exceed the SCAQMD's recommended regional CEQA thresholds of significance.

S.4 HEALTH RISK ASSESSMENT

A health risk assessment (HRA) was prepared to evaluate potential cancerogenic and non-cancerogenic health effects that could result from receptor exposure to diesel particulate matter (DPM). Construction activities associated with the proposed Project would require the use of heavy-duty, off-road, diesel-powered equipment (e.g., loaders, tractors, backhoes, bulldozers, etc.) that would generate DPM during the combustion of fuel. The construction HRA was prepared in accordance with applicable guidelines from

the California Office of Environmental Health Hazard Assessment (OEHHA) and shows that the proposed Project would not result in potentially significant effects after the implementation of recommended Mitigation Measure AIR-1.

S.5 ODORS

The proposed Project would involve construction and operational activities that could generate odors typical of many construction and residential land use operations. These types of odors (e.g., exhaust) are typical of the area and would be quick to disperse. The proposed Project would not result in the creation of objectionable odors that would affect a substantial number of people.

S.6 RECOMMENDED MITIGATION MEASURES

The following mitigation measure is necessary to ensure the proposed Project does not generate TAC emissions that have the potential to result in substantial adverse health effects at receptor locations near the proposed Project:

> **Mitigation Measure AIR-1: Reduce DPM Emissions.** To reduce potential short-term adverse health risks associated with PM_{10} exhaust emissions, including emissions of diesel particulate matter (DPM), generated during project construction activities, the City shall require the Applicant and/or its designated contractors, contractor's representatives, or other appropriate personnel to comply with the following construction equipment restriction for the Project:
>
> - All construction equipment with a rated power-output of 50 horsepower or greater shall meet U.S. EPA and CARB Tier IV Interim Emission Standards and be equipped with Level 3 Diesel Particulate Matter Filters. This may be achieved via the use of equipment with engines that have been certified to meet Tier IV Interim emission standards, or through the use of equipment that has been retrofitted with a CARB-verified diesel emission control strategy (e.g., oxidation catalyst, particulate filter) capable of reducing exhaust PM_{10} emissions to levels that meet Tier IV standards.
>
> As an alternative to using Tier IV Interim Emissions Standards for off-road equipment with a rated power-output of 50 horsepower or greater, the Applicant may prepare and submit a refined construction health risk assessment to the City once additional Project-specific construction information is known (e.g., specific construction equipment type, quantity, engine tier, and runtime by phase). The refined health risk assessment shall demonstrate and identify any measures necessary such that the proposed Project's incremental cancerogenic health risk at nearby sensitive receptor locations is below the applicable SCAQMD threshold of 10 cancers in a million.

The above measure would ensure construction emissions associated with equipment operation do not generate diesel particulate emissions that expose sensitive receptors to substantial pollutant concentrations (i.e., exceed applicable SCAQMD thresholds).

1 INTRODUCTION

Soni 2012 Irrevocable Trusts has applied for a Conditional Use Permit (CUP) from the City of Redlands for its Madera at Citrus Trail Residential Project (proposed Project). The proposed Project would be located at the northwest corner of Colton Avenue and Wabash Avenue intersection, in the eastern part portion of Redlands, and include the development of 103 single-family homes and a small community park.

MIG, Inc. (MIG) has prepared this Air Quality and Health Risk Assessment Report (Report) to evaluate the potential construction- and operations-related air quality and health risk impacts of the proposed Project using project-specific information contained in the Site Plan for the proposed Project, as well as the Redlands Madera at Citrus Trail Traffic Impact Analysis prepared by Ganddini Group (Ganddini Group 2023). Where necessary, MIG has supplemented available information with standardized sources of information, such as model assumptions pertaining to construction equipment activity levels. In general, this Report evaluates the potential "worst-case" conditions associated with the proposed Project's construction and operational emissions levels to ensure a conservative (i.e., likely to overestimate) assessment of potential air quality and health risk impacts is presented.

This Report is intended for use by the Lead Agency to assess the potential air quality impacts of the proposed Project in compliance with the California Environmental Quality Act (CEQA; PRC §21000 et seq.) and the State CEQA Guidelines (14 CCR §15000 et seq.), particularly in respect to the air quality issues identified in Appendix G of the State CEQA Guidelines.

1.1 REPORT ORGANIZATION

This Report is organized as follows:

- **Chapter 1, Introduction,** explains the contents of this Report and its intended use.
- **Chapter 2, Proposed Project Description**, provides an overview of the construction and operational activities associated with the proposed Project.
- **Chapter 3, Air Quality Setting and Regulatory Framework,** provides pertinent background information on the air quality, describes the existing air quality setting of the proposed Project, and provides information on the federal, state, and local regulations that govern the proposed Project's air quality setting and potential air quality impacts.
- **Chapter 4, Air Quality Impact and Health Risk Assessment,** discloses the methodology the potential construction and operational air quality impacts of the proposed Project, including the methodology and results of the project's construction and operational health risk assessment, and evaluates these effects in accordance with Appendix G of the State CEQA Guidelines.
- **Chapter 5, Report Preparers and References,** list the individuals involved, and the references used, in the preparation of this Report.

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2 PROPOSED PROJECT DESCRIPTION

The proposed Project would consist of the construction and operation of 103 new single-family residential buildings, consisting of approximately 216,567 square feet of gross building space, and an approximately 0.63-acre community park in the City of Redlands.

2.1 PROJECT LOCATION

The proposed Project would be located at the northwest corner of Colton Avenue and Wabash Avenue in the City of Redlands, approximately 1.4 miles northeast of Interstate 10 (I-10) and approximately 1.3 miles south of Redlands Municipal Airport. The site consists of a single, undeveloped parcel of land totaling approximately 9.01-acres of land (Assessor's Parcel Number 0168-291-02; see Figure 2-1). The site is classified single-family residential by the City's Zoning Code and designated as low density residential land by the City's General Plan (City of Redlands, 2017).

2.1.1 SURROUNDING LAND USES

In general, the proposed Project site is surrounded by single-family residential land uses to the north and west, industrial land uses to the east (across Wabash Avenue), and a mobile home park and the Orange Blossom Trail to the south (across Colton Avenue). The site is bound by Wabash Avenue to the east and Colton Avenue to the south. The Redlands Ranch single-family residential neighborhood is west of the site and single-family residential land uses are north of the site, along Mendocino Way. The underlying land use zoning and General Plan designations for the Project area are similar to those of the Project site, generally consisting of single-family residential areas to the north, west, south, with industrial areas to the east and northeast. The following schools and parks are located within 1,000 feet of the Project site:

- Orange Blossom Trail head, approximately 80 feet south of the Project site.
- Crafton Park, approximately 350 feet south of the Project site.
- Crafton Elementary School, approximately 960 feet south of the Project site.

2.2 EXISTING SITE DESCRIPTION AND OPERATIONS

The Project site consists of an undeveloped field with some ruderal vegetation. There are no active operations at the site.

Figure 2-1 Aerial View of the Project Site



2.3 PROPOSED SITE DEVELOPMENT AND OPERATIONS

The proposed Project would involve the construction of a new single-family residential development, consisting of approximately 103 units totaling approximately 216,567 square feet of gross building space. The entire approximately 9.01-acre site would be graded; the portions of the site not developed with the residential buildings would either be hardscaped (e.g., parking or sidewalks) or landscaped. The site plan for the proposed Project is shown in Figure 2-2.

In addition to the residential units, the project would include approximately 206 garage parking stalls and 63 guest parking stalls for a total of 269 parking stalls. Approximately 65,470 square feet of the site would be landscaped, and approximately 20,100 square feet of the site would be impervious surface for sidewalks.

2.3.1 SITE LAYOUT

The proposed Project includes a central block of residential buildings and landscaped common area surrounded by residential buildings along the northern, western, and southern sides of the block. The block's eastern side would be located adjacent to Wabash Avenue, while common area parking stalls would be present on the western side of the block. The Project site's interior driveway would be located along the western portion of the site and provide access to the site via a northern driveway and southeastern driveway onto Wabash Avenue, and a southwestern driveway onto Colton Avenue.

2.3.2 NEW RESIDENTIAL BUILDING DESCRIPTIONS

As discussed above, the Project will include 103 buildings with each building having a height of two (2) stories (CA Engineering Inc, 2023). The floor area sizes for the dwelling units are planned to range from approximately 1,544 square feet to approximately 1,858 square feet.

2.3.3 OPERATIONAL TRIP GENERATION ESTIMATES

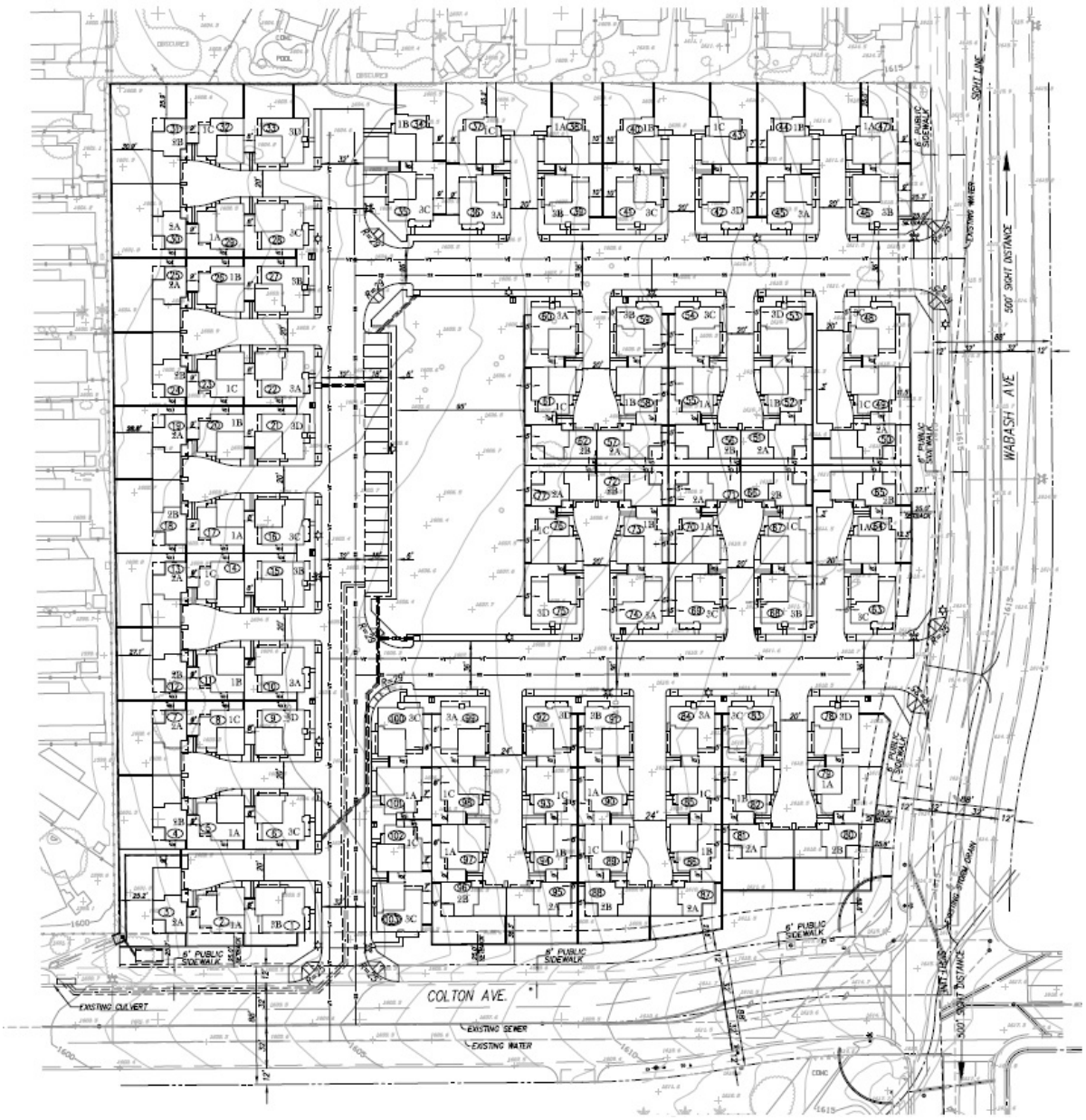
Once operational, the proposed Project would generate trips to and from the site. The proposed Project's trip generation potential is summarized in Table 2-1 (Ganddini Group, 2023).

Table 2-1: Project Trip Generation Rates

Land Use	Quantity	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Single-family housing	103	18	49	67	55	33	88	918

Source: Gandinni Group, 2023 modified by MIG

Figure 2-2 Site Plan



Source: CA Engineering Inc, 2023

2.3.4 PROJECT CONSTRUCTION

The proposed Project would involve the construction of approximately 216,567 square feet of gross building space on approximately 9.01 acres of land. Construction phasing associated with the proposed Project is anticipated to include site preparation, grading, building construction, paving, and architectural coating. The Project will require the import of approximately 7,631 cubic yards of soil. Construction activities are assumed to begin in early-2024 and last approximately 14 months based on default assumptions generated by the California Emissions Estimator Model (CalEEMod), which was used to estimate emissions associated with the proposed Project, and information provided by the Applicant. The proposed Project is anticipated to require varying types of equipment throughout the different construction

phases including, but not limited to: bulldozers, backhoes, loaders, graders, cranes and forklifts. Table 2-2 summarizes the proposed Project's construction phasing and the typical pieces of heavy-duty, off-road construction equipment that would be required during each phase.

Table 2-2: Construction Activity, Duration, and Typical Equipment

Construction Activity	Duration (Days)(A)	Typical Equipment Used(B)
Site Preparation	10	Dozer, Tractor/Loader/Backhoe
Grading	20	Excavator, Grader, Dozer, Backhoe
Building Construction	230	Crane, Forklift, Backhoe, Generator, Welder
Paving	20	Paver, Roller, Paving Equipment
Architectural Coating	20	Air Compressor

Source: MIG, 2023 (See Appendix A).

(A) Days refers to total active workdays in the construction phase, not calendar days.

(B) The typical equipment list does not reflect all equipment that would be used during the construction phase. Not all equipment would operate eight hours per day each workday.

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3 AIR QUALITY SETTING AND REGULATORY FRAMEWORK

This chapter provides information on the environmental and regulatory air quality setting of the proposed Project. Information on existing air quality conditions, federal and state ambient air quality standards, and pollutants of concern was obtained from the U.S. Environmental Protection Agency (U.S. EPA), California Air Resources Board (CARB), and South Coast Air Quality Management District (SCAQMD).

3.1 REGIONAL ENVIRONMENTAL SETTING

Air quality is a function of pollutant emissions and topographic and meteorological influences. The amount of pollutants emitted into the air and the physical features and atmospheric conditions of a geographic region interact to affect the movement and dispersion of pollutants and determine the quality of its air.

The U.S. EPA and CARB are the federal and state agencies charged with maintaining air quality in the nation and state, respectively. The U.S. EPA delegates much of its authority over air quality to CARB. CARB has geographically divided the state into 15 air basins for the purposes of managing air quality on a regional basis. An air basin is a CARB-designated management unit with similar meteorological and geographic conditions. The proposed Project is located in the County of San Bernardino, within the South Coast Air Basin (Basin). The Basin includes Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties.

3.1.1 REGULATED AIR POLLUTANTS

The U.S. EPA has established National Ambient Air Quality Standards (NAAQS) for six common air pollutants: ozone (O_3), particulate matter (PM), which consists of "inhalable coarse" PM (particles with an aerodynamic diameter between 2.5 and 10 microns in diameter, or PM_{10}) and "fine" PM (particles with an aerodynamic diameter smaller than 2.5 microns, or $PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. The U.S. EPA refers to these six common pollutants as "criteria" pollutants because the agency regulates the pollutants on the basis of human health and/or environmentally-based criteria. CARB has established California Ambient Air Quality Standards (CAAQS) for the six common air pollutants regulated by the federal Clean Air Act (the CAAQS are more stringent than the NAAQS) plus the following additional air pollutants: hydrogen sulfide (H_2S), sulfates (SO_X), vinyl chloride, and visibility reducing particles. A description of the regulated air pollutants associated with the proposed Project is provided below.

- **Ground-level ozone**, or smog, is not emitted directly into the atmosphere. It is created from chemical reactions between oxides of nitrogen (NO_X) and volatile organic compounds (VOCs), also called reactive organic gases (ROG), in the presence of sunlight (U.S. EPA, 2017a). Thus, ozone formation is typically highest on hot sunny days in urban areas with NO_X and ROG pollution. Ozone irritates the nose, throat, and air pathways and can cause or aggravate shortness of breath, coughing, asthma attacks, and lung diseases such as emphysema and bronchitis.
    - **ROG** is a CARB term defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and includes several low-reactive organic compounds which have been exempted by the U.S. EPA (CARB, 2004).

  - **VOC** is a U.S. EPA term defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. The term exempts organic compounds of carbon which have been determined to have negligible photochemical reactivity such as methane, ethane, and methylene chloride (CARB, 2004).
- **Particulate matter (PM)**, also known as particle pollution, is a mixture of extremely small solid and liquid particles made up of a variety of components such as organic chemicals, metals, and soil and dust particles (U.S. EPA, 2016a).
  - PM_{10}, also known as inhalable coarse, respirable, or suspended PM_{10}, consists of particles less than or equal to 10 micrometers in diameter (approximately 1/7th the thickness of a human hair). These particles can be inhaled deep into the lungs and possibly enter the blood stream, causing health effects that include, but are not limited to, increased respiratory symptoms (e.g., irritation, coughing), decreased lung capacity, aggravated asthma, irregular heartbeats, heart attacks, and premature death in people with heart or lung disease (U.S. EPA, 2016a).
  - $PM_{2.5}$, also known as fine PM, consists of particles less than or equal to 2.5 micrometers in diameter (approximately 1/30th the thickness of a human hair). These particles pose an increased risk because they can penetrate the deepest parts of the lung, leading to and exacerbating heart and lung health effects (U.S. EPA, 2016a).
- **Carbon Monoxide (CO)** is an odorless, colorless gas that is formed by the incomplete combustion of fuels. Motor vehicles are the single largest source of carbon monoxide in the Basin. At high concentrations, CO reduces the oxygen-carrying capacity of the blood and can aggravate cardiovascular disease and cause headaches, dizziness, unconsciousness, and even death (U.S. EPA, 2016b).
- **Nitrogen Dioxide (NO_2)** is a by-product of combustion. NO_2 is not directly emitted but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_X and are major contributors to ozone formation. NO_2 also contributes to the formation of particulate matter. NO_2 can cause breathing difficulties at high concentrations (U.S. EPA, 2016c).
- **Sulfur Dioxide (SO_2)** is one of a group of highly reactive gases known as oxides of sulfur (SO_X). Fossil fuel combustion in power plants and industrial facilities are the largest emitters of SO_2. Short-term effects of SO_2 exposure can include adverse respiratory effects such as asthma symptoms. SO_2 and other SO_X can react to form PM (U.S. EPA, 2016d).
- **Sulfates (SO_4^{2-})** are the fully oxidized ionic form of sulfur. SO_4^{2-} are primarily produced from fuel combustion. Sulfur compounds in the fuel are oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. Sulfate exposure can increase risks of respiratory disease (CARB, 2009).

In addition to criteria air pollutants, the U.S. EPA and CARB have classified certain pollutants as hazardous air pollutants (HAPs) or toxic air contaminants (TACs), respectively. These pollutants can cause severe health effects at very low concentrations, and many are suspected or confirmed carcinogens. The U.S. EPA has identified 187 HAPs, including such substances as arsenic and chlorine; CARB considers all U.S. EPA designated HAPs, as well as particulate emissions from diesel-fueled engines (DPM) and other substances, to be a TAC. Since CARB's list of TACs references and includes U.S. EPA's list of HAPs, this document uses the term TAC when referring to HAPs and TACs. A description of the TACs associated with the proposed Project and its vicinity is provided below.

- **Gasoline-Powered Mobile Sources.** According to the SCAQMD's *Multiple Air Toxics Exposure Study in the South Coast Air Basin* (SCAQMD, 2015), or MATES IV, gasoline-powered vehicles emit TACs, such as benzene, which can have adverse health risks. Gasoline-powered sources emit TACs in much smaller amounts than diesel-powered vehicles. The MATES IV study identifies that diesel emissions account for between 68% to 80% of the total air toxics and cancer risk in the Basin.
- **Diesel Particulate Matter (DPM).** Diesel engines emit both gaseous and solid material; the solid material is known as DPM. Almost all DPM is less than 1 micrometer (μm) in diameter, and thus is a subset of $PM_{2.5}$. DPM is typically composed of carbon particles and numerous organic compounds. Diesel exhaust also contains gaseous pollutants, including VOCs and NO_x. The primary sources of diesel emissions are ships, trains, trucks, rail yards and heavily traveled roadways. These sources are often located near highly populated areas, resulting in greater DPM related health consequences in urban areas. The majority of DPM is small enough to be inhaled into the lungs and what particles are not exhaled can be deposited on the lung surface and in the deepest regions of the lungs where the lung is most susceptible to injury. In 1998, CARB identified DPM as a toxic air contaminant based on evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects. DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure (CARB 2016a).

Common criteria air pollutants, such as ozone precursors, SO_2, and PM, are emitted by a large number of sources and have effects on a regional basis (i.e., throughout the Basin); other pollutants, such as HAPs, TACs, and fugitive dust, are generally not as prevalent and/or emitted by fewer and more specific sources. As such, these pollutants have much greater effects on local air quality conditions and local receptors.

3.1.2 REGIONAL AIR POLLUTANT EMISSIONS LEVELS

CARB's estimate of the amount of emissions generated within the Basin in 2012, the most recent year for which data is available, is summarized in Table 3-1.

3.1.3 SOUTH COAST AIR BASIN CLIMATE, TOPOGRAPHY, AND METEOROLOGY

Southwestern San Bernardino County and the broader Los Angeles Basin are defined by a semi-arid, Mediterranean climate with mild winters and warm summers. The San Gabriel, San Bernardino, and San Jacinto Mountains bound the Basin to the north and east trap ambient air and pollutants within the Los Angeles and Inland Empire valleys below. The climate of the greater Los Angeles region is classified as Mediterranean, but weather conditions within the Basin are dependent on local topography and proximity to the Pacific Ocean. The climate is dominated by the Pacific high-pressure system that results in generally mild, dry summers and mild, wet winters. This temperate climate is occasionally interrupted by extremely hot temperatures during the summer, Santa Ana winds during the fall, and storms from the Pacific northwest during the winter. In addition to the basin's topography and geographic location, El Niño and La Niña patterns also have large effects on weather and rainfall received between November and March.

Table 3-1: South Coast Air Basin Emissions Summary							
Emissions Source	**2017 Pollutant Emissions (Tons Per Day)**						
	ROG	**NO_X**	**$PM_{2.5}$**	**PM_{10}**	**PM**	**CO**	**SO_X**
Stationary(A)	87	42	13	18	26	85	8
Area-wide(B)	130	20	32	117	221	53	0
Mobile(C)	185	298	17	30	31	1650	5
Total(D)	529	367	72	179	292	1893.1	15
Emissions Source	**2017 Pollutant Emissions (Tons Per Year)**						
	ROG	**NO_X**	**$PM_{2.5}$**	**PM_{10}**	**PM**	**CO**	**SO_X**
Stationary(A)	31,675	15,217	4,595	6,526	9,432	30,901	2,982
Area-wide(B)	47,395	7,420	11,519	42,661	80,815	19,436	128
Mobile(C)	67,598	108,901	6,074	11,081	11,344	602,261	1,796
Total(D)	193,300	690,989	26,246	65,196	106,722	690,989	5,636

Source: CARB 2022, modified by MIG.

(A) Stationary sources include fuel combustion in stationary equipment or a specific type of facility such as printing and metals processing facilities. Concrete batching is a subset of stationary source emissions.

(B) Mobile sources include automobiles, trucks, and other vehicles intended for "on-road" travel and other self-propelled machines such as construction equipment and all-terrain vehicles intended for "off-road" travel.

(C) Area-wide sources include solvent evaporation (e.g., consumer products, painting, and asphalt paving) and miscellaneous processes such as residential space heating, fugitive windblown dust, and cooking.

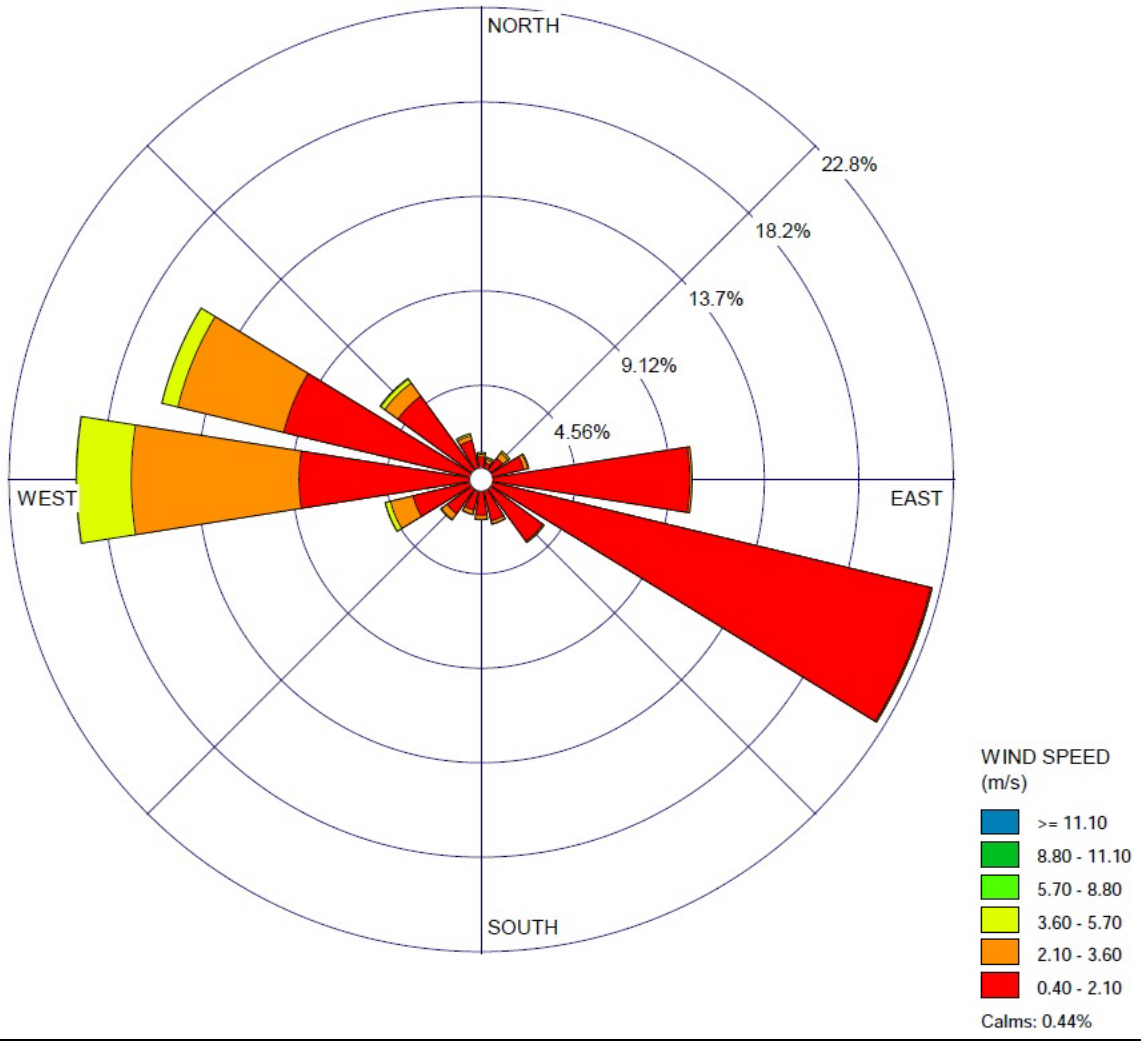
(D) Totals may not equal due to rounding.

The Pacific high-pressure system drives the prevailing winds in the Basin. The winds tend to blow onshore in the daytime and offshore at night. In the summer, an inversion layer is created over the coastal areas and increases ozone levels. A temperature inversion is created when a layer of cool air is overlain by a layer of warmer air; this can occur over coastal areas when cool, dense air that originates over the ocean is blown onto land and flows underneath the warmer, drier air that is present over land. In the winter, areas throughout the Basin often experience a shallow inversion layer that prevents the dispersion of surface level air pollutants, resulting in higher concentrations of criteria air pollutants such as CO and NO_X.

The City's average temperatures range from a high of 94 degrees Fahrenheit (F) in July and August to a low of 39 degrees Fahrenheit in December and January. Annual precipitation is approximately 13.56 inches, falling mostly from November through April (WRCC 2016).

The SCAQMD maintains publicly meteorological data for use in air quality analyses. The closest meteorological station with data representative of those at the Project site is from the Redlands Meteorological Station, approximately 0.4 miles southwest of the Project site. The wind rose for the Redlands Meteorological Station, shown in Figure 3-1, indicates the prevailing wind near the Project site is from the east-southeast.

Figure 3-1 Wind Rose for the Redlands Meteorological Station (Blowing From)



Source: SCAQMD, 2018a

3.1.4 REGIONAL AIR QUALITY CONDITIONS AND ATTAINMENT STATUS

As described in Section 3.1.1 and shown in Table 3-2, the federal and state governments have established emission standards and limits for air pollutants which may reasonably be anticipated to endanger public health or welfare. These standards typically take one of two forms: standards or requirements that are applicable to specific types of facilities or equipment (e.g., petroleum refining, metal smelting), or concentration-based standards that are applicable to overall ambient air quality. Air quality conditions are best described and understood in the context of these standards; areas that meet, or attain, concentration-based ambient air quality standards are considered to have levels of pollutants in the ambient air that, based on the latest scientific knowledge, do not endanger public health or welfare.

The U.S. EPA, CARB, and the SCAQMD assess the air quality of an area by measuring and monitoring the amount of pollutants in the ambient air and comparing pollutant levels against NAAQS and CAAQS. Based on these comparisons, regions are classified into one of the following categories:

- **Attainment.** A region is "in attainment" if monitoring shows ambient concentrations of a specific pollutant are less than or equal to NAAQS or CAAQS. In addition, an area that has been re-designated from nonattainment to attainment is classified as a "maintenance area" for 10 years to ensure that the air quality improvements are sustained.
- **Nonattainment.** If the NAAQS or CAAQS are exceeded for a pollutant, the region is designated as nonattainment for that pollutant. It is important to note that some NAAQS and CAAQS require multiple exceedances of the standard in order for a region to be classified as nonattainment. Federal and state laws require nonattainment areas to develop strategies, plans, and control measures to reduce pollutant concentrations to levels that meet, or attain, standards.
- **Unclassified.** An area is unclassified if the ambient air monitoring data are incomplete and do not support a designation of attainment or nonattainment.

Table 3-2 summarizes the Basin's attainment status for criteria pollutants. The Basin is currently in nonattainment for state and federal ozone, state PM_{10}, and state and federal $PM_{2.5}$ standards.

Pollution problems in the Basin are caused by emissions within the area and the specific meteorology that promotes pollutant concentrations. Emissions sources vary widely from smaller sources such as individual residential water heaters and short-term grading activities to extensive operational sources including long-term operation of electrical power plants and other intense industrial use. Pollutants in the Basin are blown inward from coastal areas by sea breezes from the Pacific Ocean and are prevented from horizontally dispersing due to the surrounding mountains. This is further complicated by atmospheric temperature inversions that create inversion layers. The inversion layer in Southern California refers to the warm layer of air that lies over the cooler air from the Pacific Ocean. This is strongest in the summer and prevents ozone and other pollutants from dispersing upward. A ground-level surface inversion commonly occurs during winter nights and traps carbon monoxide emitted during the morning rush hour.

3.2 LOCAL ENVIRONMENTAL SETTING

The proposed Project is located in the City of Redlands, in the eastern part of San Bernardino County. To the west and north of the Project site are other single-family residential uses. To the south are residential uses (mobile home neighborhood) and a park, and to the east commercial and industrial uses. The site is also located approximately 1.3 miles south of Redlands Municipal Airport. The existing industrial / commercial uses, as well as vehicles on the local roadways, and overhead aircraft all contribute to the local air quality conditions in proximity to the Project site.

Table 3-2: Summary of Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time[B]	California Standards[A]		National Standards[A]	
		Standard[C]	Attainment Status[D]	Standard[C]	Attainment Status[D]
Ozone	1-Hour (1979)	--	--	240 µg/m^3	Nonattainment
	1-Hour (Current)	180 µg/m^3	Nonattainment	--	--
	8-Hour (1997)	--	--	160 µg/m^3	Nonattainment
	8-Hour (2008)	--	--	147 µg/m^3	Nonattainment
	8-Hour (Current)	137 µg/m^3	Nonattainment	137 µg/m^3	Nonattainment
PM_{10}	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Attainment
	Annual Average	20 µg/m^3	Nonattainment	--	--
$PM_{2.5}$	24-Hour	--	--	35 µg/m^3	Nonattainment
	Annual Average (1997)	--	--	15 µg/m^3	Attainment
	Annual Average (Current)	12 µg/m^3	Nonattainment	12 µg/m^3	Nonattainment
Carbon Monoxide	1-Hour	23,000 µg/m^3	Attainment	40,000 µg/m^3	Attainment
	8-Hour	10,000 µg/m^3	Attainment	10,000 µg/m^3	Attainment
Nitrogen Dioxide	1-Hour	339 µg/m^3	Attainment	188 µg/m^3	Unclassifiable/ Attainment
	Annual Average	57 µg/m^3	Attainment	100 µg/m^3	Attainment
Sulfur Dioxide	1-Hour	655 µg/m^3	Attainment	196 µg/m^3	Attainment
	24-Hour	105 µg/m^3	--	367 µg/m^3	Unclassifiable/ Attainment
	Annual Average	--	--	79 µg/m^3	Unclassifiable/ Attainment
Lead	3-Months Rolling	--	--	0.15 µg/m^3	Nonattainment (Partial)
Hydrogen Sulfide	1-Hour	42 µg/m^3	Attainment	--	
Sulfates	24-Hour	25 µg/m^3	Attainment	--	
Vinyl Chloride	24-Hour	26 µg/m^3	Attainment	--	

Source: SCAQMD 2018b, modified by MIG.

(A) This table summarizes the CAAQS and NAAQS and the Basin's attainments status. This table does not prevent comprehensive information regarding the CAAQS and NAAQS. Each CAAQS and NAAQS has its own averaging time, standard unit of measurement, measurement method, and statistical test for determining if a specific standard has been exceeded. Standards are not presented for visibility reducing particles, which are not concentration-based. The Basin is unclassified for visibility reducing particles.

(B) Ambient air standards have changed over time. This table presents information on the standards previously used by the U.S. EPA for which the Basin does not meet attainment.

(C) All standards are shown in terms of micrograms per cubic meter (µg/m^3) rounded to the nearest whole number for comparison purposes (with the exception of lead, which has a standard less than 1 µg/m^3). The actual CAAQS and NAAQS standards specify units for each pollutant measurement.

(D) A= Attainment, N= Nonattainment, U=Unclassifiable.

3.2.1 LOCAL AIR QUALITY CONDITIONS

Air pollution levels are measured at monitoring stations located throughout the Basin. The Project site is located in SCAQMD Source Receptor Area (SRA) 35 – East San Bernardino Valley; The East San Bernardino Valley monitoring station is closest to the Project site, approximately 0.4 miles southwest of the Project site, and monitors O_3 and PM_{10}. This monitoring station represents the best approximation of the air quality conditions near the Project site. Table 3-3 summarizes the published monitoring data from the East San Bernardino Valley monitoring station from 2019 to 2021, the three most recent years for which verified, published data was available from the SCAQMD at the time this Report was prepared. Table 3-3 shows that air quality standards at this location have been exceeded for PM_{10} and O_3. This is consistent with the entire Basin's classification as non-attainment for PM_{10} and O_3. As shown in Table 3-3:

- The maximum 1-hour and 8-hour O_3 concentration, as well as the number of days exceeding O_3 standards, generally increased from 2019 to 2020, but decreased from 2020 to 2021.
- The maximum 24-hour PM_{10} concentration increased during the 2019 to 2020 period, but decreased from 2020 to 2021. while the average annual PM_{10} concentration decreased. The State PM_{10} 24-hour standard was exceeded only once (in 2020) over the 2019 to 2021 timeframe.

Table 3-3: 2019-2021 Local Air Quality Data for East San Bernardino Valley

Pollutant	Ambient Air Standard	Year		
		2019	2020	2021
Ozone (O_3)				
Maximum 1-hour Concentration (ppm)		0.137	0.173	0.145
Maximum 8-hr Concentration (ppm)		0.117	0.136	0.119
Number of Days Exceeding State 1-hr Standard	>180 µg/m3	73	104	74
Number of Days Exceeding State 8-hr Standard	>137 µg/m3	109	141	118
Days Exceeding Federal 1-hr Standard	>0.124 ppm	8	16	7
Days Exceeding Federal 8-hr Standard	>0.070 ppm	109	141	114
Suspended Particulate Matter (PM_{10})[(A)]				
Maximum 24-hr Concentration (µg/m^3)		44	57	44
Annual Arithmetic Mean (µg/m^3)		21.2	23.4	23.2
Samples Exceeding State 24-hr Standard	>50 µg/m^3	0	1	0
Samples Exceeding Federal 24-hr Standard	>150 µg/m^3	0	0	0

Source: SCAQMD, 2023a, 2023b, 2023c
(A) PM_{10} data were collected for 59, 40, and 59 days in 2019, 2020, and 2021, respectively.

3.2.2 SENSITIVE AIR QUALITY RECEPTORS

Some people are more affected by air pollution than others. Sensitive air quality receptors include specific subsets of the general population that are susceptible to poor air quality and the potential adverse health effects associated with poor air quality. Both CARB and the SCAQMD consider residences, schools, parks and playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes to be sensitive air quality land uses and receptors (SCAQMD, 2017a; CARB, 2005). The sensitive air quality receptors in proximity of the proposed Project include:

- Single-family residences north of the site along Mendocino Way, south of the site along Orchard Drive, and west of the site as part of the Redlands Ranch neighborhood.

- Individuals at the Crafton Park, approximately 350 feet south of the Project site.
- Students at the Crafton Elementary School, approximately 960 feet south of the Project site;

3.2.3 EXISTING HEALTH RISKS AND DISADVANTAGED COMMUNITIES

The existing sensitive air quality receptors located adjacent or in close proximity to the Project site, are exposed to air pollution associated with motor vehicles operating on the roadways (e.g., Wabash Avenue, Colton Avenue), industrial facilities in proximity of the site, and overhead aircraft. The following subsections identify existing sources of information that attempt to quantify community health risks based on the sources of pollution to which they are exposed.

3.2.3.1 SCAQMD MATES IV Carcinogenic Risk Map

According to the SCAQMD's MATES IV Carcinogenic Risk Map, the existing carcinogenic risk in the vicinity of the Project is approximately 567 incremental cancer cases per million population (SCAQMD, 2018c).[1] This estimate reflects regional modeling efforts that largely do not account for site specific emission rates and dispersion characteristics that typically result in refined and substantially lower health risk estimates.

3.2.3.2 CalEnviroScreen and Disadvantaged Communities (Senate Bill 535)

CalEnviroScreen is a mapping tool that helps identify California communities that are most affected by many sources of pollution, and where people are often especially vulnerable to pollution's effects. While CalEnviroScreen was originally developed as part of Senate Bill (SB) 535 and used to identify disadvantaged communities for the purposes of allocating funding from the State's Cap-and-Trade regulation, its application and scope have expanded over the years. The tool uses environmental, health, and socioeconomic information to produce scores for every census tract in the state. The CalEnviroScreen model is made up of four components – two pollution burden components (exposures and environmental effects) and two population characteristics components (sensitive populations and socioeconomic factors). The four components are further divided into 20 indicators. An indicator is a measure of either environmental conditions, in the case of pollution burden indicators, or health and vulnerability factors, in the case of population characteristic indicators.

- **Exposure** indicators are based on the measurements of different types of pollution that people may come into contact with. Exposure indicators include:
    - Air Quality: Ozone
    - Air Quality: $PM_{2.5}$
    - Children's Lead Risk from Housing
    - Diesel Particular Matter
    - Drinking Water Contaminants
    - Pesticide Use

[1] The potential cancer risk for a given substance is expressed as the incremental number of potential cancer cases that could be developed per million people, assuming that the population is exposed to the substance at a constant annual average concentration over a presumed 70-year lifetime. These risks are usually presented in chances per million. For example, if the cancer risks were estimated to be 100 per million, the probability of an individual developing cancer due to a lifetime of exposure would be one hundred in a million, or one in ten thousand. In other words, this predicts an additional 100 cases of cancer in a population of a million people over a 70-year lifetime (SCAQMD, 2021c).

  - Toxic Releases from Facilities
  - Traffic Density
- **Environmental effects** indicators are based on the locations of toxic chemicals in or near communities. Environmental effects indicators include:
  - Cleanup Sites
  - Groundwater Threats
  - Hazardous Waste Generators and Facilities
  - Impaired Water Bodies
  - Solid Waste Sites and Facilities
- **Sensitive population** indicators measure the number of people in a community who may be more severely affected by pollution because of their age or health. Sensitive population indicators include:
  - Asthma
  - Cardiovascular Disease
  - Low Birth Weight Infants
- **Socioeconomic factor** indicators are conditions that may increase people's stress or make healthy living difficult and cause them to be more sensitive to pollution's effects (OEHHA 2018). Socioeconomic factors include:
  - Educational Attainment
  - Housing Burden
  - Linguistic Isolation
  - Poverty
  - Unemployment

Each census tract receives scores for as many of the 20 indicators as possible, and the scores are then mapped so that different communities can be compared. Percentiles are assigned to each census tract based on the census tract's score in relation to the rest of the state. An area with a high percentile is one that experiences a much higher pollution burden than areas with low scores. For example, if a census tract has an indicator in the 40th percentile, it means that indicator's percentile is higher than 40 percent of the census tracts in the state. CalEnviroScreen also provides a total (or cumulative) score, which is the product of multiplying the 10 pollution burden components by the 10 population characteristics. This total / cumulative score helps contextualize how multiple contaminants from multiple sources affect people, while taking into account their living conditions (e.g., nonchemical factors such as socioeconomic and health status). Communities that are within the top 25th percentile for total CalEnviroScreen scores are considered disadvantaged communities pursuant to SB 535 (OEHHA, 2017a and 2017b).

According to the Office of Environmental Health Hazard Assessment (OEHHA) CalEnviroScreen 4.0 Map, the proposed Project is in the census tract north of East Citrus Avenue, between Wabash Avenue and Judson Street (census tract: 6071008402). This census tract includes student receptors at Crafton Elementary School and Crafton Park, and shows an average pollution indicator percentile of 41% based on the CalEnviroScreen indicators (e.g., exposure, environmental effects, population characteristics, socioeconomic factors) (OEHHA, 2018). Table 3-4 summarizes the CalEnviroScreen indicators for census tract 6071008402.

Table 3-4: CalEnviroScreen Health Risk Information	
Indicator	**Census Tract Indicator Values**
	Tract 6071008402
Exposure Indicators	
Air Quality: Ozone	100
Air Quality: $PM_{2.5}$	55
Children's Lead Risk from Housing	12
Diesel Particulate Matter	39
Drinking Water Contamination	61
Pesticide Use	78
Toxic Releases from Facilities	42
Traffic Density	9
Environmental Effect Indicators	
Cleanup Sites	0
Groundwater Threats	0
Hazardous Waste Generators and Facilities	17
Impaired Water Bodies	0
Solid Waste Sites and Facilities	0
Sensitive Population Indicators	
Asthma	61
Cardiovascular Disease	57
Low Birth Weight Infants	84
Socioeconomic Factor Indicators	
Educational Attainment	30
Housing Burden	14
Linguistic Isolation	22
Poverty	30
Unemployment	67
Cumulative Percentiles	
Pollution Burden Percentile	27
Population Characteristics Percentile	50
CalEnviroScreen Percentile (Total)	**41**
SB 535 Disadvantaged Community?	**No**
Source: OEHHA, 2021	

As shown in Table 3-4, census tract 6071008402 is within the bottom 50% of total CalEnviroScreen percentiles throughout the State. Though it is not substantially burdened by exposure to most pollution and socioeconomic factors as described in Table 3-4, this census tract was at the highest 100% score for air quality ozone exposure, which puts this community in the highest percentile for exposure to ozone levels compared with the rest of California. However, since this census tract is not within the top 25% in total scoring, according to the CalEnviroScreen methodology, it is not considered a disadvantaged community pursuant to SB 535.

3.2.4 EXISTING SITE OPERATIONS AND EMISSIONS ESTIMATES

The proposed Project site is currently undeveloped, this analysis assumes no emissions are generated at the site.

3.3 FEDERAL, STATE, AND LOCAL AIR QUALITY REGULATIONS

3.3.1 FEDERAL AIR QUALITY REGULATIONS

In 1975, Congress enacted the Federal Energy and Policy Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the act, the National Highway Traffic Safety Administration (NHTSA) is responsible for establishing additional vehicle standards.

3.3.1.1 Federal Air Quality Regulations

The Federal Clean Air Act (CAA) defines the U.S. EPA's responsibilities for protecting and improving the United States air quality and ozone layer. Key components of the CAA include reducing ambient concentrations of air pollutants that cause health and aesthetic problems, reducing emission of toxic air pollutants, and stopping production and use of chemicals that destroy the ozone.

Federal clean air laws require areas with unhealthy levels of ozone, inhalable particulate matter, Carbon monoxide, nitrogen dioxide, and sulfur dioxide to develop State Implementation Plans (SIPs); comprehensive documents that identify how an area will attain NAAQS. Deadlines for attainment were established in the 1990 amendments to the CAA based on the severity of an area's air pollution problem. Failure to meet air quality deadlines can result in sanctions against the State or the EPA taking over enforcement of the CAA in the affected area. SIPs are a compilation of new and previously submitted plans, programs, district rules, and State and Federal regulations. The SCAQMD implements the required provisions of an applicable SIP through its Air Quality Management Plan (AQMP). Currently, SCAQMD implements the 2012 Lead SIP for the Los Angeles County portion of Basin through the 2012 AQMP, and the 8-hr Ozone, 1-hr Ozone, 24-hr $PM_{2.5}$, and annual $PM_{2.5}$ SIPs through the 2016 AQMP. The Draft 2022 AQMP was published in May 2022.

3.3.1.2 Safe Affordable Fuel-Efficient Rule

On September 27, 2019, the U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) published the SAFE Vehicles Rule Part One: One National Program." (84 Fed. Reg. 51,310 (Sept. 27, 2019)). The Part One Rule revoked California's authority to set its own greenhouse gas emissions standards and set zero emission vehicle mandates in California. As a result of the loss of the zero emission vehicles (ZEV) sales requirements in California, there may be fewer ZEVs sold and thus additional gasoline-fueled vehicles sold in future years (CARB 2019).

In April 2020, the U.S. EPA and NHTSA issued the SAFE Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks (Final SAFE Rule) that relaxed federal greenhouse gas emissions and fuel economy standards. The Final SAFE Rule relaxed federal greenhouse gas emissions and Corporate Average Fuel Economy (CAFE) standards to approximately 1.5 percent (%) per year from model year (MY) 2020 levels over MYs 2021–2026. The previously established emission standards and related "augural" fuel economy standards would have achieved approximately 4% per year improvements through MY 2025. The Final SAFE Rule affects both upstream (production and delivery) and downstream (tailpipe exhaust) carbon dioxide (CO_2) emissions (CARB, 2020).

3.3.2 STATE AIR QUALITY REGULATIONS

3.3.2.1 California Clean Air Act

In addition to being subject to Federal requirements, air quality in the State is also governed by more stringent regulations under the California Clean Air Act, which was enacted in 1988 to develop plans and strategies for attaining the California Ambient Air Quality Standards. CARB, which is part of the California Environmental Protection Agency (Cal-EPA), develops Statewide air quality regulations, including industry-specific limits on criteria, toxic, and nuisance pollutants. The California Clean Air Act is more stringent than Federal Law in a number of ways, including revised standards for PM_{10} and ozone and for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride.

In California, both the Federal and State Clean Air acts are administered by CARB. It sets all air quality standards including emission standards for vehicles, fuels, and consumer goods as well as monitors air quality and sets control measures for toxic air contaminants. CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional level.

3.3.2.2 Air Toxics "Hot Spots" Program

State requirements specifically address air toxic issues through Assembly Bill (AB) 1807 (known as the Tanner Bill) that established the State air toxics program and the Air Toxics Hot Spots Information and Assessment Act (AB 2588). Under the: "Hot Spots" Program, stationary sources of emissions are required to report the types and quantities of certain substances that their facilities routinely release into the air.

3.3.2.3 In-Use Off-Road Diesel Equipment Program

CARB's In-Use Off-Road Diesel Equipment regulation is intended to reduce emissions of NO_x and PM from off-road diesel vehicles, including construction equipment, operating within California. The regulation imposes limits on idling; requires reporting equipment and engine information and labeling all vehicles reported; restricts adding older vehicles to fleets; and requires fleets to reduce their emissions by retiring, replacing, or repowering older engines or installing exhaust retrofits for PM. The requirements and compliance dates of the off-road regulation vary by fleet size, and large fleets (fleets with more than 5,000 horsepower) must meet average targets or comply with Best Available Control Technology (BACT) requirements beginning in 2014. CARB has off-road anti-idling regulations affecting self-propelled diesel-fueled vehicles of 25 horsepower and up. The off-road anti-idling regulations limit idling on applicable equipment to no more than five minutes, unless exempted due to safety, operation, or maintenance requirements.

3.3.2.4 On-road Heavy-Duty Vehicles (In-Use) Regulation

CARB's In-Use Heavy-Duty Diesel-Fueled regulation (also known as the Truck and Bus Regulation) is intended to reduce emissions of NO_x, PM, and other criteria pollutants generated from existing on-road diesel vehicles operating in California. The regulation applies to nearly all diesel-fueled trucks and buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds that are privately or federally owned, and for privately and publicly owned school buses. Heavier trucks and buses with a GVWR greater than 26,000 pounds must comply with a schedule by engine model year or owners can report to show compliance with more flexible options. Fleets complying with the heavier trucks and buses schedule must install the best available PM filter on 1996 model year and newer engines, and replace the vehicle 8 years later. Trucks with 1995 model year and older engines had to be replaced starting in 2015. Replacements with a 2010 model year or newer engine meet the final requirements, but owners can also replace the equipment with used trucks that have a future compliance date (as specified in regulation). By 2023, all trucks and buses must have at least 2010 model year engines, with few exceptions.

3.3.2.5 CARB Air Quality and Land Use Handbook

In 1998, CARB identified particulate matter from diesel-fueled engines as a TAC. CARB's Air Quality and Land Use Handbook is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process (CARB, 2005). The CARB Handbook recommends that planning agencies consider proximity to air pollution sources when considering new locations for "sensitive" land uses, such as residences, medical facilities, daycare centers, schools, and playgrounds. Air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners, and large gasoline service stations. Key recommendations in the Handbook relative to the Project Area include taking steps to consider or avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day;
- Within 300 feet of gasoline fueling stations; or
- Within 300 feet of dry-cleaning operations (dry cleaning with TACs is being phased out and will be prohibited in 2023). The SCAQMD (Regulation 14, Rule 21) has established emission controls for the use of perchloroethylene, the most common dry-cleaning solvent.

3.3.2.6 Assembly Bill 617: Community Air Protection Program

Adopted in 2017, AB 617 requires CARB and air districts to develop and implement additional emissions reporting, monitoring, reduction plans and measures in an effort to reduce air pollution exposure in disadvantaged communities. The bill recognizes that while California has seen tremendous improvement in regional air quality, some communities are still disproportionately impacted by local sources. Major local sources of air pollution in environmental justice communities include mobile sources (trucks, trains, ships, etc.) and industrial facilities. AB 617 deviates from prior legislation in that it requires local air districts to work in partnership with residents and community stakeholders to develop and implement community emissions reduction and/or community monitoring plans for the designated communities (as opposed to air districts unilaterally developing plans and strategies for addressing air pollution).

3.3.2.7 California Building Industry Association vs. Bay Area Air Quality Management District

The California Supreme Court in *California Building Industry Association v. Bay Area Air Quality Management District*, 62 Cal.4th 369 (2015) ruled that CEQA review is focused on a project's impact on the

environment "and not the environment's impact on the project." The opinion also holds that when a project has "potentially significant exacerbating effects on existing environmental hazards" those impacts are properly within the scope of CEQA because they can be viewed as impacts of the project on "existing conditions" rather than impacts of the environment on the project. The Supreme Court provided the example of a project that threatens to disperse existing buried environmental contaminants that would otherwise remain undisturbed. The Court concluded that it is proper under CEQA to undertake an analysis of the dispersal of existing contaminants because such an analysis would be focused on how the project "would worsen existing conditions." The court also found that the limited number of express CEQA provisions that require analysis of the impacts of the existing environment on a project – such as impacts associated with school siting and airports – should be viewed as specific statutory exceptions to the general rule that such impacts are not properly within CEQA's scope.

3.3.3 REGIONAL AIR QUALITY REGULATIONS

3.3.3.1 Southern California Association of Governments

The Southern California Association of Governments (SCAG) is a Joint Powers Authority under California State Law, established as an association of local governments and agencies that voluntarily convene as a forum to address regional issues. SCAG encompasses the counties of Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial.

SCAG is designated as a Metropolitan Planning Organization (MPO) and as a Regional Transportation Planning Agency. Under SB 375, SCAG, as a designated MPO, is required to prepare a Sustainable Communities Strategy (SCS) as an integral part of its Regional Transportation Plan (RTP). On September 3, 2020, SCAG's Regional Council adopted the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (2020 RTP/SCS). The 2020 RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. Information contained in Chapter 3: A Path to Greater Access, Mobility & Sustainable Growth of the 2020 RTP/SCS forms the basis for the land use and transportation components of the AQMP and are utilized in the preparation of air quality forecasts and consistency analysis included in the AQMP.

3.3.3.2 SCAQMD Air Quality Management Plan

The purpose of an AQMP is to bring an air basin into compliance with federal and state air quality standards and is a multi-tiered document that builds on previously adopted AQMPs. The 2016 AQMP for the Basin, which updated the 2012 AQMP, was approved by the SCAQMD Board of Directors on March 3, 2017. The 2016 AQMP provides new and revised demonstration's for how the SCAQMD, in coordination with Federal, State, Regional and Local Governments will bring the Basin back into attainment for the following NAAQS: 1997 8-hour Ozone; 1997 1-hour Ozone; 2008 8-hour Ozone; 2006 24-hour $PM_{2.5}$; and 2012 Annual $PM_{2.5}$.[2]

On December 2, 2022, the SCAQMD Governing Board adopted the 2022 AQMP, which focuses on bringing the South Coast Air Basin and the Salton Sea Air Basin into compliance with the 2015 8-hour ozone standard. The South Coast Air Basin, which is in extreme nonattainment, has an attainment year of

[2] Although the 2006 24-hour $PM_{2.5}$ standard was focused on in the 2012 AQMP, it has since been determined, primarily due to unexpected drought conditions, that it is impractical to meet the standard by the original attainment year. Since adoption of the 2012 AQMP, the U.S. EPA approved a re-classification to "serious" non-attainment for the standard, which requires a new attainment demonstration and deadline.

2037 for the 2015 8-hour ozone NAAQS. The 2022 AQMP includes growth projections developed by SCAG for the 2020 RTP/SCS that help inform emissions inventories. The 2022 AQMP plans to reduce NOx emissions to 60 tons per day, which is 67% below the current 2037 baseline, in order to meet this standard. The 2022 AQMP notes that widespread adoption of zero emission technologies across all sectors and a combination of local, state, and federal action will be required to achieve the projected NOx reductions.

The SCAQMD proposes incentive programs and 49 control measures that, with state and federal control measures, can achieve the required NOx reductions. SCAQMD's incentive programs would focus on promoting deployment of existing zero emission and low NOx technology and on developing new zero emission and ultra-low NOx technologies. SCAQMD's control measures consist of 30 measures that target stationary sources and 18 that target mobile sources. The 2022 AQMP includes stationary source measures that seek to reduce NOx from residential combustion sources, commercial combustion sources, and large combustion sources, as further described below.

- Residential control measures focus on reducing NOx by replacing appliances and devices (e.g., for heating and cooking) with zero emission and low-NOx appliances.
- Commercial control measures are identified reduce NOx from commercial appliances, cooking devices, and small internal combustion engines and commercial combustion equipment.
- Large combustion control measures have been included reduce NOx from sources including boilers, engines, and facilities.

In addition, the 2022 AQMP includes stationary source measures to reduce VOC, including reducing leaks and providing incentive funding for the adoption of low-VOC technology. The 2022 AQMP also includes co-benefit measures that quantify the reduction in criteria air pollutants from energy and climate change measures. Other stationary source measures (e.g., education and outreach) seek to reduce all criteria pollutants.

Finally, the 2022 AQMP includes mobile source control measures grouped into the following categories:

- Emission growth management, which mitigates emissions from new or redevelopment projects.
- Facility based, which focus on mobile sources at port, railyards, and intermodal facilities.
- On-road and off-road mobile sources, which focus on vehicles and equipment used during construction and operation at industrial sites.
- Incentives, for early deployment of cleaner technology.
- Other measures (e.g., infrastructure planning).

3.3.3.3 SCAQMD Rule Book

In order to control air pollution in the Basin, the SCAQMD adopts rules that establish permissible air pollutant emissions and governs a variety of businesses, processes, operations, and products to implement the AQMP and the various federal and state air quality requirements. SCAQMD does not adopt rules for mobile sources; those are established by CARB or the U.S. EPA. In general, the SCAQMD rules that are anticipated to be applicable to the development of the proposed Project, include:

- **Rule 203 (Permit to Operate)** sets forth the requirement that the use or operation any equipment or agricultural permit unit, the use of which may cause the issuance of air

contaminants, or the use of which may reduce or control the issuance of air contaminants, must receive a written permit to operate from the Executive Officer.

- **Rule 401 (Visible Emissions)** prohibits discharge into the atmosphere from any single source of emission for any contaminant for a period or periods aggregating more than three minutes in any one hour that is as dark or darker in shade than that designated as No. 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.
- **Rule 402 (Nuisance)** prohibits discharges of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
- **Rule 403 (Fugitive Dust)** prohibits emissions of fugitive dust from any grading activity, storage pile, or other disturbed surface area if it crosses the project property line or if emissions caused by vehicle movement cause substantial impairment of visibility (defined as exceeding 20 percent capacity in the air). Rule 403 requires the implementation of Best Available Control Measures and includes additional provisions for projects disturbing more than five acres and those disturbing more than fifty acres.
- **Rule 445 (Wood Burning Devices)** prohibits installation of woodburning devices such as fireplaces and wood-burning stoves in new development unless the development is located at an elevation above 3,000 feet or if existing infrastructure for natural gas service is not available within 150-feet of the development. All fireplaces installed within the Proposed Project area will be natural gas fueled fireplaces.
- **Rule 481 (Spray Coating Operations)** imposes equipment and operational restrictions during construction for all spray painting and spray coating operations.
- **Rule 1108 (Cutback Asphalt)** prohibits the sale or use of any cutback asphalt containing more than 0.5 percent by volume organic compounds which evaporate at 260°C (500°F) or lower.
- **Rule 1113 (Architectural Coatings)** establishes maximum concentrations of VOCs in paints and other applications and establishes the thresholds for low-VOC coatings.
- **Rule 1143 (Consumer Paint Thinners and Multi-Purpose Solvents)** prohibits the supply, sale, manufacture, blend, package or repackage of any consumer paint thinner or multi-purpose solvent for use in the SCAQMD unless consumer paint thinners or other multi-purpose solvents comply with applicable VOC content limits.

3.3.4 CITY OF REDLANDS

3.3.4.1 General Plan

The City of Redlands' General Plan contains the following policies regarding air quality that may be applicable to the proposed Project:

- Policy 7-A.145: Provide, whenever possible, incentives for carpooling, flex time, shortened work weeks, telecommuting, and other means of reducing vehicular miles traveled.
- Policy 7-A.147: Cooperate with the ongoing efforts of the U.S. Environmental Protection Agency, the South Coast Air Quality Management District, and the State of California Air Resources Board in improving air quality in the regional air basin.

- Policy 7-A.149: Ensure that construction and grading projects minimize short-term impacts to air quality.
    - Require grading projects to provide a stormwater pollution prevention plan (SWPPP) in compliance with City requirements, which include standards for best management practices (BMPs) that control pollutants from dust generated by construction activities and those related to vehicle and equipment cleaning, fueling, and maintenance;
    - Require grading projects to undertake measures to minimize mono-nitrogen oxides (NOx) emissions from vehicle and equipment operations; and
    - Monitor all construction to ensure that proper steps are implemented.
- Policy 7-A.152: Enforce regulations to prevent trucks from excessive idling in residential areas.
- Policy 7-A.153: Require applicants for sensitive land uses (e.g. residences, schools, daycare centers, playgrounds, and medical facilities) to site development and/or incorporate design features (e.g. pollution prevention, pollution reduction, barriers, landscaping, ventilation systems, or other measures) to minimize the potential impacts of air pollution on sensitive receptors.
- Policy 7-A.154: Require applicants for sensitive land uses within a Proposition 65 warning contour to conduct a health risk assessment and mitigate any health impacts to a less than significant level.

3.3.4.2 Municipal Code

The City of Redlands Municipal Code, Title 8 Health and Safety, Chapter 8.52 Air Pollution establishes that it is unlawful for any person to maintain or operate any factory, yard, or establishment which generates into or pollutes the atmosphere with any unwholesome gas, fumes, dust, smoke, or odors deleterious to the public health or to allow offensive odors to be emitted from offal, garbage, or any animal or vegetable matter which is used in any process of reduction or manufacturing.

4 AIR QUALITY IMPACT AND HEALTH RISK ANALYSIS

This chapter evaluates the direct and indirect air quality impacts that could result from implementation of the proposed Project.

4.1 THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines, the proposed Project could result in potentially significant impacts related to air quality if it would:

- Conflict with or obstruct implementation of the applicable SCAQMD AQMP;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the South Coast Air Basin is designated non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

4.1.1 REGIONAL AND TOXIC AIR CONTAMINANT SIGNIFICANCE THRESHOLDS

Consistent with the guidance contained in Appendix G of the State CEQA Guidelines, this Report relies upon SCAQMD-recommended methods and pollutant thresholds to evaluate whether the proposed Project's emissions would violate any air quality standard, contribute substantially to an existing or projected air quality violation, result in a cumulatively considerable net increase in nonattainment criteria air pollutants, or expose sensitive receptors to substantial pollutant concentrations. The SCAQMD's recommended thresholds of significance for criteria pollutants and incremental increases in health risk are shown in Table 4-1.

Table 4-1: SCAQMD-Recommended CEQA Thresholds

Pollutant	Maximum Daily Emissions (lbs/day)	
	Construction	Operation
NO_X	100	55
VOC/ROG	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
CO	550	550
Lead	3	3
TACs	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	

Source: SCAQMD, 2019b

4.1.2 LOCALIZED SIGNIFICANCE THRESHOLDS

In addition to establishing thresholds of significance for emissions of criteria air pollutants on a regional level, the SCAQMD has also developed Localized Significance Thresholds (LSTs) that represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable Federal or State ambient air quality standards, which would result in significant adverse localized air quality effects. The LST methodology takes into account a number of factors, including (1) existing ambient air quality in each SRA; (2) how many acres the project would disturb; and (3) how far project construction and operational activities would take place from the nearest sensitive receptor. Unlike the regional emission significance thresholds, LSTs have only been developed for NO_X, CO, PM_{10} and $PM_{2.5}$.

This Report evaluates the proposed Project's potential to expose sensitive receptors to substantial pollutant concentrations pursuant to the SCAQMD Final Localized Significance Thresholds Methodology. This methodology provides screening tables for one through five-acre project scenarios. The construction and operational LSTs for one-acre, two-acre, and five-acre sites in SRA 35 (East San Bernardino Valley), the SRA in which the project is located, are shown in Table 4-2.

Table 4-2: SCAQMD Localized Significance Thresholds for Source Receptor Area 3

Pollutant Monitored	Maximum Allowable Emissions (Pounds per Day) as a Function of Receptor Distance (in Feet) from Site Boundary				
	82 Feet	164 Feet	328 Feet	656 Feet	1,640 Feet
ONE-ACRE SITE					
Construction Thresholds					
Nitrogen Oxides (NO_x)	118	148	211	334	651
Carbon Monoxide (CO)	775	1,205	2,279	5,351	21,703
Particulate Matter (PM_{10})	4	12	36	82	220
Particulate Matter ($PM_{2.5}$)	4	5	10	26	112
Operational Thresholds					
Nitrogen Oxides (NO_x)	118	148	211	334	651
Carbon Monoxide (CO)	775	1,205	2,279	5,351	21,703
Particulate Matter (PM_{10})	1	3	9	20	53
Particulate Matter ($PM_{2.5}$)	1	2	3	7	27
TWO-ACRE SITE					
Construction Thresholds					
Nitrogen Oxides (NO_x)	170	200	263	377	683
Carbon Monoxide (CO)	1,174	1,712	3,029	6,375	23,294
Particulate Matter (PM_{10})	7	21	44	90	230
Particulate Matter ($PM_{2.5}$)	5	7	13	30	120
Operational Thresholds					
Nitrogen Oxides (NO_x)	170	200	263	377	683
Carbon Monoxide (CO)	1,174	1,712	3,029	6,375	23,294
Particulate Matter (PM_{10})	2	5	11	22	56
Particulate Matter ($PM_{2.5}$)	2	2	4	8	29

Table 4-2: SCAQMD Localized Significance Thresholds for Source Receptor Area 3					
Pollutant Monitored	**Maximum Allowable Emissions (Pounds per Day) as a Function of Receptor Distance (in Feet) from Site Boundary**				
	82 Feet	**164 Feet**	**328 Feet**	**656 Feet**	**1,640 Feet**
FIVE-ACRE SITE					
Construction Thresholds					
Nitrogen Oxides (NO_x)	270	302	378	486	778
Carbon Monoxide (CO)	2,075	2,890	4,765	9,044	27,650
Particulate Matter (PM_{10})	14	42	66	113	255
Particulate Matter ($PM_{2.5}$)	9	12	20	40	140
Operational Thresholds					
Nitrogen Oxides (NO_x)	270	302	378	486	778
Carbon Monoxide (CO)	2,075	2,890	4,765	9,044	27,650
Particulate Matter (PM_{10})	4	11	16	28	62
Particulate Matter ($PM_{2.5}$)	3	3	5	10	34

Source: SCAQMD 2009, modified by MIG 2023

Note: The localized thresholds for NOx in this table account for the conversion of NO to NO_2. The emission thresholds are based on NO_2 levels, as this is the compound associated with adverse health effects.

4.1.3 CARBON MONOXIDE "HOT SPOT" THRESHOLDS

Historically, to determine whether a project poses the potential for a CO hotspot, the quantitative CO screening procedures provided in the *Transportation Project-Level Carbon Monoxide Protocol* (the Protocol) were used (UCD ITS 1997). The Protocol determines whether a project may worsen air quality by increasing the percentage of vehicles in cold start modes by two percent or more; significantly increasing traffic volumes by five percent or more; or worsening traffic flow at signalized intersections (by increasing average delay at intersections operating at level of service (LOS) E or F or causing an intersection that would operate at LOS D or better without the project, to operate at LOS E or F). With new vehicles and improvements in fuels resulting in fewer emissions, the retirement of older polluting vehicles, and new controls and programs, CO concentrations have declined dramatically in California. As a result of emissions controls on new vehicles, the number of vehicles that can idle, and the length of time that vehicles can idle before emissions would trigger a CO impact, has increased. Therefore, the use of LOS as an indicator is no longer applicable for determining CO impacts.

The Bay Area Air Quality Management District (BAAQMD) developed a screening-level analysis for CO hotspots in 2010 which finds that projects that are consistent with the applicable congestion management program, and that do not cause traffic volumes at affected intersections to increase to more than 44,000 vehicles per hour, would not result in a CO hotspot that could exceed State or Federal air quality standards (BAAQMD 2017 pg. 3-4). CO modeling was conducted for the SCAQMD's 2003 AQMP at four busy intersections during morning and evening peak hour periods as well. The busiest intersection studied in this analysis, Wilshire Boulevard and Veteran Avenue, had 8,062 vehicles per hour during morning peak hours, 7,719 vehicles per hour during evening peak hours, and approximately 100,000 vehicles per day. The 2003 AQMP estimated that the 1-hour CO concentration for this intersection was 4.6 ppm, which is less than a fourth of the 1-hour CAAQS CO standard (20 ppm) (SCAQMD 2003a). The BAAQMD screening threshold is generally consistent with the results of the CO modeling conducted for the SCAQMD's 2003 AQMP.

Therefore, for purposes of this Report, the Project would pose the potential for a CO hotspot if it would exceed the BAAQMD's screening traffic level for peak hour intersection traffic volumes (44,000 vehicles per hour) (thereby having the potential to result in CO concentrations that exceed 1-hour State [20 ppm], 1-hour Federal [35 ppm], and/or State and Federal 8-hour [9 ppm] ambient air quality standards for CO).

4.2 ANALYSIS METHODOLOGY

Construction and operational emissions associated with buildout of the Project were calculated using CalEEMod and emission factors derived from CARB databases. The following summarizes the specific sources, and methodologies employed to estimate emissions.

4.2.1 MASS-BASED CRITERIA AIR POLLUTANT AND CONSTRUCTION TAC EMISSIONS

4.2.1.1 Construction Emissions

Construction of the proposed Project would generate equipment exhaust and dust emissions from the use of heavy-duty off-road equipment during site preparation, grading, building construction, paving, and architectural coating activities, as well as worker and vendor vehicle trips. The proposed Project's potential construction emissions were modeled using CalEEMod, Version 2022.1.1. The Project's construction activities, duration, and typical equipment used during construction are shown in Table 2-2. The construction phases, duration, and the type and amount of equipment used during construction was generated using CalEEMod default assumptions, and modified to reflect the following Project-specific characteristics:

- **Demolition:** The Demolition phase was removed to reflect the fact that the Project site is undeveloped.
- **Fugitive Dust Abatement During Construction:** The model was updated to reflect compliance with the watering requirements of SCAQMD Rule 403 during construction activities.
- **Electricity Use:** A 25 kilowatt (kW) generator was added to the model and assumed to operate 11-hours daily during construction to account for electricity consumption from the potential operation of a construction trailer on-site.

4.2.1.2 Operational Emissions

Once operational, the proposed Project would generate emission from the following sources:

- **Small "area" sources** including landscaping equipment and the use of consumer products such as paints, cleaners, and fertilizers that result in the evaporation of chemicals to the atmosphere during product use.
- **Energy use** in the form of natural gas combustion for building water and space heating needs.
- **Mobile sources** including trips made to and from the site by new residents and visitors.

Similar to construction emissions, criteria air pollutant emissions from operational activities were estimated in CalEEMod, Version 2022.1.1 based on default model assumptions, with the following modifications made to reflect Project-specific characteristics:

- **Area Sources:** Woodstoves and fireplaces were removed pursuant to SCAQMD Rule 445. The quantity of wood-burning fireplaces assumed by CalEEMod were added to natural-gas powered fireplaces.

- **Mobile Sources:** The default, weekday trip generation rate for the proposed land use was updated to reflect the trip generation rate provided in the Traffic Impact Analysis prepared for the proposed Project by Ganddini Group (Ganddini Group, 2023).

4.2.2 CONSTRUCTION EXHAUST PM_{10} MODELING METHODOLOGY

Construction activities associated with the proposed Project would generate on- and off-site exhaust emissions, including DPM, in the form of PM_{10}. The specific quantity of emissions emitted at any given time would be dependent on the type and number of pieces of equipment operating, the equipment's engine classification, the equipment's horsepower, and the load the engine is under. Off-site emissions would be generated from vendor trucks used to deliver materials to the site.

The U.S. EPA's AERMOD dispersion model (version 21112) was used to predict pollutant concentrations at existing sensitive receptors near the Project site. The AERMOD dispersion model is an EPA-approved and SCAQMD-recommended model for simulating the dispersion of pollutant emissions and estimating ground level concentrations of pollutants at specified receptor locations. AERMOD requires the user to input information on the source(s) of pollutants being modeled, the receptors where pollutant concentrations are modeled, and the meteorology, terrain, and other factors that affect the potential dispersion of pollutants. These variables are described below.

4.2.2.1 Modeled Construction Sources / Emission Rates

On- and off-site construction emissions were modeled as a series of area and line area sources, respectively, as shown in Table 4-3 and depicted in Figure 4-1. As a conservative approach, PM_{10} construction exhaust emissions were presumed to be 100 percent DPM. An emissions rate for each source listed in Table 4-3 was derived from the CalEEMod emissions estimates presented in Table 4-7. The annual PM_{10} exhaust emissions generated during construction of the proposed Project were converted to an average emission rate in terms of grams / second per hour of construction activity.

On-site DPM emissions from construction were modeled as a series of four area sources split between the northwestern, northeastern, southeastern, and southwestern quadrants of the site. The area sources were assigned a release height of five meters; this elevated source height reflects the height of the equipment exhaust pipes, plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for the plume rise of the exhaust gases.

Off-site DPM emissions from vehicles were modeled as line area sources. All hauling and vendor trips were assumed to travel via Wabash Avenue along the City's designated truck routes in proximity to the Project site. 50% of trips were assumed to travel via Wabash Avenue north of Colton Avenue, and 50% were assumed to travel via Wabash Avenue south of Colton Avenue. The release height for the line area sources was set to 4.12 meters, the approximate height of a truck exhaust.

Figure 4-1 Modeled Construction Emissions Sources



Table 4-3. AERMOD Source Parameters				
ID	Description	UTM Coordinates[A]		Size (m^2)
		X	Y	
PAREA01	Year 1 On-site PM_{10} Exhaust (northwest)	486982.64	3769341.70	9266.7
PAREA02	Year 1 On-site PM_{10} Exhaust (northeast)	487075.76	3769340.71	9417.8
PAREA03	Year 1 On-site PM_{10} Exhaust (southeast)	487075.45	3769241.18	9016.1
PAREA04	Year 1 On-site PM_{10} Exhaust (southwest)	486983.10	3769241.39	9319.6
PAREA05	Year 2 On-site PM_{10} Exhaust (northwest)	486982.64	3769341.70	9266.0
PAREA06	Year 2 On-site PM_{10} Exhaust (northeast)	487075.76	3769340.71	9417.6
PAREA07	Year 2 On-site PM_{10} Exhaust (southeast)	487075.45	3769241.18	9015.8
PAREA08	Year 2 On-site PM_{10} Exhaust (southwest)	486983.10	3769241.39	9320.1
ARLN01	Year 1 Off-site PM_{10} Exhaust (northbound Wabash Avenue)	487172.97	3769134.60	394.9[B]
ARLN02	Year 1 Off-site PM_{10} Exhaust (southbound Wabash Avenue)	487172.93	3769134.60	272.4[B]

Source: MIG 2023, see Appendix B
(A) UTM coordinates represent the northwest corner of the source.
(B) Reflects length of line area source in meters.

4.2.2.2 Meteorological Data Inputs

AERMOD requires meteorological data as an input into the model. The meteorological data is processed using AERMET, a pre-processor to AERMOD. AERMET requires surface meteorological data, upper air meteorological data, and surface parameter data such as albedo (reflectivity) and surface roughness. For the proposed Project, pre-processed surface data from the SCAQMD was obtained from the Redlands SCAQMD Meteorological Station (see Figure 3-1). Five complete years of meteorological data from January 2012 to December 2016 were utilized. Emissions were assumed to occur over an 11-hour period daily (7:00 AM to 6:00 PM) consistent with the City Municipal Code requirements.

4.2.2.3 Terrain Inputs

Terrain was incorporated by using AERMAP (an AERMOD pre-processor) to import the elevation of the Project site using data from the National Elevation Dataset (NED) with a resolution of 1/3 arcsecond.

4.2.2.4 Modeled Receptors

The following actions were performed to model receptors for the Project:

- A 1,200-meter by 1,200-meter grid was generated with a receptor spacing of 50 meters. The grid's center coordinates were 487075.45 meters Easting and 3769241.18 meters Northing, the approximate center of the Project site. The grid was converted to discrete Cartesian receptors.
- A fence line grid with one tier was generated around the perimeter of the Project site with a fence line spacing of 25 meters, segment distance of 30 meters, and tier spacing 10 meters. The grid was converted to discrete Cartesian receptors.

A plant blanking boundary was drawn around the site Project site. Based on this plant boundary and the grids described above, a total of 786 discrete receptors were modeled for the Project.

4.2.3 HEALTH RISK ANALYSIS METHODOLOGY

Cancer risk and non-cancer health risks to sensitive receptors within one-quarter mile of on-site sources were estimated using the U.S. EPA's AERMOD dispersion model and recommendations contained in the SCAQMD's *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions* white paper and *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics Hot Spots Information and Assessment Act,* as well as the OEHHA *Air Toxics Hot Spots Program Guidance Manual*.

4.2.3.1 Cancer Risk

Cancer risk is the calculated, pollutant-specific estimated probability of developing cancer based upon the dose and exposure to the TAC. Cancer risk is determined by calculating the combinatory effects of the cancer potency factor (CPF) when inhaling the toxic, the daily inhalation dose, the age group the receptor is cohort to, the duration of exposure over a lifetime (70 years), and other factors such as age sensitivity and the amount of time spent at the location of exposure. For the proposed Project, risks were assessed for the inhalation pathway (i.e., breathing) for residential and student receptors.[3] Both residential and student receptors were assessed under a 30-year exposure duration to detail potential risk to those under lifetime exposure. Cancer risk equations for residential and school receptors are summarized in Table 4-4 and Table 4-5.

4.2.3.2 Cancer Burden

Cancer burden is the product of public cancer risk and the population exposed to the carcinogen. There are approximately 330 residential dwelling units located within ¼-mile of the Project site. According to the EIR prepared for the County of San Bernardino's Countywide Plan, there are approximately 3.23 persons per household in the unincorporated portions of the county (County of San Bernardino, 2020b). Thus, an estimated population of 1,066 people live within ¼-mile of the Project site.

4.2.3.3 Non-Cancer Risk

The chronic non-cancer hazard quotient is the calculated pollutant-specific indicator for risk of developing an adverse health effect on specific organ system(s) targeted by the identified TAC, in this DPM. The potential for exposure to result in chronic non-cancer effects is evaluated by comparing the estimated annual average air concentration to the chemical-specific, non-cancer chronic RELs. The REL is a concentration below which there is assumed to be no observable adverse health impact to a target organ system. When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient. To evaluate the potential for adverse chronic non-cancer health effects from simultaneous exposure to multiple chemicals, the hazard quotients for all chemicals are summed, yielding a hazard index. The chronic REL for DPM was established by OEHHA as 5 µg/m^3. For an acute hazard quotient, the one-hour maximum concentration is divided by the acute REL for the substance; however, there is no acute REL for DPM.

[3] OEHHA has not established cancer risk values for diesel exhaust based on the ingestion or dermal pathways. Therefore, only the inhalation pathway is evaluated with regard to this TAC.

Chronic non-cancer risks are considered significant if a project's TAC emissions result in a hazard index greater than or equal to one. Non-cancer risk equations are summarized in Table 4-6.

Table 4-4: Cancer Risk Equations	
Equation 1 - Residential Risk:	$RISK_{INH.RES} = DOSE_{AIR.RES} \times CPF \times ASF \times \frac{ED}{AT} \times FAH$
Where:	
$DOSE_{AIR}$ =	Daily Inhalation Dose (mg/kg-day). See Table 4-5.
CPF =	Cancer Potency Factor for Inhalants (mg/kg-day). CPF is expressed as the 95th percent upper confidence limit of the slope of the dose response curve under continuous lifetime exposure conditions. The CPF for diesel exhaust is 1.1 mg/kg-day.
ASF =	Age Sensitivity Factor. ASF is a protective coefficient intended to take into account increased susceptibility to long-term health effects from early-life exposure to TACs. The recommended ASFs are 10 for the third-trimester to birth and two-year age bins, three for the two-year to nine-year and 16-year age bins, and one for receptors over 16 years of age.
ED =	Exposure Duration (years). Exposure duration characterizes the length of residency (30 Years) for the receptor.
AT =	Averaging Time (years). A 70-year (lifetime) averaging time is used to characterize to total risk as a factor of average risk over a typical lifespan.
FAH =	Fraction at Home / Fraction at School. FAH is the percentage of time the receptor is physically at the receptor location. *Residential Receptors* The recommended percentages are 85 percent for the third-trimester to birth and two-year age bins, 72 percent for the two-year to nine-year and 16-year age bins, and 73 for receptors over 16 years of age. *School Receptors* The FAH for school receptors was set to 42 percent. This reflects receptors being present at the site for 10 hours per day.

Table 4-5: Inhalation Dose Equations	
Residential Dose	$DOSE_{AIR.RES} = C_{AIr} \times \frac{BR}{BW} \times A \times EF \times 10^{-6}$
Where:	
C_{AIR} =	Concentration of TAC in air (µg/m^3). Concentration of toxic in micrograms per one cubic meter of air. The AERMOD program is used in the study to determine concentrations of diesel particulate matter at surrounding discrete and grid receptor points.

Table 4-5: Inhalation Dose Equations	
Residential Dose	$DOSE_{AIR.RES} = C_{AIr} \times \frac{BR}{BW} \times A \times EF \times 10^{-6}$
BR/BW =	Breathing Rate ÷ Body Weight (L/kg/day). Daily breathing rate normalized to body weight. *Residential Receptor* The 95th percentile breathing rate to body weight ratios are used in this study with a recommended 361 L/kg/day for the third-trimester to birth age bin, 1,090 L/kg/day for the birth to two-years age bin, 572 for the two-years to 16-years age bin, 261 L/kg/day for the 16-years to 30-years age bin, and 233 L/kg/day for the 16-years to 70-years age bin. *Student* Consistent with OEHHA guidance, the daily breathing rate to body weight ratios were set to 640 for the for the two-years to nine-years age bin and 520 for the for the two-years to 16-years age bin. The adult receptors were assumed to have the same breathing rate to body weight ratio as the adult receptors.
A =	Inhalation Absorption Factor. Is a coefficient that reflects the fraction of chemical absorbed in studies used in the development of CPF and Reference Exposure Levels (RELs). An absorption factor of one is recommended for all chemicals.
EF =	Exposure Frequency. EF is the ratio of days in a year that a receptor is receiving the dose. *Residential* The recommended EF is 0.96 characterizing an assumed 350 days a year that a residential receptor is home for some portion of the day. *Student* The EF for student receptors was set to 0.49. This reflects student receptors would be at the site 180 days per year.

Table 4-6: Non-Cancer Risk Equation	
Chronic Hazard Quotient:	$HI_{DPM} = \frac{C_{DPM}}{REL_{AAC}}$
Where:	
HI_{DPM} =	Hazard Index; an expression of the potential for non-cancer health effects.
C_{DPM} =	Annual average DPM concentration (µg/m^3).
REL_{DPM} =	Reference exposure level (REL) for DPM; the DPM concentration at which no adverse health effects are anticipated.

4.3 CONSISTENCY WITH THE APPLICABLE AIR QUALITY PLAN

As described in Section 3.1, the proposed Project is within the South Coast Air Basin, which is under the jurisdiction of the SCAQMD. Pursuant to the methodology provided in Chapter 12 of the SCAQMD *CEQA Air Quality Handbook*, consistency with the AQMP is affirmed if the Project:

1) Is consistent with the growth assumptions in the AQMP; and

2) Does not increase the frequency or severity of an air quality standards violation, or cause a new one.

Consistency Criterion 1 refers to the growth forecasts and associated assumptions included in the AQMP. Projects that are consistent with the AQMP growth assumptions would not interfere with attainment of air quality standards, because this growth is included in the projections used to formulate the AQMP. The proposed Project would generate approximately 333 new residents, which would be well within the SCAG 2020 RTP/SCS growth projections for the City of Redlands (i.e., 11,300 residents between 2016 and 2045; SCAG 2020). Therefore, the proposed Project would not exceed the growth assumptions contained in the AQMP.

Consistency Criterion 2 refers to the CAAQS. In developing its CEQA significance thresholds, the SCAQMD considered the emission levels at which a project's individual emissions would be cumulatively considerable (SCAQMD, 2003; page D-3). As described below in Section 4.4, the proposed Project would not generate construction or operational emissions in excess of SCAQMD criteria air pollutant thresholds.

For the reasons described above, the proposed Project would not conflict with the SCAQMD 2022 AQMP.

4.4 CUMULATIVELY CONSIDERABLE INCREASE IN REGULATED NONATTAINMENT POLLUTANTS

The proposed Project would generate short-term construction emissions. The Project's potential emissions were estimated using CalEEMod, Version 2022.1.1. As described in more detail below, the proposed Project would not generate short-term emissions that exceed SCAQMD-recommended pollutant thresholds.

4.4.1 CONSTRUCTION EMISSIONS

The proposed Project's maximum daily unmitigated construction emissions are shown in Table 4-7. The construction emissions estimates incorporate measures to control and reduce fugitive dust as required by SCAQMD Rule 403 (see Section 3.3.3). Please refer to Appendix A for CalEEMod output files and detailed construction emissions assumptions.

As shown in Table 4-7, the proposed Project's maximum daily unmitigated construction emissions would be below the SCAQMD's regional pollutant thresholds for all pollutants. Thus, the proposed Project would not generate construction-related emissions that exceed SCAQMD CEQA thresholds.

Table 4-7: Unmitigated Construction Emissions Estimates

Season	Maximum Daily Emissions (lbs/day)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Summer 2024	1.4	11.7	15.7	<0.1	0.9	0.6
Winter 2024	3.7	36.0	33.8	0.1	9.4	5.5
Winter 2025	68.2	7.5	10.7	<0.1	0.5	0.4
SCAQMD CEQA Threshold	75	100	550	150	150	55
Threshold Exceeded?	No	No	No	No	No	No

Source: MIG, 2023 (see Appendix A) and SCAQMD 2019b.

4.4.2 OPERATIONAL EMISSIONS

The proposed Project's maximum daily unmitigated operational emissions, as estimated using CalEEMod Version 2022.1.1 are shown in Table 4-8. The emissions presented are for the proposed Project's first year of operation, which is presumed to be 2025.

Table 4-8: Unmitigated Operational Emissions Estimates (Year 2025)

Source	Maximum Daily Pollutant Emissions (Pounds Per Day)(A)					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Area	5.6	1.6	6.5	<0.1	0.1	0.1
Energy	0.1	0.8	0.4	<0.1	0.1	0.1
Mobile	3.6	3.4	29.3	0.1	2.3	0.5
Total Project Emissions(B)	9.3	5.8	36.2	0.1	2.5	0.7
SCAQMD CEQA Threshold	55	55	550	150	150	55
Threshold Exceeded?	No	No	No	No	No	No

Source: MIG, 2023 (See Appendix A) and SCAQMD, 2019b.

(A) Maximum daily ROG, CO, SO_X emissions occur during the summer. Maximum daily NO_X, PM_{10}, and $PM_{2.5}$ emissions occur during the winter. See Appendix A.

(B) Totals may not equal due to rounding.

As shown in Table 4-8, the proposed Project's maximum daily unmitigated operational emissions would be below the SCAQMD's regional pollutant thresholds for all pollutants.

4.4.3 CONCLUSION

In developing its CEQA significance thresholds, the SCAQMD considered the emission levels at which a project's individual emissions would be cumulatively considerable (SCAQMD, 2003; page D-3). As described above the proposed Project's construction emissions would be below applicable SCAQMD regional thresholds for criteria air pollutants. Therefore, the proposed Project would not result in a cumulatively considerable increase in criteria air pollutants.

4.5 SENSITIVE RECEPTORS AND SUBSTANTIAL POLLUTANT CONCENTRATIONS

The proposed Project would generate both short-term construction emissions and long-term operational emissions that could impact sensitive residential receptors located near the Project; however, as described in more detail below, the proposed Project would not generate short-term or long-term emissions that exceed SCAQMD-recommended localized significance thresholds or result in other substantial pollutant concentrations after the incorporation of recommended Mitigation Measure AIR-1.

4.5.1 LOCALIZED SIGNIFICANCE THRESHOLDS ANALYSIS

4.5.1.1 Construction Emissions

The proposed Project's maximum daily construction emissions are compared against the SCAQMD's-recommended LSTs in Table 4-9. The LSTs are for SRA 35 (East San Bernardino Valley) in which the proposed Project is located. Construction emissions were estimated against the SCAQMD's thresholds for a 5-acre project size. A receptor distance of 25 meters was used to evaluate impacts at sensitive residential receptor locations for construction activities. This is considered to be a conservative

approach, since the Project would involve grading / site disturbance of approximately 9 acres, i.e., more than 5 acres.

Table 4-9: Construction Emissions Localized Significance Thresholds Analysis				
Construction Phase	**Maximum On-Site Pollutant Emissions (lbs/day)(A)**			
	NOx	**CO**	**PM_{10}**	**$PM_{2.5}$**
Site Preparation 2024	36	33	1.6	1.5
Grading 2024	18	19	0.8	0.8
Building Construction 2024	11	13	0.5	0.5
Paving 2024	7.8	10	0.4	0.4
Paving 2025	7.5	10	0.4	0.3
Architectural Coating 2025	0.9	1.1	<0.1	<0.1
SCAQMD LST Threshold	270	2,075	14	9
Threshold Exceeded?	No	No	No	No

Source: MIG, 2023 (See Appendix A)

(A) Emissions presented are worst-case emissions and may reflect summer or winter emissions levels. In general, due to rounding, there is no difference between summer and winter emissions levels for the purposes of this table.

As shown in Table 4-9, emissions from construction activities at the Project site will not exceed the SCAQMD's-recommended LSTs for SRA 35.

4.5.1.2 Operational Emissions

The proposed Project's maximum daily operational emissions are compared against the SCAQMD's-recommended LSTs in Table 4-10. The LSTs are for SRA 35 (East San Bernardino Valley) in which the proposed Project is located. The operational emissions from on-site area, mobile, and off-road emissions sources were estimated against the SCAQMD's thresholds for a 5-acre project size. A receptor distance of 25 meters was used to evaluate impacts at sensitive receptor locations for operational activities.

Table 4-10: Operational Emissions Localized Significance Thresholds Analysis				
Operational Emission Source	**Maximum On-Site Pollutant Emissions (lbs/day)(A)**			
	NOx	**CO**	**PM_{10}**	**$PM_{2.5}$**
Area	5.6	1.6	0.1	0.1
Energy	0.1	0.8	0.1	0.1
Mobile(B)	0.1	0.6	<0.1	<0.1
Total On-Site Emissions	5.8	3.0	0.2	0.2
SCAQMD LST Threshold	270	2,075	4	3
Threshold Exceeded?	No	No	No	No

Source: MIG, 2023 (See Appendix A)

(A) Emissions presented are worst-case emissions and may reflect summer or winter emissions levels. In general, due to rounding, there is no difference between summer and winter emissions levels for the purposes of this table.

(B) Mobile source emissions estimates reflect potential onsite vehicle emissions only and were derived by assuming 2% of operational mobile source emissions in Table 4-9 will occur onsite.

As shown in Table 4-10, emissions from operational activities at the Project site will not exceed the SCAQMD's-recommended LSTs for SRA 35.

4.5.2 CARBON MONOXIDE HOT SPOTS

The proposed Project would add approximately 918 new vehicle trips to the local roadway infrastructure per day, with 67 and 88 trips added during the AM and PM peak hours, respectively (Ganddini Group 2023). The Project is not located in an area where hourly or daily traffic volumes are close to 44,000 vehicles per hour, the BAAQMD screening threshold, or 100,000 vehicles per day. Furthermore, the Project would not add enough trips to result in these hourly or daily traffic volumes either. The proposed Project would not cause intersection volumes to exceed any daily (100,000) or hourly (44,000) screening vehicle volumes maintained by the SCAQMD and other regional air districts and, therefore, would not result in significant CO concentrations.

4.5.3 TOXIC AIR CONTAMINANT EMISSIONS / HEALTH RISK ASSESSMENT

As described in Section 3.2.2, sensitive receptors are located north, west, and south of the Project site. Project-related construction activities would emit PM_{10} from equipment exhaust.

4.5.3.1 Individual Cancer Risk from Exposure to DPM

The predicted locations of the annual, unmitigated point of maximum impact (PMI), the maximally exposed individual resident receptor (MEIR), and maximally exposed student receptor (MESR) for DPM exposure during construction are shown in Figure 4-2, along with contours of pollutant concentrations in proximity of the Project site. The predicted PMI is located east of the Project site, in Wabash Avenue. Since the PMI for DPM exposure is located on land that is not occupied by a receptor on a permanent basis, lifetime excess cancer risks and chronic non-cancer health hazards, which are based on exposure to annual average pollutant concentrations, were not estimated for the modeled PMI location.

Accordingly, health risks were assessed at the modeled residential MEIR location, which is located north of the Project site at 1774 Mendocino Way. The HRA for residential receptors evaluated worst-case carcinogenic and non-carcinogenic risks to child (3rd trimester, 0-2 years, and 2-16 years) and adult (16-30 years and 30-70 years) receptors. Potential health risks were also assessed for student receptors near Redlands East Valley High School, east of the Project site. The worst-case individual cancer risk from exposure to DPM during construction is summarized in Table 4-11. The worst-case risk is based on a receptor that is in the 3rd trimester at the start of construction activities. See Appendix C for estimated risks to all receptor age groups.

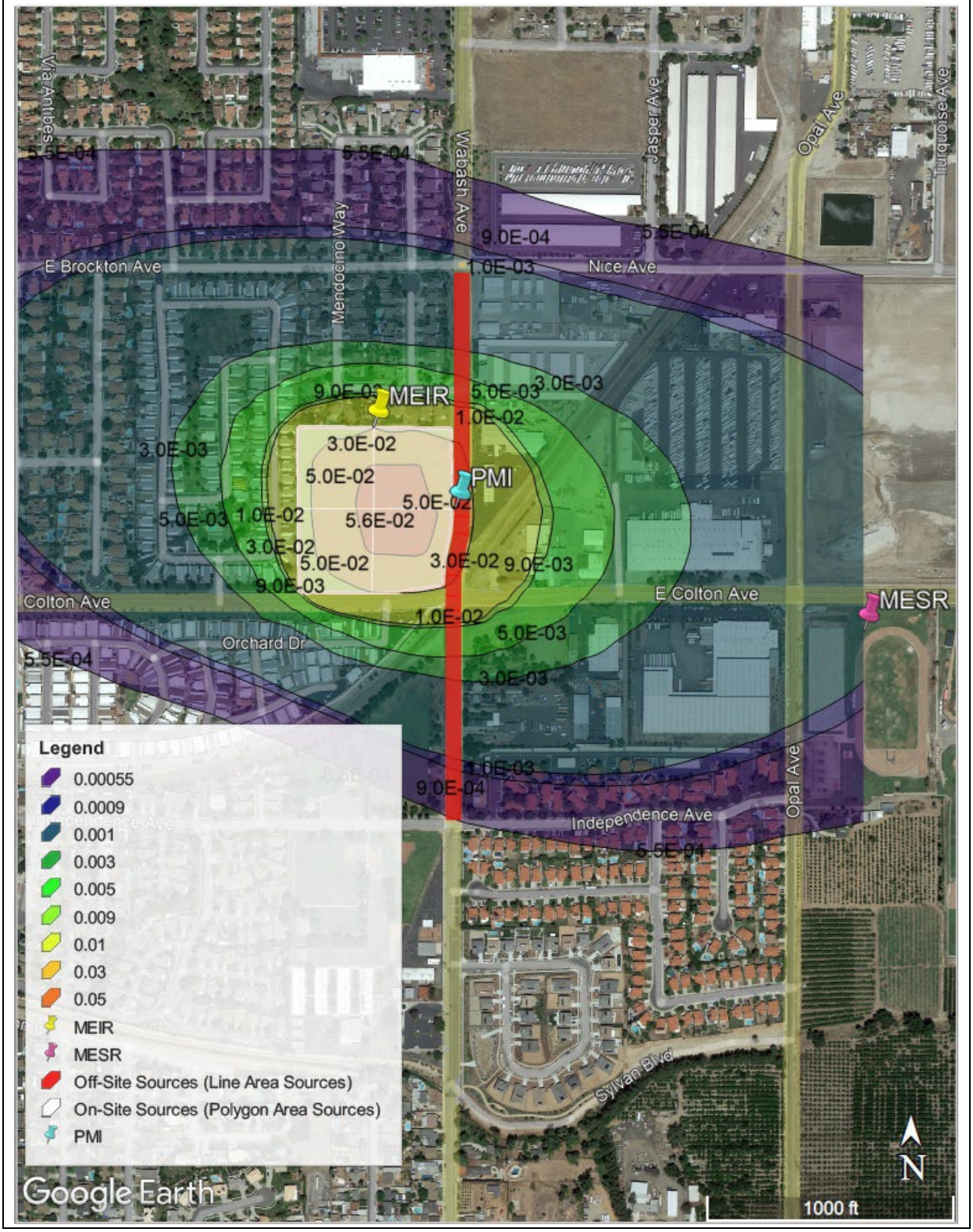
Table 4-11: Unmitigated Cancer Risk at PMI, MEIR, and MEIR

Receptor	UTM Location		Annual Average DPM Concentration ($\mu g/m^3$)(A)		Excess Cancer Risk (per million population)		
	Easting	Northing	Construction Year 1	Construction Year 2	Construction Year 1	Construction Year 2	Total
PMI(A)	487175.45	3769241.18	0.21381	0.00941	--	--	--
MEIR	487075.45	3769341.18	0.14218	0.00625	21.5	0.9	22.4
MESR	487675.45	3769091.18	0.00567	0.00025	<0.1	<0.1	<0.1

Source: MIG, 2023 (see Appendix C)

(A) The PMI is located along Wabash Avenue, which is not occupied by a long-term sensitive receptor.

Figure 4-2 Construction: Modeled Annual Average DPM Concentrations (µg/m³)



As shown in Table 4-11, the maximum construction unmitigated health risk for the MEIR location would be approximately 22.4 excess cancers in a million, which would exceed the SCAQMD cancer risk threshold of 10 in a million. Therefore, MIG recommends the implementation of Mitigation Measure AIR-1 to reduce construction-related DPM emissions and associated adverse health risks.

Mitigation Measure AIR-1: Reduce DPM Emissions. To reduce potential short-term adverse health risks associated with PM_{10} exhaust emissions, including emissions of diesel particulate matter (DPM), generated during project construction activities, the City shall require the Applicant and/or its designated contractors, contractor's representatives, or other appropriate personnel to comply with the following construction equipment restriction for the Project:

- All construction equipment with a rated power-output of 50 horsepower or greater shall meet U.S. EPA and CARB Tier IV Interim Emission Standards. This may be achieved via the use of equipment with engines that have been certified to meet Tier IV Interim emission standards, or through the use of equipment that has been retrofitted with a CARB-verified diesel emission control strategy (e.g., oxidation catalyst, particulate filter) capable of reducing exhaust PM_{10} emissions to levels that meet Tier IV standards.

As an alternative to using equipment that meets Tier IV Interim Emissions Standards for off-road equipment with a rated power-output of 50 horsepower or greater, the Applicant may prepare and submit a refined construction health risk assessment to the City once additional Project-specific construction information is known (e.g., specific construction equipment type, quantity, engine tier, and runtime by phase). The refined health risk assessment shall demonstrate and identify any measures necessary such that the proposed Project's incremental cancerogenic health risk at nearby sensitive receptor locations is below the applicable SCAQMD threshold of 10 cancers in a million.

Mitigation Measure AIR-1 would reduce PM_{10} exhaust emissions by approximately 79.4%, as accounted for in the CalEEMod emissions modeling (see Appendix A). Table 4-12 summarizes potential cancerogenic health risks after the implementation of Mitigation Measure AIR-1. As shown in Table 4-12, with the implementation of Mitigation Measure AIR-1, potential excess cancer risk from project activities at the MEIR location would be reduced to approximately 4.7 excess cancers in a million, which is less than the SCAQMD's threshold of 10 in a million.

Table 4-12: Mitigated Cancer Risk at PMI, MEIR, and MEIR

Receptor	UTM Location		Annual Average DPM Concentration (µg/m³)(A)		Excess Cancer Risk (per million population)		
	Easting	Northing	Construction Year 1	Construction Year 2	Construction Year 1	Construction Year 2	Total(B)
PMI(C)	487175.45	3769241.18	0.04423	0.00335	--	--	--
MEIR	487075.45	3769341.18	0.02936	0.00222	4.4	0.3	4.7
MESR	487675.45	3769091.18	0.00117	9.00E-5	<0.1	<0.1	<0.1

Source: MIG, 2023 (see Appendix C)

(A) The annual average DPM concentration for construction is based on the first year of construction.
(B) Totals may not equal due to rounding.
(C) The PMI is located along Wabash Avenue, which is not occupied by a long-term sensitive receptor.

4.5.3.2 Cancer Burden

The average cancer risk based on the lifetime exposure scenario (70 years), when taking into account Mitigation Measure AIR-1 to address construction risks, is 1.34E-06 (approximately 1.34 cases per million people). The product of cancer risk and the estimated population (1,066) is 0.001429 and does not exceed the SCAQMD threshold of 0.5 excess cancer cases.

4.5.3.3 Non-Cancer Risk

The maximum annual average DPM concentration at any receptor location under unmitigated conditions would be approximately 0.14218 µg/m^3, which would occur at the MEIR location. Based on the chronic inhalation REL for DPM (5 µg/m^3), the calculated chronic hazard quotient during the maximum exposure to DPM concentration would be 0.0284, which is below the SCAQMD's non-cancer hazard index threshold value of 1.0.

4.6 ODORS

According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural operations, wastewater treatment plants, landfills, and certain industrial operations (such as manufacturing uses that produce chemicals, paper, etc.). The proposed Project does not include such sources but would result in the construction of new single-family homes and parking area that could generate odors related to vehicle parking and refuse collection (e.g. oils, lubricants, fuel vapors, short-term waste odors). These activities would not generate sustained odors that would affect substantial numbers of people.

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5 REPORT PREPARERS AND REFERENCES

This report was prepared by MIG under contract to City of Redlands. This report reflects the independent, objective, professional opinion of MIG. The following individuals were involved in the preparation and review of this report:

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APPENDIX A: CalEEMod Output Files

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Madera at Citrus Trail Single Family Detailed Report

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5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.9.2. Mitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.10.4. Landscape Equipment - Mitigated

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.11.2. Mitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.12.2. Mitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.13.2. Mitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.14.2. Mitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Madera at Citrus Trail Single Family
Construction Start Date	1/1/2024
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	11.2
Location	34.06398413695213, -117.14011516418039
County	San Bernardino-South Coast
City	Redlands
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5388
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.12

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

Single Family Housing	103	Dwelling Unit	8.55	216,576	65,470	—	341	—
Other Asphalt Surfaces	20.1	1000sqft	0.46	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.66	1.39	11.7	15.7	0.03	0.50	0.43	0.93	0.46	0.10	0.57	—	3,070	3,070	0.14	0.08	2.33	3,098
Mit.	0.87	0.77	9.74	17.5	0.03	0.12	0.43	0.55	0.12	0.10	0.22	—	3,070	3,070	0.14	0.08	2.33	3,098
% Reduced	48%	45%	17%	-12%	—	75%	—	41%	75%	—	61%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.43	68.2	36.0	33.8	0.05	1.60	7.83	9.43	1.47	3.98	5.45	—	6,462	6,462	0.50	0.57	0.20	6,644
Mit.	1.01	68.2	14.8	29.2	0.05	0.14	7.83	7.93	0.12	3.98	4.08	—	6,462	6,462	0.50	0.57	0.20	6,644
% Reduced	77%	—	59%	14%	—	91%	—	16%	92%	—	25%	—	—	—	—	—	—	—

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.32	3.78	9.69	11.8	0.02	0.41	0.69	1.10	0.38	0.26	0.64	—	2,434	2,434	0.12	0.08	0.82	2,462
Mit.	0.62	3.77	7.41	12.8	0.02	0.09	0.69	0.78	0.08	0.26	0.35	—	2,434	2,434	0.12	0.08	0.82	2,462
% Reduced	53%	< 0.5%	23%	-9%	—	78%	—	29%	78%	—	46%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.24	0.69	1.77	2.15	< 0.005	0.08	0.13	0.20	0.07	0.05	0.12	—	403	403	0.02	0.01	0.14	408
Mit.	0.11	0.69	1.35	2.34	< 0.005	0.02	0.13	0.14	0.02	0.05	0.06	—	403	403	0.02	0.01	0.14	408
% Reduced	53%	< 0.5%	23%	-9%	—	78%	—	29%	78%	—	46%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.66	1.39	11.7	15.7	0.03	0.50	0.43	0.93	0.46	0.10	0.57	—	3,070	3,070	0.14	0.08	2.33	3,098
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.43	3.73	36.0	33.8	0.05	1.60	7.83	9.43	1.47	3.98	5.45	—	6,462	6,462	0.50	0.57	0.20	6,644
2025	1.02	68.2	7.51	10.7	0.01	0.35	0.14	0.49	0.32	0.03	0.35	—	1,653	1,653	0.07	0.02	0.01	1,660
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.32	1.09	9.69	11.8	0.02	0.41	0.69	1.10	0.38	0.26	0.64	—	2,434	2,434	0.12	0.08	0.82	2,462
2025	0.06	3.78	0.40	0.58	< 0.005	0.02	0.01	0.03	0.02	< 0.005	0.02	—	88.9	88.9	< 0.005	< 0.005	0.02	89.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	0.24	0.20	1.77	2.15	< 0.005	0.08	0.13	0.20	0.07	0.05	0.12	—	403	403	0.02	0.01	0.14	408
2025	0.01	0.69	0.07	0.11	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	14.7	14.7	< 0.005	< 0.005	< 0.005	14.8

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.87	0.77	9.74	17.5	0.03	0.12	0.43	0.55	0.12	0.10	0.22	—	3,070	3,070	0.14	0.08	2.33	3,098
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.01	0.76	14.8	29.2	0.05	0.14	7.83	7.93	0.12	3.98	4.08	—	6,462	6,462	0.50	0.57	0.20	6,644
2025	0.58	68.2	6.84	11.3	0.01	0.10	0.14	0.25	0.10	0.03	0.13	—	1,653	1,653	0.07	0.02	0.01	1,660
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.62	0.53	7.41	12.8	0.02	0.09	0.69	0.78	0.08	0.26	0.35	—	2,434	2,434	0.12	0.08	0.82	2,462
2025	0.04	3.77	0.37	0.61	< 0.005	0.01	0.01	0.02	0.01	< 0.005	0.01	—	88.9	88.9	< 0.005	< 0.005	0.02	89.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.11	0.10	1.35	2.34	< 0.005	0.02	0.13	0.14	0.02	0.05	0.06	—	403	403	0.02	0.01	0.14	408
2025	0.01	0.69	0.07	0.11	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.7	14.7	< 0.005	< 0.005	< 0.005	14.8

2.4. Operations Emissions Compared Against Thresholds

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

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

Unmit.	4.81	9.31	5.54	36.1	0.08	0.24	2.28	2.52	0.24	0.41	0.64	61.9	11,230	11,292	6.75	0.36	27.5	11,596
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.98	8.51	5.71	25.7	0.08	0.24	2.28	2.52	0.23	0.41	0.64	61.9	10,776	10,838	6.77	0.37	2.22	11,121
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.17	8.76	4.38	30.0	0.07	0.12	2.28	2.40	0.12	0.41	0.53	61.9	9,037	9,099	6.74	0.37	12.8	9,391
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.76	1.60	0.80	5.47	0.01	0.02	0.42	0.44	0.02	0.07	0.10	10.2	1,496	1,506	1.12	0.06	2.11	1,555

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
Area	0.73	5.62	1.59	6.49	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,968	1,968	0.04	< 0.005	—	1,970
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	4.81	9.31	5.54	36.1	0.08	0.24	2.28	2.52	0.24	0.41	0.64	61.9	11,230	11,292	6.75	0.36	27.5	11,596
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
Area	0.18	5.10	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	3.98	8.51	5.71	25.7	0.08	0.24	2.28	2.52	0.23	0.41	0.64	61.9	10,776	10,838	6.77	0.37	2.22	11,121
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.68	3.34	3.42	25.6	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,639	6,639	0.36	0.34	11.2	6,760
Area	0.39	5.38	0.14	4.04	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	144	144	< 0.005	< 0.005	—	145
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	4.17	8.76	4.38	30.0	0.07	0.12	2.28	2.40	0.12	0.41	0.53	61.9	9,037	9,099	6.74	0.37	12.8	9,391
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119
Area	0.07	0.98	0.03	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.9	23.9	< 0.005	< 0.005	—	23.9
Energy	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	360	360	0.03	< 0.005	—	361
Water	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6
Waste	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32

Total	0.76	1.60	0.80	5.47	0.01	0.02	0.42	0.44	0.02	0.07	0.10	10.2	1,496	1,506	1.12	0.06	2.11	1,555

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
Area	0.73	5.62	1.59	6.49	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,968	1,968	0.04	< 0.005	—	1,970
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	4.81	9.31	5.54	36.1	0.08	0.24	2.28	2.52	0.24	0.41	0.64	61.9	11,230	11,292	6.75	0.36	27.5	11,596
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
Area	0.18	5.10	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	3.98	8.51	5.71	25.7	0.08	0.24	2.28	2.52	0.23	0.41	0.64	61.9	10,776	10,838	6.77	0.37	2.22	11,121

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.68	3.34	3.42	25.6	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,639	6,639	0.36	0.34	11.2	6,760
Area	0.39	5.38	0.14	4.04	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	144	144	< 0.005	< 0.005	—	145
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	4.17	8.76	4.38	30.0	0.07	0.12	2.28	2.40	0.12	0.41	0.53	61.9	9,037	9,099	6.74	0.37	12.8	9,391
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119
Area	0.07	0.98	0.03	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.9	23.9	< 0.005	< 0.005	—	23.9
Energy	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	360	360	0.03	< 0.005	—	361
Water	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6
Waste	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32
Total	0.76	1.60	0.80	5.47	0.01	0.02	0.42	0.44	0.02	0.07	0.10	10.2	1,496	1,506	1.12	0.06	2.11	1,555

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.99	0.90	< 0.005	0.04	—	0.04	0.04	—	0.04	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.16	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	0.86	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	168	168	0.01	0.01	0.02	170
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.66	4.66	< 0.005	< 0.005	0.01	4.73
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.78
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. Site Preparation (2024) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	14.7	28.3	0.05	0.10	—	0.10	0.10	—	0.10	—	5,296	5,296	0.21	0.04	—	5,314

Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.40	0.78	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.07	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	0.86	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	168	168	0.01	0.01	0.02	170
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.66	4.66	< 0.005	< 0.005	0.01	4.73
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.78
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.26	1.90	18.2	18.8	0.03	0.84	—	0.84	0.77	—	0.77	—	2,958	2,958	0.12	0.02	—	2,969
Dust From Material Movement	—	—	—	—	—	—	2.77	2.77	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	1.00	1.03	< 0.005	0.05	—	0.05	0.04	—	0.04	—	162	162	0.01	< 0.005	—	163

Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	26.8	26.8	< 0.005	< 0.005	—	26.9
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	0.74	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.44	0.07	4.30	2.32	0.02	0.06	0.88	0.95	0.04	0.24	0.28	—	3,359	3,359	0.37	0.54	0.18	3,530
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	0.01	8.12
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.24	0.13	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	184	184	0.02	0.03	0.17	194
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.32	1.32	< 0.005	< 0.005	< 0.005	1.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.5	30.5	< 0.005	< 0.005	0.03	32.0

3.4. Grading (2024) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.49	0.47	10.0	17.8	0.03	0.08	—	0.08	0.08	—	0.08	—	2,958	2,958	0.12	0.02	—	2,969
Dust From Material Movement	—	—	—	—	—	—	2.77	2.77	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.55	0.97	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	162	162	0.01	< 0.005	—	163
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.10	0.18	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	26.8	26.8	< 0.005	< 0.005	—	26.9

Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	0.74	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.44	0.07	4.30	2.32	0.02	0.06	0.88	0.95	0.04	0.24	0.28	—	3,359	3,359	0.37	0.54	0.18	3,530
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	0.01	8.12
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.24	0.13	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	184	184	0.02	0.03	0.17	194
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.32	1.32	< 0.005	< 0.005	< 0.005	1.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.5	30.5	< 0.005	< 0.005	0.03	32.0

3.5. Building Construction (2024) - Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	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	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	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	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.76	7.07	8.26	0.01	0.31	—	0.31	0.29	—	0.29	—	1,511	1,511	0.06	0.01	—	1,516
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.29	1.51	< 0.005	0.06	—	0.06	0.05	—	0.05	—	250	250	0.01	< 0.005	—	251
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.18	0.14	2.36	0.00	0.00	0.35	0.35	0.00	0.08	0.08	—	388	388	0.02	0.01	1.54	394
Vendor	0.03	0.01	0.34	0.19	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	284	284	0.02	0.04	0.79	298
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19	0.17	0.16	1.82	0.00	0.00	0.35	0.35	0.00	0.08	0.08	—	356	356	0.02	0.01	0.04	361
Vendor	0.03	0.01	0.36	0.19	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	284	284	0.02	0.04	0.02	298
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.10	1.20	0.00	0.00	0.22	0.22	0.00	0.05	0.05	—	227	227	0.01	0.01	0.42	231
Vendor	0.02	0.01	0.23	0.12	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	179	179	0.01	0.03	0.21	188
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.6	37.6	< 0.005	< 0.005	0.07	38.2
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.7	29.7	< 0.005	< 0.005	0.04	31.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Building Construction (2024) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.58	9.26	15.0	0.02	0.12	—	0.12	0.11	—	0.11	—	2,398	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	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.64	0.58	9.26	15.0	0.02	0.12	—	0.12	0.11	—	0.11	—	2,398	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	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.40	0.36	5.83	9.45	0.01	0.08	—	0.08	0.07	—	0.07	—	1,511	1,511	0.06	0.01	—	1,516
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.07	1.06	1.72	< 0.005	0.01	—	0.01	0.01	—	0.01	—	250	250	0.01	< 0.005	—	251
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.18	0.14	2.36	0.00	0.00	0.35	0.35	0.00	0.08	0.08	—	388	388	0.02	0.01	1.54	394
Vendor	0.03	0.01	0.34	0.19	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	284	284	0.02	0.04	0.79	298
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19	0.17	0.16	1.82	0.00	0.00	0.35	0.35	0.00	0.08	0.08	—	356	356	0.02	0.01	0.04	361
Vendor	0.03	0.01	0.36	0.19	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	284	284	0.02	0.04	0.02	298
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.10	1.20	0.00	0.00	0.22	0.22	0.00	0.05	0.05	—	227	227	0.01	0.01	0.42	231
Vendor	0.02	0.01	0.23	0.12	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	179	179	0.01	0.03	0.21	188

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.6	37.6	< 0.005	< 0.005	0.07	38.2
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.7	29.7	< 0.005	< 0.005	0.04	31.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Paving (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	0.85	7.81	10.0	0.01	0.39	—	0.39	0.36	—	0.36	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.9
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.96	1.96	< 0.005	< 0.005	—	1.97

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	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	0.74	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.14	1.14	< 0.005	< 0.005	< 0.005	1.16
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.19
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Paving (2024) - Mitigated

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

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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.54	0.48	6.85	10.6	0.01	0.12	—	0.12	0.11	—	0.11	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.05	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.9
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.96	1.96	< 0.005	< 0.005	—	1.97
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	0.74	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.14	1.14	< 0.005	< 0.005	< 0.005	1.16
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.19
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Paving (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.04	0.35	0.47	< 0.005	0.02	—	0.02	0.02	—	0.02	—	71.0	71.0	< 0.005	< 0.005	—	71.2
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	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.8
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.68	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	141	141	0.01	0.01	0.01	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.71	6.71	< 0.005	< 0.005	0.01	6.81
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.11	1.11	< 0.005	< 0.005	< 0.005	1.13
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Paving (2025) - Mitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.51	0.46	6.78	10.6	0.01	0.10	—	0.10	0.10	—	0.10	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.32	0.50	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	71.0	71.0	< 0.005	< 0.005	—	71.2
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.06	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.8
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.68	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	141	141	0.01	0.01	0.01	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.71	6.71	< 0.005	< 0.005	0.01	6.81
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.11	1.11	< 0.005	< 0.005	< 0.005	1.13
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Architectural Coating (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	68.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	—	3.73	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	—	0.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.33	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	69.7	69.7	< 0.005	< 0.005	0.01	70.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.87	3.87	< 0.005	< 0.005	0.01	3.93
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.64	0.64	< 0.005	< 0.005	< 0.005	0.65

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Architectural Coating (2025) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	68.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	—	3.73	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22

Architect Coatings	—	0.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.33	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	69.7	69.7	< 0.005	< 0.005	0.01	70.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.87	3.87	< 0.005	< 0.005	0.01	3.93
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.64	0.64	< 0.005	< 0.005	< 0.005	0.65
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	189	189	0.01	< 0.005	—	190
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	189	189	0.01	< 0.005	—	190

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	189	189	0.01	< 0.005	—	190
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	189	189	0.01	< 0.005	—	190

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
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	0.00	0.00	—	0.00
Total	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
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	0.00	0.00	—	0.00
Total	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	171	171	0.02	< 0.005	—	171
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	0.00	0.00	—	0.00
Total	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	171	171	0.02	< 0.005	—	171

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
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	0.00	0.00	—	0.00
Total	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
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	0.00	0.00	—	0.00
Total	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	171	171	0.02	< 0.005	—	171
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	0.00	0.00	—	0.00
Total	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	171	171	0.02	< 0.005	—	171

4.3. Area Emissions by Source

4.3.2. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Consumer Products	—	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.55	0.53	0.06	5.83	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.6	15.6	< 0.005	< 0.005	—	15.7
Total	0.73	5.62	1.59	6.49	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,968	1,968	0.04	< 0.005	—	1,970
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Consumer Products	—	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.18	5.10	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	22.1	22.1	< 0.005	< 0.005	—	22.2
Consumer Products	—	0.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.07	0.07	0.01	0.73	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.77	1.77	< 0.005	< 0.005	—	1.78
Total	0.07	0.98	0.03	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.9	23.9	< 0.005	< 0.005	—	23.9

4.3.1. Mitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Consumer Products	—	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.55	0.53	0.06	5.83	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.6	15.6	< 0.005	< 0.005	—	15.7
Total	0.73	5.62	1.59	6.49	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,968	1,968	0.04	< 0.005	—	1,970
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Consumer Products	—	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.18	5.10	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	22.1	22.1	< 0.005	< 0.005	—	22.2
Consumer Products	—	0.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.07	0.07	0.01	0.73	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.77	1.77	< 0.005	< 0.005	—	1.78
Total	0.07	0.98	0.03	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.9	23.9	< 0.005	< 0.005	—	23.9

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6

4.4.1. Mitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1

4.5.1. Mitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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

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

4.7.2. Mitigated

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

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

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

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

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

4.8.2. Mitigated

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

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

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

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

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

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

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

4.10.2. 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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32
Total	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32

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

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

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

4.10.5. 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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32
Total	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	1/1/2024	1/12/2024	5.00	10.0	—
Grading	Grading	1/13/2024	2/9/2024	5.00	20.0	—
Building Construction	Building Construction	2/10/2024	12/27/2024	5.00	230	—
Paving	Paving	12/28/2024	1/24/2025	5.00	20.0	—
Architectural Coating	Architectural Coating	1/25/2025	2/21/2025	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	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37

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

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Interim	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Tier 4 Interim	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	8.00	84.0	0.37
Grading	Rubber Tired Dozers	Diesel	Tier 4 Interim	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Tier 4 Interim	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Tier 4 Interim	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Tier 4 Interim	2.00	8.00	81.0	0.42

Paving	Paving Equipment	Diesel	Tier 4 Interim	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	13.4	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.33	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	13.4	LDA,LDT1,LDT2
Grading	Vendor	—	8.33	HHDT,MHDT
Grading	Hauling	47.7	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	37.1	13.4	LDA,LDT1,LDT2
Building Construction	Vendor	11.0	8.33	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	13.4	LDA,LDT1,LDT2
Paving	Vendor	—	8.33	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT

Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	7.42	13.4	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.33	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	13.4	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.33	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	13.4	LDA,LDT1,LDT2
Grading	Vendor	—	8.33	HHDT,MHDT
Grading	Hauling	47.7	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	37.1	13.4	LDA,LDT1,LDT2
Building Construction	Vendor	11.0	8.33	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	13.4	LDA,LDT1,LDT2
Paving	Vendor	—	8.33	HHDT,MHDT

Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	7.42	13.4	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.33	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	438,566	146,189	0.00	0.00	1,206

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	0.00	0.00	15.0	0.00	—
Grading	7,631	0.00	20.0	0.00	—
Paving	0.00	0.00	0.00	0.00	1.60

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction

Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	1.13	0%
Other Asphalt Surfaces	0.46	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	11.5	532	0.03	< 0.005
2025	11.5	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
Single Family Housing	918	918	918	335,070	8,184	8,184	8,184	2,987,160
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
Single Family Housing	918	918	918	335,070	8,184	8,184	8,184	2,987,160

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)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	93
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	10

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	93
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	10

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)

438566.39999999997	146,189	0.00	0.00	1,206

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)
Single Family Housing	783,791	532	0.0330	0.0040	3,222,841
Other Asphalt Surfaces	0.00	532	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)
Single Family Housing	783,791	532	0.0330	0.0040	3,222,841
Other Asphalt Surfaces	0.00	532	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)
Single Family Housing	4,293,161	1,285,033
Other Asphalt Surfaces	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	4,293,161	1,285,033
Other Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	99.6	—
Other Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	99.6	—
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
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	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
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	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
Grassland	9.01	0.00

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres
Grassland	9.01	0.00

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	27.8	annual days of extreme heat
Extreme Precipitation	4.35	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	24.9	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 (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth 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 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
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	100
AQ-PM	54.9
AQ-DPM	38.7
Drinking Water	60.9
Lead Risk Housing	12.4
Pesticides	77.6
Toxic Releases	41.8
Traffic	9.22
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	16.6
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	60.9
Cardio-vascular	57.4

Low Birth Weights	84.0
Socioeconomic Factor Indicators	—
Education	30.0
Housing	13.6
Linguistic	22.2
Poverty	30.3
Unemployment	66.6

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	77.77492622
Employed	32.144232
Median HI	75.87578596
Education	—
Bachelor's or higher	59.98973438
High school enrollment	100
Preschool enrollment	65.54600282
Transportation	—
Auto Access	70.20402926
Active commuting	60.27203901
Social	—
2-parent households	47.77364301
Voting	65.10971385
Neighborhood	—
Alcohol availability	79.76389067

Park access	40.33106634
Retail density	23.63659695
Supermarket access	33.46593096
Tree canopy	32.7216733
Housing	—
Homeownership	92.89105608
Housing habitability	96.7406647
Low-inc homeowner severe housing cost burden	85.75644809
Low-inc renter severe housing cost burden	89.32375209
Uncrowded housing	96.93314513
Health Outcomes	—
Insured adults	76.99217246
Arthritis	36.9
Asthma ER Admissions	48.9
High Blood Pressure	59.0
Cancer (excluding skin)	22.7
Asthma	51.9
Coronary Heart Disease	61.0
Chronic Obstructive Pulmonary Disease	59.8
Diagnosed Diabetes	78.0
Life Expectancy at Birth	36.8
Cognitively Disabled	93.6
Physically Disabled	46.5
Heart Attack ER Admissions	44.1
Mental Health Not Good	68.6
Chronic Kidney Disease	73.0
Obesity	64.9

Pedestrian Injuries	19.6
Physical Health Not Good	72.6
Stroke	70.4
Health Risk Behaviors	—
Binge Drinking	14.4
Current Smoker	69.0
No Leisure Time for Physical Activity	82.7
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	55.0
Elderly	49.5
English Speaking	94.9
Foreign-born	1.7
Outdoor Workers	84.8
Climate Change Adaptive Capacity	—
Impervious Surface Cover	66.4
Traffic Density	16.9
Traffic Access	23.0
Other Indices	—
Hardship	19.6
Other Decision Support	—
2016 Voting	81.2

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	41.0

Healthy Places Index Score for Project Location (b)	68.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
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	Updated land use lot acreage, building square footage and landscape area based on project site plan 3/10/23 and data request response 4/26/23.
Construction: Construction Phases	Removed Demolition phase as the project site is undeveloped.
Operations: Vehicle Data	Updated daily trip rate based on traffic impact analysis conducted by Ganddini Group 5/3/23. Updated trip length based on TAZ VMT per the VMT screening assessment conducted by Ganddini Group 4/7/23.
Operations: Hearths	Updated fireplaces to be all natural gas fueled and removed wood burning stoves based on South Coast Rule 445.
Construction: Electricity	Added a 25kW generator, assumed to operate for an 11 hour period any day during the week, to represent electricity consumption associated with construction trailer operation.

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APPENDIX B: AERMOD Output Files

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```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

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

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

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

 **Model Uses URBAN Dispersion Algorithm for the SBL for    16 Source(s),
   for Total of    1 Urban Area(s):
   Urban Population =   2035210.0 ;  Urban Roughness Length =  1.000 m

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

 **Other Options Specified:
         ADJ_U*   - Use ADJ_U* option for SBL in AERMET
         TEMP_Sub - Meteorological data includes TEMP substitutions

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  PM_10

 **Model Calculates PERIOD Averages Only

 **This Run Includes:     16 Source(s);       4 Source Group(s); and   786 Receptor(s)

                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:      0 VOLUME source(s)
                 and:     16 AREA type source(s)
```

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


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

 **The AERMET Input Meteorological Data Version Date:  16216

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

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for
Calm Hours
                                                                 m for
Missing Hours
                                                                 b for
Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =    10.00
;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC
;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

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

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

 **Detailed Error/Message File:   Madera at Citrus Trail.err
 **File for Summary of Results:   Madera at Citrus Trail.sum

 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\Madera at Citrus
Trail\Madera at Citrus Trail.isc          ***       05/16/23
 *** AERMET - VERSION  16216 ***   ***
***       11:57:55

PAGE   2
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

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

```
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

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

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

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

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

Surface file: Z:\Shared\Riverside\Projects\City of Redlands\13791.00_Redlands_Madera Citrus Tr Met Version: 16216
Profile file: Z:\Shared\Riverside\Projects\City of Redlands\13791.00_Redlands_Madera Citrus Tr
Surface format: FREE
Profile format: FREE
Surface station no.: 3171 Upper air station no.: 3190
Name: UNKNOWN Name: UNKNOWN
Year: 2012 Year: 2012

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
12	01	01	1	01	-10.6	0.149	-9.000	-9.000	-999.	138.		26.7	0.32	3.22	1.00	1.30	110.	9.1	285.4	5.5
12	01	01	1	02	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	130.	9.1	284.5	5.5
12	01	01	1	03	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	100.	9.1	285.0	5.5
12	01	01	1	04	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	107.	9.1	284.6	5.5
12	01	01	1	05	-10.7	0.149	-9.000	-9.000	-999.	138.		26.7	0.32	3.22	1.00	1.30	98.	9.1	284.9	5.5
12	01	01	1	06	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	86.	9.1	284.5	5.5
12	01	01	1	07	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	91.	9.1	284.0	5.5
12	01	01	1	08	-4.0	0.102	-9.000	-9.000	-999.	78.		22.9	0.32	3.22	0.54	0.90	107.	9.1	285.0	5.5
12	01	01	1	09	44.6	0.237	0.382	0.006	43.	276.		-25.6	0.15	3.22	0.33	2.10	81.	10.1	289.1	5.5
12	01	01	1	10	134.3	0.111	0.882	0.008	176.	99.		-1.0	0.32	3.22	0.26	0.40	72.	9.1	295.1	5.5
12	01	01	1	11	199.8	0.409	1.429	0.005	503.	627.		-29.4	0.15	3.22	0.23	3.68	78.	10.1	297.9	5.5
12	01	01	1	12	232.3	0.300	1.889	0.005	999.	402.		-10.0	0.32	3.22	0.22	1.80	333.	9.1	299.4	5.5
12	01	01	1	13	230.0	0.300	2.134	0.005	1453.	394.		-10.1	0.32	3.22	0.22	1.80	72.	9.1	300.4	5.5
12	01	01	1	14	194.0	0.294	2.109	0.005	1663.	382.		-11.2	0.32	3.22	0.24	1.80	277.	9.1	301.0	5.5
12	01	01	1	15	126.3	0.378	1.872	0.005	1784.	557.		-36.5	0.32	3.22	0.27	2.70	243.	9.1	301.0	5.5
12	01	01	1	16	39.5	0.199	1.278	0.005	1817.	240.		-17.2	0.32	3.22	0.36	1.30	274.	9.1	300.1	5.5
12	01	01	1	17	-4.7	0.101	-9.000	-9.000	-999.	85.		19.0	0.32	3.22	0.65	0.90	252.	9.1	298.2	5.5
12	01	01	1	18	-4.9	0.102	-9.000	-9.000	-999.	78.		18.2	0.32	3.22	1.00	0.90	116.	9.1	296.4	5.5
12	01	01	1	19	-18.8	0.204	-9.000	-9.000	-999.	220.		45.6	0.15	3.22	1.00	2.27	79.	10.1	292.2	5.5
12	01	01	1	20	-5.0	0.102	-9.000	-9.000	-999.	83.		18.1	0.32	3.22	1.00	0.90	95.	9.1	290.2	5.5
12	01	01	1	21	-5.0	0.102	-9.000	-9.000	-999.	78.		18.0	0.32	3.22	1.00	0.90	99.	9.1	287.8	5.5
12	01	01	1	22	-5.0	0.102	-9.000	-9.000	-999.	78.		18.0	0.32	3.22	1.00	0.90	110.	9.1	287.6	5.5
12	01	01	1	23	-10.6	0.149	-9.000	-9.000	-999.	138.		26.8	0.32	3.22	1.00	1.30	89.	9.1	287.2	5.5

```
 12 01 01   1 24   -5.0  0.102 -9.000 -9.000 -999.   78.     17.9
0.32   3.22   1.00    0.90  105.    9.1  285.9    5.5


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 12 01 01 01    5.5 0 -999.  -99.00   285.5   99.0  -99.00  -99.00
 12 01 01 01    9.1 1  110.    1.30  -999.0   99.0  -99.00  -99.00

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

 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\Madera at Citrus
Trail\Madera at Citrus Trail.isc          ***       05/16/23
 *** AERMET - VERSION  16216 ***   ***
***        11:57:55

PAGE   4
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

                                        *** THE SUMMARY OF MAXIMUM
PERIOD ( 43848 HRS) RESULTS ***


                                     ** CONC OF PM_10    IN
MICROGRAMS/M**3                          **


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

Y1_OFF    1ST HIGHEST VALUE IS       0.00008 AT (  487197.69,
3769203.87,   492.69,  2401.29,    0.00)  DC
          2ND HIGHEST VALUE IS       0.00008 AT (  487199.53,
3769215.67,   492.52,  2401.29,    0.00)  DC
          3RD HIGHEST VALUE IS       0.00008 AT (  487200.27,
3769225.29,   492.50,  2401.29,    0.00)  DC
          4TH HIGHEST VALUE IS       0.00008 AT (  487199.98,
3769339.98,   492.81,  2401.29,    0.00)  DC
          5TH HIGHEST VALUE IS       0.00008 AT (  487200.48,
3769277.71,   492.79,  2401.29,    0.00)  DC
          6TH HIGHEST VALUE IS       0.00008 AT (  487200.32,
3769298.47,   492.64,  2401.29,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00008 AT (  487200.15,
3769319.22,   492.64,  2401.29,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00008 AT (  487200.65,
3769256.95,   492.77,  2401.29,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00008 AT (  487193.25,
3769182.13,   492.60,  2401.29,    0.00)  DC
```

```
         10TH HIGHEST VALUE IS       0.00008 AT (  487200.82,
3769236.19,   492.60,  2401.29,    0.00)  DC

Y1_ALL    1ST HIGHEST VALUE IS       0.27032 AT (  487125.45,
3769241.18,   490.90,  2401.29,    0.00)  DC
          2ND HIGHEST VALUE IS       0.26609 AT (  487075.45,
3769241.18,   490.01,  2401.29,    0.00)  DC
          3RD HIGHEST VALUE IS       0.25740 AT (  487125.45,
3769191.18,   491.30,  2401.29,    0.00)  DC
          4TH HIGHEST VALUE IS       0.25189 AT (  487075.45,
3769191.18,   490.22,  2401.29,    0.00)  DC
          5TH HIGHEST VALUE IS       0.25173 AT (  487075.45,
3769291.18,   489.82,  2401.29,    0.00)  DC
          6TH HIGHEST VALUE IS       0.25163 AT (  487125.45,
3769291.18,   490.79,  2401.29,    0.00)  DC
          7TH HIGHEST VALUE IS       0.22387 AT (  487169.96,
3769225.27,   492.05,  2401.29,    0.00)  DC
          8TH HIGHEST VALUE IS       0.22329 AT (  487170.58,
3769229.57,   492.06,  2401.29,    0.00)  DC
          9TH HIGHEST VALUE IS       0.22314 AT (  487169.89,
3769220.29,   492.06,  2401.29,    0.00)  DC
         10TH HIGHEST VALUE IS       0.22274 AT (  487170.82,
3769235.95,   492.06,  2401.29,    0.00)  DC

Y1_ON     1ST HIGHEST VALUE IS       0.27031 AT (  487125.45,
3769241.18,   490.90,  2401.29,    0.00)  DC
          2ND HIGHEST VALUE IS       0.26609 AT (  487075.45,
3769241.18,   490.01,  2401.29,    0.00)  DC
          3RD HIGHEST VALUE IS       0.25738 AT (  487125.45,
3769191.18,   491.30,  2401.29,    0.00)  DC
          4TH HIGHEST VALUE IS       0.25188 AT (  487075.45,
3769191.18,   490.22,  2401.29,    0.00)  DC
          5TH HIGHEST VALUE IS       0.25173 AT (  487075.45,
3769291.18,   489.82,  2401.29,    0.00)  DC
          6TH HIGHEST VALUE IS       0.25162 AT (  487125.45,
3769291.18,   490.79,  2401.29,    0.00)  DC
          7TH HIGHEST VALUE IS       0.22383 AT (  487169.96,
3769225.27,   492.05,  2401.29,    0.00)  DC
          8TH HIGHEST VALUE IS       0.22324 AT (  487170.58,
3769229.57,   492.06,  2401.29,    0.00)  DC
          9TH HIGHEST VALUE IS       0.22309 AT (  487169.89,
3769220.29,   492.06,  2401.29,    0.00)  DC
         10TH HIGHEST VALUE IS       0.22269 AT (  487170.82,
3769235.95,   492.06,  2401.29,    0.00)  DC

Y2_ON     1ST HIGHEST VALUE IS       0.01190 AT (  487125.45,
3769241.18,   490.90,  2401.29,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01171 AT (  487075.45,
3769241.18,   490.01,  2401.29,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01135 AT (  487125.45,
3769191.18,   491.30,  2401.29,    0.00)  DC
```

```
          4TH HIGHEST VALUE IS       0.01110 AT (  487075.45,
3769191.18,   490.22,  2401.29,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01107 AT (  487075.45,
3769291.18,   489.82,  2401.29,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01106 AT (  487125.45,
3769291.18,   490.79,  2401.29,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00986 AT (  487169.96,
3769225.27,   492.05,  2401.29,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00983 AT (  487170.58,
3769229.57,   492.06,  2401.29,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00983 AT (  487169.89,
3769220.29,   492.06,  2401.29,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00981 AT (  487170.82,
3769235.95,   492.06,  2401.29,    0.00)  DC


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

 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\Madera at Citrus
Trail\Madera at Citrus Trail.isc          ***        05/16/23
 *** AERMET - VERSION  16216 ***   ***
***        11:57:55

PAGE   5
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

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

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

 A Total of            0 Fatal Error Message(s)
 A Total of            2 Warning Message(s)
 A Total of          388 Informational Message(s)

 A Total of        43848 Hours Were Processed

 A Total of          191 Calm Hours Identified

 A Total of          197 Missing Hours Identified (  0.45 Percent)


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


    ********   WARNING MESSAGES   ********
 ME W186     246       MEOPEN: THRESH_1MIN 1-min ASOS wind speed
threshold used           0.50
```

ME W187 246 MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

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

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

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

**Model Uses URBAN Dispersion Algorithm for the SBL for 16 Source(s),
for Total of 1 Urban Area(s):
Urban Population = 2035210.0 ; Urban Roughness Length = 1.000 m

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

**Other Options Specified:
ADJ_U* - Use ADJ_U* option for SBL in AERMET
TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Assumes No FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: PM_10

**Model Calculates PERIOD Averages Only

**This Run Includes: 16 Source(s); 4 Source Group(s); and 786 Receptor(s)

with: 0 POINT(s), including
0 POINTCAP(s) and 0 POINTHOR(s)
and: 0 VOLUME source(s)
and: 16 AREA type source(s)

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


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

 **The AERMET Input Meteorological Data Version Date:  16216

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

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for
Calm Hours
                                                                 m for
Missing Hours
                                                                 b for
Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =    10.00
;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC
;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

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

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

 **Detailed Error/Message File:   Madera at Citrus Trail Mitigated.err
 **File for Summary of Results:   Madera at Citrus Trail Mitigated.sum

 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\Madera at Citrus Trail
Mitigated\Madera at Citrus Trail Mit ***        05/17/23
 *** AERMET - VERSION  16216 ***   ***
***        11:08:58

PAGE   2
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

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

```
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

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

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

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** MODELOPTs: RegDFAULT CONC ELEV URBAN ADJ_U*

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

Surface file: Z:\Shared\Riverside\Projects\City of Redlands\13791.00_Redlands_Madera Citrus Tr Met Version: 16216
Profile file: Z:\Shared\Riverside\Projects\City of Redlands\13791.00_Redlands_Madera Citrus Tr
Surface format: FREE
Profile format: FREE
Surface station no.: 3171 Upper air station no.: 3190
Name: UNKNOWN Name: UNKNOWN
Year: 2012 Year: 2012

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
12	01	01	1	01	-10.6	0.149	-9.000	-9.000	-999.	138.		26.7	0.32	3.22	1.00	1.30	110.	9.1	285.4	5.5
12	01	01	1	02	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	130.	9.1	284.5	5.5
12	01	01	1	03	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	100.	9.1	285.0	5.5
12	01	01	1	04	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	107.	9.1	284.6	5.5
12	01	01	1	05	-10.7	0.149	-9.000	-9.000	-999.	138.		26.7	0.32	3.22	1.00	1.30	98.	9.1	284.9	5.5
12	01	01	1	06	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	86.	9.1	284.5	5.5
12	01	01	1	07	-5.0	0.102	-9.000	-9.000	-999.	78.		17.9	0.32	3.22	1.00	0.90	91.	9.1	284.0	5.5
12	01	01	1	08	-4.0	0.102	-9.000	-9.000	-999.	78.		22.9	0.32	3.22	0.54	0.90	107.	9.1	285.0	5.5
12	01	01	1	09	44.6	0.237	0.382	0.006	43.	276.		-25.6	0.15	3.22	0.33	2.10	81.	10.1	289.1	5.5
12	01	01	1	10	134.3	0.111	0.882	0.008	176.	99.		-1.0	0.32	3.22	0.26	0.40	72.	9.1	295.1	5.5
12	01	01	1	11	199.8	0.409	1.429	0.005	503.	627.		-29.4	0.15	3.22	0.23	3.68	78.	10.1	297.9	5.5
12	01	01	1	12	232.3	0.300	1.889	0.005	999.	402.		-10.0	0.32	3.22	0.22	1.80	333.	9.1	299.4	5.5
12	01	01	1	13	230.0	0.300	2.134	0.005	1453.	394.		-10.1	0.32	3.22	0.22	1.80	72.	9.1	300.4	5.5
12	01	01	1	14	194.0	0.294	2.109	0.005	1663.	382.		-11.2	0.32	3.22	0.24	1.80	277.	9.1	301.0	5.5
12	01	01	1	15	126.3	0.378	1.872	0.005	1784.	557.		-36.5	0.32	3.22	0.27	2.70	243.	9.1	301.0	5.5
12	01	01	1	16	39.5	0.199	1.278	0.005	1817.	240.		-17.2	0.32	3.22	0.36	1.30	274.	9.1	300.1	5.5
12	01	01	1	17	-4.7	0.101	-9.000	-9.000	-999.	85.		19.0	0.32	3.22	0.65	0.90	252.	9.1	298.2	5.5
12	01	01	1	18	-4.9	0.102	-9.000	-9.000	-999.	78.		18.2	0.32	3.22	1.00	0.90	116.	9.1	296.4	5.5
12	01	01	1	19	-18.8	0.204	-9.000	-9.000	-999.	220.		45.6	0.15	3.22	1.00	2.27	79.	10.1	292.2	5.5
12	01	01	1	20	-5.0	0.102	-9.000	-9.000	-999.	83.		18.1	0.32	3.22	1.00	0.90	95.	9.1	290.2	5.5
12	01	01	1	21	-5.0	0.102	-9.000	-9.000	-999.	78.		18.0	0.32	3.22	1.00	0.90	99.	9.1	287.8	5.5
12	01	01	1	22	-5.0	0.102	-9.000	-9.000	-999.	78.		18.0	0.32	3.22	1.00	0.90	110.	9.1	287.6	5.5
12	01	01	1	23	-10.6	0.149	-9.000	-9.000	-999.	138.		26.8	0.32	3.22	1.00	1.30	89.	9.1	287.2	5.5

```
 12 01 01   1 24   -5.0  0.102 -9.000 -9.000 -999.   78.     17.9
0.32   3.22   1.00    0.90  105.    9.1  285.9    5.5


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 12 01 01 01    5.5 0 -999.  -99.00   285.5   99.0  -99.00  -99.00
 12 01 01 01    9.1 1  110.    1.30  -999.0   99.0  -99.00  -99.00

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

 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\Madera at Citrus Trail
Mitigated\Madera at Citrus Trail Mit ***        05/17/23
 *** AERMET - VERSION  16216 ***   ***
***        11:08:58

PAGE   4
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

                                        *** THE SUMMARY OF MAXIMUM
PERIOD ( 43848 HRS) RESULTS ***


                                    ** CONC OF PM_10    IN
MICROGRAMS/M**3                         **


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

Y1_OFF    1ST HIGHEST VALUE IS       0.00008 AT (  487197.69,
3769203.87,   492.69,  2401.29,    0.00)  DC
          2ND HIGHEST VALUE IS       0.00008 AT (  487199.53,
3769215.67,   492.52,  2401.29,    0.00)  DC
          3RD HIGHEST VALUE IS       0.00008 AT (  487200.27,
3769225.29,   492.50,  2401.29,    0.00)  DC
          4TH HIGHEST VALUE IS       0.00008 AT (  487199.98,
3769339.98,   492.81,  2401.29,    0.00)  DC
          5TH HIGHEST VALUE IS       0.00008 AT (  487200.48,
3769277.71,   492.79,  2401.29,    0.00)  DC
          6TH HIGHEST VALUE IS       0.00008 AT (  487200.32,
3769298.47,   492.64,  2401.29,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00008 AT (  487200.15,
3769319.22,   492.64,  2401.29,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00008 AT (  487200.65,
3769256.95,   492.77,  2401.29,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00008 AT (  487193.25,
3769182.13,   492.60,  2401.29,    0.00)  DC
```

```
         10TH HIGHEST VALUE IS       0.00008 AT (  487200.82,
3769236.19,   492.60,  2401.29,    0.00)  DC

Y1_ALL    1ST HIGHEST VALUE IS       0.05589 AT (  487125.45,
3769241.18,   490.90,  2401.29,    0.00)  DC
          2ND HIGHEST VALUE IS       0.05502 AT (  487075.45,
3769241.18,   490.01,  2401.29,    0.00)  DC
          3RD HIGHEST VALUE IS       0.05328 AT (  487125.45,
3769191.18,   491.30,  2401.29,    0.00)  DC
          4TH HIGHEST VALUE IS       0.05216 AT (  487075.45,
3769191.18,   490.22,  2401.29,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05198 AT (  487075.45,
3769291.18,   489.82,  2401.29,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05197 AT (  487125.45,
3769291.18,   490.79,  2401.29,    0.00)  DC
          7TH HIGHEST VALUE IS       0.04633 AT (  487169.96,
3769225.27,   492.05,  2401.29,    0.00)  DC
          8TH HIGHEST VALUE IS       0.04621 AT (  487170.58,
3769229.57,   492.06,  2401.29,    0.00)  DC
          9TH HIGHEST VALUE IS       0.04619 AT (  487169.89,
3769220.29,   492.06,  2401.29,    0.00)  DC
         10TH HIGHEST VALUE IS       0.04608 AT (  487170.82,
3769235.95,   492.06,  2401.29,    0.00)  DC

Y1_ON     1ST HIGHEST VALUE IS       0.05588 AT (  487125.45,
3769241.18,   490.90,  2401.29,    0.00)  DC
          2ND HIGHEST VALUE IS       0.05501 AT (  487075.45,
3769241.18,   490.01,  2401.29,    0.00)  DC
          3RD HIGHEST VALUE IS       0.05327 AT (  487125.45,
3769191.18,   491.30,  2401.29,    0.00)  DC
          4TH HIGHEST VALUE IS       0.05215 AT (  487075.45,
3769191.18,   490.22,  2401.29,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05197 AT (  487075.45,
3769291.18,   489.82,  2401.29,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05196 AT (  487125.45,
3769291.18,   490.79,  2401.29,    0.00)  DC
          7TH HIGHEST VALUE IS       0.04629 AT (  487169.96,
3769225.27,   492.05,  2401.29,    0.00)  DC
          8TH HIGHEST VALUE IS       0.04616 AT (  487170.58,
3769229.57,   492.06,  2401.29,    0.00)  DC
          9TH HIGHEST VALUE IS       0.04614 AT (  487169.89,
3769220.29,   492.06,  2401.29,    0.00)  DC
         10TH HIGHEST VALUE IS       0.04604 AT (  487170.82,
3769235.95,   492.06,  2401.29,    0.00)  DC

Y2_ON     1ST HIGHEST VALUE IS       0.00424 AT (  487125.45,
3769241.18,   490.90,  2401.29,    0.00)  DC
          2ND HIGHEST VALUE IS       0.00417 AT (  487075.45,
3769241.18,   490.01,  2401.29,    0.00)  DC
          3RD HIGHEST VALUE IS       0.00404 AT (  487125.45,
3769191.18,   491.30,  2401.29,    0.00)  DC
```

```
          4TH HIGHEST VALUE IS       0.00395 AT (  487075.45,
3769191.18,   490.22,  2401.29,    0.00)  DC
          5TH HIGHEST VALUE IS       0.00394 AT (  487075.45,
3769291.18,   489.82,  2401.29,    0.00)  DC
          6TH HIGHEST VALUE IS       0.00394 AT (  487125.45,
3769291.18,   490.79,  2401.29,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00351 AT (  487169.96,
3769225.27,   492.05,  2401.29,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00350 AT (  487170.58,
3769229.57,   492.06,  2401.29,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00350 AT (  487169.89,
3769220.29,   492.06,  2401.29,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00349 AT (  487170.82,
3769235.95,   492.06,  2401.29,    0.00)  DC


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

 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\Madera at Citrus Trail
Mitigated\Madera at Citrus Trail Mit ***        05/17/23
 *** AERMET - VERSION  16216 ***   ***
***        11:08:58

PAGE   5
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN  ADJ_U*

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

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

 A Total of            0 Fatal Error Message(s)
 A Total of            2 Warning Message(s)
 A Total of          388 Informational Message(s)

 A Total of        43848 Hours Were Processed

 A Total of          191 Calm Hours Identified

 A Total of          197 Missing Hours Identified (  0.45 Percent)


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


    ********   WARNING MESSAGES   ********
 ME W186     246       MEOPEN: THRESH_1MIN 1-min ASOS wind speed
threshold used           0.50
```

ME W187 246 MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

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APPENDIX C: Health Risk Assessment Calculations

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Appendix A.4: Construction Health Risk Assessment Calculations (DPM)
Madera at Citrus Trail Project HRA
Unmitigated Health Risk Calculations - Residential

METHODOLOGY

Dose (Air) = Cair x DBR x A x EF x CF

Where:
- Cair: Chemical concentration in air (µg/m^3)
- DBR: Daily breathing rate (L/kg-day)
- A: Inhalation adsorption factor (unitless)
- EF: Exposure Frequency, days at home / days in year (unitless)
- CF: 10^{-6} Conversion Factor (m^3/L and mg/µg)

Cancer Risk (per million) = Dose (Air) x CPF x ASF x (ED/AT) x FAH x 1,000,000

Where:
- Dose: Dose of chemical in the air (µg/m3)
- CPF: Cancer Potency Factor (mg/kg-day)$^{-1}$
- ASF: Age Sensitivity Factor
- ED: Exposure Duration (years)
- AT: Averaging Time for lifetime cancer risks
- FAH: Fraction of daily time spent at home / school

Risk Parameter Values by Age Bin

Variable	Residential Age Bin				
	3rd Trimester	0-2 Years	2-16 Years	16-30 Years	16-70 Years
DBR	361	1090	572	261	233
A	1	1	1	1	1
EF	0.96	0.96	0.96	0.96	0.96
CF	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
CPF	1.1	1.1	1.1	1.1	1.1
ASF	10	10	3	1	1
ED	0.25	2	14	14	54
AT	70	70	70	70	70
FAH	0.85	0.85	0.72	0.73	0.73

AERMOD Modeled DPM Concentrations (PMI/MEIR)

	PMI			MEIR		
	Conc.	X	Y	Conc.	X	Y
Year 1	0.21381	487175.45	3769241.18	0.14218	487075.45	3769341.18
Year 2	0.00941	487175.45	3769241.18	0.00625	487075.45	3769341.18

Risk Assessment Year 1 MEIR

Scenario	AERMOD DPM Conc.	Chronic Hazard Quotient
Year 1	0.14218	0.028436
Year 2	0.00625	0.00125

Year 1 Dose @ MEIR

Age Group	Cair x	BR	A	EF	CF		Dose
3rd Trimester	0.14218	361	1	0.96	1.00E-06	=	4.92E-05
0-2 Years	0.14218	1090	1	0.96	1.00E-06	=	1.49E-04
2-16 Years	0.14218	572	1	0.96	1.00E-06	=	7.80E-05
16-30 Years	0.14218	261	1	0.96	1.00E-06	=	3.56E-05
30-70 Years	0.14218	233	1	0.96	1.00E-06	=	3.18E-05

Year 1 Excess Risk at MEIR

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk
3rd Trimester	4.92E-05	1.1	10	0.25	70	0.85	1,000,000	1.6
0-2 Years	1.49E-04	1.1	10	1.00	70	0.85	1,000,000	19.8
0-2 Years	1.49E-04	1.1	10	1.00	70	0.85	1,000,000	19.8
2-16 Years	7.80E-05	1.1	3	1.00	70	0.72	1,000,000	2.6
16-30 Years	3.56E-05	1.1	1	1.00	70	0.73	1,000,000	0.4

30-70 Years	3.18E-05	1.1	1	1.00	70	0.73	1,000,000	0.4

Year 2 Dose @ MEIR

Age Group	Cair x	BR	A	EF	CF		Dose
0-2 Years	0.00625	1090	1	0.96	1.00E-06	=	6.53E-06
2-16 Years	0.00625	572	1	0.96	1.00E-06	=	3.43E-06
16-30 Years	0.00625	261	1	0.96	1.00E-06	=	1.56E-06
30-70 Years	0.00625	233	1	0.96	1.00E-06	=	1.40E-06

Year 2 Excess Risk at MEIR

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk
0-2 Years	6.53E-06	1.1	10	1.00	70	0.85	1,000,000	0.9
2-16 Years	3.43E-06	1.1	3	1.00	70	0.72	1,000,000	0.1
16-30 Years	1.56E-06	1.1	1	1.00	70	0.73	1,000,000	0.0
30-70 Years	1.40E-06	1.1	1	1.00	70	0.73	1,000,000	0.0

Total Excess Risk at MEIR (Cumulative, Based on Age at Start of Construction)

	Infant	Child < 2	Child 2<x<16	Adult 16<x<30	Adult 30<x<70
Year 1	21.5	19.8	2.6	0.4	0.4
Year 2	0.9	0.9	0.1	0.0	0.0
Total	22.4	20.7	2.8	0.4	0.4

Appendix A.4: Construction Health Risk Assessment Calculations (DPM)
Madera at Citrus Trail Project HRA
Unmitigated Health Risk Calculations - Student

METHODOLOGY

Dose (Air) = Cair x DBR x A x EF x CF

Where:
- Cair: Chemical concentration in air (µg/m^3)
- DBR: Daily breathing rate (L/kg-day)
- A: Inhalation adsorption factor (unitless)
- EF: Exposure Frequency, days at home / days in year (unitless)
- CF: 10^-6 Conversion Factor (m^3/L and mg/µg)

Cancer Risk (per million) = Dose (Air) x CPF x ASF x (ED/AT) x FAH x 1,000,000

Where:
- Dose: Dose of chemical in the air (µg/m3)
- CPF: Cancer Potency Factor (mg/kg-day)$^{-1}$
- ASF: Age Sensitivity Factor
- ED: Exposure Duration (years)
- AT: Averaging Time for lifetime cancer risks
- FAH: Fraction of daily time spent at home / school

Risk Parameter Values by Age Bin

Variable	School Age Bin			
	2-9 Years	2-16 Years	16-30 Years	16-70 Years
DBR	640	572	261	233
A	1	1	1	1
EF	0.49	0.49	0.49	0.49
CF	1.00E-06	1.00E-06	1.00E-06	1.00E-06
CPF	1.1	1.1	1.1	1.1
ASF	3	3	1	1
ED	7	14	14	54
AT	70	70	70	70
FAH	0.42	0.42	0.42	0.42

AERMOD Modeled DPM Concentrations (PMI/MESR)

	PMI			MESR		
	Conc.	X	Y	Conc.	X	Y
Year 1	0.21381	487175.45	3769241.18	0.00567	487675.45	3769091.18
Year 2	0.00941	487175.45	3769241.18	0.00025	487675.45	3769091.18

Risk Assessment Year 1 MESR

Scenario	AERMOD DPM Conc.	Chronic Hazard Quotient
Year 1	0.00567	0.001134
Year 2	0.00025	0.00005

Year 1 Dose @ MESR

Age Group	Cair x	BR	A	EF	CF		Dose
9-16 Years	0.00567	572	1	0.49	1.00E-06	=	1.59E-06

Year 1 Excess Risk at MESR

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk
9-16 Years	1.59E-06	1.1	3	1	70	0.42	1,000,000	0.03

Year 2 Dose @ MESR

Age Group	Cair x	BR	A	EF	CF		Dose
9-16 Years	0.00025	572	1	0.49	0.000001	=	7.01E-08

Year 2 Excess Risk at MESR

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk

9-16 Years	7.01E-08	1.1	3	1	70	0.42	1,000,000	0.00

Total Excess Risk at MESR (Cumulative, Based on Age at Start of Construction)

	9-16 Years
Year 1	0.03
Year 2	0.00
Total	0.03

Appendix C: Construction Health Risk Assessment Calculations (DPM)
Citrus Warehouse Project HRA
Unmitigated Health Risk Calculations - Community Burden

METHODOLOGY

Dose (Air) = Cair x DBR x A x EF x CF

Where:
- Cair: Chemical concentration in air (µg/m^3)
- DBR: Daily breathing rate (L/kg-day)
- A: Inhalation adsorption factor (unitless)
- EF: Exposure Frequency, days at home / days in year (unitless)
- CF: $10^{\wedge -6}$ Conversion Factor (m^3/L and mg/µg)

Cancer Risk (per million) = Dose (Air) x CPF x ASF x (ED/AT) x FAH x 1,000,000

Where:
- Dose: Dose of chemical in the air (µg/m3)
- CPF: Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$
- ASF: Age Sensitivity Factor
- ED: Exposure Duration (years)
- AT: Averaging Time for lifetime cancer risks
- FAH: Fraction of daily time spent at home / school

Risk Parameter Values by Age Bin

Variable	Residential Age Bin				
	3rd Trimester	0-2 Years	2-16 Years	16-30 Years	16-70 Years
DBR	361	1090	572	261	233
A	1	1	1	1	1
EF	0.96	0.96	0.96	0.96	0.96
CF	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
CPF	1.1	1.1	1.1	1.1	1.1
ASF	10	10	3	1	1
ED	0.25	2	14	14	54
AT	70	70	70	70	70
FAH	0.85	0.85	0.72	0.73	0.73

AERMOD Modeled DPM Concentrations

	Conc.
Year 1	0.008867
Year 2	

Age Group	Cair x	BR	A	EF	CF		Dose
3rd Trimester	0.008867	361	1	0.96	1.00E-06	=	3.07E-06
0-2 Years	0.008867	1090	1	0.96	1.00E-06	=	9.27E-06
2-16 Years	0.008867	572	1	0.96	1.00E-06	=	4.86E-06
16-30 Years	0.008867	261	1	0.96	1.00E-06	=	2.22E-06
30-70 Years	0.008867	233	1	0.96	1.00E-06	=	1.98E-06

Year 1 Excess Risk for Community

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk
3rd Trimester	3.07E-06	1.1	10	0.25	70	0.85	1,000,000	0.1
0-2 Years	9.27E-06	1.1	10	1.00	70	0.85	1,000,000	1.2
2-16 Years	4.86E-06	1.1	3	1.00	70	0.72	1,000,000	0.2

16-30 Years	2.22E-06	1.1	1	1.00	70	0.73	1,000,000	0.0
30-70 Years	1.98E-06	1.1	1	1.00	70	0.73	1,000,000	0.0

Year 2 Dose for Community

Age Group	Cair x	BR	A	EF	CF		Dose
0-2 Years	0	1090	1	0.96	1.00E-06	=	0.00E+00
2-16 Years	0	572	1	0.96	1.00E-06	=	0.00E+00
16-30 Years	0	261	1	0.96	1.00E-06	=	0.00E+00
30-70 Years	0	233	1	0.96	1.00E-06	=	0.00E+00

Year 2 Excess Risk for Community

Year 2 - 30 D	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk
0-2 Years	0.00E+00	1.1	10	1.00	70	0.85	1,000,000	0.0
2-16 Years	0.00E+00	1.1	3	1.00	70	0.72	1,000,000	0.0
16-30 Years	0.00E+00	1.1	1	1.00	70	0.73	1,000,000	0.0
30-70 Years	0.00E+00	1.1	1	1.00	70	0.73	1,000,000	0.0

Total Excess Risk for Community (Adjusted for Millions)

	Infant	Child < 2	Child 2<x<16	Adult 16<x<30	Adult 30<x<70
Year 1	1.34E-06	1.24E-06	1.65E-07	2.55E-08	2.27E-08
Year 2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Year 2-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Year 16-30	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Year 30-70	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-
Total	1.34E-06	1.24E-06	1.65E-07	2.55E-08	2.27E-08

Note: Infant exposure includes infant and child (0.75 years exposure) in Year 1

Population 1066

Calculated Community Cancer Burden (Product of Risk, in Millions, and Population)

	Infant	Child < 2	Child 2<x<16	Adult 16<x<30	Adult 30<x<70
Total	0.001429	0.001320	0.000176	0.000027	0.000024

Appendix A.4: Construction Health Risk Assessment Calculations (DPM)
Madera at Citrus Trail Project HRA
Mitigated (Tier 4 Interim) Health Risk Calculations - Residential

METHODOLOGY

Dose (Air) = Cair x DBR x A x EF x CF

Where:
- Cair: Chemical concentration in air (µg/m^3)
- DBR: Daily breathing rate (L/kg-day)
- A: Inhalation adsorption factor (unitless)
- EF: Exposure Frequency, days at home / days in year (unitless)
- CF: 10^-6 Conversion Factor (m^3/L and mg/µg)

Cancer Risk (per million) = Dose (Air) x CPF x ASF x (ED/AT) x FAH x 1,000,000

Where:
- Dose: Dose of chemical in the air (µg/m3)
- CPF: Cancer Potency Factor (mg/kg-day)$^{-1}$
- ASF: Age Sensitivity Factor
- ED: Exposure Duration (years)
- AT: Averaging Time for lifetime cancer risks
- FAH: Fraction of daily time spent at home / school

Risk Parameter Values by Age Bin

Variable	Residential Age Bin				
	3rd Trimester	0-2 Years	2-16 Years	16-30 Years	16-70 Years
DBR	361	1090	572	261	233
A	1	1	1	1	1
EF	0.96	0.96	0.96	0.96	0.96
CF	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
CPF	1.1	1.1	1.1	1.1	1.1
ASF	10	10	3	1	1
ED	0.25	2	14	14	54
AT	70	70	70	70	70
FAH	0.85	0.85	0.72	0.73	0.73

AERMOD Modeled DPM Concentrations (PMI/MEIR)

	PMI			MEIR		
	Conc.	X	Y	Conc.	X	Y
Year 1	0.04423	487175.45	3769241.18	0.02936	487075.45	3769341.18
Year 2	0.00335	487175.45	3769241.18	0.00222	487075.45	3769341.18

Risk Assessment Year 1 MEIR

Scenario	AERMOD DPM Conc.	Chronic Hazard Quotient
Year 1	0.02936	0.005872
Year 2	0.00222	0.000444

Year 1 Dose @ MEIR

Age Group	Cair x	BR	A	EF	CF		Dose
3rd Trimester	0.02936	361	1	0.96	1.00E-06	=	1.02E-05
0-2 Years	0.02936	1090	1	0.96	1.00E-06	=	3.07E-05
2-16 Years	0.02936	572	1	0.96	1.00E-06	=	1.61E-05
16-30 Years	0.02936	261	1	0.96	1.00E-06	=	7.35E-06
30-70 Years	0.02936	233	1	0.96	1.00E-06	=	6.56E-06

Year 1 Excess Risk at MEIR

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk
3rd Trimester	1.02E-05	1.1	10	0.25	70	0.85	1,000,000	0.3
0-2 Years	3.07E-05	1.1	10	1.00	70	0.85	1,000,000	4.1
0-2 Years	3.07E-05	1.1	10	1.00	70	0.85	1,000,000	4.1
2-16 Years	1.61E-05	1.1	3	1.00	70	0.72	1,000,000	0.5
16-30 Years	7.35E-06	1.1	1	1.00	70	0.73	1,000,000	0.1

30-70 Years	6.56E-06	1.1	1	1.00	70	0.73	1,000,000	0.1

Year 2 Dose @ MEIR

Age Group	Cair x	BR	A	EF	CF		Dose
0-2 Years	0.00222	1090	1	0.96	1.00E-06	=	2.32E-06
2-16 Years	0.00222	572	1	0.96	1.00E-06	=	1.22E-06
16-30 Years	0.00222	261	1	0.96	1.00E-06	=	5.56E-07
30-70 Years	0.00222	233	1	0.96	1.00E-06	=	4.96E-07

Year 2 Excess Risk at MEIR

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk
0-2 Years	2.32E-06	1.1	10	1.00	70	0.85	1,000,000	0.3
2-16 Years	1.22E-06	1.1	3	1.00	70	0.72	1,000,000	0.0
16-30 Years	5.56E-07	1.1	1	1.00	70	0.73	1,000,000	0.0
30-70 Years	4.96E-07	1.1	1	1.00	70	0.73	1,000,000	0.0

Total Excess Risk at MEIR (Cumulative, Based on Age at Start of Construction)

	Infant	Child < 2	Child 2<x<16	Adult 16<x<30	Adult 30<x<70
Year 1	4.4	4.1	0.5	0.1	0.1
Year 2	0.3	0.3	0.0	0.0	0.0
Total	4.7	4.4	0.6	0.1	0.1

Appendix A.4: Construction Health Risk Assessment Calculations (DPM)
Madera at Citrus Trail Project HRA
Mitigated (Tier 4 Interim) Health Risk Calculations - Student

METHODOLOGY

Dose (Air) = Cair x DBR x A x EF x CF

Where:
- Cair: Chemical concentration in air (µg/m^3)
- DBR: Daily breathing rate (L/kg-day)
- A: Inhalation adsorption factor (unitless)
- EF: Exposure Frequency, days at home / days in year (unitless)
- CF: 10^-6 Conversion Factor (m^3/L and mg/µg)

Cancer Risk (per million) = Dose (Air) x CPF x ASF x (ED/AT) x FAH x 1,000,000

Where:
- Dose: Dose of chemical in the air (µg/m3)
- CPF: Cancer Potency Factor (mg/kg-day)$^{-1}$
- ASF: Age Sensitivity Factor
- ED: Exposure Duration (years)
- AT: Averaging Time for lifetime cancer risks
- FAH: Fraction of daily time spent at home / school

Risk Parameter Values by Age Bin

Variable	School Age Bin	
	2-9 Years	2-16 Years
DBR	640	572
A	1	1
EF	0.49	0.49
CF	1.00E-06	1.00E-06
CPF	1.1	1.1
ASF	3	3
ED	7	14
AT	70	70
FAH	0.42	0.42

AERMOD Modeled DPM Concentrations (PMI/MESR)

	PMI			MESR		
	Conc.	X	Y	Conc.	X	Y
Year 1	0.21381	487175.45	3769241.18	0.00117	487675.45	3769091.18
Year 2	0.00941	487175.45	3769241.18	9.00E-05	487675.45	3769091.18

Risk Assessment Year 1 MESR

Scenario	AERMOD DPM Conc.	Chronic Hazard Quotient
Year 1	0.00117	0.000234
Year 2	0.00009	0.000018

Year 1 Dose @ MESR

Age Group	Cair x	BR	A	EF	CF		Dose
9-16 Years	0.00117	572	1	0.49	1.00E-06	=	3.28E-07

Year 1 Excess Risk at MESR

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk
9-16 Years	3.28E-07	1.1	3	1	70	0.42	1,000,000	0.0

Year 2 Dose @ MESR

Age Group	Cair x	BR	A	EF	CF		Dose
9-16 Years	0.00009	572	1	0.49	0.000001	=	2.52E-08

Year 2 Excess Risk at MESR

Age Group	Dose	CPF	ASF	ED	AT	FAH	Conversion	Risk

9-16 Years	2.52E-08	1.1	3	1	70	0.42	1,000,000	0.0

Total Excess Risk at MESR (Cumulative, Based on Age at Start of Construction)

	9-16 Years
Year 1	0.01
Year 2	0.00
Total	0.01

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Biological Technical Report

9.5-Acre Project on Colton and Wabash in Redlands, California

(APN 0168-29-102)

San Bernardino County, California

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June 2022

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1.0 INTRODUCTION

ECORP Consulting, Inc. conducted a biological reconnaissance survey at an approximately 9.5-acre property (Assessor Parcel Number 0168-29-102) in the City of Redlands, San Bernardino County, California. The survey was conducted to identify any potential biological resources that could be affected by the proposed 9.5-Acre Wabash and Colton Project (Project) pursuant to the terms of the California Environmental Quality Act (CEQA), and for the purposes of identifying any biological constraints that would affect the proposed site plan for the Project. The Project will be subject to county, state, and federal regulations regarding compliance with the federal Endangered Species Act (ESA), California ESA, Migratory Bird Treaty Act (MBTA), Clean Water Act (CWA) regulations, California State Water Resources Control Board for state waters, and California Fish and Game Code.

1.1 Project Description and Location

The Project proposes the private development of an approximately 9.5-acre site within the City of Redlands. The Project site is located west of Wabash Avenue and north of Colton Avenue in the City of Redlands, San Bernardino County, California (Figure 1). The Project site is bounded by streets on two sides: Wabash Avenue immediately to the east and Colton Avenue immediately to the south. The west and north sides are bounded by residential development. The Project site, as depicted on the U.S. Geological Survey (USGS) 7.5-minute Redlands topographic quadrangle, lies within Sections 19 of Township 1 south, and Range 2 West (USGS 2022a; Figure 2). The elevation of the Project site ranges from approximately 1,604 to1,618 feet above mean sea level.

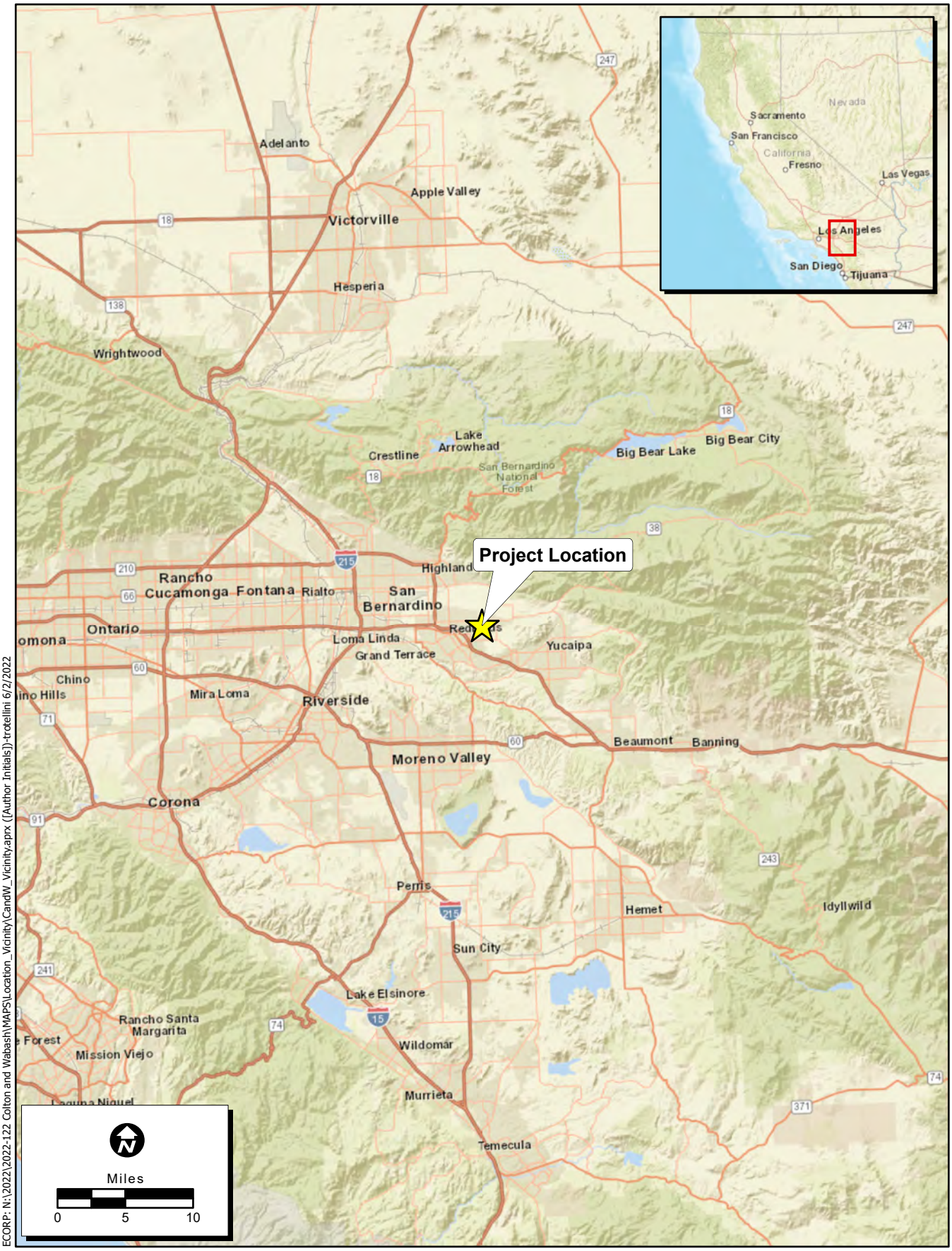
2.0 FEDERAL, STATE, AND LOCAL REGULATIONS

This biological reconnaissance survey was conducted to identify potential biological resource constraints and ensure compliance with state and federal regulations regarding listed, protected, and sensitive species. The regulations are detailed below.

2.1 Federal Regulations

2.1.1 The Federal Endangered Species Act

The federal ESA protects plants and animals that are listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service. Section 9 of the ESA prohibits the taking of endangered wildlife, where taking is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any endangered plant on federal land and removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law (16 U.S. Code [USC] 1538).



ECORP: N:\2022\2022-122 Colton and Wabash\MAPS\Location_Vicinity\CandW_Vicinity.aprx ([Author Initials])-trotellini 6/2/2022

Map Date:

Service Layer Credits: World_Street_Map: Esri, HERE, Garmin, NGA, USGS, NPS
World_Street_Map: Esri, HERE, Garmin, NGA, USGS

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ENVIRONMENTAL CONSULTANTS

Figure 1. Project Vicinity

2022-122 Colton and Wabash



Location: N:\2022\2022-122 Colton and Wabash\MAPS\Location_Vicinity\CandW_Location.aprx ([Author Initials])-trotellini 6/2/2022

Map Date: 6/2/2022

Service Layer Credits: World_Street_Map: Esri, HERE, Garmin, NGA, USGS, NPS
Hybrid Reference Layer: Esri Community Maps Contributors, Loma Linda University, City of Redlands, County of Riverside, County of San Bernardino, California State Parks, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA
World Imagery: San Bernardino County, Maxar

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 2. Project Location

2022-122 Colton and Wabash

Under Section 7 of the ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion, the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of the ESA provides for issuance of incidental take permits (ITPs) where no other federal actions are necessary provided a habitat conservation plan (HCP) is developed.

2.1.2 National Environmental Policy Act

Signed into law on January 1, 1970, the National Environmental Policy Act (NEPA) requires all federal agencies to analyze the environmental impacts related to their proposed actions prior to making and implementing decisions or actions. This framework for evaluation of environmental and associated economic and social effects of proposed actions, described in 42 USC 4321, also provides the public opportunity to review and comment. Actions that are covered by NEPA include decision-making related to publicly owned facilities such as highways, permit applications, and federal land management.

2.1.3 Migratory Bird Treaty Act

The MBTA implements international treaties between the U.S. and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities including hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR Part 13 General Permit Procedures and 50 CFR Part 21 Migratory Bird Permits.

2.1.4 Federal Clean Water Act

The USACE regulates discharge of dredged or fill material into Waters of the U.S. under Section 404 of the CWA. "Discharges of fill material" is defined as the addition of fill material into Waters of the U.S., including, but not limited to the following: placement of fill necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines [33 CFR § 328.2(f)]. In addition, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification from the USACE that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetland and non-wetland Waters of the U.S. (over 0.5 acre of impact) may require an individual permit. Projects that only minimally affect Waters of the U.S. (less than 0.5 acre of impact) may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions. In California, this

certification or waiver is typically issued by the Regional Water Quality Control Board (RWQCB). However, in the case of tribal lands that are held in trust, this certification or waiver is issued by the USACE.

According to the Navigable Waters Protection Rule, which came into effect June 22, 2020, the agencies interpret the term "waters of the United States" to encompass:

- The territorial seas and traditional navigable waters;
- Perennial and intermittent tributaries that contribute surface water flow to such waters;
- Certain lakes, ponds, and impoundments of jurisdictional waters; and
- Wetlands adjacent to other jurisdictional waters.

This latest Rule also excludes several waters and other features not mentioned in the above definition, including "ephemeral features that flow only in direct response to precipitation, including ephemeral streams, swales, gullies, rills, and pools."

2.2 State and Local Regulations

2.2.1 California Endangered Species Act

The California ESA generally parallels the main provisions of the ESA but, unlike its federal counterpart, the California ESA applies the take prohibitions to species proposed for listing (called "candidates" by the state). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California ESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with California Department of Fish and Wildlife (CDFW) to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

2.2.2 Fully Protected Species

The State of California first began to designate species as *fully protected* prior to the creation of the federal and California ESAs. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, amphibians and reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under federal or California ESAs. The regulations that implement the Fully Protected Species Statute (California Fish and Game Code § 4700) provide that fully protected species may not be taken or possessed at any time. Furthermore, CDFW prohibits any state agency from issuing ITPs for fully protected species, except for necessary scientific research.

2.2.3 Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (California Fish and Game Code §§ 1900-1913) was created with the intent to "*preserve, protect and enhance rare and endangered plants in this State*." The

NPPA is administered by CDFW. The California Fish and Game Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The California ESA of 1984 (California Fish and Game Code § 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

2.2.4 California Fish and Game Code

2.2.4.1 Streambed Alteration Agreement

Pursuant to Section 1602 of the California Fish and Game Code, a Streambed Alteration Agreement (SAA) application must be submitted for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake" (CDFW 2021). In Title 14 of the CCR, Section 1.72, the CDFW defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

The CDFW's jurisdiction includes drainages with a definable bed, bank, or channel with the jurisdictional limit being the top-of-bank. It also includes areas that support intermittent, perennial, or subsurface flows; supports fish or other aquatic life; or supports riparian or hydrophytic vegetation. It also includes areas that have a hydrologic source.

The CDFW will determine if the proposed actions will result in diversion, obstruction, or change of the natural flow, bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. The CDFW will submit a SAA that includes measures to protect affected fish and wildlife resources; this SAA is the final proposal agreed upon by the CDFW and the applicant.

2.2.4.2 Migratory Birds

The CDFW enforces the protection of nongame native birds in §§ 3503, 3503.5, and 3800 of the California Fish and Game Code. Section 3513 of the California Fish and Game Code prohibits the possession or take of birds listed under the MBTA. These sections mandate the protection of California nongame native birds' nests and also make it unlawful to take these birds. All raptor species are also protected from "take" pursuant to California Fish and Game Code § 3503.5 and are also protected at the federal level by the MBTA of 1918 (USFWS 1918).

2.2.5 Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Control Act requires "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the State to file a report of discharge" with the RWQCB through State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures; California Code of Regulations [CCR], title 23, § 3855). "Waters of the State" is defined as any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code § 13050[e]). Pollution is defined as an alteration of the quality of the Waters of the State by waste to a degree that unreasonably affects its beneficial uses (California Water Code § 13050) and includes filling in Waters of the State. Note that CCR, title 23, § 3855

applies only to individual water quality certifications, but the new Procedures extend the application of § 3855 to individual waste discharge requirements for discharges of dredged or fill material to Waters of the State and waivers thereof.

Regardless, if a CWA Section 404 permit is not required for a project, a permit for impacts to Waters of the State may still be required under the Porter-Cologne Water Quality Control Act. To determine whether a project should be regulated pursuant to the Porter-Cologne Water Quality Control Act, the RWQCB considers whether project activities could impact the quality of Waters of the State.

2.2.6 California Environmental Quality Act Significance Criteria

Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the CEQA checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if a project would:

- 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 CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or state HCP.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of an important resource on a population-wide or region-wide basis.

3.0 METHODS

3.1 Literature Review

Prior to conducting the biological reconnaissance survey, ECORP biologists performed a literature review using the CDFW's California Natural Diversity Database (CNDDB; CDFW 2022a) and the California Native Plant Society's (CNPS) Electronic Inventory (CNPSEI; CNPS 2022) to determine the special-status plant and wildlife species that have been documented near the Project site. ECORP searched CNDDB and CNPSEI records within the Project site boundaries as depicted on USGS 7.5-minute Redlands topographic quadrangle, plus the surrounding eight topographic quadrangles including San Bernardino North, San Bernardino South, Harrison Mtn., Keller Peak, Yucaipa, Riverside East, Sunnymead, and El Casco. The CNDDB and CNPSEI contain records of reported occurrences of federally and/or state-listed endangered, threatened, proposed endangered or threatened species, California Species of Special Concern (SSC), or other special-status species or habitat that may occur within or near the Project. Additional information was gathered from the following sources and includes, but is not limited to:

- *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2022b);
- *Special Animals List* (CDFW 2022c);
- *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012);
- *The Manual of California Vegetation*, 2nd Edition (Sawyer et al. 2009);
- Countywide – All Biotic Resources Overlay Map (County of San Bernardino 2012); and
- various online websites (e.g., Calflora 2022).

Using this information and observations in the field, a list of special-status plant and animal species that have the potential to occur on or near the Project site was generated. For the purposes of this assessment, special-status species are defined as plants or animals that:

- have been designated as either rare, threatened, or endangered by CDFW, CNPS, or the USFWS, or are protected under either the federal ESA or California ESA;
- are candidate species being considered or proposed for listing under these same acts;
- are fully protected by the California Fish and Game Code, §§ 3511, 4700, 5050, or 5515; or
- are of expressed concern to resource and regulatory agencies or local jurisdictions.

Special-status species reported for the region in the literature review or for which suitable habitat occurs on the site were assessed for their potential to occur within the Project site based on the following guidelines:

Present: The species was observed onsite during a site visit or focused survey.

High: Habitat (including soils and elevation factors) for the species occurs within the Project site and a known occurrence has recently been recorded (within the last 20 years) within five miles of the area.

Moderate: Habitat (including soils and elevation factors) for the species occurs within the Project site and a documented observation occurs within the database search, but not within five miles of the area; a historic documented observation (more than 20 years old) was recorded within five miles of the Project site; or a recently documented observation occurs within five miles of the area and marginal or limited amounts of habitat occurs in the Project site.

Low: Limited or marginal habitat for the species occurs within the Project site and a recently documented observation occurs within the database search, but not within five miles of the area; a historic documented observation (more than 20 years old) was recorded within five miles of the Project site; or suitable habitat strongly associated with the species occurs on site, but no records or only historic records were found within the database search.

Presumed Absent: Species was not observed during a site visit or focused surveys conducted in accordance with protocol guidelines at an appropriate time for identification; habitat (including soils and elevation factors) does not exist on site; or the known geographic range of the species does not include the Project site.

Note that location information on some special-status species may be of questionable accuracy or unavailable. Therefore, for survey purposes, the environmental factors associated with a species' occurrence requirements may be considered sufficient reason to give a species a positive potential for occurrence. In addition, just because a record of a species does not exist in the databases does not mean it does not occur. In many cases, records may not be present in the databases because an area has not been surveyed for that species.

A review of the Natural Resources Conservation Service (NRCS 2022a) Web Soil Survey, NRCS Hydric Soils List (NRCS 2022b), National Wetlands Inventory (USFWS 2022a), and the corresponding USGS topographic maps was also conducted to determine if there were any blue line streams or drainages present on the Project site that potentially fall under the jurisdiction of either federal or state agencies.

3.2 Field Survey

3.2.1 Biological Reconnaissance Survey

The biological reconnaissance survey was conducted by walking the entire Project site and a 500-foot buffer, where accessible, to determine the vegetation communities and wildlife habitats present on the site. Areas that were not accessible by foot were scanned using binoculars for suitable habitat. The biologists documented the plant and animal species present on the Project site, and the location and condition of the Project site were assessed for the potential to provide habitat for special-status plant and wildlife species. Data were recorded on a Global Positioning System (GPS) unit, field notebooks, or maps. Photographs were also taken during the survey to provide visual representation of the conditions within the Project site. The Project site was also examined to assess its potential to facilitate wildlife movement or function as a movement corridor for wildlife moving throughout the region. In addition, the biologists documented the vegetation communities present on the Project site.

Plant and wildlife species, including any special-status species that were observed during the survey, were recorded. Plant nomenclature follows that of *The Jepson Manual: Vascular Plants of California* (Baldwin et

al. 2012). Wildlife nomenclature follows Society for the Study of Amphibians and Reptiles (SSAR 2017), *Check-list of North American Birds* (Chesser et al. 2020), and the *Revised Checklist of North American Mammals North of Mexico* (Bradley et al. 2014).

In instances where a special-status species was observed, the date, species, location and habitat, and GPS coordinates were recorded. The locations of special-status species observations were recorded using a handheld GPS in North American Datum 1983, Universal Transverse Mercator coordinates, Zone 11S.

4.0 RESULTS

Summarized below are the results of the literature review and field surveys, including site characteristics, vegetation communities, wildlife, special-status species, and special-status habitats (including any potential wildlife corridors).

4.1 Literature Review

4.1.1 Special-Status Plants and Wildlife

The literature review and database searches identified 72 special-status plant species and 47 special-status wildlife species that could occur near the Project site. A list was generated from the results of the literature review and the Project site was evaluated for suitable habitat that could support any of the special-status plant or wildlife species on the list. The Project site is located within the San Bernardino County biotic overlay for burrowing owl and is within five miles of the San Bernardino County biotic overlay for California gnatcatcher, San Bernardino kangaroo rat, Santa Ana River woolly star, and Santa Ana sucker (County of San Bernardino 2012).

4.1.2 U.S. Fish and Wildlife Service Designated Critical Habitat

The Project site is not located within any USFWS-designated critical habitat (USFWS 2022b). San Bernardino kangaroo rat (*Dipodomys merriami parvus*) designated critical habitat is present approximately 1.25 mile from the Project site. Santa Ana sucker (*Catostomus santaanae*) designated critical habitat is also present approximately 1.25 mile from the Project site. There are no expected impacts to the critical habitat because there is no critical habitat on or adjacent to the Project site.

4.1.3 Preliminary Aquatic Resources Delineation Literature Review

The desktop review of the NRCS identified one hydric soil type on the site: Tujunga gravelly loamy sand, 0 to 9 percent slopes (NRCS 2022b). The USGS National Map (USGS 2022b) identified the Redlands Aqueduct within the Project site, however, this feature actually flows under the intersection Colton Avenue and Wabash Avenue, adjacent to the Project site in northeast to southwest fashion. The Redlands Aqueduct is classified as 13.91 acre of Riverine habitat R4SBC; R4SBC meaning that it is a riverine system that is intermittent, has a streambed, and is seasonally flooded (USFWS 2022a).

4.2 Biological Reconnaissance Survey

The biological reconnaissance survey was conducted on May 13, 2022, by ECORP wildlife biologist Corrina Tapia. Summarized below are the results of the biological reconnaissance survey including site characteristics, plant communities, wildlife, special-status species, and special-status habitats (including any potential wildlife corridors). Weather conditions during the survey are summarized in Table 1.

Table 1. Weather Conditions During the Survey

Date	Surveyors	Time		Temperature (˚F)		Cloud Cover (%)		Wind Speed (mph)	
		start	end	min	max	min	max	min	max
5/13/2022	Corrina Tapia	0645	0845	63	76	0	0	0-1	0-1

4.2.1 Property Characteristics

The Project site consists of an undeveloped lot containing ruderal vegetation that was disturbed. Vehicle tracks were present in the southern portion of the site and trash was observed scattered throughout the site. Soil types within the Project site consist of Hanford coarse sandy loam, 2 to 9 percent slopes (HaC) and Tujunga gravelly loamy sand, 0 to 9 percent slopes (TvC; NRCS 2022). The Project site is bounded by Colton Avenue to the south, Wabash Avenue to the east, and residential housing to the north and west. Adjacent to the Project site there is commercial development to the east, on the east side of Wabash Avenue. Representative photographs of the Project site are presented in Appendix A.

4.2.2 Vegetation Communities

The Project site is within a developed environment that is generally subjected to repeated and ongoing disturbance from human activities. The vegetation community on the Project site was identified as disturbed ruderal grassland. Native vegetation was very sparse. Other disturbances included vehicle tracks and scattered trash. The vegetation height throughout most of the site was between 1 to 8 inches at the time of the survey.

Dominant plant species observed on the Project site were nonnative weedy and ruderal species including jimson weed (*Datura stramonium*), Russian thistle (*Salsola tragus*), black mustard (*Brassica nigra*), wild oat (*Avena barbata*) and cheatgrass (*Bromus tectorum*).

4.2.3 Plants

Plant species observed on the Project site were generally characteristic of disturbed native vegetation communities. The most common native species observed on the Project site was fiddleneck (*Amsinckia* sp.) while nonnatives included wild oat, black mustard, and cheatgrass. Only one tree species was identified on the Project site, an oak species (*Quercus* sp.) present in the southwest corner of the site. Immediately adjacent to the Project site were planted ornamental tree species such as Peruvian pepper tree (*Schinus mole*) and California fan palm (*Washingtonia filifera*). Due to the disturbed nature of the entire Project site, the property represents relatively low-quality habitat for most plant species, including

common ones. A full list of plant species observed on and immediately adjacent to the Project site is included in Appendix B.

4.2.4 Wildlife

Despite the disturbed nature of the Project site, wildlife species were present. Two mammal species were observed during the biological survey: and California ground squirrels (*Otospermophilus beecheyi*) and a Botta's pocket gopher (*Thomomys bottae*) carcass were observed on site. One reptile species was observed: western fence lizard (*Sceloporus occidentalis*). Eleven bird species were detected on or in the vicinity of the Project site including American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), and lesser goldfinch (*Spinus psaltria*).

4.2.5 Potential for Special-Status Plant and Wildlife Species to Occur on the Project Site

The literature review and database searches identified 72 special-status plant species and 47 special-status wildlife species that could occur on or near the Project site. However, due to the level of human disturbance at the Project site and the current lack of suitable habitat for the special-status plant and wildlife species, many of the species are presumed absent from the Project site.

4.2.5.1 Special-Status Plants

There were 72 special-status plant species that appeared in the literature review and database searches for the Project site (CDFW 2022a; CNPS 2022). A list was generated from the results of the literature review and the Project was evaluated for suitable habitat that could support any of the special-status plant species on the list. With various habitat types occurring within the 9-quadrangle search, including the San Bernardino Mountains, several species appeared in the literature review results that had no potential to occur on or near the Project site due to elevational requirements.

After review, all the special-status plant species identified in the literature review were presumed absent to the heavily disturbed nature of the Project site and the lack of suitable habitat (including elevation and soils), or because the Project is located outside of the known range for the species. Descriptions of the CNPS Rare Plant Rank (CRPR) designations are found in Table 2. A table outlining each species, their designations, and potential for occurrence on the Project site can be found in Appendix C.

Table 2. CRPR Status Designations	
List Designation	**Meaning**
1A	Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
1B	Plants Rare, Threatened, or Endangered in California and Elsewhere
2A	Plants Presumed Extirpated in California, But Common Elsewhere
2B	Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3	Plants about which more information is needed; a review list
4	Plants of limited distribution; a watch list
List .1, .2 and .3 extension meanings:	
.1	Seriously threatened in California (over 80 percent of occurrences threatened / high degree and immediacy of threat)
.2	Moderately threatened in California (20 to 80 percent occurrences threatened / moderate degree and immediacy of threat)
.3	Not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known)

Note: According to CNPS (Skinner and Pavlik 1994), plants on Lists 1B and 2 meet definitions for listing as threatened or endangered under Section 1901, Chapter 10, of the California Fish and Game Code (CDFG 1984). This interpretation is inconsistent with other definitions.

4.2.5.2 Plant Species Presumed Absent

The following species were presumed absent from the Project site due to the heavily disturbed nature of the Project site and the lack of suitable habitat (including elevation and soils), or because the Project is located outside of the known range for the species:

- Chaparral sand-verbena (*Abronia villosa* var. *aurita*), CRPR 1B.1;
- Parish's oxytheca (*Acanthoscyphus parishii* var. *parishii*), CRPR 4.2;
- Mt. Pinos onion (*Allium howelii* var. *clokeyi*), CRPR 1B.3;
- Yucaipa onion (*Allium marvinii*), CRPR 1B.2;
- California androsace (*Androsace elongata* ssp. *acuta*), CRPR 4.2;
- Marsh sandwort (*Arenaria paludicola*), CRPR 1B.1, federally listed (endangered), state listed (endangered);
- San Diego sagewort (*Artemisia palmeri*), CRPR 4.2;
- Western spleenwort (*Asplenium vespertinum*), CRPR 4.2;
- Horn's milk-vetch (*Astragalus hornii* var. *hornii*), CRPR 1B.1;
- Jaeger's milk-vetch (*Astragalus pachypus* var. *jaegeri*), CRPR 1B.1;

- San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*), CRPR 1B.1, federally listed (endangered);
- Davidson's saltscale (*Atriplex serenana* var. *davidsonii*), CRPR 1B.2;
- Nevin's barberry (*Berberis nevinii*), CRPR 1B.1, federally listed (endangered), state listed (endangered);
- Three-awned grama (*Bouteloua trifida*), CRPR 2B.3;
- Thread-leaved brodiaea (*Brodiaea filifolia*), federally listed (threatened), state listed (endangered), CRPR 1B.1;
- Catalina mariposa lily (*Calochortus catalinae*), CRPR 4.2;
- Palmer's mariposa lily (*Calochortus palmeri* var. *palmeri*), CRPR 1B.2;
- Plummer's mariposa lily (*Calochortus plummerae*), CRPR 4.2;
- La Panza mariposa-lily (*Calochortus simulans*), CRPR 1B.3;
- Bristly sedge (*Carex comosa*), CRPR 2B.1;
- Ash-gray paintbrush (*Castilleja cinerea*), CRPR 1B.2;
- San Bernardino Mountains owl's-clover (*Castilleja lasiorhyncha*), CRPR 1B.2;
- Heckard's paintbrush (*Castilleja montigena*), CRPR 4.3;
- Smooth tarplant (*Centromadia pungens* ssp. *laevis*), CRPR 1B.1;
- Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*), CRPR 1B.2, federally listed (endangered), state listed (endangered);
- Peninsular spineflower (*Chorizanthe parryi* var. *parryi*), CRPR 1B.1;
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*), CRPR 1B.1;
- White-bracted spineflower (*Chorizanthe xanti* var. *leucotheca*), CRPR 1B.2;
- Small-flowered morning-glory (*Convolvulus simulans*), CRPR 4.2;
- Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*), CRPR 2B.2;
- Paniculate tarplant (*Deinandra paniculata*), CRPR 4.2;
- Cleveland's bush monkeyflower (*Diplacus clevelandii*), CRPR 4.2;
- Slender-horned spineflower (*Dodecahema leptoceras*), federally listed (endangered), state listed (endangered), CRPR 1B.1;
- Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*), federally listed (endangered), state listed (endangered), CRPR 1B.1;
- Southern Sierra woolly sunflower (*Eriophyllum lanatum* var. *obovatum*), CRPR 4.3;
- San Bernardino mountains monkeyflower (*Erythranthe exigua*), CRPR 1B.2;

- Hot Springs fimbristylis (*Fimbristylis thermalis*), CRPR 2B.2;
- Pine green-gentian (*Frasera neglecta*), CRPR 4.3;
- Pine fritillary (*Fritillaria pinetorum*), CRPR 4.3;
- Alvin Meadow bedstraw (*Galium californicum* ssp. *primum*), CRPR 1B.3;
- Johnston's bedstraw (*Galium johnstonii*), CRPR 4.3;
- Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*), CRPR 1A;
- Urn-flowered alumroot (*Heuchera caespitosa*), CRPR 4.3;
- Parish's alumroot (*Heuchera parishii*), CRPR 1B.3;
- Vernal barley (*Hordeum intercedens*), CRPR 1B.3;
- Mesa horkelia (*Horkelia cuneata* var. *puberula*), CRPR 1B.1;
- Parry's sunflower (*Hulsea vestita* ssp. *parryi*), CRPR 4.3;
- California satintail (*Imperata brevifolia*), CRPR 2B.1;
- Silver-haired ivesia (*Ivesia argyrocoma* var. *argyrocoma*), CRPR 1B.2;
- Southern California black walnut (*Juglans californica*), CRPR 4.2;
- Duran's rush (*Juncus duranii*), CRPR 4.3;
- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*), CRPR 1B.1;
- Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*), CRPR 4.3;
- Ocellated Humboldt lily (*Lilium humboldtii* ssp. *ocellatum*), CRPR 4.2;
- Lemon lily (*Lilium parryi*), CRPR 1B.2;
- Parish's desert-thorn (*Lycium parishii*), CRPR 2B.3;
- Parish's bush-mallow (*Malacothamnus parishii*), CRPR 1A;
- Hall's monardella (*Monardella macrantha ssp. hallii),* CRPR 1B.3;
- Pringle's monardella (*Monardella pringlei*), CRPR 1A;
- California muhly (*Muhlenbergia californica*), CRPR 4.3;
- Crowned muilla (*Muilla coronata*), CRPR 4.2;
- Mud nama (*Nama stenocarpa*), CRPR 2B.2;
- Gambel's water cress (*Nasturtium gambelii*), CRPR 1B.1; federally listed (endangered); state listed (threatened);
- San Bernardino ragwort (*Packera bernardina*), CRPR 1B.2;
- Parish's yampah (*Perideridia parishii* ssp. *parishii*), CRPR 2B.2;
- Mojave phacelia (*Phacelia mohavensis*), CRPR 4.3;

- Brand's star phacelia (*Phacelia stellaris*), CRPR 1B.1;
- Narrow-petaled rein orchid (*Piperia leptopetala*), CRPR 4.3;
- Deep Canyon snapdragon (*Pseudorontium cyathiferum*), CRPR 2B.3;
- Engelmann oak (*Quercus engelmannii*), CRPR 4.2;
- Parish's gooseberry (*Ribes divaricatum* var. *parishii*), CRPR 1A;
- Coulter's matilija poppy (*Romneya coulteri*), CRPR 4.2;
- Parish's rupertia (*Rupertia rigida*), CRPR 4.3;
- Black bog-rush (*Schoenus nigricans*), CRPR 2B.2;
- Chaparral ragwort (*Senecio aphanactis*), CRPR 2B.2;
- San Gabriel ragwort (*Senecio astephanus*), CRPR 4.3;
- Parish's checkerbloom (*Sidalcea hickmanii* ssp. *parishii*), CRPR 1B.2;
- Bear Valley checkerbloom (*Sialcea malviflora* ssp. *dolosa*), CRPR 1B.2;
- Salt spring checkerbloom (*Sidalcea neomexicana*), CRPR 2B.2;
- Bird-foot checkerbloom (*Sidalcea pedata*), CRPR 2B.2;
- Chickweed oxytheca (*Sidotheca caryophylloides*), CRPR 4.3;
- Prairie Wedge Grass (*Sphenopholis obtusata*), CRPR 2B.2;
- Laguna Mountains jewel-flower (*Streptanthus bernardinus*), CRPR 4.3;
- Southern jewelflower (*Streptanthus campestris*), CRPR 1B.3;
- San Bernardino aster (*Symphyotrichum defoliatum*), CRPR 1B.2;
- Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*), CRPR 2B.2;
- Wright's trichocoronis (*Trichocoronis wrightii* var. *wrightii*), CRPR 2B.1; and
- Western Joshua tree (*Yucca brevifolia*), CRPR N/A; state candidate species.

4.2.5.3 Special-Status Wildlife

The literature search documented 47 special-status wildlife species in the vicinity of the Project site. A list was generated from the results of the literature review and the Project was evaluated for suitable habitat that could support any of the special-status plant species on the list. The Project site's long history of mechanical disturbances (e.g., discing, mowing) on the site, proximity to residential development, and the presence of anthropogenic influences on the site likely preclude many of these species from occurring. A brief natural history and discussion of the special-status wildlife species that have a moderate potential to occur on the Project site is provided below. A table outlining each species, their designations, and potential for occurrence on the Project site can be found in Appendix D.

4.2.5.4 Wildlife Species with a Moderate Potential to Occur

One species was found to have a moderate potential to occur on the Project site. Although this species was not present on the Project site during the biological reconnaissance survey, habitat for the species occurs onsite, and a known occurrence has been reported in the database, but not within five miles of the site; or a historic documented observation (more than 20 years old) was recorded within five miles of the Project site; or a recently documented observation occurs within five miles of the site and marginal or limited amounts of habitat occurs onsite.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is a CDFW SSC. Burrowing owls historically occurred throughout much of California and the western U.S.; however, many former California populations have been extirpated. Burrowing owls typically inhabit open habitats, primarily grasslands and deserts. Burrowing owls require burrows for roosting and nesting cover. Although they often nest in abandoned California ground squirrel (*Otospermophilus beecheyi*) burrows, they will also use other small mammal burrows, pipes, culverts, and nest boxes, particularly where burrows are scarce (Zeiner et al. 1990). The Project site provided marginally suitable burrowing owl habitat at the time of the survey. The low-growing vegetation within the ruderal grassland was suitable for burrowing owl and soils within the Project site consisted of friable, sandy loam soils. The site also had many small mammal burrows of suitable size for burrowing owl. Due to the mobile nature of the burrowing owl, it is possible for burrowing owl to be move into the site due to the presence suitable burrows. One historic record of the species occurs within five miles of the Project site from 1983 (Occurrence 314; CDFW 2022a). Based on the presence of marginally suitable burrowing habitat and the historical record of the species within five miles of the Project site, this species has a low potential to occur on the Project site.

4.2.5.5 Wildlife Species Presumed Absent

A total of 46 species were presumed absent. These species were not present at the site during the biological reconnaissance survey and the habitat present on the Project site was not suitable. For some species, there were historic or recent sightings near the site; however, due to the lack of suitable habitat within the Project site, these species are presumed absent. The species presumed absent are listed below and a table outlining each species, their designations, and potential for occurrence on the Project site can be found in Appendix D:

- Riverside fairy shrimp (*Streptocephalus woottoni*), federally listed (endangered);
- Quino checkerspot butterfly (*Euphydryas editha quino*), federally listed (endangered);
- Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*), federally listed (endangered);
- Santa Ana sucker (*Catostomus santaanae*), federally listed (threatened);
- Arroyo chub (*Gila orcutti*), CDFW SSC;

- Steelhead - southern California Distinct Population Segment (*Oncorhynchus mykiss irideus* pop. *10*), federally listed (endangered);
- Santa Ana speckled dace (*Rhinichthys osculus* ssp. *8*), CDFW SSC;
- California red-legged frog (*Rana draytonii*), federally listed (threatened), CDFW SSC;
- Southern mountain yellow-legged frog (*Rana muscosa*), federally listed (endangered), state listed (endangered);
- Western spadefoot (*Spea hammondii*), CDFW SSC;
- Southern California legless lizard (*Anniella stebbinsi*) CDFW SSC;
- California glossy snake (*Arizona elegans occientalis*) CDFW SSC;
- San Diegan coastal whiptail (*Aspidoscelis tigris stejnegeri*), CDFW SSC;
- Southern rubber boa (*Charina umbratica*), state listed (threatened);
- San Diego banded gecko (*Coleonyx variegatus abbotti*), CDFW SSC;
- Red-diamond rattlesnake (*Crotalus ruber*), CDFW SSC;
- Western pond turtle (*Emys marmorata*), CDFW SSC;
- Coast horned lizard (*Phrynosoma blainvillii*) CDFW SSC;
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*), CDFW SSC;
- Two striped gartersnake (*Thamnphis hammondii*), CDFW SSC
- Tricolored blackbird (*Agelaius tricolor*), state listed (threatened), CDFW SSC;
- Golden eagle (*Aquila chrysaetos*), CDFW Fully Protected;
- Swainson's hawk (*Buteo swainsoni*) state listed (threatened).
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), federally listed (threatened), state-listed (endangered);
- White-tailed kite (*Elanus leucurus*), CDFW Fully Protected;
- Southwestern willow flycatcher (*Empidonax traillii extimus*), federally listed (endangered), state listed (endangered);
- Bald eagle (*Haliaeetus leucocephalus*), federally delisted, state listed (endangered), CDFW Fully Protected;
- Yellow-breasted chat (*Icteria virens*), CDFW SSC;
- Loggerhead shrike (*Lanius ludovicianus*), CDFW SSC;

- California black rail (*Laterallus jamaicensis coturniculus*), state listed (threatened), CDFW Fully Protected;
- Coastal California gnatcatcher (*Polioptila californica californica*), federally listed (threatened), CDFW SSC;
- Yellow warbler (*Setophaga petechia*), CDFW SSC;
- Least Bell's vireo (*Vireo bellii pusillus*), federally listed (endangered), state listed (endangered);
- Pallid bat (*Antrozous pallidus*), CDFW SSC;
- San Bernardino kangaroo rat (*Dipodomys merriami parvus*), federally listed (endangered), state listed (endangered), CDFW SSC;
- Stephens' kangaroo rat (*Dipodomys stephensi*), federally listed (endangered), state listed (threatened);
- Western mastiff bat (*Eumops perotis californicus*), CDFW SSC;
- San Bernardino flying squirrel (*Glaucomys oregonensis californicus*), CDFW SSC;
- Western yellow bat (*Lasiurus xanthinus*), CDFW SSC;
- Lesser long-nosed bat (*Leptonycteris yerbabuenae*), federally delisted, CDFW SSC;
- San Diego desert woodrat (*Neotoma lepida intermedia*), CDFW SSC;
- Pocketed free-tailed bat (*Nyctinomops femorosaccus*), CDFW SSC;
- Southern grasshopper mouse (*Onychomys torridus ramona*), CDFW SSC;
- White-eared pocket mouse (*Perognathus alticola alticola*), CDFW SSC;
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), CDFW SSC; and
- American badger (*Taxidea taxus*), CDFW SSC.

4.2.6 Raptors and Migratory Birds

Potential nesting habitat for migratory birds and raptors protected by the MBTA and California Fish and Game Code was present in the trees immediately adjacent to the Project site and within the single oak tree present in the southwest corner of the Project site. Suitable nesting habitat for ground-nesting bird species, such as mourning doves, was also present on the Project site. Therefore, nesting birds could use the Project site during the nesting bird season (typically February 1 through August 31).

4.2.7 Wildlife Movement Corridors, Linkages, and Significant Ecological Areas

The concept of habitat corridors addresses the linkage between large blocks of habitat that allow the safe movement of mammals and other wildlife species from one habitat area to another. The definition of a corridor varies, but corridors may include such areas as greenbelts, refuge systems, underpasses, and biogeographic land bridges. In general, a corridor is described as a linear habitat embedded in a dissimilar

matrix that connects two or more large blocks of habitat. Wildlife movement corridors are critical for the survivorship of ecological systems for several reasons. Corridors can connect water, food, and cover sources, spatially linking these three resources with wildlife in different areas. In addition, wildlife movement between habitat areas provides for the potential of genetic exchange between wildlife species populations, thereby maintaining genetic variability and adaptability to maximize the success of wildlife responses to changing environmental conditions. This is especially critical for small populations subject to loss of variability from genetic drift and effects of inbreeding. The nature of corridor usage and wildlife movement patterns vary greatly among species.

The Project site was assessed for its ability to function as a wildlife corridor. The Project site is disturbed and surrounded by paved roads and development. Although the Project site is undeveloped, it is surrounded by development and isolated from large, contiguous blocks of native habitat. Wabash Avenue borders the east side of the Project site, Colton Avenue borders the south side, and residential developments border the west and north sides. These features isolate the habitat that is present within the Project site from its surrounding area and provide potential barriers to wildlife movement. Additionally, the lack of vegetative cover within the Project site, the urban nature of the site, and the high density of nonnative weedy vegetation across the site would likely deter wildlife from using the Project site for movement opportunities due to lack of suitable cover.

5.0 IMPACT ANALYSIS

5.1 Special-Status Species

The Project site consists of disturbed land and is largely devoid of native vegetation. Vegetation communities onsite consisted primarily of disturbed ruderal grassland. Disturbances observed on the site were mainly associated with nonnative species, vehicle tracks, and scattered trash. The literature review and database searches identified 72 special-status plant species that have been documented in the vicinity of the Project site. However, all 72 special-status plant species were presumed absent from the Project site due to the heavily disturbed nature of the Project site and the lack of suitable habitat (including elevation and soils) or because the Project is located outside of the known range for the species. Therefore, development of the Project site will not contribute to the overall decline of any of the special-status plant species identified in the literature review and database searches. No significant impacts to special-status plant species are anticipated to result from the development of this Project.

Of the 47 special-status wildlife species identified in the literature review and database searches, one was found to have a low potential to occur: burrowing owl.

Burrowing owls are a CDFW SSC species and are also protected by the MBTA and California Fish and Game Code. During the survey, suitable California ground squirrel burrows were observed on the Project site. The site also contained marginally suitable foraging habitat consisting of low-growing ruderal grassland habitat and friable, sandy loam soils. The literature review and database search identified one historical record from 1983 within five miles of the Project site. The Project site did not appear to have been currently or recently used by burrowing owl at the time of the survey; however, the species is mobile and due to the presence of California ground squirrel burrows, burrowing owl could take up residence on the Project site at prior to the start of Project activities. If burrowing owls are present on the Project site

prior to construction, direct impacts in the form of ground disturbance, vegetation removal, habitat loss, and mortality and indirect impacts from construction noise and vibrations may occur. Impacts to burrowing owl would be less than significant with the implementation of Mitigation Measure BIO-1 and BIO-2. The Mitigation Measures for the Proposed Project are discussed in Section 6.0.

The remaining 46 special-status wildlife species are presumed absent from occurring on or adjacent to the site due to the lack of suitable habitat; proximity to the surrounding residential, commercial, and industrial development; and the presence of anthropogenic disturbances associated with the commercial and industrial development surrounding the site. No significant impacts to the 47 special-status wildlife species that are presumed absent are anticipated to result from the development of this Project.

The oak tree observed on the Project site as well as the trees immediately adjacent to the Project site could provide nesting habitat for nesting birds and raptors protected by the MBTA and California Fish and Game Code. Furthermore, the Project site could provide nesting habitat for ground-nesting bird species. If construction of the proposed Project occurs during the bird breeding season (typically February 1 through August 31), ground-disturbing construction activities could directly affect birds protected by the MBTA and their nests through the removal of habitat on the Project site, and indirectly through increased noise, vibrations, and increased human activity. Impacts to nesting birds would be less than significant with the implementation of Mitigation Measure BIO-2.

5.2 Sensitive Natural Communities

The Project site consists of disturbed land that supports mostly nonnative ruderal vegetation species. The Project site does not contain any riparian habitat or other sensitive natural communities that would need to be preserved. No impacts to sensitive natural communities are anticipated to result from the development of this Project.

5.3 State and Federally Protected Wetlands and Waters of the United States

According to the results of the preliminary aquatic resources delineation, no state or federally protected wetlands or Waters of the U.S. were identified on the Project site, therefore no impacts to state or federally protected wetlands are expected to occur.

5.4 Wildlife Corridors and Nursery Sites

The Project site is located within and adjacent to areas containing existing disturbances (e.g., paved roads and residential and commercial development). The Project site is disturbed and contains insufficient vegetative cover to facilitate wildlife movement and it is isolated from large, contiguous blocks of native habitat. No migratory wildlife corridors or native wildlife nursery sites were identified within the Project site. No impacts to these resources are expected to occur during the development of the Project site.

6.0 RECOMMENDATIONS

The following mitigation measures are recommended prior to Project implementation:

BIO-1 – Pre-Construction Burrowing Owl Surveys: Preconstruction surveys for burrowing owl should be conducted. The surveys should follow the methods described in the CDFW's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game [CDFG] 2012). Two surveys should be conducted, with the first survey being scheduled between 30 and 14 days before initial ground disturbance (grading, grubbing, and construction), and the second survey being conducted no more than 24 hours prior to initial ground disturbance. If burrowing owls and/or suitable burrowing owl burrows are identified on the Project site during the survey, the Project should consult with CDFW and follow the methods listed in the CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012) for avoidance and/or passive relocation. If burrowing owls or suitable burrowing owl burrows with sign (e.g., whitewash, pellets, feathers, prey remains) are identified on the Project site during the survey, these features must be completely avoided. If impacts to those features are unavoidable then the Project proponent must also develop an owl mitigation plan in consultation with CDFW. Mitigation methods may include passive relocation conducted outside of the owl breeding season (between September 1 and February 28). If an active owl burrow is identified, and construction is to proceed, then a qualified biologist (with two or more years of burrowing owl experience) can establish an appropriate disturbance-limit buffer around the burrow using flagging or staking. Construction activities shall not occur within any buffer zones until the burrow is deemed inactive by the qualified biologist.

BIO-2 – Pre-Construction Nesting Bird Survey: If construction or other Project activities are scheduled to occur during the nesting bird season (February 1 through August 31), a preconstruction nesting bird survey shall be conducted by a qualified avian biologist to ensure that active bird nests will not be disturbed or destroyed. The survey shall be completed no more than three days prior to initial ground disturbance. The nesting bird survey shall include the Project site and adjacent areas where Project activities have the potential to affect active nests, either directly or indirectly, due to construction activity, noise, human activity, or ground disturbance. If an active nest is identified, a qualified avian biologist shall establish an appropriately sized non-disturbance buffer around the nest using flagging or staking. Construction activities shall not occur within any non-disturbance buffer zones until the nest is deemed inactive by the qualified avian biologist. If initial ground-disturbing activities are scheduled to occur during the nesting bird season, then a biological monitor shall be present during all vegetation removal activities to ensure no impacts to nesting birds occur.

6.1 Additional Recommendations

The following best management practices are not mitigation measures pursuant to CEQA but are recommended to further reduce impacts to species that have potential to occur on the property:

- Confine all work activities to a predetermined work area.
- To prevent inadvertent entrapment of wildlife during the construction phase of the Project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen fill or wooden planks shall be installed.

Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals.

- Wildlife are often attracted to burrow- or den-like structures such as pipes and may enter stored pipes and become trapped or injured. To prevent wildlife use of these structures, all construction pipes, culverts, or similar structures with a diameter of 4 inches or greater should be capped while stored onsite.
- All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in securely closed containers and removed at least once a week from the construction or Project site.
- Use of rodenticides and herbicides on the Project site should be restricted. This is necessary to prevent primary or secondary poisoning of wildlife, and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other state and federal legislation. If rodent control must be conducted, zinc phosphide should be used because it has a proven lower risk to predatory wildlife.

7.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the 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. Field work conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the Project applicant or the applicant's representative and that I have no financial interest in the Project.

SIGNED: Corrina Tapia DATE: 6/17/2022

Chelsie Brown
Associate Biologist
ECORP Consulting, Inc.

Under the direction of:

SIGNED: Phillip Wasz DATE: 6/17/2022

Phillip Wasz
Senior Wildlife Biologist
ECORP Consulting, Inc.

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LIST OF APPENDICES

Appendix A – Representative Site Photographs

Appendix B – Plant Species Observed

Appendix C – Special-Status Plant Species Potential for Occurrence

Appendix D – Special-Status Wildlife Species Potential for Occurrence

APPENDIX A

Representative Site Photographs



Photo 1. South side of the Project site, looking north.



Photo 2. Middle of Project site, looking east.



Photo 3. North side of Project site, looking west.



Photo 4. Northwest corner of Project site, looking southwest.



Photo 5. Vehicle tracks present within the Project site, south end.



Photo 6. Example of trash present sporadically throughout the Project site.



Photo 7. Example of California ground squirrel (*Otospermophilus beecheyi*) burrow and potential burrowing owl (*Athene cunicularia*) burrow within the Project site.



Photo 8. Vegetation present within culvert adjacent to the south side of the Project site; culvert exit on south side of Colton Avenue.



Photo 9. Culvert entrance on east side of Wabash Avenue. Adjacent to the Project site, on the east side.



Photo 10. Example of trees present immediately adjacent to Project site; habitat for nesting birds.

APPENDIX B

Plant Species Observed

Plant Species Observed

SCIENTIFIC NAME	COMMON NAME
Amsinckia sp.	Fiddleneck
*Avena barbata**	Slender wild oat
Bougainvillea spectabilis	Bougainvillea
*Brassica nigra**	Black mustard
Bromus sp.	Brome grass
*Cupressus sempervirens**	Italian cypress
*Datura stramonium**	Annual jimson weed
*Erodium cicutarium**	Red-stemmed filaree
Lonicera sp.	Honeysuckle
Quercus sp.	Oak
*Salsola tragus**	Russian thistle
*Schinus mole**	Peruvian pepper tree
Washingtonia filifera	California fan palm
Washingtonia robusta	Mexican fan palm

*Nonnative species

Wildlife Species Observed

SCIENTIFIC NAME	COMMON NAME
Birds	
Calypte anna	Anna's hummingbird
Corvus brachyrhynchos	American crow
Falco sparverius	American kestrel
Haemorhous mexicanus	House finch
Hirundo rustica	Barn swallow
Mimus polyglottos	Northern mockingbird
Sayornis saya	Say's phoebe
Spinus psaltria	Lesser goldfinch
Stelgidopteryx serripennis	Northern rough-winged swallow
Tyrannus vociferans	Cassin's kingbird
Zenaida macroura	Mourning dove
Reptiles	
Sceloporus occidentalis	Western fence lizard
Mammals	
Canis latrans	Coyote (scat)
Otospermophilus beecheyi	California ground squirrel
Thomomys bottae	Botta's pocket gopher

APPENDIX C

Special-Status Plant Species Potential for Occurrence

Scientific Name Common Name	Status		Bloom Period & Elevation (meters)	Habitat Requirements	Potential for Occurrence
Abronia villosa var. *aurita* chaparral sand-verbena	Fed: Ca: CRPR:	none none 1B.1	(Jan) Mar-Sep 75-1600	Occurs in sandy soils within chaparral, coastal scrub, and desert dunes. Threatened by non-native plants, changes to fire regimes, development, and vehicles and road maintenances.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Acanthoscyphus parishii var. *parishii* Parish's oxytheca	Fed: Ca: CRPR:	none none 4.2	Jun-Sep 1200-2600	Occurs in chaparral and lower montane coniferous forests. Often found in gravelly and sandy soils.	**Presumed Absent.** The Project site is outside the known elevation range for this species.
Allium howelii var. *clokeyi* Mt. Pinos onion	Fed: Ca: CRPR:	none none 1B.3	Apr- Jun 1300-1850	Occurs in Great Basin scrub, the edges of meadows and seeps, and pinyon and juniper woodlands. Threatened by mining, road maintenance, and vehicles. Potentially threatened by foot traffic and grazing.	**Presumed Absent.** The Project site is outside the known elevation range for this species.
Allium marvinii Yucaipa onion	Fed: Ca: CRPR:	none none 1B.2	Apr-May 760-1065	Occurs in chaparral habitats within clay soils and in openings. Threatened by non-native plants, urbanization, and the alteration of fire regimes.	**Presumed Absent.** The Project site is outside the known elevation range for this species.
Androsace elongata ssp. *acuta* California androsace	Fed: Ca: CRPR:	none none 4.2	Mar-Jun 150-1305	Occurs in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland habitats. Potentially threatened by graing, foot traffic, non-native plants, recreational activities, and the alteration of fire regimes.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Arenaria paludicola marsh sandwort	Fed: Ca: CRPR:	END END 1B.1	May-Aug 3-170	Occurs in marshes and swamps, often in brackish or freshwater.	**Presumed Absent.** No suitable habitat was present within the Project site.
Artemisia palmeri San Diego sagewort	Fed: Ca: CRPR:	none none 4.2	(Feb) May-Sep 15-915	Occurs within mesic and sandy areas. Occurs in chaparral, coastal scrub, and riparian forest, scrub, and woodland habitats. Threatened by development and flood control. Potentially threatened by non-native plants.	**Presumed Absent.** No suitable habitat is present within the Project site. One occurrence was documented within the Redlands quad (ID cn219) however no date or specific location was specified (Calflora 2022). No occurrences were documented in CNDDB.
Asplenium vespertinum western spleenwort	Fed: Ca: CRPR:	none none 4.2	Feb-Jun 180-1000	Occus in chaparral, cismontane woodland, and coastal scrub habitats. Often found within rocky areas.	**Presumed Absent.** No suitable habitat is present within the Project site. One occurrence was documented within the San Bernardino South quad (ID cn324) however no date or specific location was specificed (Calflora 2022). No occurrences were documented in CNDDB.
Astragalus hornii var. *hornii* Horn's milk-vetch	Fed: Ca: CRPR:	none none 1B.1	May-Oct 60-850	Occurs in alkaline and lake margins within meadows and seeps, and playas.	**Presumed Absent.** No suitable habitat was present within the Project site.
Astragalus hornii var. *jaegeri* Jaeger's milk-vetch	Fed: Ca: CRPR:	none none 1B.1	Dec-Jun 365-975	Occurs within chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland. Sometimes found within sandy and rocky areas. Threatened by habitat loss, urbanization, vehicles, and road maintenance, and agriculture.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Atriplex coronata var. *notatior* San Jacinto Valley crownscale	Fed: Ca: CRPR:	END none 1B.1	Apr-Aug 139-500	Occurs in playas, valley and foothill grassland, and vernal pools. Occurs within alkaline habitats. Threatened by flood control, non-native plants, urbanization, vehicles, construction, and agriculture.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in CNDDB or Calflora.

Atriplex serenana var. *davidsonii* Davidson's saltscale	Fed: Ca: CRPR:	none none 1B.2	Apr-Oct 10-200	Occurs in coastal scrub and coastal bluff scrub within alkaline areas.	Presumed Absent. The Project site is outside the known elevation range for this species.
Berberis nevinii Nevin's Barberry	Fed: Ca: CRPR:	END END 1B.1	Feb-Jun 70-825	Occurs in chaparral, cismontane woodland, coastal scrub, and riparian woodland in sandy or gravelly soils.	Presumed Absent. No suitable chaparral, cismontane woodland, coastal scrub, and riparian woodland habitat is present within the Project site. Numerous historic occurrences have been documented in Calflora within five miles of the Project site. These are documented near the San Timoteo Creek, southwest of the Project site (Calflora 2022). One recent (OCC 4) occurrence was documented in 2009 within five miles of the Project site in CNDDB.
Bouteloua trifida three-awned grama	Fed: Ca: CRPR:	none none 2B.3	(Apr) May-Sep 700-2000	Occurs within Mojavean desert scrub within carbonate rocky areas.	Presumed Absent. The Project site is outside the known elevation range for this species.
Brodiaea filifolia thread-leaved brodiaea	Fed: Ca: CRPR:	THR END 1B.1	Mar-Jun 25-1120	Occurs in open chaparral, coastal scrub, vernal pools, valley and foothill grassland, cismontane woodland, and playas. Often found in with clay soils.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Calochortus catalinae Catalina mariposa lily	Fed: Ca: CRPR:	none none 4.2	(Feb)Mar-Jun 15-700	Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grasslands. Threatened by development.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Calochortus palmeri var. *palmeri* Palmer's mariposa-lily	Fed: Ca: CRPR:	none none 1B.2	Apr-Jul 710-2390	Occurs in chaparral, lower montane coniferous forest, and meadows and seeps. Often found within mesic habitats. Threatened by development, grazing, non-native plants, vehicles, and recreational activities.	Presumed Absent. The Project site is outside the known elevation range for this species.
Calochortus plummerae Plummer's mariposa-lily	Fed: Ca: CRPR:	none none 4.2	Mar-Jul 100-1700	Occurs in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forests, and valley and foothill grasslands. Often found within granitic or rocky habitat. Threatened by development, fire supression, foot traffic, mining, recreational activities, and powerline construction.	Presumed Absent. No suitable habitat is present within the Project site. Numerous occurrences have been documented in Calflora within five miles of the Project site. Two historic occurrences are documented north of the Project and of the Santa Ana River (ID UCR-82263 in 1992 and ID UCR-102429 in 1997). No occurrences were documented in CNDDB.
Calochortus simulans La Panza mariposa-lily	Fed: Ca: CRPR:	none none 1B.3	Apr-Jun 325-1150	Occurs in chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland. Often found in granitic areas as well as sandy and serpentinite areas.Threatened by grazing and development.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calfora or CNDDB.
Carex comosa bristly sedge	Fed: Ca: CRPR:	none none 2B.1	May-Sep 0-625	Occurs within coastal prairie, marshes and swamps, and valley and foothill grasslands. Threatened by marsh drainage and road maintenance.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Castilleja cinerea ash-gray paintbrush	Fed: Ca: CRPR:	none none 1B.2	Jun-Aug 1800-2960	Occurs in Mojavean desert scrub, meadows and seeps, pebble plains, pinyon and juniper woodland, and upper montane coniferous forest. Threatened by vehicles, development, logging, non-native plants, among others.	Presumed Absent. The Project site is outside the known elevation range for this species.
Castilleja lasiorhyncha San Bernardino Mountains owl's-clover	Fed: Ca: CRPR:	none none 1B.2	May-Aug 1300-2390	Occurs in chaparral, meadows and seeps, pebble plains, riparian woodland, and upper montane coniferous forests. Occurs within mesic habitats. Threatened by development, mining, non-native plants, recreational activities, among others.	Presumed Absent. The Project site is outside the known elevation range for this species.
Centromadia pungens ssp. *laevis* smooth tarplant	Fed: Ca: CRPR:	none none 1B.1	Apr-Sep 0-640	Occurs in alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodlands, and valley and foothill grassland.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.

Chloropyron maritimum ssp. *maritimum* salt marsh bird's-beak	Fed: Ca: CRPR:	END END 1B.2	May-Oct 0-30	Occurs in coastal dunes and in coastal salt marshes and swamps.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora. One historic occurrence (OCC 16) was documented within five miles of the Project site in 1888.
Chorizanthe leptotheca Peninsular spineflower	Fed: Ca: CRPR:	none none 4.2	May-Aug 300-1900	Occurs in chaparral, coastal scrub, and lower montane coniferous forest within granitic soils. Threatened by habitat loss and non-native grasses.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Chorizanthe parryi var. *parryi* Parry's spineflower	Fed: Ca: CRPR:	none none 1B.1	Apr-Jun 275-1220	Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats in openings in sandy or rocky soils.	Presumed Absent. No suitable chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitat is present within the Project site. Although several occurrences have been documented within five miles of the Project site.
Chorizanthe xanti var. *leucotheca* white-bracted spineflower	Fed: Ca: CRPR:	none none 1B.2	Apr-Jun 300-1200	Occurs on alluvial fans in coastal scrub habitat, Mojavean desert scrub, and pinyon and juniper woodland. Often found in sandy or gravelly soils.	Presumed Absent. No suitable habitat is present within the Project site. One recent occurrence (ID UCR0091736) was documented within five miles of the Project Site off HWY 38. One recent occurrence (OCC 34) was documented within four miles from the Project site in 2011.
Convolvulus simulans small-flowered morning-glory	Fed: Ca: CRPR:	none none 4.2	Mar-Jul 30-740	Occurs in chaparral, coastal scrub, and valley and foothill grasslands. Occurs within clay, seeps, and serpentinite habitats. Threatened by development, vehicles, and non-native plants.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Cuscuta obtusiflora var. *glandulosa* Peruvian dodder	Fed: Ca: CRPR:	none none 2B.2	Jul-Oct 15-280	Occurs within freshwater marshes and swamps.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in CNDDB.
Deinandra paniculata paniculate tarplant	Fed: Ca: CRPR:	none none 4.2	(Mar) Apr-Nov 25-940	Occurs within coastal scrub, valley and foothill grasslands, and vernal pools. Found within vernally mesic habitats and sometimes sandy areas. Threatened by development.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in CNDDB.
Diplacus clevelandii Cleveland's bush monkeyflower	Fed: Ca: CRPR:	none none 4.2	Apr-Jul 450-2000	Occurs within chaparral, cismontane woodland, and lower montane coniferous forest. Found within disturbed areas, gabbroic, openings, and rocky areas. Threatened by recreational activities.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Dodecahema leptoceras Slender-horned spineflower	Fed: Ca: CRPR:	END END 1B.1	Apr-Jun 200-760	Occurs in chaparral, cismontane woodland, and alluvial fan coastal scrub in sandy soils.	Presumed Absent. No suitable chaparral, cismontain woodland, or alluvial fan sage scrub habitat is present within the Project site. One recent (OCC 2) and six historic occurrences were documented in CNDDB within five miles of the Project site.
Eriastrum densifolium ssp. *sanctorum* Santa Ana River Woollystar	Fed: Ca: CRPR:	END END 1B.1	Apr-Sep 91-610	Occurs in chaparral and alluvial fan coastal scrub in sandy or gravelly soils.	Presumed Absent. No suitable chaparral or alluvial fan sage scrub habitat was present on site. Although, numerous historic and recent occurrences have been documented within five miles of the Project site (Calflora 2022). Occurrences are predominantly located along the Santa Ana River and adjacent habitat. Four recent and four historic occurrences were documented within five miles of CNDDB.
Erythranthe exigua San Bernardino Mountains monkeyflower	Fed: Ca: CRPR:	none none 1B.2	May-Jul 1800-2315	Occurs in meadows and seeps, pebble plains, and upper montane coniferous forest. Found within clay and mesic areas. Threatened by development, mining, vehicles, and recreational activities.	Presumed Absent. The Project site is outside the known elevation range for this species.

Fimbristylis thermalis Hot Springs Fimbristylis	Fed: Ca: CRPR:	none none 2B.2	Jul-Sep 110-1340	Occurs in alkaline meadows and seeps near hot springs.	Presumed Absent. No suitable habitat is present within the Project site. No ocurrences were documented within five miles o the Project site in CNDDB.
Galium californicum ssp. *primum* Alvin Meadow bedstraw	Fed: Ca: CRPR:	none none 1B.2	May-Jul 1350-1700	Occurs within chaparral and lower montane coniferous forest. Found within granitic and sandy areas. Threatened by recreational activities.	Presumed Absent. The Project site is outside the known elevation range for this species.
Helianthus nuttallii ssp. *parishii* Los Angeles Sunflower	Fed: Ca: CRPR:	none none 1A	Aug- Oct 10-1675	Occurs in coastal salt and freshwater marshes and swamps. Last seen in 1937.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site in CNDDB.
Heuchera parishii Parish's Alumroot	Fed: Ca: CRPR:	none none 1B.3	Jun-Aug 1500-3800	Occurs in alpine boulder and rock fields, lower montane coniferous forest, subalpine coniferous forest, and upper montane coniferous forest. Found in rocky, sometimes carbonate soils.	Presumed Absent. The Project site is outside the known elevation range for this species.
Hordeum intercedens vernal barley	Fed: Ca: CRPR:	none none 3.2	Mar-Jun 5-1000	Occurs in coastal dunes, coastal scrub, valley and foothill grassland, and vernal pools. Threatened by development, habitat loss, non-native plants, and road construction.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Horkelia cuneata var. *puberula* Mesa Horkelia	Fed: Ca: CRPR:	none none 1B.1	Feb-Sep 70-810	Occurs in maritime chaparral, cismontane woodland, and coastal scrub in sandy or gravelly soils.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Imperata brevifolia California Satintail	Fed: Ca: CRPR:	none none 2B.1	Sep-May 0-1215	Occurs in chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps, and riparian scrub. Threatened by development and agriculture.	Presumed Absent. No suitable habitat is present within the Project site. Three historic occurrences were documented within five miles of the Project site (Calflora 2022). One historic occurrence (OCC 6) was documented in the Project site in 1891.
Ivesia argyrocoma var. *argyrocoma* silver-haired ivesia	Fed: Ca: CRPR:	none none 1B.2	Jun-Aug 1463-2960	Occurs within meadows and seeps, pebble plains, and upper montane coniferous forests. Threatened by development, grazing, foot traffic, non-native species, road maintenance and construction, and vehicles.	Presumed Absent. The Project site is outside the known elevation range for this species.
Juglans californica Southern California Black Walnut	Fed: Ca: CRPR:	none none 4.2	Mar-Aug 50-900	Occurs in chaparral, cismontane woodland, coastal scrub, and riparian woodland, often alluvial soils.	Presumed Absent. No suitable habitat is present within the Project site. Numerous historic and recent occurrences were documented within five miles of the Proejct site (Calflora 2022). No occurrences were documented in CNDDB within five miles of the Project site.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	Fed: Ca: CRPR:	none none 1B.1	Feb-Jun 1-1220	Occurs in marshes and swamps, playas, and vernal pools. Threatened by urbanization, agriculture, road maintenance, and drought.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Lilium humboldtii ssp. *ocellatum* ocellated Humboldt lily	Fed: Ca: CRPR:	none none 4.2	Mar-Aug 30-1800	Occurs in openings in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Lilium parryi Lemon Lily	Fed: Ca: CRPR:	none none 1B.2	Jul-Aug 1220-2745	Occurs in mesic soils in lower and upper montane coniferous forests, meadows and seeps, and riparian forests.	Presumed Absent. The Project site is outside the known elevation range for this species.
Lycium parishii Parish's desert-thorn	Fed: Ca: CRPR:	none none 2B.3	Mar-Apr 135-1000	Occurs in coastal scrub and Sonoran desert scrub.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Malacothamnus parishii Parish's bush-mallow	Fed: Ca: CRPR:	none none 1A	Jun-Jul 305-455	Occurs in chaparral and coastal scrub habitats.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora. One historic occurrence (OCC 2) was documented in 1895 within five miles of the Project site in CNDDB.

Monardella macrantha ssp. *hallii* Hall's monardella	Fed: Ca: CRPR:	none none 1B.3	Jun-Oct 730-2195	Occurs in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland. Threatened by road maintenance and recreational activities.	**Presumed Absent.** The Project site is outside the known elevation range for this species.
Monardella pringlei Pringle's monardella	Fed: Ca: CRPR:	none none 1A	May-Jun 300-400	Occurs in coastal scrub.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Muilla coronata Crowned muilla	Fed: Ca: CRPR:	none none 4.2	Mar-Apr 670-1960	Occurs in Joshua tree woodland, Chenopod scrub, Mojavean desert scrub, and pinyon and juniper woodland.	**Presumed Absent.** The Project site is outside the known elevation range for this species.
Nama stenocarpa mud nama	Fed: Ca: CRPR:	none none 2B.2	Jan-Jul 5-500	Occurs in marshes and swamps.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site in CNDDB.
Nasturtium gambelii Gambel's water cress	Fed: Ca: CRPR:	END THR 1B.1	Apr-Oct 5-330	Occurs in marshes and swamps that are brackish or freshwater. Threatened by habitat loss, erosion, and altered hydrology.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site in CNDDB.
Packera bernardina San Bernardino ragwort	Fed: Ca: CRPR:	none none 1B.2	May-Jul 1800-2300	Occurs in meadows and seeps, pebble plains, and upper montane coniferous forest. Threatened by development, foot traffic, mining, and vehicles.	**Presumed Absent.** The Project site is outside the known elevation range for this species.
Perideridia parishii ssp. *parishii* Parish's yampah	Fed: Ca: CRPR:	none none 2B.2	Jun-Aug 1465-3000	Occurs in lower and upper montane coniferous forest and meadows and seeps. Threatened by development, fire suppression, non-native plants, vehicles, and road maintenance.	**Presumed Absent.** The Project site is outside the known elevation range for this species.
Phacelia stellaris Brand's star phacelia	Fed: Ca: CRPR:	none none 1B.1	Mar-Jun 1-400	Occurs in coastal scrub and dunes. Threatened by development and non-native plants.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Pseudorontium cyanthiferum Deep Canyon snapdragon	Fed: Ca: CRPR:	none none 2B.3	Feb-Apr 0-800	Occurs in Sonoran desert scrub.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Quercus engelmannii Engelmann oak	Fed: Ca: CRPR:	none none 4.2	Mar-Jun 50-1300	Occurs within chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland. Threatened by development and grazing.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Ribes divaricatum var. *parishii* Parish's gooseberry	Fed: Ca: CRPR:	none none 1A	Feb-Apr 65-300	Occurs within riparian woodland. Threatened by habitat loss and non-native plants.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Romneya coulteri Coulter's matilija poppy	Fed: Ca: CRPR:	none none 4.2	Mar-Aug 20-1200	Occurs in chaparral and coastal scrub, often after burns.	**Presumed Absent.** No suitable habitat is present within the Project site. Two recent occurrences have been documented within five miles of the Project site (ID 24796227 in 2019 and 24692528 in 2019) (Calflora 2022). No occurrences were documented within five miles of the Project site in CNDDB.
Schoenus nigricans black bog-rush	Fed: Ca: CRPR:	none none 2B.2	Aug-Sep 150-2000	Occurs in marshes and swamps, often alkaline.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site in CNDDB.
Senecio aphanactis chaparral ragwort	Fed: Ca: CRPR:	none none 2B.2	Jan-Apr (May) 15-800	Occurs within chaparral, cismontane woodland, and coastal scrub. Sometimes found in alkaline areas. Threatened by development.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.

Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	Fed: Ca: CRPR:	none rare 1B.2	(May) Jun-Aug 1000-2499	Occurs within chaparral, cismontane woodland, and lower montane coniferous forest. Threatened by urbanization, recreational activities, fire suppression, foot traffic, and road maintenance.	Presumed Absent. The Project site is outside the known elevation range for this species.
Sialcea malviflora ssp. *dolosa* Bear Valley checkerbloom	Fed: Ca: CRPR:	none none 1B.2	May-Aug 1495-2685	Occurs in lower and upper montane coniferous forest, meadows and seeps, and riparian woodlands. Threatened by development, foot traffic, and recreational activities.	Presumed Absent. The Project site is outside the known elevation range for this species.
Sidalcea neomexicana salt spring checkerbloom	Fed: Ca: CRPR:	none none 2B.2	Mar-Jun 15-1530	Occurs in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas. Often within alkaline and mesic areas.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora. One recent occurrence (OCC 23) was documented in 2011 within two miles of the Project site in CNDDB.
Sidalcea pedata bird-foot checkerbloom	Fed: Ca: CRPR:	END END 1B.1	May-Aug 1600-2500	Occurs within meadows and seeps and pebble plains. Threatened by development, erosion, grazing, non-native plants, and vehicles.	Presumed Absent. The Project site is outside the known elevation range for this species.
Sphenopholis obtusata prairie wedge grass	Fed: Ca: CRPR:	none none 2B.2	Apr-Jul 300-2000	Occurs within cismontane woodland and meadows and seeps.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora or CNDDB.
Streptanthus campestris southern jewelflower	Fed: Ca: CRPR:	none none 1B.3	Apr-Jul 900-2300	Occurs in rocky areas of chaparral, lower montane coniferous forest, and pinyon and juniper woodland.	Presumed Absent. The Project site is outside the known elevation range for this species.
Symphyotrichum defoliatum San Bernardino aster	Fed: Ca: CRPR:	none none 1B.2	Jul-Nov 2-2040	Occurs in meadows and seeps, marshes, and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest, and vernally mesic valley and foothill grassland. Often found in disturbed areas and near ditches, streams, and springs.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora. One historic occurrence (OCC 24) was documented in 1951 approximately five miles from the Project site.
Trelypteris puberula var. *sonorensis* Sonoran maiden fern	Fed: Ca: CRPR:	none none 2B.2	Jan-Sep 50-610	Occurs in meadows and seeps.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in CNDDB.
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	Fed: Ca: CRPR:	none none 2B.1	May-Sep 5-435	Occurs within meadows and seeps, marshes and swamps, riparian forest, and vernal pools. Occurs within alkaline areas.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in CNDDB..
Yucca brevifolia western joshua tree	Fed: Ca: CRPR:	none CAN -	-	Occurs in Mojavean desert scrub, Great Basin scrub, and California juniper woodlands. Often found in sandy areas. Threatened by fire, drought, climate change, and habitat loss.	Presumed Absent. No suitable habitat is present within the Project site. No occurrences have been documented within five miles of the Project site in Calflora.

Federal Designations:	State designations:	CRPR Ranking
(Federal Endangered Species Act, USFWS)	(California Endangered Species Act, CDFG)	1A: Presumed extinct
END: federally listed, endangered	END: state-listed, endangered	1B: Rare, threatened, or endangered in California and elsewhere
THR: federally listed, threatened	THR: state-listed, threatened	2B: Rare, threatened, or endangered in California, but more common elsewhere
	CAN: Candidate for state listing	3: Review list of plants requiring more study
	FP: Fully Protected Species	4: Plants of limited distribution watch list
	SSC: Species of Special Concern	CRPR Threat Code
		0.1: Seriously threatened in California
		0.2: Fairly threatened in California
		0.3: Not very threatened in California

Source: California Natural Diversity Data Base (CNDDB) California Native Plant Society Electronic Inventory (CRPREI) San Bernardino North, San Bernardino South, Riverside East, Sunnymead, El Casco, Redlands, Yucaipa, Harrison Mtn., and Keller Peak 7.5-minute quads.

APPENDIX D

Special-Status Wildlife Species Potential for Occurrence

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
Crustaceans				
Streptocephalus woottoni Riverside fairy shrimp	Fed: CA: USFS:	**END** none none	Occur in vernal pools. These vernal pools occur on relatively flat land.	**Presumed Absent.** No suitable habitat is present within the Project site.
Insects				
Euphydryas editha quino quino checkerspot butterfly	Fed: CA: USFS:	**END** none none	Occurs in chaparral and coastal sage scrublands, containing the proper host plants (i.e. dwarf plantain, white snapdragon, woolly plantain, and chinese houses) and abundant nectar resources.	**Presumed Absent.** No suitable habitat is present within the Project site. No host plants were observed.
Rhaphiomidas terminatus abdominalis Delhi Sands flower-loving fly	Fed: CA: USFS:	**END** none none	Occur in Delhi Sands series soils. Indicator plant species include telegraph weed (*Heterotheca grandiflora*), California buckwheat (*Eriogonum fasciculatum*), and California croton (*Croton californica*).	**Presumed Absent.** No suitable habitat is present within the Project site.
Fish				
Catostomus santaanae Santa Ana sucker	Fed: CA: USFS:	**THR** none none	Occurs in clean, shallow portions of rivers and streams. They occur in water systems that experience a range of currents from swift to sluggish.	**Presumed Absent.** No suitable habitat is present within the Project site.
Gila orcuttii arroyo chub	Fed: CA: USFS:	none SSC none	Occurs primarily in the warm streams and rivers of the Los Angeles plain.	**Presumed Absent.** No suitable habitat is present within the Project site.
Oncorhynchus mykiss irideus pop. 10 steelhead- southern California DPS	Fed: CA: USFS:	**END** none none	Occur in warmer water temerpatures, up to 77°F. They depend on winter rains to provide passage through seasonal waterways.	**Presumed Absent.** No suitable habitat is present within the Project site.
Rhinichthys osculus ssp. 8 Santa Ana speckled dace	Fed: CA: USFS:	none SSC S	Occur in a variety of aquatic habitats including small springs, streams, large rivers, and deep lakes. They are found in waters that are clear, well oxygenated, and with currents or waves. Vegetative cover allows for protection against predation.	**Presumed Absent.** No suitable habitat is present within the Project site.
Amphibians				
Rana draytonii California red-legged frog	Fed: CA: USFS:	**THR** SSC none	Occurs in aquatic, artificial flowing waters, artificial standing waters, freshwater marsh, marsh & swamp, riparian forest, riparian scrub, riparian woodland, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, south coast flowing waters, south coast standing waters, and wetland habitats. Requires 11-20 weeks of permanent water for larval development. Often found in lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation.	**Presumed Absent.** No suitable habitat is present within the Project site.
Rana muscosa southern mountain yellow-legged frog	Fed: CA: USFS:	**END** **END** S	Occur in glaciated, alpine lakes, ponds, springs, and streams. Lakes usually have grassy or muddy margins.	**Presumed Absent.** No suitable habitat is present within the Project site.
Spea hammondii western spadefoot	Fed: CA: USFS:	none SSC none	Typically occurs in scrub, chaparral, vernal pools, and rivers with sandy banks, willows, cottonwoods, and sycamores with loose, gravelly areas of streams in drier parts of range.	**Presumed Absent.** No suitable habitat is present within the Project site.
Reptiles				
Anniella stebbinsi Southern California legless lizard	Fed: CA: USFS:	none SSC S	Typically occurs in moist warm loose soil with plant cover in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks.	**Presumed Absent.** No suitable moist soil, dune, chaparral, woodland, scrub, or wash habitat was present on the Project site. Although, numerous recent and historicalal occurrences were documented within five miles in CNDDB.
Arizona elegans occidentalis California glossy snake	Fed: CA: USFS:	none SSC none	Typically occurs in rocky washes, chaparral, scrub and grassland habitat, often with loose or sandy soils.	**Presumed Absent.** No suitable wash, chapparal, or scrub habitat occurs on site. The site is also very disturbed. Two recent (OCC 99 and 100) have been documented within five miles of the Project site. In 2015 and 2014, respectively.
Aspidoscelis tigris stejnegeri San Diegan coastal whiptail	Fed: CA: USFS:	none SSC none	Found in a variety of habitats. They prefer hot, dry open areas that have little cover. Common habitats include chaparral, woodland, and riparian.	**Presumed Absent.** The Project site is outside the known range for this species.
Charina umbratica southern rubber boa	Fed: CA: USFS:	none **THR** S	Occurs in coniferous forests within riparian areas in the San Bernardino and San Jacinto Mountains. Preferred habitat is damp woodland, coniferous forests, grassy meadows, and moist sandy areas near streams. Downed logs and forest litter area also crucial habitat qualities.	**Presumed Absent.** The Project site is outside the known range for this species.
Coleonyx variegatus abbotti San Diego banded gecko	Fed: CA: USFS:	none SSC none	Occur within rocky areas in coastal sage scrub and chaparral habitats.	**Presumed Absent.** The Project site is outside the known range for this species.

Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Crotalus ruber red-diamond rattlesnake	Fed: CA: USFS:	none SSC S	Occur in aris scrub, coastal chaparral, oak and pine woodlands, rocky grasslands, and cultivated areas. Within desert slopes on mountains, often found within rocky desert flats.	**Presumed Absent.** The Project site is outside the known range for this species.
Emys marmorata western pond turtle	Fed: CA: USFS:	none SSC S	Occurs in aquatic, artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, south coast flowing waters, south coast standing waters, and wetland habitats. Needs basking sites (logs, rocks, and exposed banks) and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	**Presumed Absent.** No suitable habitat is present within the Project site.
Phrynosoma blainvillii coast horned lizard	Fed: CA: USFS:	none SSC none	Occurs in chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinon & juniper woodlands, riparian scrub, riparian woodland, and valley & foothill grassland habitats. Requires open areas for sunning, bushes to provide cover, and loose soil for burial. Diet consists mainly of ants and also small invertebrates. Most commonly found in lowlands along sandy washes with scattered low bushes.	**Presumed Absent.** No suitable chapparal, woodland, scrub, wash, woodland, or grassland habitats are present on site. Four historicalal occurrences (OCC 252, 431, 433, and 771) were documented within five miles of the Project site.
Salvadora hexalepis virgultea coast patch-nosed snake	Fed: CA: USFS:	none SSC none	Occurs in semi-arid brushy areas. Often found within chaparral habitats within canyons, hillsides, and plains	**Presumed Absent.** The Project site is outside the known range for this species.
Thamnophis hammondii two-striped gartersnake	Fed: CA: USFS:	none SSC S	Typically occurs near permanent or semi-permanent water sources in a variety of habitats.	**Presumed Absent.** No suitable aquatic habitat is present on the site. Four recent (OCC 92, 143, 154, and 160) and one historical (OCC 5) occurrence were documented within five miles of the Project site in CNDDB.
Birds				
Agelaius tricolor tricolored blackbird (nesting colony)	Fed: CA: USFS:	none **THR**/SSC none	Occurs in freshwater marsh, swamp, and wetland habitats. Largely endemic to California. Highly colonial species, most numerous in Central Valley & vicinity. Requires open water, protected nesting substrate, and foraging area with insect prep within a few kilometers of the colony. Forages in open habitat such as cultivated fields and pastures.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site.
Aquila chrysaetos golden eagle (nesting & wintering)	Fed: CA: USFS:	none FP none	Occurs in broadleaved upland forest, cismontane woodland, coastal prairie, Great Basin grassland, Great Basin scrub, lower montane coniferous forest, pinon & juniper woodlands, upper montane coniferous forest, and valley & foothill grassland habitats. Found in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also large trees such as eucalyptus or oak in open areas.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site.
Athene cunicularia burrowing owl (burrow & some wintering sites)	Fed: CA: USFS:	none SSC none	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Occurs in coastal prairie, coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, and valley & foothill grassland habitats. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel. Also found in vacant lots and airports.	**Moderate Potential**. Marginally suitable habitat exists due to the presence of small mammal burrows (gopher and California ground squirrel) throughout the Project site. One historical occurrence (OCC 314) was documented in 1983 within five miles of the Project site.
Buteo swainsoni Swainson's hawk (nesting)	Fed: CA: USFS:	none **THR** none	Occurs in Great Basin grassland, riparian forest, riparian woodland, and valley & foothill grassland habitats. Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees. Nests in solitary bush or tree, or in small groves. Requires adjacent suitable foraging areas such as grasslands or alfalfa/grain fields supporting rodent populations.	**Presumed Absent.** Due to the high level of disturbance, the sites proximity to development, and its generally urban nature would preclude this speceis from nesting on the site. Additionally the site is small and does not represent typcical foraging habitat.
Coccyzus americanus occidentalis western yellow-billed cuckoo (nesting)	Fed: CA: USFS:	**THR** **END** S	Occurs in riparian forest habitat. Nests along the broad (≥ 12.4 acres) patches of multi-layered riparian woodland, often dominated by willows and cottonwoods of lower flood bottoms of larger river systems.	**Presumed Absent.** No suitable habitat is present within the Project site.

Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Elanus leucurus white-tailed kite	Fed: CA: USFS:	none FP none	Occur in savannas, open woodlands, marshes, desert grasslands, cultivated fields, and other partially cleared areas. They will avoid areas that are too heavily grazed.	**Presumed Absent.** No occurrences were documented within five miles of the Project site.
Empidonax traillii extimus southwestern willow flycatcher (nesting)	Fed: CA: USFS:	**END** **END** none	Occurs in riparian woodland habitat in Southern California. Nests in densest areas of riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes and reservoirs. Nests are often in nonnative tamarisk (*Tamarisk* spp.) and native willow (*Salix* spp.), typically in vegetation stands of 4-7 m in height.	**Presumed Absent.** No suitable habitat is present within the Project site. One historical occurrence (OCC 29) was documented within four miles of the Project site in 1999.
Haliaeetus leucocephalus bald eagle	Fed: CA: USFS:	DEL **END**/FP S	Occur habitats near lakes and reservoirs that are adjacent to forest habitats. In winter, they can be found around unfrozen lakes, along rivers, and along coastlines.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site.
Icteria virens yellow-breasted chat	Fed: CA: USFS:	none SSC none	Occurs in riparian forest, riparian scrub, and riparian woodland habitats. Nests in low, dense riparian, consisting of willow, blackberry, wild grape along streams or at the edges of ponds or swamps. Forages and nests within 10 ft of ground.	**Presumed Absent.** No suitable habitat is present within the Project site. One historical occurrence (OCC 99) was documented in 1999 within five miles of the Project site.
Lanius ludovicianus loggerhead shrike (nesting)	Fed: CA: USFS:	none SSC none	Occurs in broadleaved upland forest, desert wash, Joshua tree woodland, Mojavean desert scrub, pinon & juniper woodlands, riparian woodland, and Sonoran desert scrub habitats. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	**Presumed Absent.** No suitable habitat is present within the Project site. One historical occurrence (OCC 5) was documented within four miles in 1999.
Laterallus jamaicensis coturniculus California black rail	Fed: CA: USFS:	none **THR/**FP none	Occurs in marshes, wet meadows, riparian marshes, coastal prairies, saltmarshes, and impounded wetlands. Water levels are usually shallow, less than 2 inches deep. American glasswort (Salicornia *sp.*), bulrush species (*Typha angustifolia*), and alkali seaheath (*Frankenia salina*) are common plant species.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site.
polioptila californica californica coastal California gnatcatcher	Fed: CA: USFS:	**THR** SSC none	Occurs in coastal bluff scrub.	**Presumed Absent.** No suitable habitat is present within the Project site. Two recent occurrences (OCC 916 in 2008 and OCC 917 in 2006) and one historical occurrence (OCC 494 in 1995) were documented within five miles of the Project site
Setophaga petechia yellow warbler (nesting)	Fed: CA: USFS:	none SSC none	Occurs in riparian forest, riparian scrub, and riparian woodland habitats. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders. Diet consists primarily of insects.	**Presumed Absent.** No suitable habitat is present within the Project site. One historical occurrence (OCC 86) was documented within four miles in 1999.
Vireo bellii pusillus least Bell's vireo (nesting)	Fed: CA: USFS:	**END** **END** none	Occurs in riparian forest, riparian scrub, and riparian woodland habitats. Summer resident of Southern California in low riparian vegetation in the vicinity of water or in dry river bottoms, below 2,000 ft msl. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, mule fat, and mesquite.	**Presumed Absent.** No suitable habitat is present within the Project site. Numerous recent and historicalal occurrences were documented within five miles of the Project site.
Mammals				
Antrozous pallidus pallid bat	Fed: CA: USFS:	none SSC S	Occurs in chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, riparian woodland, Sonoran desert scrub, upper montane coniferous forest, and valley & foothill grassland habitats. Most commonly found in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Frequently roost in live trees and snags that have holes and cavities or crevices formed by exfoliating bark. Very sensitive to disturbance of roosting sites.	**Presumed Absent.** No suitable habitat is present within the Project site. One historical occurrence (OCC 244) was documented in 1929 with approximately one mile of the Project site.
Dipodomys merriami parvus San Bernardino kangaroo rat	Fed: CA: USFS:	**END** **END**/SSC none	Occur on the gentle slopes of alluvial fans, flood plains, washes, and adjacent habitats. Common habitats include alluvial sage scrub, coastal sage scrub, and chaparral.	**Presumed Absent.** No suitable habitat is present within the Project site. Numerous recent and historical occurrences were documented within five miles of the Project site. The most recent occurrence (OCC 3) was documented in 2017 approximately one mile from the Project site.
Dipodomys stephensi Stephens' kangaroo rat	Fed: CA: USFS:	**END** **THR** none	Occur in arid and semi-arid habitats. Prefer open areas where the cover is less than 50%.	**Presumed Absent.** No suitable habitat is present within the Project site. One historical occurrence (OCC 167) was documented approximately five miles from the Project site in 1976.

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
Eumops perotis californicus western mastiff bat	Fed: CA: USFS:	none SSC none	Occurs in open areas that have potential roosting areas. Primarily roosts in cliffs and rock crevices. Found in semi-arid to arid habitats.	**Presumed Absent.** No suitable habitat is within the Project site. Two historical occurrence (OCC 10 and 175) were documented within approximately five miles of the Project site in 1992 and 1991, respectively.
Glaucomys oregonensis californicus San Bernardino flying squirrel	Fed: CA: USFS:	none SSC S	Occurs in high-elevation, mixed-conifer forests dominated by Jeffrey pine, white fir, and black oak between 4,600 and 7,500 feet.	**Presumed Absent.** No suitable habitat is present within the Project site.
Lasiurus xanthinus western yellow bat	Fed: CA: USFS:	none SSC none	Occurs within riparian woodland habitats with tree species such as Fremont cottonwood (*Populus fremontii*), Arizona syacamore (*Platanus wrightii*), and Arizona white oak (*Quercus arizonica*).	**Presumed Absent.** No suitable habitat is present within the Project site.
Leptonycteris yerbabuenae lesser long-nosed bat	Fed: CA: USFS:	DEL SSC none	Occur in desert scrub habitats	**Presumed Absent**. No suitable habitat is present within the Project site. One historical occurrence (OCC 1) was documented in 1993 within five miles of the Project site.
Neotoma lepida intermedia San Diego desert woodrat	Fed: CA: USFS:	none SSC none	Occur in a variet of habitats such as desert scrub. They are known to prefer rock outcroppings and cactus patches.	**Presumed Absent.** No suitable habitat is present within the Project site. One recent (OCC 46) was documented in 2007 and two historical occurrences (OCC 111 and 54) were documented in 2000 and 2002, respectively, within five miles of the Project site.
Nyctinomops femorosaccus pocketed free-tailed bat	Fed: CA: USFS:	none SSC none	Occurs in pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis habitat. Primarily roosts in cliffs and rock crevices. This species is not known to roost in bridges.	**Presumed Absent**. No suitable roosting habitat is present within the Project site. One historical occurrence (OCC 23) was documented within five miles of the Project site in 1985.
Onychomys torridus ramona southern grasshopper mouse	Fed: CA: USFS:	none SSC none	Occur in grassland prairies and prefer low to moderate shrub cover.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site.
Perognathus alticola alticola white-eared pocket mouse	Fed: CA: USFS:	none SSC S	Occurs within mountain habitats. They can be found within ponderosa and Jeffrey pine habitats. They can also be found in open, dry pine forests where braken fern is present.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site.
perognathus longimembris brevinasus Los Angeles pocket mouse	Fed: CA: USFS:	none SSC none	Occurs in low elevational grassland, alluvial sage scrub, and coastal sage scrub.	**Presumed Absent.** No suitable habitat is present within the Project site. One recent occurrence (OCC 39) was documented within five miles of the Project site in 2006.
Taxidea taxus American badger	Fed: CA: USFS:	none SSC none	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	**Presumed Absent.** No suitable habitat is present within the Project site. No occurrences were documented within five miles of the Project site.

Federal Designations:
(Federal Endangered Species Act, U.S. Fish and
END: Federally-listed, Endangered
THR: Federally-listed, Threatened
FC: Federal Candidate Species
DL: Federally-delisted

State designations:
(California Endangered Species Act, CDFW)
END: State-listed, Endangered
THR: State-listed, Threatened
CAN: Candidate for state listing
SSC: Species of Special Concern
FP: Fully Protected Species
WL: Watch List Species

Source: California Natural Diversity Data Base (CNDDB) San Bernardino North, San Bernardino South, Riverside East, Sunnymead, El Casco, Redlands, Yucaipa, Harrison Mtn., and Keller Peak 7.5-minute quads.

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Cultural Resources Inventory and Evaluation Report for the Colton and Wabash Project

San Bernardino County, California

Prepared For:

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July 2022 (Revised September 2023)

MANAGEMENT SUMMARY

Pat Meyer of Urban Environs retained ECORP Consulting, Inc. on behalf of Vanita Puri in 2022 to conduct a Cultural Resources Inventory for the Colton and Wabash Project in San Bernardino County, California. The project proponent seeks to develop a 9.01-acre parcel of land located north of Colton Avenue and west of Wabash Avenue in the City of Redlands, San Bernardino County.

The inventory included a records search, literature review, and field survey. A records search of the California Historical Resources Information System at the South Central Coastal Information Center indicated that no previous cultural resource studies have been conducted within the Project Area. Twenty-four studies have been conducted within 1 mile of the Project Area. Forty-three cultural resources were previously recorded within 1 mile of the Project Area.

Results from the search of the Sacred Lands File by the California Native American Heritage Commission were positive, indicating the presence of sacred lands within the Project Area. As a result of the field survey, two historic-period cultural resources were recorded inside the Project Area. These have been evaluated and found not eligible for the National Register of Historic Places or the California Register of Historical Resources under any criteria. Due to the presence of Holocene sediments within the Project Area, there is a moderate potential for the discovery of subsurface deposits or eligible sites within the Project Area. Recommendations for the management of unanticipated discoveries are provided.

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Description
AB	Assembly Bill
APE	Area of Potential Effects
APN	Assessor's Parcel Number

LIST OF ACRONYMS AND ABBREVIATIONS

Term	Description
BLM	Bureau of Land Management
BERD	Built Environment Resource Directory
BP	Before Present
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
DPR	Department of Parks and Recreation
ECORP	ECORP Consulting, Inc.
GLO	General Land Office
MLD	Most Likely Descendant
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PRC	Public Resources Code
RPA	Registered Professional Archaeologist
SCCIC	South Central Coastal Information Center
SHPO	State Historic Preservation Officer
TCRs	Tribal Cultural Resources
USC	U.S. Code
USGS	U.S. Geological Survey

1.0 INTRODUCTION

Urban Environs retained ECORP Consulting, Inc. in 2022 to conduct a Cultural Resources Inventory for the Colton and Wabash Project in the City of Redlands in San Bernardino County, California. A survey of the property was required to identify potentially eligible cultural resources (i.e., archaeological sites and historic buildings, structures, and objects) that could be affected by the Project.

1.1 Project Location and Description

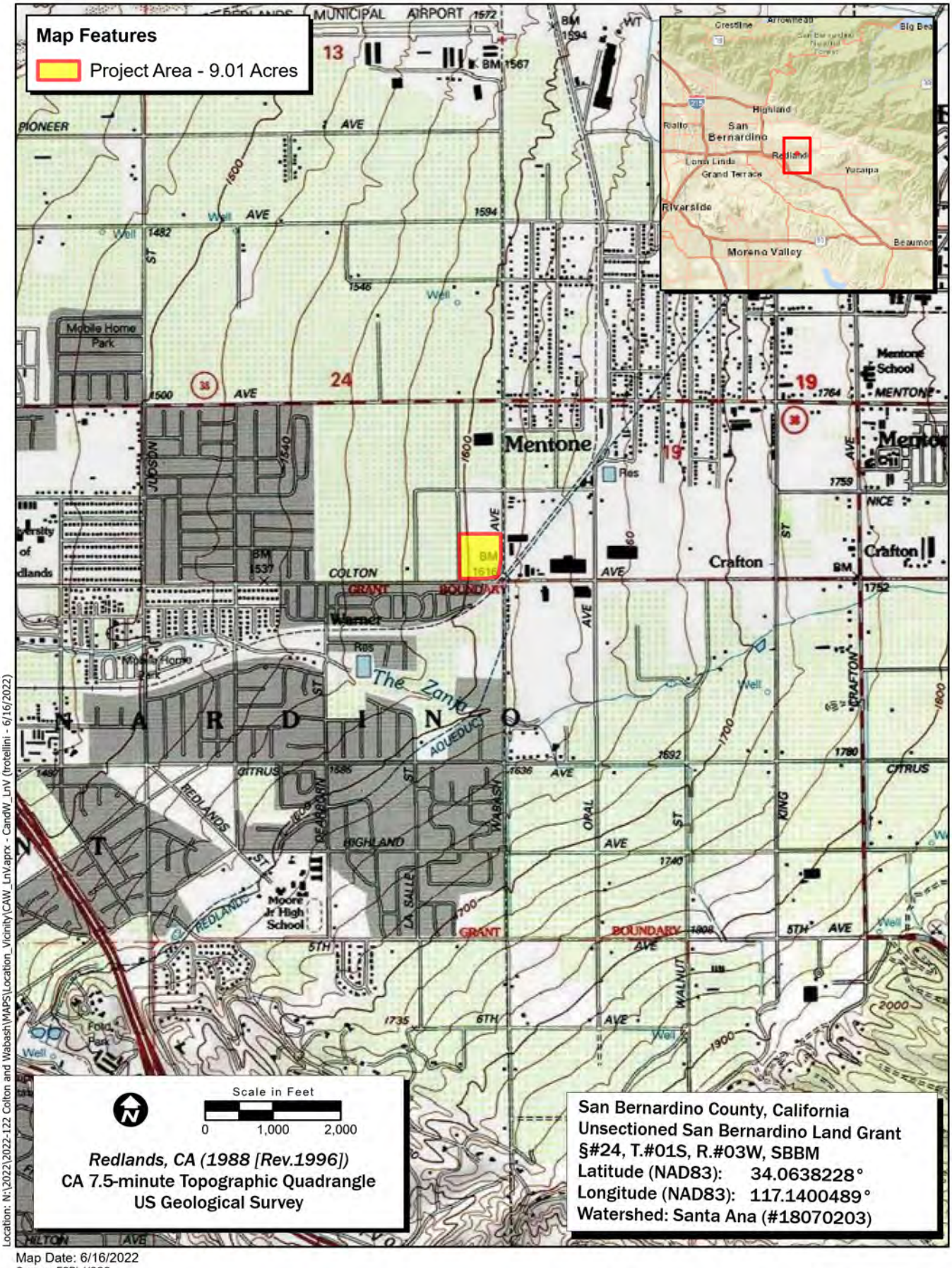
The Project Area consists of approximately 9.01 acres located in the southwestern quarter of the southwestern quarter of Section 24 of Township 1 South, Range 3 West, San Bernardino Base and Meridian, as depicted on the 1988 (Photorevised 1996) Redlands, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps (Figure 1-1). It is also known as Assessor's Parcel Number (APN 0168291020000). The Project Area is located north of Colton Avenue and west of Wabash Avenue. Urban Environs is proposing the development of the property.

1.2 Area of Potential Effects

The Area of Potential Effects (APE) consists of all areas where activities associated with a project may occur. In the case of this Project, the horizontal APE is equal to the Project Area subject to environmental review under the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) and includes areas proposed for construction, pole replacement, vegetation removal, grading, trenching, stockpiling, staging, paving, and other elements in the official Project description. The horizontal APE represents the survey coverage area and measures approximately 609 feet in length by 663 feet in width (Figure 1-1).

The vertical APE is defined as the maximum depth below the surface to which excavations for Project foundations and facilities will extend. Therefore, the vertical APE for the Project includes all subsurface areas where archaeological deposits could be affected. This study assumes the depth of disturbance will not exceed 10 feet in depth.

The vertical APE also is defined as the maximum height of structures that could impact the physical integrity and integrity of setting of cultural resources, including districts and traditional cultural properties. This project assumes the Vertical APE will not exceed 15 feet in height.



Map Date: 6/16/2022
Sources: ESRI, USGS

Figure 1. Project Location and Vicinity

2022-122 Colton and Wabash

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

1.3 Regulatory Context

ECORP conducted the cultural resources investigation pursuant to the provisions for the treatment of cultural resources contained within Section 106 of the National Historic Preservation Act (NHPA) and in CEQA (Public Resources Code [PRC] § 21000 et seq.) to meet the regulatory requirements of this Proposed Project. The goal of NHPA and CEQA is to develop and maintain a high-quality environment that serves to identify the significant environmental effects of the actions of a proposed project and to either avoid or mitigate those significant effects, where feasible. CEQA pertains to all proposed projects that require state or local government agency approval, including the enactment of zoning ordinances, the issuance of conditional use permits, and the approval of development project maps. The NHPA pertains to projects that entail some degree of federal funding or permit approval.

The NHPA and CEQA (Title 54 U.S. Code [USC] Section 100101 et seq and Title 14, California Code of Regulations [CCR], Article 5, § 15064.5) apply to cultural resources of the historical and pre-contact (prehistoric) periods. Any project with an effect that may cause a substantial adverse change in the significance of a cultural resource, either directly or indirectly, is a project that may have a significant effect on the environment. As a result, such a project would require avoidance or mitigation of impacts to those affected resources. Significant cultural resources must meet at least one of four criteria that define eligibility for listing on either the California Register of Historical Resources (CRHR; PRC § 5024.1, Title 14 CCR, § 4852) or the National Register of Historic Places (NRHP; 36 Code of Federal Regulations [CFR] 60.4). Cultural resources eligible for listing on the NRHP are considered Historic Properties under 36 CFR Part 800 and are automatically eligible for the CRHR. Resources listed on or eligible for inclusion in the CRHR are considered Historical Resources under CEQA.

Tribal Cultural Resources (TCRs) are defined in Section 21074 of the California PRC as sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either included in or determined to be eligible for inclusion in the CRHR, are included in a local register of historical resources as defined in subdivision (k) of Section 5020.1, or are 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. Section 1(b)(4) of Assembly Bill (AB) 52 established that only California Native American tribes, as defined in Section 21073 of the California PRC, are experts in the identification of TCRs and impacts thereto. Because ECORP does not meet the definition of a California Native American tribe, this report only addresses information for which ECORP is qualified to identify and evaluate, and that which is needed to inform the cultural resources section of CEQA documents. This report, therefore, does not identify or evaluate TCRs. Should California Native American tribes ascribe additional importance to or interpretation of archaeological resources described herein, or provide information about non-archaeological TCRs, that information is documented separately in the AB 52 tribal consultation record between the tribe(s) and lead agency, and summarized in the TCRs section of the CEQA document, if applicable.

1.4 Report Organization

This report documents the study and its findings and was prepared in conformance with the California Office of Historic Preservation's (OHP's) *Archaeological Resource Management Reports: Recommended Contents and Format*. Appendix 1 contains documentation of the CHRIS records search. Appendix 2 contains documentation of the Sacred Lands File. Appendix 3 presents photographs of the Project Area.

Sections 6253, 6254, and 6254.10 of the California Code authorize state agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code § 6250 et seq.) and California's open meeting laws (The Brown Act, Government Code § 54950 et seq.) protect the confidentiality of Native American cultural place information. Under Exemption 3 of the federal Freedom of Information Act (5 USC 5), because the disclosure of cultural resources location information is prohibited by the Archaeological Resources Protection Act of 1979 (16 USC 470hh) and Section 307103 of the NHPA, it is also exempted from disclosure under the Freedom of Information Act. Likewise, the Information Centers of the CHRIS maintained by the OHP prohibit public dissemination of records search information. In compliance with these requirements, the results of this cultural resource investigation were prepared as a non-confidential document (redacting sensitive, protected information) intended for public distribution in either paper or electronic format.

2.0 SETTING

2.1 Environmental Setting

Elevations in the Project Area range from 1,607 to 1,620 feet above mean sea level. The Project Area is vacant land located in a mixed residential and industrial area of the City of Redlands, California. The Project Area is bounded by Wabash Avenue to the east, residential properties to the north and west, and Colton Avenue to the south.

2.2 Geology and Soils

Sediments within the Project Area consist of Quaternary (Holocene) surficial sediments (Qg) described as alluvial gravel and sand of stream channels and (Qa) alluvial sand and clay of valley areas (Dibblee and Minch 2004). Holocene sediments can be contemporaneous with human occupation of the region.

According to the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Web Soil Survey website (NRCS 2022), two soil types are located within the Project Area: Hanford coarse sandy loam, 2 to 9 percent slopes; and Tujunga gravelly loamy sand, 0 to 9 percent slopes. The parent material for both soil types is alluvium derived from granite

3.0 CULTURAL CONTEXT

3.1 Regional Pre-Contact History

3.1.1 Paleo-Indian Period/Terminal Pleistocene (12,000 Before Present [BP] to 10,000 BP)

The first inhabitants of southern California were big-game hunters and gatherers exploiting extinct species of Pleistocene megafauna (e.g., mammoth and other Rancholabrean fauna). Local fluted point assemblages, composed of large spear points or knives, are stylistically and technologically similar to the Clovis Paleo-Indian cultural tradition dated to this period elsewhere in North America (Moratto 1984). Archaeological evidence for this period in Southern California is limited to a few small temporary camps with fluted points found around late Pleistocene lake margins in the Mojave Desert and around Tulare Lake in the southern San Joaquin Valley. Single points are reported from Ocotillo Wells and Cuyamaca Pass in eastern San Diego County and from the Yuha Desert in Imperial County (Rondeau et al. 2007).

3.1.2 Early Archaic Period/Early Holocene (10,000 BP to 8,500 BP)

Approximately 10,000 years ago, at the beginning of the Holocene, warming temperatures and the extinction of the megafauna resulted in changing subsistence strategies with an emphasis on hunting smaller game and increasing reliance on plant gathering. Previously, Early Holocene sites were represented by only a few sites and isolates from the Lake Mojave and San Dieguito complexes found along former lakebeds and grasslands of the Mojave Desert and in inland San Diego County. More recently, Southern California Early Holocene sites have been found along the Santa Barbara Channel (Erlandson 1994), in western Riverside County (Goldberg 2001; Grenda 1997), and along the San Diego County coast (Gallegos 1991; Koerper et al. 1991; Warren 1967).

The San Dieguito Complex was defined based on material found at the Harris site (CA-SDI-149) on the San Dieguito River near Lake Hodges in San Diego County. San Dieguito artifacts include large leaf-shaped points; leaf-shaped knives; large ovoid, domed, and rectangular end and side scrapers; engraving tools; and crescentics (Koerper et al. 1991). The San Dieguito Complex at the Harris site dates to 9,000 before present (BP) to 7,500 BP (Gallegos 1991). However, sites from this time period in coastal San Diego County have yielded artifacts and subsistence remains characteristic of the succeeding Encinitas Tradition, including manos, metates, core-cobble tools, and marine shell (Gallegos 1991; Koerper et al. 1991).

3.1.3 Encinitas Tradition or Milling Stone Period/Middle Holocene (8,500 BP to 1,250 BP)

The Encinitas Tradition (Warren 1968) and the Milling Stone Period (Wallace 1955) refer to a long period of time during which small mobile bands of people foraged for a wide variety of resources, including hard seeds, berries, and roots/tubers (e.g., yucca in inland areas), rabbits and other small animals, and shellfish and fish in coastal areas. Sites from the Encinitas Tradition consist of residential bases and resource acquisition locations with no evidence of overnight stays. Residential bases have hearths and fire-affected

rock, indicating overnight stays and food preparation. Residential bases along the coast have large amounts of shell and are often termed *shell middens*.

The Encinitas Tradition as originally defined (Warren 1968) applied to all non-desert areas of Southern California. Recently, four patterns have been proposed within the Encinitas Tradition that apply to different regions of Southern California (Sutton and Gardner 2010). The Topanga Pattern includes archaeological material from the Los Angeles Basin and Orange County. The Greven Knoll Pattern pertains to southwestern San Bernardino County and western Riverside County (Sutton and Gardner 2010). Each pattern is divided into temporal phases. The Topanga I phase extends from 8,500 BP to 5,000 BP and Topanga II runs from 5,000 BP to 3,500 BP. The Topanga Pattern ended approximately 3,500 BP with the arrival of Takic speakers, except in the Santa Monica Mountains where the Topanga III phase lasted until about 2,000 BP.

The Encinitas Tradition in inland areas east of the Topanga Pattern (southwestern San Bernardino County and western Riverside County) is the Greven Knoll Pattern (Sutton and Gardner 2010). Greven Knoll I (9,400 BP to 4,000 BP) has abundant manos and metates. Projectile points are few and are mostly Pinto points. Greven Knoll II (4,000 BP to 3,000 BP) has abundant manos, metates, and core tools. Projectile points are mostly Elko points. The Elsinore site on the east shore of Lake Elsinore was occupied during Greven Knoll I and Greven Knoll II. During Greven Knoll I, faunal processing (butchering) took place at the lakeshore and floral processing (seed grinding), cooking, and eating took place farther from the shore. The primary foods were rabbit meat and seeds from grasses, sage, and ragweed. A few deer, waterfowl, and reptiles were consumed. The recovered archaeological material suggests that a highly mobile population visited the site at a specific time each year. It is possible that their seasonal rounds included the ocean coast at other times of the year. These people had an unspecialized technology as exemplified by the numerous crescents, a multi-purpose tool. The few projectile points suggest that most of the small game was trapped using nets and snares (Grenda 1997). During Greven Knoll II, which included a warmer drier climatic episode known as the Altithermal; it is thought that populations in interior southern California concentrated at oases and that Lake Elsinore was one of them. The Elsinore site (CA-RIV-2798) is one of five known Middle Holocene residential sites around Lake Elsinore. Tools were mostly manos, metates, and hammerstones. Scraper planes were absent. Flaked-stone tools consisted mostly of utilized flakes used as scrapers. The Elsinore site during the Middle Holocene was a recurrent extended encampment, which could have been occupied during much of the year.

The Encinitas Tradition lasted longer in inland areas (until circa 1,000 BP). Greven Knoll III (3,000 BP to 1,000 BP) is present at the Liberty Grove site in Cucamonga (Salls 1983) and at sites in Cajon Pass that were defined as part of the Sayles Complex (Kowta 1969). Greven Knoll III sites have a large proportion of manos, metates, and core tools, as well as scraper planes. Kowta (1969) suggested the scraper planes may have been used to process yucca and agave. The faunal assemblage consists of large quantities of lagomorphs (rabbits and hares) and lesser quantities of deer, rodents, birds, carnivores, and reptiles.

3.1.4 Palomar Tradition (1,250 BP to 150 BP)

The material culture of the inland areas where Takic languages, which form a branch or subfamily of the Uto-Aztecan language family, were spoken at the time of Spanish contact is part of the Palomar Tradition

(Sutton 2011). San Luis Rey I Phase (1,000 BP to 500 BP) and San Luis Rey II Phase (500 BP to 150 BP) pertain to the area occupied by the Luiseño at the time of Spanish contact. The Peninsular I (1,000 BP to 750 BP), Peninsular II (750 BP to 300 BP), and Peninsular III (300 BP to 150 BP) phases are used in the areas occupied by the Cahuilla and Serrano (Sutton 2011).

San Luis Rey I is characterized by Cottonwood Triangular arrow points, use of bedrock mortars, stone pendants, shell beads, quartz crystals, and bone tools. San Luis Rey II sees the addition of ceramics, including ceramic cremation urns, red pictographs on boulders in village sites, and steatite arrow straighteners. San Luis Rey II represents the archaeological manifestation of the antecedents of the historically known Luiseño (Goldberg 2001). During San Luis Rey I, there were a series of small permanent residential bases at water sources, each occupied by a kin group (probably a lineage). During San Luis Rey II, people from several related residential bases moved into a large village located at the most reliable water source (Waugh 1986). Each village had a territory that included acorn harvesting camps at higher elevations. Villages have numerous bedrock mortars, large dense midden areas with a full range of flaked and ground stone tools, rock art, and a cemetery.

3.2 Ethnography

Ethnographic accounts of Native Americans indicate that the Project Area lies predominantly within the original territory of the Serrano. The Serrano people are associated with both the San Manuel Band of Mission Indians and the Morongo Band of Mission Indians. The Serrano occupied an area in and around the San Bernardino Mountains and northward into the Mojave Desert. Their territory also extended west along the north slope of the San Gabriel Mountains, east as far as Twentynine Palms, north into the Victorville and Lucerne Valley areas, and south to the Yucaipa Valley and San Jacinto Valley (Cultural Systems Research 2005). The Serrano speakers in the Mojave Desert who lived along the Mojave River were known as Vanyume. Serrano is a language within the Takic family of the Uto-Aztecan language stock.

The Serrano were mainly hunters and gatherers who occasionally fished. Game that was hunted included mountain sheep, deer, antelope, rabbits, small rodents, and various birds, particularly quail. Vegetable staples consisted of acorns, pinyon nuts, bulbs and tubers, shoots and roots, juniper berries, mesquite, barrel cacti, and Joshua tree (Bean and Smith 1978).

A variety of materials were used for hunting, gathering, and processing food, as well as for shelter, clothing, and luxury items. Shells, wood, bone, stone, plant materials, and animal skins and feathers were used for making baskets, pottery, blankets, mats, nets, bags and pouches, cordage, awls, bows, arrows, drills, stone pipes, musical instruments, and clothing (Bean and Smith 1978).

Settlement locations were determined by water availability, and most Serrano lived in villages near water sources. Houses and ramadas were round and constructed of poles covered with bark and tule mats (Kroeber 1925). Most Serrano villages also had a ceremonial house used as a religious center. Other structures within the village might include granaries and sweathouses (Bean and Smith 1978).

Serrano social and political units were clans, patrilineal exogamous territorial groups. Each clan was led by a chief who had both political and ceremonial roles. The chief lived in a principal village within the clan's

territory. The clans were part of a moiety system such that each clan was either a wildcat or coyote clan and marriages could only occur between members of opposite moieties (Earle 2004). On the north side of the San Bernardino Mountains, clan villages were located along the desert-mountain interface on Deep Creek, on the upper Mojave River, in Summit Valley, and in Cajon Pass. The principal plant food available near these villages was juniper berries. These villages also had access to mountain resources, such as acorns and pinyon nuts.

Partly due to their mountainous and desert inland territory, contact between Serrano and European-Americans was minimal prior to the early 1800s. In 1819, an *asistencia* (mission outpost) was established near present-day Redlands and was used to help relocate many Serrano to Mission San Gabriel. However, small groups of Serrano remained in the area northeast of the San Gorgonio Pass and were able to preserve some of their native culture. Today, most Serrano live either on the Morongo or San Manuel reservations (Bean and Smith 1978).

3.3 Regional History

Colonization of California by European-Americans began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and towns were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California), beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. Mission San Gabriel Archangel was founded in 1771, east of what is now Los Angeles, to convert the Tongva or Gabrielino. Mission San Luis Rey was established in 1798 on the San Luis Rey River (in what is now northern San Diego County) to convert the Luiseño (Castillo 1978). Some missions later established outposts in inland areas. An asistencia (mission outpost) of Mission San Luis Rey, known as San Antonio de Pala, was built in Luiseño territory along the upper San Luis Rey River near Mount Palomar in 1810 (Pourade 1961). A chapel administered by Mission San Gabriel Archangel was established in the San Bernardino area in 1819 (Bean and Smith 1978). The present asistencia within the western outskirts of present-day Redlands was built circa 1830 (Haenszel and Reynolds 1975).

The missions sustained themselves through cattle ranching and traded hides and tallow for supplies brought by ship. Mission San Luis Rey established large cattle ranches at Temecula and San Jacinto (Gunther 1984). The Spanish also constructed presidios at San Diego and Santa Barbara, and established a pueblo, or town, at Los Angeles. The Spanish period in California began in 1769 with the Portolá expedition and ended in 1821 with Mexican independence.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California. The Mexican government closed the missions in the 1830s and granted former mission lands to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or ranchos (Robinson

1948). The rancho owners lived in an adobe house on the rancho. The Mexican period includes the years 1821 to 1848.

The American period began when Mexico and the U.S. signed the Treaty of Guadalupe Hidalgo in 1848 that ended the Mexican-American War. As a result of the treaty, Alta California became part of the U.S. as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. The U.S. courts confirmed most Mexican land grants to the grantees, but usually with more restricted boundaries surveyed by the U.S. Surveyor General's office. The U.S. government owned land that was not part of a land grant until that land was acquired by individuals through purchase or homesteading. Floods and drought in the 1860s greatly reduced the cattle herds on the ranchos, making it difficult to pay the new American taxes on the thousands of acres they owned.

Many Mexican-American cattle ranchers borrowed money at usurious rates from newly arrived Anglo-Americans. The resulting foreclosures and land sales transferred most of the land grants into the hands of Anglo-Americans (Cleland 1941).).

3.4 Project Area History

The first settlement in the area that later became known as Redlands was the Serrano and Cahuilla village of Guachama which was located in present-day Loma Linda (Kyle 2002). In 1819, Serrano and Cahuilla workers under the direction of Chief Solano with assistance from Pedro Alvarez, constructed the first irrigation system in California. This irrigation feature known as the Mill Creek Zanja, was constructed to bring water to the Guachama Rancheria (Burgess and Gonzales 2004).

The City of Redlands is situated on a portion of the land known as Rancho San Bernardino, which was acquired from the Mexican government by Don Antonio Maria Lugo and his three sons in 1842 during the Mexican period. Around 1830, prior to the establishment of Rancho San Bernardino, a small Asistencia, or outpost chapel of the San Gabriel Mission, was constructed in what is now the western outskirts of Redlands, and a small Mexican settlement called Politana existed west of the chapel near present-day Colton. In 1851, the Lugos sold Rancho San Bernardino to Mormon settlers, who founded the modern City of San Bernardino at its present site (City of Colton 2000, Cleland 1941, Moore 1987, Reneich n.d., Richards 1966).

The arrival in the San Bernardino area of the Southern Pacific Railroad in the late 1870s and the Atchison, Topeka, and Santa Fe Railway in the mid-1880s increased communications, travel, and shipping between the region and Los Angeles, as well as other parts of the country. A land boom brought about by inexpensive rail fares and aggressive real estate promotions was in progress by the late 1880s. Many new families began to arrive and numerous small towns, including Redlands, were founded. The Redlands Colony was formed in 1881 by Frank E. Brown, a civil engineer from Connecticut, and Edward G. Judson, a businessman from New York. The original settlement comprised 160 acres around the present-day intersection of Center Street and Cypress Avenue. By 1888, the business center of Redlands was established at its present location surrounding the intersection of Orange and State Streets, and the community had grown to encompass several thousand acres with citrus agriculture as its primary industry. The City of Redlands was incorporated that same year (Burgess 1981; Kupfer 1979; Moore 1987; Moore 1983).

The new City of Redlands was subdivided from the beginning in anticipation of a quickly growing population, but the economic depression of the 1890s resulted in most early 20th century residential development, prior to World War II, taking place in the area south and west of present-day Redlands Boulevard (the road curves as it passes through the community, changing from an east-west to a northwest-southeast alignment). With the economic prosperity and need for new housing immediately after the war, citrus groves began to give way to housing tracts, and construction of large apartment complexes began in the early 1960s (Moore 1987). This trend of increasing residential and commercial development has continued to the present day, and very little of the agricultural setting of early Redlands remains..

4.0 METHODS

4.1 Personnel Qualifications

Registered Professional Archaeologist (RPA) John O'Connor, Ph.D. supervised all phases of the cultural resources investigation. Staff Archaeologist Julian Acuña, RPA conducted the fieldwork and was the primary author of the report; Steve Wintergerst and Evelyn Hildebrand, RPA assisted in report preparation. Robert Cunningham evaluated the historic-period resources identified within the Project Area.

Dr. O'Connor serves as the Southern California Cultural Resources Manager for ECORP. He has more than 13 years of archaeological experience in North America and the Pacific Islands. His experience includes cultural resources management, academic research, museum collections management, and university teaching. Dr. O'Connor meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology. He is well-versed in the evaluation of impacts to cultural resources for CEQA and NHPA projects, and he has written and contributed to numerous environmental compliance documents.

Julian Acuña, RPA is an Associate Archaeologist with over six years of experience in cultural resources management. Mr. Acuña holds an M.A. in Applied Archaeology and a B.A. Cum Laude in Anthropology from California State University, San Bernardino. He meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology. Mr. Acuña has participated in various aspects of archaeological fieldwork including survey, test excavation, construction monitoring, the recording of both pre-contact and historic-period archaeological sites, and laboratory work for the analysis and cataloging of artifacts from multi-component sites.

Steve Wintergerst has 14 years of experience in cultural resources management. He holds a B.A. in Anthropology with an emphasis in Archaeology. His experience includes faunal bone analysis, cultural resources literature searches, historic/archival research, archaeological field surveys, site recording and mapping, paleontological survey, excavation, curation, and construction monitoring.

Evelyn Hildebrand, RPA is an Associate Archaeologist at ECORP with over five years of experience working in cultural resource management across southern California. She holds an M.A. in Applied Archaeology and a B.A. in Anthropology with a focused curriculum in archaeology. She meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology. She has participated in various aspects of archaeological fieldwork including survey, test excavation, data recovery, artifact analysis, construction monitoring and the recording of both pre-contact and historic-period archaeological sites.

Robert Cunningham is a Staff Archaeologist for ECORP and has more than 14 years of experience in cultural resources management, primarily in southern California. He holds a B.A. in Anthropology and has participated in and supervised numerous surveys, test programs, and data recovery excavations for both prehistoric and historical sites; and has cataloged, identified, and curated thousands of artifacts. He has conducted evaluations of cultural resources for eligibility for the NRHP and CRHR.

4.2 Records Search Methods

ECORP requested a records search for the property at the South Central Coastal Information Center (SCCIC) of the CHRIS at California State University, Fullerton, on June 6, 2022. The purpose of the records search was to determine the extent of previous surveys within a 1-mile (1,600-meter) radius of the Proposed Project location, and whether previously documented pre-contact or historic archaeological sites, architectural resources, or traditional cultural properties exist within this area. SCCIC staff completed and returned the records search to ECORP on June 8, 2022.

In addition to the official records and maps for archaeological sites and surveys in Riverside County, ECORP also reviewed the historic references listed below.

- Built Environment Resources Directory (BERD) for San Bernardino (OHP 2022)
- The National Register Information System (National Park Service [NPS] 2022)
- Office of Historic Preservation, California Historical Landmarks (OHP 1996)
- California Historical Landmarks (OHP 1996 and updates)
- Caltrans State Bridge Survey (Caltrans 2019a)
- Caltrans Local Bridge Survey (Caltrans 2019b)

Other references examined include historic General Land Office (GLO) land patent records (Bureau of Land Management [BLM] 2022). Historic maps reviewed include:

- 1899 USGS Redlands, California topographic quadrangle map (1:62,500 scale);
- 1901 USGS Redlands, California topographic quadrangle map (1:62,500 scale);
- 1904 USGS Southern California topographic quadrangle map (1:250,000 scale)
- 1954 USGS Redlands, California topographic quadrangle map (1:62,500 scale);
- 1966 USGS San Bernardino topographic quadrangle map (1:250,000 scale);
- 1967 USGS Redlands, California topographic quadrangle map (1:24,000 scale);
- 1975 USGS Redlands, California aerial quadrangle map (1:24,000 scale);
- 1982 USGS San Bernardino topographic quadrangle map 1:1,000,000 scale);
- 1996 USGS Redlands, California aerial quadrangle map (1:24,000 scale);
- 2012 USGS Redlands, California aerial quadrangle map (1:24,000 scale);
- 2015 USGS Redlands, California aerial quadrangle map (1:24,000 scale);
- 2018 USGS Redlands, California aerial quadrangle map (1:24,000 scale); and
- 2021 USGS Redlands, California aerial quadrangle map (1:24,000 scale).

ECORP also reviewed historic aerial photos taken in 1938, 1959, 1966, 1968, and 1980 to present for any indications of property usage and built environment.

4.3 Sacred Lands File Coordination Methods

In addition to the CHRIS records search, ECORP contacted the California Native American Heritage Commission (NAHC) on June 6, 2022 to request a search of the Sacred Lands File for the APE (Appendix B). This search will determine whether the California Native American tribes within the APE have recorded Sacred Lands, because the Sacred Lands File is populated by members of the Native American community with knowledge about the locations of tribal resources. In requesting a search of the Sacred Lands File, ECORP solicited information from the Native American community regarding Tribal Cultural Resources, however, the responsibility to formally consult with the Native American community lies exclusively with the federal and local agencies under applicable state and federal laws. The lead agencies have not delegated authority to ECORP to conduct tribal consultation.

4.4 Field Methods

On June 1, 2022, ECORP subjected the APE to an intensive pedestrian survey under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (NPS 1983) using 15-meter transects. ECORP expended one-seventh of one person-day in the field. ECORP archaeologists examined the ground surface for indications of surface or subsurface cultural resources. The archaeologists inspected the general morphological characteristics of the ground surface for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the archaeologists examined the locations of subsurface exposures caused by factors such as rodent activity, water or soil erosion, or vegetation disturbances for artifacts or for indications of buried deposits. ECORP did not conduct subsurface investigations or artifact collections during the pedestrian survey.

ECORP archaeologists were required to record all cultural resources encountered during the survey using Department of Parks and Recreation (DPR) 523-series forms approved by the California OHP. Recording included photography of the resources, mapping using a handheld Global Positioning System receiver, and sketching them, as necessary, to document their presence using appropriate DPR forms.

5.0 RESULTS

5.1 Records Search

ECORP received the results of the records search of the CHRIS from the SCCIC on June 9, 2022. The records search consisted of a review of previous research and literature, records on file with the SCCIC for previously recorded resources, and historical aerial photographs and maps of the vicinity.

5.1.1 Previous Research

Twenty-four previous cultural resource investigations have been conducted within 1 mile of the property, covering approximately 10 percent of the total area surrounding the property within the record search

radius (Table 5-1). The previous studies were conducted between 1976 and 2010. The results of the records search indicate that none of the property has been previously surveyed for cultural resources. Therefore, a pedestrian survey of the Project Area was warranted.

Table 5-1. Previous Cultural Studies In or Within 1 Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
SB-00323	Smith, Gerald	Archaeological-Historical Resources Assessment of Approximately 16 Acres of Land in the Mentone And Crafton Area of San Bernardino County	1976	No
SB-00489	Hearn, Joseph	Archaeological-Historical Resources Assessment of Approximately 19 Acres, Lots 3 and 6, Block 19, Map Book 3, Page 14	1977	No
SB-00542	Hearn, Joseph	Archaeological-Historical Resources Assessment of Approximately 18 Acre Project Site in the Mentone Area	1977	No
SB-01783	Hornbeck, David and Howard Botts	Seven Oaks Dam Project: Water Systems	1988	No
SB-02438	Laska, Robin and Mark Swanson	An Archaeological Survey of Tentative Tract No. 13887, Mentone, San Bernardino County, California	1991	No
SB-02835	Love, Bruce and Bai Tom Tang	Cultural Resources Evaluation Tentative Parcel Map 14472, Near Redlands, San Bernardino County	1993	No
SB-02853	Foster, John M., James J. Schmidt, Carmen A. Weber, Gwendolyn R Romani, and Roberta S. Greenwood	Cultural Resource Investigation: Inland Feeder Project, MWD of Southern California	1991	No
SB-02973	Wells, Helen	Cultural Resources Investigation for Realignment of the Gilman Springs & Opal Ave. Portals, Inland Feeder Project, Metropolitan Water District of Southern California	1994	No
SB-03005	Toren, A.G. & Roberta Greenwood	Cultural Resources Study & Evaluation for the Proposed Redlands High School No. 2 Location, San Bernardino County, California	1995	No
SB-03142	Schmidt, James J.	Cultural Resource Evaluation of CA-SBR-7050H 67PP	1996	No
SB-03733	McKenna, Jeanette	A Phase One Cultural Resources Investigation of the Redlands Sports Park Project in the City of Redlands, San Bernardino County, California 10PP	2001	No
SB-03743	Schmidt, James J.	Bear Valley Canal Investigation, Inland Feeder Project. 20PP	1998	No

Table 5-1. Previous Cultural Studies In or Within 1 Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
SB-03745	Schmidt, James J. and Judith R. Rasson	Mill Creek Zanja. 28PP	1999	No
SB-03749	Toren, George A.	Archaeological Study of Historical Wall Segments in Redlands, California 28PP	1997	No
SB-04043	Toren, George A.	Archaeological Study of Historical Wall Segments in Redlands, California, 16PP	1999	No
SB-04050	Tejada, Barbara	Historic Property Survey Report for the state Route & Wabash Ave. Intersection Improvements, Mentone, San Bernardino County, California 48PP	2004	No
SB-04599	Dice, Michael and Marnie Vianna	An Archaeological and Paleontological Resource Evaluation of APN #168-132-05-0000 near San Bernardino and Wabash Avenues, City of Redlands, County of San Bernardino, California	2003	No
SB-04810	Wlodarski, Robert J.	Cingular Wireless Communications Site ES0079-01 (Dearborn Reservoir)	2005	No
SB-05666	Godwin, Rory, and Patricia Tuck	Cultural Resources Assessment, Simus Property APN 0298-052-093 San Bernardino County, California	2004	No
SB-05668	Cotterman, Cary	Structure and Feature Assessment of Tentative Tract No. 16689, Redlands, San Bernardino County, California	2005	No
SB-06631	McKenna, Jeanette A.	Redlands East Valley High School Records Search	2009	No
SB-06634	Bonner, Wayne H. and Arabesque Said	Cultural Resources Records Search and Site Visit Results for Verizon Wireless Candidate "Hellen" 1897 East Colton Avenue, Redlands, San Bernardino County, California	2009	No
SB-06802	Heidelberg, Kurt	Archaeological Survey Report for Southern California Edison's Deteriorated Pole Replacements in Redlands, San Bernardino County, California	2010	No
SB-08006	Brodie, Natalie	Archaeological Survey Report for Southern California Edison Company Replacement of four Deteriorated Power Poles on the Book 33 kV Circuit TD710457, San Bernardino County, California	2014	No

The records search also determined that a total of 43 cultural resources were previously recorded within 1 mile of the Project Area: 39 historic-period cultural resources and four pre-contact cultural resources. None of the resources overlap the Project Area itself (Table 5-2). The historic-period resources consist of refuse scatters/deposits, orchards/groves, single-family residences and agricultural buildings, a septic

tank, a Pony Express station, a railroad, roads, wells/water conveyance systems, and one Native American village site. Pre-contact cultural resources consist of bedrock milling features and an isolated obsidian flake.

Table 5-2. Previously Recorded Cultural Resources In or Within 1 Mile of the Project Area

Site Number CA-SBR-	Primary Number P-36-	Recorder and Year	Age/ Period	Site Description	Within Project Area?
705-H	000705	R. Paul Hampson, John Goodman, 1988	Historic	Small refuse disposal site	No
846	000846	James S. Benton, 1975	Precontact	Collapsed shelter facing SE contains burnt soil, chalcedony flakes and midden material, shelter with heavy smoke deposit on roof, floor contains charcoal, bone fragments, some has been burnt, chert point	No
SBCM-110	002312	Smith, 1962	Precontact	Fire stones, mortars, points, scrapers, choppers, arrow straighteners, pottery, beads	No
7663H	007663	Charlotte Whelan, 1992	Historic/ WWII to modern	Two rock structures with miscellaneous machinery parts and three underground fuel storage tanks possibly established in mid-forties. Steel cables nearby potentially part of the rope tow, cement foundation	No
008092H	008092	Robert Cunningham, 2018	Historic/ 1820	NRHP- listed water conveyance ditch constructed in 1820, earliest remaining civil engineer project still in use today	No
8100H	008100	George Toren, Dana Slawson, 1995	Historic	Residence, garage, two trash features, and other debris. Trash dates to 1907, another post-dates 1927.	No
8546H	008546	Hannah Hicok, 2016	Historic/ 1881	Irrigation ditch, with concrete pipe and metal valve in a concrete box	No
9355H	009355	James J Schmidt, 1997	Historic	Remnants of two structures, a stone wall and poured concrete footing	No
9594	009594	M. Horne. 1999	Precontact	Two handstones and a metate, food processing site	No

Table 5-2. Previously Recorded Cultural Resources In or Within 1 Mile of the Project Area

Site Number CA-SBR-	Primary Number P-36-	Recorder and Year	Age/ Period	Site Description	Within Project Area?
10793H	P36-010793	Sylia M. Campbell, K. Swope, 2002/2003	Historic	Two weir boxes, two irrigation ditches, concrete foundation	No
11761H	P36-011761	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Concrete irrigation ditch,	No
11762H	011762	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Irrigation ditch,	No
11763H	011763	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Cobblestone and concrete residential foundation	No
11764H	011764	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Concrete irrigation ditch and pipe	No
11765H	011765	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Irrigation ditch	No
11766H	011766	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Residential/ citrus farming, concrete foundation	No
11767H	011767	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Water collection box or weir, concrete and cobblestone construction, irrigation ditch, drain	No
11768H	011768	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Irrigation ditch, cobblestone and concrete box/weir,	No
11769H	011769	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Refuse scatter,	No
11770H	011770	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Irrigation ditch,	No
11771H	011771	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Irrigation ditch, concrete foundation	No

Table 5-2. Previously Recorded Cultural Resources In or Within 1 Mile of the Project Area

Site Number CA-SBR-	Primary Number P-36-	Recorder and Year	Age/ Period	Site Description	Within Project Area?
11772H	011772	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Residential/ citrus farm, concrete foundation	No
11773H	011773	J.S. Alexandrowicz, S.R. Alexandrowicz, 1999	Historic	Irrigation, cobblestone and concrete collection box,	No
	012842	Eugene Heck, 2004	Historic	Single story house constructed between 1919-1922	No
	012957	Larry J. Pierson, Brian F. Smith, 2007	Historic	Brick septic tank, possibly 1888,	No
	014484	Britt W. Wilson, Mike Lerch, 2008	Historic	Morongo tribe village and cemetery in 1860's	No
12198H	024013	J. Lev-Tov, 2011	Historic	Historic road, Chrysolite Ave. stop signs on wooden posts, two wooden power poles	No
15199H	024014	J. Lev-Tov, 2011	Historic	Historic road, Jasper Ave.	No
15200H	024015	J. Lev-Tov, 2011	Historic	Historic road, Opal Way	No
15201H	024016	J. Lev-Tov, 2011	Historic	Historic road, Opal Ave.	No
15202H	024017	J. Lev-Tov, 2011	Historic	Historic road, Turquoise Ave.	No
15203H	024018	J. Lev-Tov, 2011	Historic	Historic road, Tourmaline Ave.	No
15204H	024019	J. Lev-Tov, 2011	Historic	Historic road, Beryl Ave.	No
15205H	024020	J. Lev-Tov, 2011	Historic	Historic road, Olivine Ave.	No
15266H	024081	J. Lev-Tov, 2011	Historic	Historic road, Malachite Road	No
15267H	024082	J. Lev-Tov, 2011	Historic	Historic Road, N. Wabash Ave.	No
17244H	027718	Robert S. White, 2014	Historic	Irrigation flume and wind machine	No
31266H	031266	Hannah Hicok, 2016	Historic	Railroad bridge and tracks	No
	031267	Hannah Hicok, 2016	Precontact	Secondary flake, obsidian	No
	031268	Hannah Hicok, 2016	Historic	Amethyst bottle base with maker's mark, 1900-1919	No
31726H	031726	Ryan Tubbs, 2015	Historic	Citrus orchard, irrigation features	No

Table 5-2. Previously Recorded Cultural Resources In or Within 1 Mile of the Project Area

Site Number CA-SBR-	Primary Number P-36-	Recorder and Year	Age/ Period	Site Description	Within Project Area?
31729H	031729	Robert Cunningham, Andrew Myers, 2015	Historic	Weirbox and flume, cobblestone retaining wall	No
	032876	Garnett S. Smith, 2018	Historic	Concrete cobblestone slab	No

5.1.2 Records

The BERD for San Bernardino County (OHP 2022) lists three properties within 1 mile of the Project Area. Table 5-3 lists the three properties, and all are evaluated as 6Y – determined ineligible for the NRHP by consensus through Section 106 process.

Table 5-3. Built Environment Resources In or Within 1 Mile of the Project Area

Street Number	Street Name	City	Evaluation Code	Within Project Area?
1703	Mentone Boulevard	Mentone	6Y	No
1348	Tourmaline Avenue	Mentone	6Y	No
1305	Tourmaline Avenue	Mentone	6Y	No

The National Register Information System (NPS 2022) did not reveal any eligible or listed properties within the Project Area. The nearest National Register property is the Mill Creek Zanja, located 0.35 mile south of the Project Area in Redlands.

ECORP reviewed resources listed as California Historical Landmarks (OHP 1996). The Mill Creek Zanja is located approximately 0.35 mile south of the Project Area, while the plaque for the Zanja is located at Sylvan Park on University Street in Redlands.

Historic GLO land patent records from the BLM's patent information database (BLM 2022) revealed that on May 9, 1905, the southern half of the northwestern quarter of Section 24, and the western half of the southwestern quarter of Section 24 were granted in patent to Felice Pagliuso as a grant of 160 acres under the authority of the 1862 Homestead Act. While this land grant was within 1 mile of the Project Area, the Project was located outside of this grant, in the northeastern quarter of Section 24.

The Caltrans Bridge State Inventory (Caltrans 2019) did not list any significant bridges within 1 mile of the Project Area. The Caltrans Bridge Local Agency Bridges Inventory (Caltrans 2019) did not list any bridges within 1 mile of the Project Area.

5.1.3 Map Review and Aerial Photographs

The review of historic aerial photographs and maps of the Project Area provide information on the past land uses of the property and potential for buried archaeological sites. Based on this information, the property was agricultural in nature. Following is a summary of the review of historical maps and photographs (NETROnline 2022).

- The 1899 USGS Redlands, California Topographic Quadrangle Map (1:62,500 scale) shows the Project Area with Colton and Wabash largely in their current position. A canal passes northeast to southwest through the intersection, and a railroad line (the Redlands Loop) runs through the southeastern corner of the Project Area.
- The 1901 USGS Redlands, California topographic quadrangle map (1:62,500 scale) shows no change from 1899.
- The 1904 USGS Southern California topographic quadrangle map (1:250,000 scale) shows no apparent change from 1899.
- The 1953 USGS San Bernardino, California topographic quadrangle map (1:250,000 scale) shows only Wabash Avenue and the railroad in this area.
- The 1954 USGS Redlands, California topographical quadrangle map (1:62,500 scale) again shows Colton and Wabash largely in their current position, but with the Redlands loop rail line cutting through the southeastern corner. The terrain is coded as orchard in this map.
- The 1956, 1957, 1958, and 1959, USGS San Bernardino, California topographic quadrangle Map (1:250,000 scale) shows no change from 1953 maps of the same scale.
- The 1966 USGS San Bernardino, California topographic quadrangle map (1:250,000 scale) appears to show an east-west running road about where Colton Avenue would be located.
- The 1967 USGS Redlands, California topographic quadrangle map (1:24,000 scale) shows the roadways and railways as previous maps but does not denote orchards in the area.
- The 1975 USGS Redlands, California topographic quadrangle map (1:24,000) shows an aerial photograph of the area. Speckled patterns on the site suggest an orchard is present. The southwestern corner is cutoff by linear features, and the western boundary of the Project Area appears to be a narrow roadway.
- The 1982 USGS San Bernardino topographic quadrangle map (1:100,000 scale) shows a roadway on the western, eastern, and southern boundary, with a rail line cutting slightly through the southeastern corner of the Project Area.
- The 1996 USGS Redlands, California topographic quadrangle map (1:24,000 scale) again indicates the area is covered in orchards, with roadways along the west, south, and east boundaries. In place of the rail line, a trail is marked cutting through the southeastern corner of the Project. A canal, labeled as the Redlands Aqueduct, appears to touch or come near to the southeastern corner of the Project before veering back east and south.

- The 2012 USGS Redlands, California topographic quadrangle map (1:24,000 scale) continues to indicate Colton on the south and Wabash on the east. The road along the western boundary is now gone, and there are no markings for orchards, or other types of terrain.
- The 2015, 2018, and 2021 USGS Redlands, California topographic quadrangle maps (1:24,000 scale) show no change from 2012.
- Aerial photography from 1938 shows the property as an orchard, except for the southeastern corner, which is more rounded due to the Redlands Loop Railroad and associated roads. Variations in shading in the orchard suggest there may have been previous disturbances farther into the southwestern corner, and part of an unusual ring structure extended into the northeastern corner.
- The 1959 aerial photograph shows the southeastern corner is cut off by a turnout between Colton and Wabash.
- The 1966, 1968, 1980, 1984, and 1985 aerial photographs show no change from 1959.
- The 1995 aerial photograph shows a decided thinning of orange trees from 1985.
- The 2002 aerial photograph shows all of the orange trees gone, with one standing object, likely a windmill, near the center of the field. The corner of Wabash and Colton has been squared off.
- The 2005 aerial photograph shows that the standing structure in the center of the field is gone.
- The 2009, 2010, and 2012 aerial photographs show no change from 2005.
- The 2014 aerial photograph shows a number of green spots, likely trees, appearing in the field.
- The 2016 and 2018 aerial photographs show no change from 2014.

5.2 Sacred Lands File Results

ECORP received the results of the Sacred Lands File by the NAHC on July 7, 2022. The results of the search were positive, indicating the presence of Native American cultural resources in the Project Area. A record of all correspondence to date is provided in Appendix B.

5.3 Field Survey Results

ECORP surveyed the Project Area for cultural resources on June 1, 2022. Ground visibility varied from approximately 50 to 85 percent. Disturbances include disking, modern refuse, and damage to standpipes. The main vegetation types are low grasses and plants. No evidence of the orchards was visible during the survey. The survey took approximately 0.5-person day to complete.

REDACTED

Figure 5-1. Project Area overview from northwestern corner (view south; June 1, 2022).



Figure 5-2. Project Area overview from northeastern corner (view west; June 1, 2022).



Figure 5-3. Modern debris pile in Project Area (view east; June 1, 2022).

5.3.1 Cultural Resources

As a result of the field survey, ECORP recorded two new cultural resources (CW-001-I and CW-002-I). These historic-period resources consist of two concrete irrigation standpipes. No other indications of prior land use within the Project Area were observed. The following sections provide site descriptions.

5.3.1.1 CW-001-I

Resource CW-001-I consists of a concrete standpipe that measures 27 inches tall by 15 inches in diameter. The top end of the pipe is closed off and one granite cobble remains adhering to the bottom of the standpipe. Four metal water control slots are located near the top of the standpipe. This isolated resource has been removed from its original context and no associated features are present.



Figure 5-4. CW-001-I Overview (view Detail; June 1, 2022).

5.3.1.2 CW-002-I

Resource CW-002-I consists of a concrete standpipe that measures 22 inches tall by 13 inches in diameter. The top of the pipe is closed off and four metal water-control slots are located near the top of the standpipe. This isolated resource has been removed from its original context and no associated features are present.



Figure 5-5. CW-002-I Overview (view northeast; February 9, 2022).

5.4 EVALUATION CRITERIA

5.4.1 Federal Evaluation Criteria

ECORP evaluated the resources using the NRHP eligibility criteria following the regulations implementing Section 106 of the NHPA (36 CFR Part 800). The eligibility criteria for the NRHP are as follows (36 CFR 60.4):

> "The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and
>
> (A) Is associated with events that have made a significant contribution to the broad patterns of our nation's history and cultural heritage;
>
> (B) Is associated with the lives of persons important in our past;
>
> (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."

In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4).

Historical buildings, structures, and objects are usually eligible under Criteria A, B, and C, based on historical research and architectural or engineering characteristics. Archaeological sites are usually eligible under Criterion D, the potential to yield information important in prehistory or history. The lead federal agency makes the determination of eligibility and seeks concurrence from the State Historic Preservation Officer.

Effects to NRHP-eligible resources (i.e., historic properties) are adverse if the project may alter, directly or indirectly, any of the characteristics of a Historic Property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

5.4.2 State Evaluation Criteria

Under state law (i.e., CEQA), cultural resources are evaluated using CRHR eligibility criteria in order to determine whether any of the resources are Historical Resources, as defined by CEQA. CEQA requires that impacts to Historical Resources be identified and, if the impacts would be significant, that mitigation measures to reduce the impacts be applied.

A Historical Resource is a resource that:

1. is listed in or has been determined eligible for listing in the CRHR by the State Historical Resources Commission;

2. is included in a local register of historical resources, as defined in PRC 5020.1(k);

3. has been identified as significant in a historical resources survey, as defined in PRC 5024.1(g); or

4. is determined to be historically significant by the CEQA lead agency CCR Title 14, § 15064.5(a)]. In making this determination, the CEQA lead agency usually applies the CRHR eligibility criteria.

The eligibility criteria for the CRHR (CCR Title 14, § 4852(b)) state that a resource is eligible if:

1. it is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;

2. it is associated with the lives of persons important to local, California, or national history.

3. it embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or

4. it has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the Nation.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association (CCR Title 14, § 4852(c)).

Historical buildings, structures, and objects are usually eligible under Criteria 1, 2, and 3 based on historical research and architectural or engineering characteristics. Archaeological sites are usually eligible under Criterion 4, the potential to yield information important in prehistory or history. The CEQA lead agency makes the determination of eligibility. Cultural resources determined eligible for the NRHP by a federal agency are automatically eligible for the CRHR.

Impacts to a Historical Resource, as defined by CEQA, are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired (CCR Title 14, § 15064.5(a)).

Lastly, a TCR, as defined in Section 21074 of the California PRC, can only be identified and evaluated by culturally-affiliated California Native American tribes through government-to-government consultation. As such, only the consultation record of the CEQA lead agency, and not this technical report, addresses TCRs.

6.0 EVALUATION

This section provides an evaluation of the significance of the historic-period archaeological find located within the Project Area relative to eligibility criteria set forth in the NRHP and the CRHR.

6.1 CW-001-I and CW-002-I

These isolates consist of two historic-period concrete standpipes located in a once active agricultural field. These artifacts were once part of a field irrigation system during use of the agricultural field. The field/orchard is present in aerial photographs as early as 1938; however, the photographs are not clear enough to distinguish any standpipe irrigation system. Additionally, both standpipes have been removed from their original context likely during the removal and mowing of the agricultural field and are no longer connected to any irrigation system.

Both isolates are not part of a site nor found in association with a building, structure, or object, and are removed from the human activity where they were produced and used. Isolates typically do not individually contribute to the broad patterns of history because they cannot be connected to a particular event and therefore are not eligible under NRHP Criterion A/CRHR Criterion 1. Isolates are similarly difficult to associate with specific individuals due to their lack of association with archaeological or historical sites, and generally no information exists in the archival record to associate isolates with important individuals in history (NRHP Criterion B / CRHR Criterion 2). Isolates do not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values (NRHP Criterion C / CRHR Criterion 3). Finally, isolates in general do not provide important information in history or prehistory (NRHP Criterion D / CRHR Criterion 4). Therefore, these isolates do not meet the eligibility criteria for inclusion in the NRHP or CRHR as an individual resource. The two isolates do not contribute to any known or suspected historic districts; and are neither considered to be Historic Properties for the purpose of Section 106 NHPA, nor Historical Resources under CEQA.

CW-001-I and CW-002-I are evaluated as not eligible for listing in the NRHP and CRHR under any criteria and are not considered to be Historic Properties for the purpose of Section 106 NHPA, nor Historical Resources under CEQA.

7.0 MANAGEMENT CONSIDERATIONS

7.1 Conclusions

As a result of the field survey, ECORP identified CW-001-I and CW-002-I. These isolated resources have been evaluated and are recommended not eligible for listing in the NRHP or CRHR under any criteria. Therefore, these finds are not considered Historical Resources under CEQA or Historic Properties under Section 106 of the NHPA (if applicable). Until the lead agencies concur with the identification and evaluation of eligibility of cultural resources, no Project activity should occur.

7.2 Likelihood for Subsurface Cultural Resources

The Project Area contains Holocene alluvial deposits contemporaneous with human occupation of the region. Although ECORP archaeologists did not identify pre-contact resources during the field survey, due to the presence of Holocene alluvial deposits within the Project Area and the proximity of the Project Area to the Santa Ana River, a moderate potential exists for buried pre-contact archaeological sites within the Project Area.

7.3 Post-Review Discoveries

The potential always remains for ground-disturbing activities to expose previously unrecorded cultural resources. Both CEQA and Section 106 of the NHPA require the lead agency to address any unanticipated cultural resource discoveries during construction of the Project. Therefore, ECORP recommends the following mitigation measures be adopted and implemented by the lead agency to reduce potential adverse impacts to less than significant:

- If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for pre-contact and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:
    - If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately, and no agency notifications are required.
    - If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, the archaeologist shall immediately notify the lead agencies. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be a Historical Resource under CEQA, as defined in Section 15064.5(a) of the CEQA Guidelines or a Historic Property under Section 106 NHPA, if applicable. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not a Historical Resource under CEQA or a Historic Property under Section 106; or 2) that the treatment measures have been completed to their satisfaction.

- If the find includes human remains, or remains that are potentially human, they shall ensure reasonable protection measures are taken to protect the discovery from disturbance (AB 2641). The archaeologist shall notify the San Bernardino County Coroner (per § 7050.5 of the Health and Safety Code). The provisions of § 7050.5 of the California Health and Safety Code, § 5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the Project (§ 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (§ 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§ 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

The lead agency is responsible for ensuring compliance with these mitigation measures. Section 15097 of Title 14, Chapter 3, Article 7 of CEQA, *Mitigation Monitoring or Reporting*, "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

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LIST OF APPENDICES

Appendix 1 – CHRIS Coordination

Appendix 2 – Sacred Lands File Coordination

Appendix 3 – Project Area Photographs

APPENDIX 1

CHRIS Coordination

CHRIS Data Request Form

ACCESS AND USE AGREEMENT NO.: 34 **IC FILE NO.:** _____

To: South Central Coastal Information Center

Print Name: Rob Cunningham Date: 6/6/2022

Affiliation: ECORP Consulting, Inc.

Address: 213 North 5th Street

City: Redlands, State: CA Zip: 95677

Phone: (909)307-0046 Fax: (909)307-0056 Email: rjcunningham@ecorpconsulting.com

Billing Address (if different than above): _____

Billing Email: _____ Billing Phone: _____

Project Name / Reference: 2022-122 Colton and Wabash

Project Street Address: _____

County or Counties: San Bernardino

Township/Range/UTMs: 01S, 02W, 03W

USGS 7.5' Quad(s): Redlands, CA (1988 [Rev. 1996]), Yucaipa, CA (1988[Rev. 1996])

PRIORITY RESPONSE (Additional Fee): yes ☐ / no ■

TOTAL FEE NOT TO EXCEED: $ 1000
(If blank, the Information Center will contact you if the fee is expected to exceed $1,000.00)

Special Instructions:

Forward results to Robert J. Cunningham at rjcunningham@ecorpconsulting.com

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Information Center Use Only

Date of CHRIS Data Provided for this Request: _____

Confidential Data Included in Response: yes ☐ / no ☐

Notes: _____

CHRIS Data Request Form

Mark the request form as needed. Attach a PDF of your project area (with the radius if applicable) mapped on a 7.5' USGS topographic quadrangle to scale 1:24000 ratio 1:1 neither enlarged nor reduced and include a shapefile of your project area, if available. Shapefiles are the current CHRIS standard for submitting digital spatial data for your project area or radius. **Check with the appropriate IC for current availability of digital data products.**

- Documents will be provided in PDF format. Paper copies will only be provided if PDFs are not available at the time of the request or under specially arranged circumstances.
- Location information will be provided as a digital map product (Custom Maps or GIS data) unless the area has not yet been digitized. In such circumstances, the IC may provide hand drawn maps.
- In addition to the $150/hr. staff time fee, client will be charged the Custom Map fee when GIS is required to complete the request [e.g., a map printout or map image/PDF is requested and no GIS Data is requested, or an electronic product is requested (derived from GIS data) but no mapping is requested].

For product fees, see the CHRIS IC Fee Structure on the OHP website.

1. Map Format Choice:

Select One: Custom GIS Maps ☐ GIS Data ☒ Custom GIS Maps **and** GIS Data ☒ No Maps ☐

Any selection below left unmarked will be considered a "no. "

Location Information:

	Within project area	Within 1.0 mi. radius
ARCHAEOLOGICAL Resource Locations[1]	yes ☒ / no ☐	yes ☒ / no ☐
NON-ARCHAEOLOGICAL Resource Locations	yes ☒ / no ☐	yes ☒ / no ☐
Report Locations[1]	yes ☒ / no ☐	yes ☒ / no ☐
"Other" Report Locations[2]	yes ☒ / no ☐	yes ☐ / no ☒

3. Database Information:
(contact the IC for product examples, or visit the SSJVIC website for examples)

	Within project area	Within 1.0 mi. radius
ARCHAEOLOGICAL Resource Database[1]		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☒ / no ☐	yes ☐ / no ☒
Excel Spreadsheet	yes ☐ / no ☒	yes ☐ / no ☒
NON-ARCHAEOLOGICAL Resource Database		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☐ / no ☒	yes ☐ / no ☒
Excel Spreadsheet	yes ☐ / no ☒	yes ☐ / no ☒
Report Database[1]		
List (PDF format)	yes ☒ / no ☐	yes ☒ / no ☐
Detail (PDF format)	yes ☐ / no ☒	yes ☐ / no ☒
Excel Spreadsheet	yes ☐ / no ☒	yes ☐ / no ☒
Include "Other" Reports [2]	yes ☒ / no ☐	yes ☒ / no ☐

4. Document PDFs (paper copy only upon request)**:**

	Within project area	Within 1.0 mi. radius
ARCHAEOLOGICAL Resource Records[1]	yes ☒ / no ☐	yes ☒ / no ☐
NON-ARCHAEOLOGICAL Resource Records	yes ☒ / no ☐	yes ☒ / no ☐
Reports[1]	yes ☒ / no ☐	yes ☐ / no ☒
"Other" Reports[2]	yes ☒ / no ☐	yes ☐ / no ☒

CHRIS Data Request Form

5. Eligibility Listings and Documentation:

	Within project area	Within 1.0 mi. radius
OHP Built Environment Resources Directory[3]:		
Directory listing only (Excel format)	yes ☐ / no ☒	yes ☐ / no ☒
Associated documentation[4]	yes ☐ / no ☒	yes ☐ / no ☒
OHP Archaeological Resources Directory[1,5]:		
Directory listing only (Excel format)	yes ☐ / no ☒	yes ☐ / no ☒
Associated documentation[4]	yes ☐ / no ☒	yes ☐ / no ☒
***California Inventory of Historic Resources* (1976):**		
Directory listing only (PDF format)	yes ☒ / no ☐	yes ☐ / no ☒
Associated documentation[4]	yes ☒ / no ☐	yes ☐ / no ☒

6. Additional Information:

The following sources of information may be available through the Information Center. However, several of these sources are now available on the OHP website and can be accessed directly. The Office of Historic Preservation makes no guarantees about the availability, completeness, or accuracy of the information provided through these sources. Indicate below if the Information Center should review and provide documentation (if available) of any of the following sources as part of this request.

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 ☒

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[1] 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 or Conditional User under an active CHRIS Access and Use Agreement.

[2] "Other" Reports GIS layer consists of report study areas for which the report content is almost entirely non-fieldwork related (e.g., local/regional history, or overview) and/or for which the presentation of the study area boundary may or may not add value to a record search.

[3] Provided as Excel spreadsheets with no cost for the rows; the only cost for this component is IC staff time. Includes, but 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. Previously known as the HRI and then as the HPD, it is now known as the Built Environment Resources Directory (BERD). The Office of Historic Preservation compiles this documentation and it is the source of the official status codes for evaluated resources.

[4] Associated documentation will vary by resource. Contact the IC for further details.

[5] Provided as Excel spreadsheets with no cost for the rows; the only cost for this component is IC staff time. Previously known as the Archaeological Determinations of Eligibility, now it is known as the Archaeological Resources Directory (ARD). The Office of Historic Preservation compiles this documentation and it is the source of the official status codes for evaluated resources.

Report List

Caton & Wabash 2022-122

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-00323	NADB-R - 1060323; Voided - 76-4.7	1976	SMITH, GERALD A.	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT OF APPROXIMATELY 16 ACRES OF LAND IN THE MENTONE AND CRAFTON AREA OF SAN BERNARDINO COUNTY	SAN BERNARDINO COUNTY MUSEUM	
SB-00489	NADB-R - 1060489; Voided - 77-4.7	1977	HEARN, JOSEPH E.	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT OF APPROXIMATELY 19 ACRES, LOTS 3 AND 6, BLOCK 19, MAP BOOK 3, PAGE 14	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-00542	NADB-R - 1060542; Voided - 77-8.12	1977	HEARN, JOSEPH E.	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT OF APPROXIMATELY 18 ACRE PROJECT SITE IN THE MENTONE AREA	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-01783	NADB-R - 1061783; Voided - 88-3.5	1988	HORNBECK, DAVID and HOWARD BOTTS	SEVEN OAKS DAM PROJECT: WATER SYSTEMS	AREA LOCATION SYSTEMS	36-006545, 36-008546, 36-013549
SB-02438	NADB-R - 1062438; Voided - 91-7.5	1991	LASKA, ROBIN and MARK SWANSON	AN ARCHAEOLOGICAL SURVEY OF TENTATIVE TRACT NO. 13887, MENTONE, SAN BERNARDINO COUNTY, CALIFORNIA	RESEARCH ASSOCIATES	
SB-02835	NADB-R - 1062835	1993	LOVE, BRUCE and BAI TOM TANG	CULTURAL RESOURCES EVALUATION TENTATIVE PARCEL MAP 14472, NEAR REDLANDS, SAN BERNARDIN COUNTY	CRM TECH	36-007662
SB-02853	NADB-R - 1062853	1991	FOSTER, JOHN M., JAMES J. SCHMIDT, CARMEN A. WEBER, GWENDOLYN R. ROMANI, and ROBERTA S. GREENWOOD	CULTURAL RESOURCE INVESTIGATION: INLAND FEEDER PROJECT, MWD OF SOUTHERN CA	GREENWOOD & ASSOCIATES	36-006086, 36-006354, 36-006847, 36-006848, 36-006849, 36-006850, 36-006851, 36-006852, 36-006853, 36-006854, 36-006855, 36-006856, 36-006857, 36-006858, 36-006859, 36-006860, 36-006861, 36-006862, 36-006863, 36-006864, 36-006865, 36-006866, 36-006867, 36-006868, 36-006869, 36-006870, 36-006871, 36-006872, 36-006940, 36-007021, 36-007050, 36-007051, 36-007053, 36-007054, 36-007055, 36-007702
SB-02973	NADB-R - 1062973	1994	WELLS, HELEN	CULTURAL RESOURCES INVESTIGATION FOR REALIGNMENT OF THE GILMAN SPRINGS & OPAL AVE. PORTALS, INLAND FEEDER PROJECT, METROPOLITAN WATER DISTRICT OF SOUTHERN CA		36-007050

Report List

Caton & Wabash 2022-122

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-03005	NADB-R - 1063005	1995	TOREN, A.G. & ROBERTA GREENWOOD	CULTURAL RESOURCES STUDY & EVALUATION FOR THE PROPOSED REDLANDS HIGH SCHOOL NO. 2 LOCATION, SAN BERNARDINO COUNTY, CA	GREENWOOD & ASSOCIATES	36-008092
SB-03142	NADB-R - 1063142	1996	SCHMIDT, JAMES J.	CULTURAL RESOURCE EVALUATION OF CA-SBR-7050H. 67PP	GREENWOOD & ASSOCIATES	36-007050
SB-03733	NADB-R - 1063733	2001	MCKENNA, JEANETTE A.	A PHASE I CULTURAL RESOURCES INVESTIGATION OF THE REDLANDS SPORTS PARK PROJECT IN THE CITY OF REDLANDS, SAN BERNARDINO COUNTY, CA. 10PP	MCKENNA ET AL	
SB-03743	NADB-R - 1063743	1998	SCHMIDT, JAMES J.	BEAR VALLEY CANAL INVESTIGATION, INLAND FEEDER PROJECT. 20PP	GREENWOOD & ASSOCIATES	36-008546
SB-03745	NADB-R - 1063745	1999	SCHMIDT, JAMES and JUDITH R. RASSON	MILL CREEK ZANJA. 28PP	GREENWOOD & ASSOCIATES	36-008092
SB-03749	NADB-R - 1063749	1997	TOREN, GEORGE A.	ARCHAEOLOGICAL STUDY OF HISTORICAL WALL SEGMENTS IN REDLANDS, CA. 16PP	GREENWOOD & ASSOCIATES	36-008846
SB-04043	NADB-R - 1064043	1999	ALEXANDROWICZ, JOHN STEPHEN and SUSAN R. ALEXANDROWICZ	A HISTORICAL RESOURCES IDENTIFICATION INVESTIGATION FOR THE PHASE I PORTION OF #15937, CITY OF REDLANDS, COUNTY OF SAN BERNARDINO, CA. 74PP	ACS	36-011760, 36-011761, 36-011762, 36-011763, 36-011764, 36-011765, 36-011766, 36-011767, 36-011768, 36-011769, 36-011770, 36-011771, 36-011772, 36-011773
SB-04050	NADB-R - 1064050	2004	TEJADA, BARBARA	HISTORIC PROPERTY SURVEY REPORT FOR THE STATE ROUTE & WABASH AVE INTERSECTION IMPROVEMENTS, MENTONE, SAN BERNARDINO COUNTY, CA. 48PP	CALTRANS	36-010793, 36-010973, 36-012842
SB-04599	NADB-R - 1064599	2003	Dice, Michael and Marnie Vianna	An Archaeological and Paleontological Resource Evaluation of APN #168-132-05-0000 near San Bernardino and Wabash Avenues, City of Redlands, County of San Bernardino, California.		
SB-04810	NADB-R - 1064810	2005	WLODARSKI, ROBERT J	CINGULAR WIRELESS COMMUNICATIONS SITE ES0079-01 (DEARBORN RESERVOIR)		
SB-05666						
SB-05668	NADB-R - 1065668	2005	Cotterman, Cary	Structure and Feature Assessment of Tentative Tract No. 16689, Redlands, San Bernardino County, California.	Ecorp	36-011770

Report List

Caton & Wabash 2022-122

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-06631	NADB-R - 1066631	2009	McKenna, Jeanette A.	Redlands East Valley High School Records Search.		
SB-06634	NADB-R - 1066634	2009	Bonner, Wayne H. and Arabesque Said	Cultural resources Records Search and Site Visit Results for Verizon Wireless Candidate "Hellen" 1897 East Colton Avenue, Redlands, San Bernardino County, California.	Michael Brandman Associates	
SB-06802	NADB-R - 1066802	2010	Heidelberg, Kurt	Archaeological Survey Report for Southern California Edison's Deteriorated Pole Replacements in Redlands, San Bernardino County, California.		
SB-08006		2014	Brodie, Natalie	Archaeological Survey Report for the Southern California Edison Company Replacement of four Deteriorated Power Poles on the Book 33 kV Circuit TD710457, San Bernardino County, California	LSA Associates	36-026941

APPENDIX 2

Sacred Lands File Coordination

From:	Julian Acuna
To:	nahc@nahc.ca.gov
Cc:	Robert Cunningham
Subject:	Sacred Lands File search request for Colton and Wabash project 2022-122
Date:	Monday, June 6, 2022 3:13:00 PM
Attachments:	sacred-lands-file-na-contact-form.pdf image001.jpg CandW_RS(draft01).pdf

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Hello,
ECORP is requesting a Sacred Lands File search for the Colton and Wabash project in the City of Redlands. I have attached a copy of the Sacred Lands File contact form above along with a map showing the project area. The results of this search can be sent to me at rjcunningham@ecorpconsulting.com. They can also be faxed to my attention at **(909) 307-0056**.
Please reference the project number 2022-122 on all correspondence.
Please let me know if you have any questions or need any additional information.
Thanks,

Julian E. Acuña, M.A., RPA

Associate Archaeologist

ECORP Consulting, Inc.

Federal Small Business

California Small Business for Public Works (SB-PW)

All ECORP offices will be closed for Thanksgiving from Thursday, November 25, 2021 through Friday, November 26, 2021. We will reopen on Monday, November 29, 2021.

215 N. Fifth Street, Redlands, CA 92374
Ph: 909.307.0046 ◆ Cell: 909.649.8587
wblumel@ecorpconsulting.com ◆ www.ecorpconsulting.com
Rocklin ◆ Redlands ◆ Santa Ana ◆ San Diego ◆ Chico ◆ Flagstaff, AZ ◆ Santa Fe, NM

Sacred Lands File & Native American Contacts List Request

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

Information Below is Required for a Sacred Lands File Search

Project: 2022-122 Colton and Wabash

County: San Bernardino County

USGS Quadrangle Name: Redlands, CA (1988 [Rev. 1996])) and Yucaipa, CA (1988 [1996])

Township: 01S **Range:** 2W, 3W **Section(s):** 13, 18. 19, 23, 24

Company/Firm/Agency: ECORP Consulting, Inc.

Street Address: 215 North Fifth Street

City: Redlands **Zip:** 92374

Phone: (909) 307-0046

Fax: (909) 307-0056

Email: rjcunningham@ecorpconsulting.com

Project Description: ECORP is requesting a Sacred Lands File search for the Colton and Wabash project in the City of Redlands. I have attached a copy of the Sacred Lands File contact form above along with a map showing the project area. The results of this search can be sent to me at rjcunningham@ecorpconsulting.com. They can also be faxed to my attention at **(909) 307-0056**. Please reference the project number 2022-122 on all correspondence.

Please let me know if you have any questions or need any additional information.

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

PARLIAMENTARIAN
Russell Attebery
Karuk

SECRETARY
Sara Dutschke
Miwok

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

COMMISSIONER
Wayne Nelson
Luiseño

COMMISSIONER
Stanley Rodriguez
Kumeyaay

EXECUTIVE SECRETARY
Raymond C. Hitchcock
Miwok/Nisenan

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

July 7, 2022

Robert Cunningham
ECORP Consulting, Inc.

Via Email to: rjcunningham@ecorpconsulting.com

Re: 2022-122 Colton and Wabash Project, San Bernardino County

Dear Mr. Cunningham:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information submitted for the above referenced project. The results were positive. Please contact the Morongo Band of Mission Indians and the San Manuel Band of Mission Indians on the attached list for information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. A SLF search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with a project's geographic area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites, such as the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center for the presence of recorded archaeological sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
7/7/2022

Agua Caliente Band of Cahuilla Indians
Reid Milanovich, Chairperson
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6800
Fax: (760) 699-6919
laviles@aguacaliente.net

Agua Caliente Band of Cahuilla Indians
Patricia Garcia-Plotkin, Director
5401 Dinah Shore Drive — Cahuilla
Palm Springs, CA, 92264
Phone: (760) 699 - 6907
Fax: (760) 699-6924
ACBCI-THPO@aguacaliente.net

Augustine Band of Cahuilla Mission Indians
Amanda Vance, Chairperson
P.O. Box 846 — Cahuilla
Coachella, CA, 92236
Phone: (760) 398 - 4722
Fax: (760) 369-7161
hhaines@augustinetribe.com

Cabazon Band of Mission Indians
Doug Welmas, Chairperson
84-245 Indio Springs Parkway — Cahuilla
Indio, CA, 92203
Phone: (760) 342 - 2593
Fax: (760) 347-7880
jstapp@cabazonindians-nsn.gov

Cahuilla Band of Indians
Daniel Salgado, Chairperson
52701 U.S. Highway 371 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 5549
Fax: (951) 763-2808
Chairman@cahuilla.net

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org

Los Coyotes Band of Cahuilla and Cupeño Indians
Ray Chapparosa, Chairperson
P.O. Box 189 — Cahuilla
Warner Springs, CA, 92086-0189
Phone: (760) 782 - 0711
Fax: (760) 782-0712

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Road — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 755 - 5110
Fax: (951) 755-5177
abrierty@morongo-nsn.gov

Morongo Band of Mission Indians
Ann Brierty, THPO
12700 Pumarra Road — Cahuilla
Banning, CA, 92220 — Serrano
Phone: (951) 755 - 5259
Fax: (951) 572-6004
abrierty@morongo-nsn.gov

Quechan Tribe of the Fort Yuma Reservation
Manfred Scott, Acting Chairman
Kw'ts'an Cultural Committee
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

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

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed 2022-122 Colton and Wabash Project, San Bernardino County.

Ramona Band of Cahuilla
Joseph Hamilton, Chairperson
P.O. Box 391670 Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
admin@ramona-nsn.gov

Ramona Band of Cahuilla
John Gomez, Environmental Coordinator
P. O. Box 391670 Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
jgomez@ramona-nsn.gov

San Manuel Band of Mission Indians
Jessica Mauck, Director of Cultural Resources
26569 Community Center Drive Serrano
Highland, CA, 92346
Phone: (909) 864 - 8933
Jessica.Mauck@sanmanuel-nsn.gov

Santa Rosa Band of Cahuilla Indians
Lovina Redner, Tribal Chair
P.O. Box 391820 Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
lsaul@santarosa-nsn.gov

Serrano Nation of Mission Indians
Wayne Walker, Co-Chairperson
P. O. Box 343 Serrano
Patton, CA, 92369
Phone: (253) 370 - 0167
serranonation1@gmail.com

Serrano Nation of Mission Indians
Mark Cochrane, Co-Chairperson
P. O. Box 343 Serrano
Patton, CA, 92369
Phone: (909) 528 - 9032
serranonation1@gmail.com

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 Cahuilla
San Jacinto, CA, 92581 Luiseno
Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Soboba Band of Luiseno Indians
Isaiah Vivanco, Chairperson
P. O. Box 487 Cahuilla
San Jacinto, CA, 92581 Luiseno
Phone: (951) 654 - 5544
Fax: (951) 654-4198
ivivanco@soboba-nsn.gov

Torres-Martinez Desert Cahuilla Indians
Cultural Committee,
P.O. Box 1160 Cahuilla
Thermal, CA, 92274
Phone: (760) 397 - 0300
Fax: (760) 397-8146
Cultural-Committee@torresmartinez-nsn.gov

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

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed 2022-122 Colton and Wabash Project, San Bernardino County.

APPENDIX 3

Project Area Photographs

PHOTOLOG

Project Name: Colton and Wabash

Project Number: 2022-122

Camera	Photo No.	Description	Facing	Date	Initials
Samsung	074001	Project area from northeast corner	West	6/1/22	JEA
	074005	Project area from northeast corner	South	6/1/22	JEA
	074019	Ground conditions	Detail	6/1/22	JEA
	074155	Modern refuse	Detail	6/1/22	JEA
	074406	Project from northwest corner	South	6/1/22	JEA
	082211	Project from southeast corner	West	6/1/22	JEA
	082215	Project from southwest corner	Northeast	6/1/22	JEA
	082431	Project from southwest corner	North	6/1/22	JEA
	082434	Project from southwest corner	East	6/1/22	JEA
	083002	CW-001-I	Detail	6/1/22	JEA
	082951	CW-001-I	Detail	6/1/22	JEA
	082945	CW-001-I	Detail	6/1/22	JEA
	083329	CW-002-I	Detail	6/1/22	JEA
	083333	CW-002-I	Detail	6/1/22	JEA
	083337	CW-002-I	Detail	6/1/22	JEA


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20220601_074005


20220601_074019


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20220601_082211


20220601_082215


20220601_082431


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20220601_083002


20220601_083329


20220601_083333


20220601_083337









REDACTED





















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1650 SPRUCE STREET, STE 106
RIVERSIDE, CA 92507
951.787.9222
WWW.MIGCOM.COM

Memo

To: Ryan Murphy, Senior Planner, City of Redlands

CC: Cameron Hile and Bob Prasse, MIG

From: William Deeman and Chris Dugan

Date: July 7, 2023

SUBJECT: Greenhouse Gas and Energy Analysis for Madera at Citrus Trail Project, Redlands, CA

MIG, Inc. (MIG) has prepared this memorandum at the request of the City of Redlands. This memorandum estimates the potential greenhouse gas (GHG) emissions and energy consumption levels for the proposed Madera at Citrus Trail Project (proposed Project) and evaluates Project emissions against applicable South Coast Air Quality Management District (SCAQMD)-recommended California Environmental Quality Act (CEQA) significance thresholds. As explained in this memorandum, the proposed Project does not have the potential to result in emissions that exceed SCAQMD thresholds or result in wasteful, inefficient, or unnecessary energy consumption. MIG has included recommended mitigation measures to align the Project's design and GHG emissions with statewide GHG emission reduction goals.

PROJECT DESCRIPTION

The proposed Project involves the construction of 103 single family residential buildings on a parcel of undeveloped land in the eastern part of Redlands, California.

The approximately 9.01-acre Project site is located at the northwest corner of Colton Avenue and Wabash Avenue. The proposed Project would include 216,567 square feet of gross building space, 65,470 square feet of landscaped space for private yards and for a central common area, and 20,100 square feet of impervious surfaces such as walkways, drive aisles, driveways, and parking spaces. Each dwelling unit would range from approximately 1,544 to 1,858 square feet. The site would contain 206 garage stalls and 63 guest stalls. The site would be internally connected by A Street, which would run north to south, and by B Street and C Street, which would run east to west. Refer to Attachment 1 for the proposed Project site plan.

The Project site is bound on the north and west by single-family residential uses, on the east by Wabash Avenue and on the south by Colton Avenue. Commercial uses are located across Wabash Avenue, approximately 90 feet east of the site and single-family residential uses are located across Colton Avenue, approximately 100 feet south of the site. The Project site is located approximately 0.4 miles south of State Route (SR) 38, approximately 1.4 miles northeast of Interstate 10 (I-10), and approximately 3.4 miles east of the I-210. The nearest airport, Redlands Municipal Airport, is approximately 1.3 miles north of the Project site and the nearest school, Crafton Elementary School, is located approximately 960 feet south of the Project site. The nearest park, Orange Blossom Trail head, is located approximately 80 feet south of the Project site, across Colton Avenue.

The proposed Project would involve site preparation, grading, new building construction, paving, and architectural coating. Construction activities are assumed to begin in early-2024 and last

approximately 14 months. The proposed Project's construction schedule and anticipated equipment usage is listed in Table 1.

Table 1: Madera at Citrus Trail Project Construction Activities

Construction Phase	Duration (Days)[(A)]	Typical Equipment Used[(B)]
Site Preparation	10	Dozer, Tractor/Loader/Backhoe
Grading	20	Excavator, Grader, Dozer, Backhoe
Building Construction	230	Crane, Forklift, Backhoe, Generator, Welder
Paving	20	Paver, Roller, Paving Equipment
Architectural Coating	20	Air Compressor

Source: Attachment 2.

(A) Days refers to total active workdays in the construction phase, not calendar days.

(B) The typical equipment list does not reflect all equipment that would be used during the construction phase. Not all equipment would operate eight hours per day each workday.

The proposed Project is anticipated to become operational in early 2025. Per the Traffic Impact Analysis prepared by Ganddini Group, the Project is anticipated to generate approximately 918 vehicle trips per day (Ganddini, 2023).

GHG ANALYSIS

Gases that trap heat in the atmosphere and affect regulation of the Earth's temperature are known as GHGs. GHG that contribute to climate change are a different type of pollutant than criteria or hazardous air pollutants because climate change is global in scale, both in terms of causes and effects. Some GHG are emitted to the atmosphere naturally by biological and geological processes such as evaporation (water vapor), aerobic respiration (carbon dioxide), and off-gassing from low oxygen environments such as swamps or exposed permafrost (methane); however, GHG emissions from human activities such as fuel combustion (e.g., carbon dioxide) and refrigerants use (e.g., hydrofluorocarbons) significantly contribute to overall GHG concentrations in the atmosphere, climate regulation, and global climate change. The 1997 United Nations' Kyoto Protocol international treaty set targets for reductions in emissions of four specific GHGs – carbon dioxide, methane, nitrous oxide, and sulfur hexafluoride – and two groups of gases – hydrofluorocarbons and perfluorocarbons. These GHG are the primary GHG emitted into the atmosphere by human activities. The six most common GHG's are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride, hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

GHG emissions from human activities contribute to overall GHG concentrations in the atmosphere and the corresponding effects of global climate change (e.g., rising temperatures, increased severe weather events such as drought and flooding). GHGs can remain in the atmosphere long after they are emitted. The potential for a GHG to absorb and trap heat in the atmosphere is considered its global warming potential (GWP). The reference gas for measuring GWP is CO_2, which has a GWP of one. By comparison, CH_4 has a GWP of 25, which means that one molecule of CH_4 has 25 times the effect on global warming as one molecule of CO_2. Multiplying the estimated emissions for non-CO_2 GHGs by their GWP determines their carbon dioxide equivalent (CO_2e), which enables a project's combined global warming potential to be expressed in terms of mass CO_2 emissions (referred to as CO_2 equivalents, or CO_2e).

The proposed Project is located within the South Coast Air Basin, under the jurisdiction of the SCAQMD. In order to provide guidance to local lead agencies on determining the significance of

GHG emissions in their CEQA documents, the SCAQMD convened the first GHG Significance Threshold Working Group (Working Group) meeting on April 30, 2008. To date, the Working Group has convened a total of 15 times, with the last meeting taking place on September 28, 2010. Based on the last Working Group meeting, the SCAQMD identified an interim, tiered approach for evaluating GHG emissions intent on capturing 90 percent of development projects where the SCAQMD is not the lead agency. The following describes the basic structure of the SCAQMD's tiered, interim GHG significance thresholds (SCAQMD, 2010):

- Tier 1 consists of evaluating whether or not the project qualifies for applicable CEQA exemptions.
- Tier 2 consists of determining whether or not a project is consistent with a greenhouse gas reduction plan. If a project is consistent with a greenhouse gas reduction plan, it would not have a significant impact.
- Tier 3 consists of using screening values at the discretion of the Lead Agency; however, the Lead Agency should be consistent for all projects within its jurisdiction. The following thresholds were proposed for consideration:
    - 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 projects.
- Tier 4 has three options for projects that exceed the screening values identified in Tier 3:
    - Option 1: Reduce emissions from business-as-usual by a certain percentage (currently undefined); or
    - Option 2: Early implementation of applicable AB 32 Scoping Measures; or
    - Option 3: For plan-level analyses, analyze a project's emissions against an efficiency value of 6.6 $MTCO_2e$/year/service population by 2020 and 4.1 $MTCO_2e$/year/service population by 2035. For project-level analyses, analyze a project's emissions against an efficiency value of 4.8 and 3.0 $MTCO_2e$/year/service population for the 2020 and 2035 calendar years, respectively.

This analysis uses the SCAQMD's interim Tier 3 GHG threshold to evaluate the proposed Project's GHG emissions levels. This analysis also uses an 1,800 MTCO2e Project-specific goal for the purposes of helping evaluate the Project's GHG emissions levels.[1] The 1,800 $MTCO_2e$ per year Project-specific goal takes into account post 2020 GHG emissions targets the state is currently working towards.

GHG Emissions and Plan Consistency Analysis

The proposed project would generate GHG emission from both short-term construction and long-term operational activities. Construction activities would generate GHG emissions primarily

[1] The 1,800 $MTCO_2e$ per year goal was developed by taking the SCAQMD's Tier 3 threshold of 3,000 $MTCO_2e$ per year, which was the threshold to reduce emissions back to 1990 levels, and reducing it by 40 percent (3,000 MTCO2e/yr * (1 - 0.6) = 1,800 $MTCO_2e$/yr). This reduction is consistent with the GHG reductions required to meet GHG reductions required under SB 32 (to reduce GHG emissions to levels 40% below 1990 levels by 2030). This linear reduction approach oversimplifies the threshold development process. MIG is not proposing the City of Redlands adopt or use the 1,800 $MTCO_2e$ Project-specific goal as a CEQA GHG threshold for general use; rather, it is only intended for to provide additional context and information on the magnitude of the proposed Project's GHG emissions for this project.

from equipment fuel combustion as well as worker, vendor, and haul trips to and from the project site during site preparation, grading, building construction, paving, and architectural coating activities. Construction activities would cease to emit GHG upon completion, unlike operational emissions that would be continuous year after year until the project is decommissioned. The SCAQMD recommends amortizing construction GHG emissions over a 30-year period and including them with operational emissions estimates. This normalizes construction emissions so that they can be grouped with operational emissions and compared to appropriate thresholds, plans, etc. Once operational, the proposed Project would generate GHG emissions from area, stationary, mobile, water/wastewater, refrigerant, and solid waste sources.

The proposed Project's potential GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod), Version (V.) 2022.1.1. Project emissions were generated using CalEEMod default assumptions and modified as necessary to reflect the following Project-specific context, information, and details:

- The type and length of construction phases for each site, as well as the equipment used in each phase and the number of worker trips per day, were modified per information provided by the Project Applicant.
- The default, weekday trip generation rate, average vehicle miles travelled (VMT) distance, and fleet mix were updated to reflect the information provided in the Traffic Impact Analysis (Ganddini Group 2023).

The proposed Project's total GHG emissions are shown in Table 2, *Project Greenhouse Gas Emissions*.

Table 2: Unmitigated Project Greenhouse Gas Emissions

GHG Emissions Source	**GHG Emissions ($MTCO_2e$ Per Year)**
Operations	
Mobile	1,119
Area	24
Energy	361
Water	15
Waste	31
Refrigerants	<1
Vegetation	4
Subtotal(A)	1,555
Construction	
Total Construction Emissions	423
Average Annual Emissions (30 Year Lifetime)(B)	14
Total Project Emissions(A)	1,569
SCAQMD Tier 3 Screening Threshold	**3,000**
SCAQMD Tier 3 Threshold Exceeded?	***No***
Project-specific 2030 GHG Emissions Goal	**1,800**
Project-specific GHG Emissions Goal Exceeded?	***No***

Source: MIG 2023 (See Attachment 2) and SCAQMD, 2010.
(A) Totals may not equal due to rounding.
(B) Construction emissions value has been averaged over a 30-year assumed project lifetime.

As shown in Table 2, the proposed Project's potential increase in GHG emissions would be below the SCAQMD's recommended GHG emissions thresholds. Furthermore, the proposed Project's GHG emissions would also be below an adjusted Project-specific GHG emissions goal of 1,800 $MTCO_2e$ per year, which takes into account post 2020 GHG emissions targets the state is currently working towards. The proposed Project, therefore, would not generate GHG emissions that exceed SCAQMD CEQA thresholds or otherwise result in a significant impact on the environment.

The proposed Project also would not conflict with or otherwise obstruct implementation of the California Air Resources Board (CARB) 2022 Climate Change Scoping Plan (2022 Scoping Plan) and Redland's Climate Action Plan (CAP). The 2022 Scoping Plan is CARB's primary document used to ensure statewide GHG reduction goals are met. The 2022 Scoping Plan's primary objective is to identify the measures needed to achieve the 2030 reduction target established under SB 32 and have the state achieve carbon neutrality by 2045, as codified by AB 1279. Appendix D to CARB's 2022 Scoping Plan Update identifies potential actions that could be undertaken at a local level to support the State's climate goals. In addition to providing guidance to local lead agencies on long-term climate planning (e.g., developing a qualified climate action plan), this appendix also provides a list of key GHG reducing attributes for residential and mixed-use developments, such as providing electric vehicle(EV) infrastructure, VMT reductions, and prohibiting natural gas infrastructure, that would support achievement of the State long-term GHG reduction goals. The proposed Project would not result in significant VMT impacts (see above) but is not proposing to prohibit natural gas hookups or install additional voluntary EV charging infrastructure beyond that required by the current CalGREEN code; however, the proposed Project's potential use of natural gas and installation of standard EV infrastructure would not conflict with the State's 2030 GHG reduction goal or impede achievement of carbon neutrality by 2045 because the proposed Project would be consistent with the City's CAP. The CAP, adopted in December 2017, presents the City's GHG inventories, identifies regulatory measures at the state-level that would have benefits at reducing local GHG emissions and quantifies those reductions, and identifies local measures the City would implement to achieve its identified GHG reduction targets for 2030 and 2035. As identified in Table 3-1 of the CAP, community-wide GHG emissions would need to reach an efficiency goal of 6.0 MTCO2e per capita per year and 5.0 MTCO2e per capita per year, to reach its 2030 and 2035 goals, respectively. As identified in Table 2, the proposed Project is estimated to generate approximately 1,569 MTCO2e upon its first year of operation in 2025. Based on an estimated Project population of 273 people, the proposed Project would have a GHG efficiency of approximately 5.75 MTCO2e per capita per year, which is below the City's 2030 GHG emissions reduction goal. The proposed Project, therefore, would be consistent with the Redlands CAP, which is intended to reduce community-wide GHG emissions consistent with State's GHG reduction goals, and the 2022 Scoping Plan's primary objective (achieve the State's 2030 GHG reduction target).

Conclusion

As described above, the proposed Project would not result in significant GHG emissions and would not conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing GHG emissions.

ENERGY ANALYSIS

The proposed Project consists of the construction and operation of 103 new single-family residential buildings. Construction activities associated with the proposed project would require the use of heavy-duty, off-road equipment and construction-related vehicle trips that would combust fuel, primarily diesel and gasoline. Heavy-duty construction equipment would be

required to comply with CARB's airborne toxic control measures, which restrict heavy-duty diesel vehicle idling to five minutes. It is estimated that construction activities would consume approximately 28,031 gallons of diesel fuel and 14 kilowatt-hours (kWh) of electricity to power on-site, off-road heavy-duty construction equipment. Worker, vendor, and haul truck trips during construction activities are anticipated to consume 5,017 gallons of gasoline, 5,279 gallons of diesel, and 943 kWh of electricity.

Once operational, the proposed Project would consume energy for vehicle trips and electricity usage. Operational vehicle trips are anticipated to consume approximately 105,772 gallons of gasoline, 26,881 gallons of diesel, and 38,286 kWh of electricity on an annual basis, upon its first year of operation. As estimated using CalEEMod, the proposed Project unmitigated residential buildings would consume approximately 784 megawatt-hours (mWh) of electricity and 3,223 million British Thermal Units (BTU) of natural gas per year. With mitigation measures GHG-1 and GHG-2 incorporated, the proposed Project mitigated residential buildings would consume approximately 1,767 mWh of electricity per year. Refer to Attachment 3 for detailed energy calculations.

Electricity, natural gas, and gasoline fuel consumption are energy sources necessary to operate and maintain the proposed Project in a safe manner. Lighting is essential for safety and security and natural gas consumption is needed for heating and other temperature-controlled activities.

The proposed Project is consistent with the City of Redlands CAP, as discussed above in the GHG Emissions and Plan Consistency Analysis section. The proposed Project would not conflict with or obstruct any other state or local plan adopted for the purposes of increasing the amount of renewable energy or energy efficiency because no other plans are in place in the Project area.

As discussed above, the proposed Project would be built to the latest CALGreen Code and would not conflict with or obstruct a state or local plan for renewable energy. For these reasons, the proposed project would not result in the wasteful, inefficient, or unnecessary use of energy resources.

CONCLUSION

As described in this memo, the proposed Project would not exceed any applicable SCAQMD-recommended CEQA threshold of significance and would be consistent with all applicable plans, policies and regulations adopted for the purposes of reducing GHG emissions. The proposed project also would not result in energy consumption impacts. The proposed project, therefore, would not result in substantial adverse GHG or energy-related effects on the environment.

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The following references were used to prepare this memorandum:

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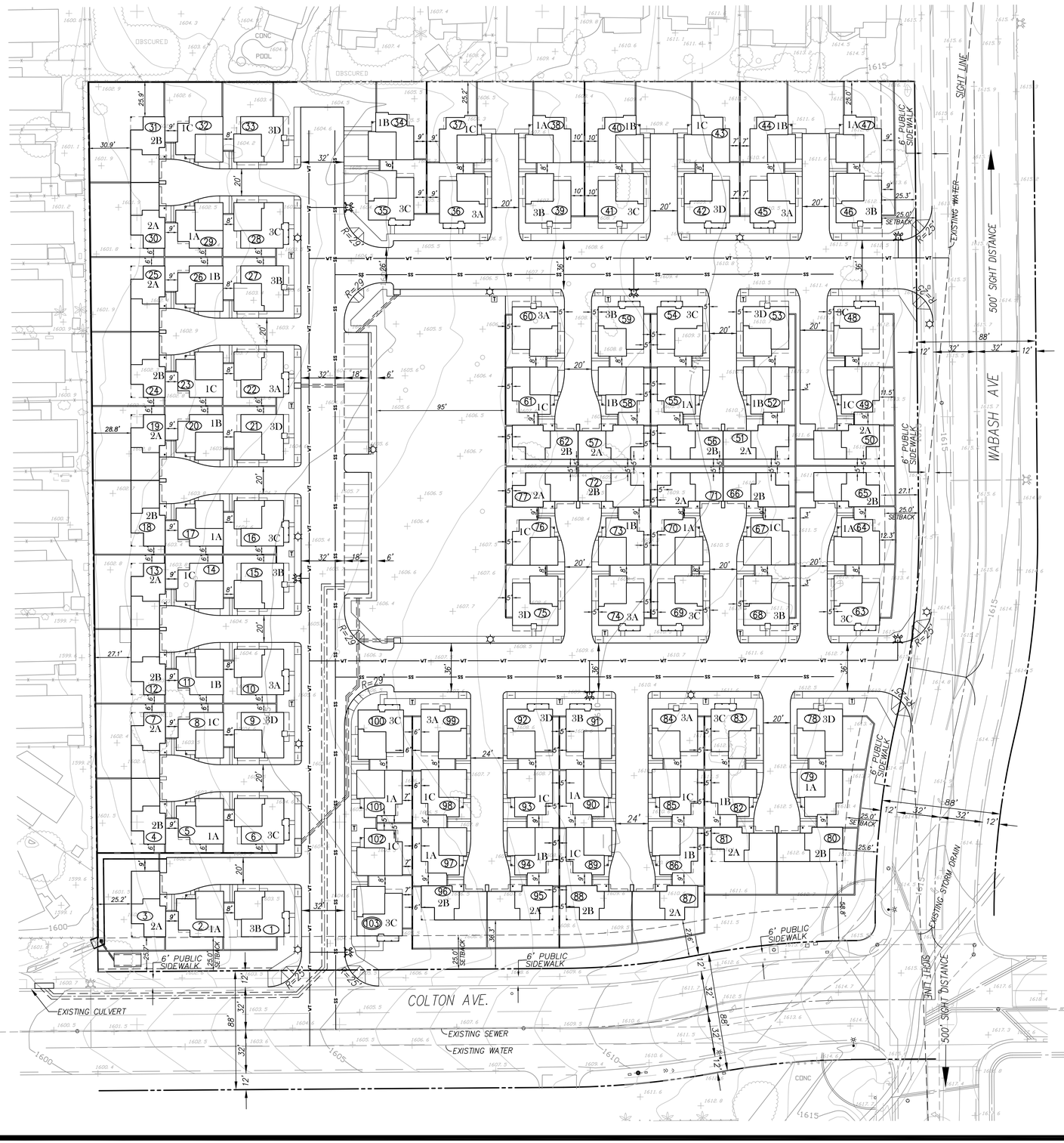
Attachment 1

Project Site Plan

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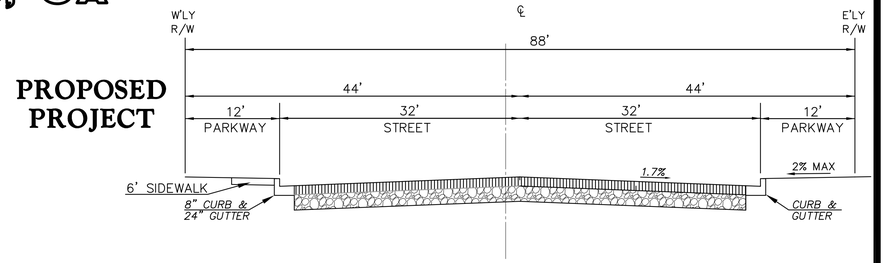
SITE PLAN

COLTON AVE & WABASH AVE, REDLANDS, CA



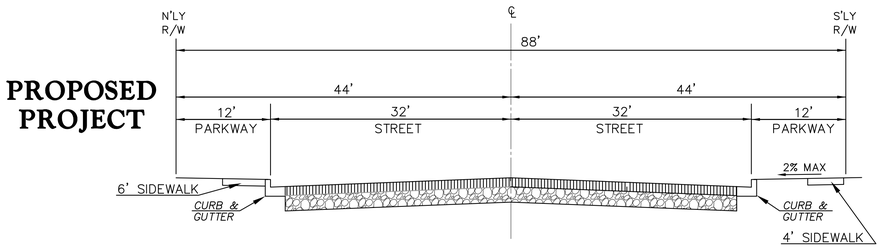
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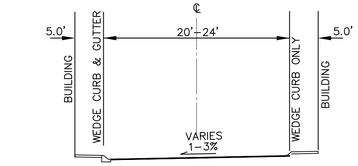
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COLTON AVE. TYPICAL SECTION

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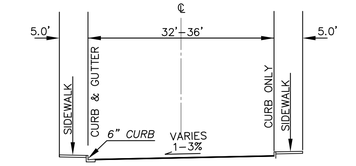




PRIVATE ON-SITE ALLEY

STREET SECTION

NO SCALE



PRIVATE ON-SITE STREET

STREET SECTION

NO SCALE

LEGEND

- PROP. LOT LINE
- BOUNDARY LINE
- PROP. CURB
- EX. CURB
- PROPOSED SEWER
- EXISTING SEWER
- PROPOSED WATER
- EXISTING WATER
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN

NORTH

CA

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PROJECT SUMMARY

9.01 ACRES (NET & GROSS)
11.43 DU/ACRE
103 TOTAL UNITS

PRODUCT 1
40 UNITS
1,544 SF

PRODUCT 2
27 UNITS
1,700 SF

PROCUCT 3
36 UNITS
1,858 SF

PARKING SUMMARY
63 GUEST STALLS
206 GARAGE STALLS
269 TOTAL STALLS

MIX SUMMARY
PRODUCT 1 – 40 UNITS 38.8%
PRODUCT 2 – 27 UNITS 26.2%
PRODUCT 3 – 36 UNITS 35.0%

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Mar 10 2023
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Attachment 2
CalEEMod Project File Outputs

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Madera at Citrus Trail Single Family Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Madera at Citrus Trail Single Family
Construction Start Date	1/1/2024
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	11.2
Location	34.06398413695213, -117.14011516418039
County	San Bernardino-South Coast
City	Redlands
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5388
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.12

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

Single Family Housing	103	Dwelling Unit	8.55	216,576	65,470	—	341	—
Other Asphalt Surfaces	20.1	1000sqft	0.46	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.66	1.39	11.7	15.7	0.03	0.50	0.43	0.93	0.46	0.10	0.57	—	3,070	3,070	0.14	0.08	2.33	3,098
Mit.	0.87	0.77	9.74	17.5	0.03	0.12	0.43	0.55	0.12	0.10	0.22	—	3,070	3,070	0.14	0.08	2.33	3,098
% Reduced	48%	45%	17%	-12%	—	75%	—	41%	75%	—	61%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.43	68.2	36.0	33.8	0.05	1.60	7.83	9.43	1.47	3.98	5.45	—	6,462	6,462	0.50	0.57	0.20	6,644
Mit.	1.01	68.2	14.8	29.2	0.05	0.14	7.83	7.93	0.12	3.98	4.08	—	6,462	6,462	0.50	0.57	0.20	6,644
% Reduced	77%	—	59%	14%	—	91%	—	16%	92%	—	25%	—	—	—	—	—	—	—

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.32	3.78	9.69	11.8	0.02	0.41	0.69	1.10	0.38	0.26	0.64	—	2,434	2,434	0.12	0.08	0.82	2,462
Mit.	0.62	3.77	7.41	12.8	0.02	0.09	0.69	0.78	0.08	0.26	0.35	—	2,434	2,434	0.12	0.08	0.82	2,462
% Reduced	53%	< 0.5%	23%	-9%	—	78%	—	29%	78%	—	46%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.24	0.69	1.77	2.15	< 0.005	0.08	0.13	0.20	0.07	0.05	0.12	—	403	403	0.02	0.01	0.14	408
Mit.	0.11	0.69	1.35	2.34	< 0.005	0.02	0.13	0.14	0.02	0.05	0.06	—	403	403	0.02	0.01	0.14	408
% Reduced	53%	< 0.5%	23%	-9%	—	78%	—	29%	78%	—	46%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.66	1.39	11.7	15.7	0.03	0.50	0.43	0.93	0.46	0.10	0.57	—	3,070	3,070	0.14	0.08	2.33	3,098
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.43	3.73	36.0	33.8	0.05	1.60	7.83	9.43	1.47	3.98	5.45	—	6,462	6,462	0.50	0.57	0.20	6,644
2025	1.02	68.2	7.51	10.7	0.01	0.35	0.14	0.49	0.32	0.03	0.35	—	1,653	1,653	0.07	0.02	0.01	1,660
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.32	1.09	9.69	11.8	0.02	0.41	0.69	1.10	0.38	0.26	0.64	—	2,434	2,434	0.12	0.08	0.82	2,462
2025	0.06	3.78	0.40	0.58	< 0.005	0.02	0.01	0.03	0.02	< 0.005	0.02	—	88.9	88.9	< 0.005	< 0.005	0.02	89.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	0.24	0.20	1.77	2.15	< 0.005	0.08	0.13	0.20	0.07	0.05	0.12	—	403	403	0.02	0.01	0.14	408
2025	0.01	0.69	0.07	0.11	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	14.7	14.7	< 0.005	< 0.005	< 0.005	14.8

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.87	0.77	9.74	17.5	0.03	0.12	0.43	0.55	0.12	0.10	0.22	—	3,070	3,070	0.14	0.08	2.33	3,098
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.01	0.76	14.8	29.2	0.05	0.14	7.83	7.93	0.12	3.98	4.08	—	6,462	6,462	0.50	0.57	0.20	6,644
2025	0.58	68.2	6.84	11.3	0.01	0.10	0.14	0.25	0.10	0.03	0.13	—	1,653	1,653	0.07	0.02	0.01	1,660
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.62	0.53	7.41	12.8	0.02	0.09	0.69	0.78	0.08	0.26	0.35	—	2,434	2,434	0.12	0.08	0.82	2,462
2025	0.04	3.77	0.37	0.61	< 0.005	0.01	0.01	0.02	0.01	< 0.005	0.01	—	88.9	88.9	< 0.005	< 0.005	0.02	89.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.11	0.10	1.35	2.34	< 0.005	0.02	0.13	0.14	0.02	0.05	0.06	—	403	403	0.02	0.01	0.14	408
2025	0.01	0.69	0.07	0.11	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.7	14.7	< 0.005	< 0.005	< 0.005	14.8

2.4. Operations Emissions Compared Against Thresholds

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

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

Unmit.	4.81	9.31	5.54	36.1	0.08	0.24	2.28	2.52	0.24	0.41	0.64	61.9	11,230	11,292	6.75	0.36	27.5	11,596
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.98	8.51	5.71	25.7	0.08	0.24	2.28	2.52	0.23	0.41	0.64	61.9	10,776	10,838	6.77	0.37	2.22	11,121
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.17	8.76	4.38	30.0	0.07	0.12	2.28	2.40	0.12	0.41	0.53	61.9	9,037	9,099	6.74	0.37	12.8	9,391
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.76	1.60	0.80	5.47	0.01	0.02	0.42	0.44	0.02	0.07	0.10	10.2	1,496	1,506	1.12	0.06	2.11	1,555

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
Area	0.73	5.62	1.59	6.49	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,968	1,968	0.04	< 0.005	—	1,970
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	4.81	9.31	5.54	36.1	0.08	0.24	2.28	2.52	0.24	0.41	0.64	61.9	11,230	11,292	6.75	0.36	27.5	11,596
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
Area	0.18	5.10	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	3.98	8.51	5.71	25.7	0.08	0.24	2.28	2.52	0.23	0.41	0.64	61.9	10,776	10,838	6.77	0.37	2.22	11,121
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.68	3.34	3.42	25.6	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,639	6,639	0.36	0.34	11.2	6,760
Area	0.39	5.38	0.14	4.04	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	144	144	< 0.005	< 0.005	—	145
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	4.17	8.76	4.38	30.0	0.07	0.12	2.28	2.40	0.12	0.41	0.53	61.9	9,037	9,099	6.74	0.37	12.8	9,391
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119
Area	0.07	0.98	0.03	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.9	23.9	< 0.005	< 0.005	—	23.9
Energy	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	360	360	0.03	< 0.005	—	361
Water	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6
Waste	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32

Total	0.76	1.60	0.80	5.47	0.01	0.02	0.42	0.44	0.02	0.07	0.10	10.2	1,496	1,506	1.12	0.06	2.11	1,555

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
Area	0.73	5.62	1.59	6.49	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,968	1,968	0.04	< 0.005	—	1,970
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	4.81	9.31	5.54	36.1	0.08	0.24	2.28	2.52	0.24	0.41	0.64	61.9	11,230	11,292	6.75	0.36	27.5	11,596
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
Area	0.18	5.10	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	3.98	8.51	5.71	25.7	0.08	0.24	2.28	2.52	0.23	0.41	0.64	61.9	10,776	10,838	6.77	0.37	2.22	11,121

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.68	3.34	3.42	25.6	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,639	6,639	0.36	0.34	11.2	6,760
Area	0.39	5.38	0.14	4.04	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	144	144	< 0.005	< 0.005	—	145
Energy	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	2,175	2,175	0.16	0.01	—	2,182
Water	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Waste	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	4.17	8.76	4.38	30.0	0.07	0.12	2.28	2.40	0.12	0.41	0.53	61.9	9,037	9,099	6.74	0.37	12.8	9,391
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119
Area	0.07	0.98	0.03	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.9	23.9	< 0.005	< 0.005	—	23.9
Energy	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	360	360	0.03	< 0.005	—	361
Water	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6
Waste	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26
Vegetation	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32
Total	0.76	1.60	0.80	5.47	0.01	0.02	0.42	0.44	0.02	0.07	0.10	10.2	1,496	1,506	1.12	0.06	2.11	1,555

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.99	0.90	< 0.005	0.04	—	0.04	0.04	—	0.04	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.16	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	0.86	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	168	168	0.01	0.01	0.02	170
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.66	4.66	< 0.005	< 0.005	0.01	4.73
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.78
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. Site Preparation (2024) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	14.7	28.3	0.05	0.10	—	0.10	0.10	—	0.10	—	5,296	5,296	0.21	0.04	—	5,314

Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.40	0.78	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.07	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	0.86	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	168	168	0.01	0.01	0.02	170
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.66	4.66	< 0.005	< 0.005	0.01	4.73
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.78
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.26	1.90	18.2	18.8	0.03	0.84	—	0.84	0.77	—	0.77	—	2,958	2,958	0.12	0.02	—	2,969
Dust From Material Movement	—	—	—	—	—	—	2.77	2.77	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	1.00	1.03	< 0.005	0.05	—	0.05	0.04	—	0.04	—	162	162	0.01	< 0.005	—	163

Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	26.8	26.8	< 0.005	< 0.005	—	26.9
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	0.74	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.44	0.07	4.30	2.32	0.02	0.06	0.88	0.95	0.04	0.24	0.28	—	3,359	3,359	0.37	0.54	0.18	3,530
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	0.01	8.12
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.24	0.13	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	184	184	0.02	0.03	0.17	194
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.32	1.32	< 0.005	< 0.005	< 0.005	1.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.5	30.5	< 0.005	< 0.005	0.03	32.0

3.4. Grading (2024) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.49	0.47	10.0	17.8	0.03	0.08	—	0.08	0.08	—	0.08	—	2,958	2,958	0.12	0.02	—	2,969
Dust From Material Movement	—	—	—	—	—	—	2.77	2.77	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.55	0.97	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	162	162	0.01	< 0.005	—	163
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.07	0.07	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.10	0.18	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	26.8	26.8	< 0.005	< 0.005	—	26.9

Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	0.74	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.44	0.07	4.30	2.32	0.02	0.06	0.88	0.95	0.04	0.24	0.28	—	3,359	3,359	0.37	0.54	0.18	3,530
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.00	8.00	< 0.005	< 0.005	0.01	8.12
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.24	0.13	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	184	184	0.02	0.03	0.17	194
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.32	1.32	< 0.005	< 0.005	< 0.005	1.34
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.5	30.5	< 0.005	< 0.005	0.03	32.0

3.5. Building Construction (2024) - Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	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	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	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	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.76	7.07	8.26	0.01	0.31	—	0.31	0.29	—	0.29	—	1,511	1,511	0.06	0.01	—	1,516
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.29	1.51	< 0.005	0.06	—	0.06	0.05	—	0.05	—	250	250	0.01	< 0.005	—	251
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.18	0.14	2.36	0.00	0.00	0.35	0.35	0.00	0.08	0.08	—	388	388	0.02	0.01	1.54	394
Vendor	0.03	0.01	0.34	0.19	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	284	284	0.02	0.04	0.79	298
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19	0.17	0.16	1.82	0.00	0.00	0.35	0.35	0.00	0.08	0.08	—	356	356	0.02	0.01	0.04	361
Vendor	0.03	0.01	0.36	0.19	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	284	284	0.02	0.04	0.02	298
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.10	1.20	0.00	0.00	0.22	0.22	0.00	0.05	0.05	—	227	227	0.01	0.01	0.42	231
Vendor	0.02	0.01	0.23	0.12	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	179	179	0.01	0.03	0.21	188
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.6	37.6	< 0.005	< 0.005	0.07	38.2
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.7	29.7	< 0.005	< 0.005	0.04	31.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Building Construction (2024) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.58	9.26	15.0	0.02	0.12	—	0.12	0.11	—	0.11	—	2,398	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	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.64	0.58	9.26	15.0	0.02	0.12	—	0.12	0.11	—	0.11	—	2,398	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	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.40	0.36	5.83	9.45	0.01	0.08	—	0.08	0.07	—	0.07	—	1,511	1,511	0.06	0.01	—	1,516
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.07	1.06	1.72	< 0.005	0.01	—	0.01	0.01	—	0.01	—	250	250	0.01	< 0.005	—	251
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.18	0.14	2.36	0.00	0.00	0.35	0.35	0.00	0.08	0.08	—	388	388	0.02	0.01	1.54	394
Vendor	0.03	0.01	0.34	0.19	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	284	284	0.02	0.04	0.79	298
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19	0.17	0.16	1.82	0.00	0.00	0.35	0.35	0.00	0.08	0.08	—	356	356	0.02	0.01	0.04	361
Vendor	0.03	0.01	0.36	0.19	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	284	284	0.02	0.04	0.02	298
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.10	1.20	0.00	0.00	0.22	0.22	0.00	0.05	0.05	—	227	227	0.01	0.01	0.42	231
Vendor	0.02	0.01	0.23	0.12	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	179	179	0.01	0.03	0.21	188

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.22	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	37.6	37.6	< 0.005	< 0.005	0.07	38.2
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.7	29.7	< 0.005	< 0.005	0.04	31.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Paving (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.01	0.85	7.81	10.0	0.01	0.39	—	0.39	0.36	—	0.36	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.9
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.96	1.96	< 0.005	< 0.005	—	1.97

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	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	0.74	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.14	1.14	< 0.005	< 0.005	< 0.005	1.16
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.19
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Paving (2024) - Mitigated

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

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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.54	0.48	6.85	10.6	0.01	0.12	—	0.12	0.11	—	0.11	—	1,512	1,512	0.06	0.01	—	1,517
Paving	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.05	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.9
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.96	1.96	< 0.005	< 0.005	—	1.97
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	0.74	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.14	1.14	< 0.005	< 0.005	< 0.005	1.16
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.19	0.19	< 0.005	< 0.005	< 0.005	0.19
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Paving (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.04	0.35	0.47	< 0.005	0.02	—	0.02	0.02	—	0.02	—	71.0	71.0	< 0.005	< 0.005	—	71.2
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	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.8
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.68	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	141	141	0.01	0.01	0.01	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.71	6.71	< 0.005	< 0.005	0.01	6.81
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.11	1.11	< 0.005	< 0.005	< 0.005	1.13
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Paving (2025) - Mitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.51	0.46	6.78	10.6	0.01	0.10	—	0.10	0.10	—	0.10	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.32	0.50	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	71.0	71.0	< 0.005	< 0.005	—	71.2
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.06	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.8	11.8	< 0.005	< 0.005	—	11.8
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.68	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	141	141	0.01	0.01	0.01	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.71	6.71	< 0.005	< 0.005	0.01	6.81
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.11	1.11	< 0.005	< 0.005	< 0.005	1.13
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Architectural Coating (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	68.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	—	3.73	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	—	0.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.33	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	69.7	69.7	< 0.005	< 0.005	0.01	70.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.87	3.87	< 0.005	< 0.005	0.01	3.93
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.64	0.64	< 0.005	< 0.005	< 0.005	0.65

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Architectural Coating (2025) - Mitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	68.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	—	3.73	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22

Architect Coatings	—	0.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.33	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	69.7	69.7	< 0.005	< 0.005	0.01	70.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.87	3.87	< 0.005	< 0.005	0.01	3.93
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.64	0.64	< 0.005	< 0.005	< 0.005	0.65
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.98	3.64	3.13	29.3	0.07	0.05	2.28	2.33	0.04	0.41	0.45	—	7,009	7,009	0.35	0.33	26.0	7,141
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.71	3.36	3.36	24.7	0.06	0.05	2.28	2.33	0.04	0.41	0.45	—	6,571	6,571	0.36	0.34	0.67	6,681
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119
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	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.67	0.61	0.62	4.67	0.01	0.01	0.42	0.42	0.01	0.07	0.08	—	1,099	1,099	0.06	0.06	1.86	1,119

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	189	189	0.01	< 0.005	—	190
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	189	189	0.01	< 0.005	—	190

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,142	1,142	0.07	0.01	—	1,147
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	189	189	0.01	< 0.005	—	190
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	189	189	0.01	< 0.005	—	190

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
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	0.00	0.00	—	0.00
Total	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
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	0.00	0.00	—	0.00
Total	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	171	171	0.02	< 0.005	—	171
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	0.00	0.00	—	0.00
Total	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	171	171	0.02	< 0.005	—	171

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
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	0.00	0.00	—	0.00
Total	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
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	0.00	0.00	—	0.00
Total	0.10	0.05	0.81	0.35	0.01	0.07	—	0.07	0.07	—	0.07	—	1,033	1,033	0.09	< 0.005	—	1,036
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	171	171	0.02	< 0.005	—	171
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	0.00	0.00	—	0.00
Total	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	171	171	0.02	< 0.005	—	171

4.3. Area Emissions by Source

4.3.2. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Consumer Products	—	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.55	0.53	0.06	5.83	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.6	15.6	< 0.005	< 0.005	—	15.7
Total	0.73	5.62	1.59	6.49	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,968	1,968	0.04	< 0.005	—	1,970
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Consumer Products	—	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.18	5.10	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	22.1	22.1	< 0.005	< 0.005	—	22.2
Consumer Products	—	0.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.07	0.07	0.01	0.73	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.77	1.77	< 0.005	< 0.005	—	1.78
Total	0.07	0.98	0.03	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.9	23.9	< 0.005	< 0.005	—	23.9

4.3.1. Mitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Consumer Products	—	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.55	0.53	0.06	5.83	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.6	15.6	< 0.005	< 0.005	—	15.7
Total	0.73	5.62	1.59	6.49	0.01	0.13	—	0.13	0.13	—	0.13	0.00	1,968	1,968	0.04	< 0.005	—	1,970
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.18	0.09	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Consumer Products	—	4.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.18	5.10	1.54	0.65	0.01	0.12	—	0.12	0.12	—	0.12	0.00	1,952	1,952	0.04	< 0.005	—	1,954
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	22.1	22.1	< 0.005	< 0.005	—	22.2
Consumer Products	—	0.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.07	0.07	0.01	0.73	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.77	1.77	< 0.005	< 0.005	—	1.78
Total	0.07	0.98	0.03	0.74	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.9	23.9	< 0.005	< 0.005	—	23.9

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6

4.4.1. Mitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.23	52.5	60.8	0.85	0.02	—	88.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	1.36	8.70	10.1	0.14	< 0.005	—	14.6

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Total	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1

4.5.1. Mitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	53.7	0.00	53.7	5.36	0.00	—	188
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	8.88	0.00	8.88	0.89	0.00	—	31.1

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.55	1.55
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.26	0.26

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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

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

4.7.2. Mitigated

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

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

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

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

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

4.8.2. Mitigated

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

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

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

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

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

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

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

4.10.2. 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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32
Total	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32

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

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

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

4.10.5. 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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Total	—	—	—	—	—	—	—	—	—	—	—	—	26.1	26.1	—	—	—	26.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Grassland	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32
Total	—	—	—	—	—	—	—	—	—	—	—	—	4.32	4.32	—	—	—	4.32

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	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	1/1/2024	1/12/2024	5.00	10.0	—
Grading	Grading	1/13/2024	2/9/2024	5.00	20.0	—
Building Construction	Building Construction	2/10/2024	12/27/2024	5.00	230	—
Paving	Paving	12/28/2024	1/24/2025	5.00	20.0	—
Architectural Coating	Architectural Coating	1/25/2025	2/21/2025	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	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37

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

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Interim	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Tier 4 Interim	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	8.00	84.0	0.37
Grading	Rubber Tired Dozers	Diesel	Tier 4 Interim	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Tier 4 Interim	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Tier 4 Interim	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Interim	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Tier 4 Interim	2.00	8.00	81.0	0.42

Paving	Paving Equipment	Diesel	Tier 4 Interim	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	13.4	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.33	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	13.4	LDA,LDT1,LDT2
Grading	Vendor	—	8.33	HHDT,MHDT
Grading	Hauling	47.7	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	37.1	13.4	LDA,LDT1,LDT2
Building Construction	Vendor	11.0	8.33	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	13.4	LDA,LDT1,LDT2
Paving	Vendor	—	8.33	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT

Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	7.42	13.4	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.33	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	13.4	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.33	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	13.4	LDA,LDT1,LDT2
Grading	Vendor	—	8.33	HHDT,MHDT
Grading	Hauling	47.7	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	37.1	13.4	LDA,LDT1,LDT2
Building Construction	Vendor	11.0	8.33	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	13.4	LDA,LDT1,LDT2
Paving	Vendor	—	8.33	HHDT,MHDT

Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	7.42	13.4	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.33	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	438,566	146,189	0.00	0.00	1,206

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	0.00	0.00	15.0	0.00	—
Grading	7,631	0.00	20.0	0.00	—
Paving	0.00	0.00	0.00	0.00	1.60

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction

Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	1.13	0%
Other Asphalt Surfaces	0.46	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	11.5	532	0.03	< 0.005
2025	11.5	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
Single Family Housing	918	918	918	335,070	8,184	8,184	8,184	2,987,160
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
Single Family Housing	918	918	918	335,070	8,184	8,184	8,184	2,987,160

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)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	93
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	10

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	93
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	10

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)

438566.39999999997	146,189	0.00	0.00	1,206

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)
Single Family Housing	783,791	532	0.0330	0.0040	3,222,841
Other Asphalt Surfaces	0.00	532	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)
Single Family Housing	783,791	532	0.0330	0.0040	3,222,841
Other Asphalt Surfaces	0.00	532	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)
Single Family Housing	4,293,161	1,285,033
Other Asphalt Surfaces	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	4,293,161	1,285,033
Other Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	99.6	—
Other Asphalt Surfaces	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	99.6	—
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
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	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
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	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
Grassland	9.01	0.00

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres
Grassland	9.01	0.00

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	27.8	annual days of extreme heat
Extreme Precipitation	4.35	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	24.9	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 (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth 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 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
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	100
AQ-PM	54.9
AQ-DPM	38.7
Drinking Water	60.9
Lead Risk Housing	12.4
Pesticides	77.6
Toxic Releases	41.8
Traffic	9.22
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	16.6
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	60.9
Cardio-vascular	57.4

Low Birth Weights	84.0
Socioeconomic Factor Indicators	—
Education	30.0
Housing	13.6
Linguistic	22.2
Poverty	30.3
Unemployment	66.6

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	77.77492622
Employed	32.144232
Median HI	75.87578596
Education	—
Bachelor's or higher	59.98973438
High school enrollment	100
Preschool enrollment	65.54600282
Transportation	—
Auto Access	70.20402926
Active commuting	60.27203901
Social	—
2-parent households	47.77364301
Voting	65.10971385
Neighborhood	—
Alcohol availability	79.76389067

Park access	40.33106634
Retail density	23.63659695
Supermarket access	33.46593096
Tree canopy	32.7216733
Housing	—
Homeownership	92.89105608
Housing habitability	96.7406647
Low-inc homeowner severe housing cost burden	85.75644809
Low-inc renter severe housing cost burden	89.32375209
Uncrowded housing	96.93314513
Health Outcomes	—
Insured adults	76.99217246
Arthritis	36.9
Asthma ER Admissions	48.9
High Blood Pressure	59.0
Cancer (excluding skin)	22.7
Asthma	51.9
Coronary Heart Disease	61.0
Chronic Obstructive Pulmonary Disease	59.8
Diagnosed Diabetes	78.0
Life Expectancy at Birth	36.8
Cognitively Disabled	93.6
Physically Disabled	46.5
Heart Attack ER Admissions	44.1
Mental Health Not Good	68.6
Chronic Kidney Disease	73.0
Obesity	64.9

Pedestrian Injuries	19.6
Physical Health Not Good	72.6
Stroke	70.4
Health Risk Behaviors	—
Binge Drinking	14.4
Current Smoker	69.0
No Leisure Time for Physical Activity	82.7
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	55.0
Elderly	49.5
English Speaking	94.9
Foreign-born	1.7
Outdoor Workers	84.8
Climate Change Adaptive Capacity	—
Impervious Surface Cover	66.4
Traffic Density	16.9
Traffic Access	23.0
Other Indices	—
Hardship	19.6
Other Decision Support	—
2016 Voting	81.2

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	41.0

Healthy Places Index Score for Project Location (b)	68.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
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	Updated land use lot acreage, building square footage and landscape area based on project site plan 3/10/23 and data request response 4/26/23.
Construction: Construction Phases	Removed Demolition phase as the project site is undeveloped.
Operations: Vehicle Data	Updated daily trip rate based on traffic impact analysis conducted by Ganddini Group 5/3/23. Updated trip length based on TAZ VMT per the VMT screening assessment conducted by Ganddini Group 4/7/23.
Operations: Hearths	Updated fireplaces to be all natural gas fueled and removed wood burning stoves based on South Coast Rule 445.
Construction: Electricity	Added a 25kW generator, assumed to operate for an 11 hour period any day during the week, to represent electricity consumption associated with construction trailer operation.

Attachment 3

Energy Calculations

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ATTACHMENT 3

Madera at Citrus Trail Residential Project (Redlands, CA)

Energy Calculations

Prepared by: MIG, Inc.

July 2023

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Sheet 2: Construction On-site Fuel Consumption Estimates

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Sheet 4: Operational Fuel Efficiency

Sheet 5: Raw EMFAC2021 (v1.0.2) Emissions Inventory for San Bernardino County (2024)

Sheet 1: Summary of Energy Consumption

Table 1-1: Off-Road Equipment Fuel Consumption

Year	Diesel Fuel Consumed (Gal)	Gasoline Fuel Consumed (Gal)	Electricity Consumed (kWh)*
Off-Road Equipment	22,753	--	14
On-Road Equipment	5,279	5,017	949
Total	28,031	5,017	963

*Included approximately 14 kWh to account for on-site generator

Table 1-2: Operational Vehicle Fuel Consumption

Operational Estimates	Diesel Fuel Consumed (Gal)	Gasoline Fuel Consumed (Gal)	Electricity Consumed (kW)
Mobile Sources	26,881	105,772	38,286
Based on Annual VMT of:	2,987,160		

Table 1-3: Operational Energy Consumption (Building)

Land Use	Unmitigated		Mitigated*	
	Electricity (kWh/yr)	Natural Gas (kBTU/yr)	Electricity (kWh/yr)	Natural Gas (kBTU/yr)
Apartments Mid Rise	783,791	3,222,841	1,728,352	0
Other Asphalt	0	0	0	0
Total	783,791	3,222,841	1,728,352	0

* CalEEMod default natural gas use of was converted to kWh assuming 3.412 KBTU/kWh

Table 1-4: Total Operational Energy Consumption (Unmitigated)

Source	Diesel Fuel Consumed (Gal)	Gasoline Fuel Consumed (Gal)	Electricity Consumed (kW)	Natural Gas (kBTU/yr)
Mobile Source	26,881	105,772	38,286	0
Building	0	0	783,791	3,222,841
Total	26,881	105,772	822,077	3,222,841

Table 1-5: Total Operational Energy Consumption (Mitigated)

Source	Diesel Fuel Consumed (Gal)	Gasoline Fuel Consumed (Gal)	Electricity Consumed (kW)	Natural Gas (kBTU/yr)
Mobile Source	26,881	105,772	38,286	0
Building	0	0	1,728,352	0
Total	26,881	105,772	1,766,637	0

Sheet 2: Construction On-site Fuel Consumption Estimations

Phase	Days	Equipment	# of Pieces	Hr/Day	Horsepower	Load Factor	Runtime (bhp-hr)	Consumption (bhp-hr/gal)[1]	Gallons of Diesel
Site Preparation	10	Rubber Tired Dozers	3	8	367	0.40	35,232	18.5	1,904
		Tractors/Loaders/Backhoes	4	8	84	0.37	9,946		538
Grading	20	Grader	1	8	148	0.41	9,709		525
		Excavators	1	8	36	0.38	2,189		118
		Tractors/Loaders/Backhoes	3	8	84	0.37	14,918		806
		Rubber Tired Dozers	1	8	367	0.40	23,488		1,270
Building Construction	230	Forklifts	3	8	82	0.20	90,528		4,893
		Generator Sets	1	8	14	0.74	19,062		1,030
		Cranes	1	7	367	0.29	0		
		Welders	1	8	46	0.45	38,088		2,059
		Tractors/Loaders/Backhoes	3	7	84	0.37	150,116		8,114
Paving	20	Pavers	2	8	81	0.42	10,886		588
		Paving Equipment	2	8	89	0.36	10,253		554
		Rollers	2	8	36	0.38	4,378		237
Architectural Coating	20	Air Compressors	1	6	37	0.48	2,131		115
								Total	22,753

[1] The Carl Moyer Program Guidelines 2017 Revisions. Table D-21. Approved by the Board April 27, 2017.

Sheet 3: Construction Off-site Fuel Consumption Estimates

Phase	Days	Number of Trips	Dist (mi)	Total VMT	Vehicle Class	Percent of Workers by Vehcile Class	Gasoline Average Fuel Economy (MPG)	Gasoline Fuel Split	Gasoline Fuel Consumption by Class (gal)	Diesel Average Fuel Economy (MPG)	Diesel Fuel Split	Diesel Fuel Consumption by Class (gal)	Electricity Average Economy (mi/kWh)	Electric Split	Electricity Consumption by Class (kWh)	Hybrid Average Economy (mi/kWh)	Hybrid Average Economy (mi/gal)	Hybrid Split	Hybrid Consumption by Class (kWh)	Hybrid Consumption by Class (gal)	Gasoline Fuel Consumption by Phase (gal)	Diesel Fuel Consumption by Phase (gal)	Electricity Consumption by Phase (kWh)
Worker Trips																							
Site Preparation	10	18	13.38	2408.4	LDA	0.25	29.7	93.33%	19	42.9	0.21%	0.0	2.59	3.92%	9.1	6.6	60.6	2.54%	2.3	0.3	92.3	0.1	14.6
					LDT1	0.50	24.5	99.70%	49	24.3	0.03%	0.0	2.59	0.14%	0.7	6.0	66.6	0.13%	0.3	0.0			
					LDT2	0.25	24.2	98.31%	24	33.1	0.27%	0.0	2.59	0.61%	1.4	6.2	63.6	0.81%	0.8	0.1			
Grading	20	15	13.38	4014	LDA	0.25	29.7	93.33%	31	42.9	0.2%	0.0	2.59	3.92%	15.2	6.6	60.6	2.54%	3.9	0.4	153.9	0.2	24.3
					LDT1	0.50	24.5	99.70%	82	24.3	0.03%	0.0	2.59	0.14%	1.1	6.0	66.6	0.13%	0.4	0.0			
					LDT2	0.25	24.2	98.31%	41	33.1	0.3%	0.1	2.59	0.61%	2.4	6.2	63.6	0.81%	1.3	0.1			
Building Foundation	230	37	13.38	113864	LDA	0.25	29.7	93.3%	893	42.9	0.2%	1.4	2.59	3.92%	430.7	6.6	60.6	2.54%	110.1	11.9	4,364.6	4.3	688.8
					LDT1	0.50	24.5	99.7%	2,315	24.3	0.03%	0.6	2.59	0.14%	31.4	6.0	66.6	0.13%	12.1	1.1			
					LDT2	0.25	24.2	98.3%	1,156	33.1	0.3%	2.3	2.59	0.61%	67.3	6.2	63.6	0.81%	37.3	3.6			
Paving	20	15	13.38	4014	LDA	0.25	29.7	93.3%	31	42.9	0.2%	0.0	2.59	3.92%	15.2	6.6	60.6	2.54%	3.9	0.4	153.9	0.2	24.3
					LDT1	0.50	24.5	99.7%	82	24.3	0.03%	0.0	2.59	0.14%	1.1	6.0	66.6	0.13%	0.4	0.0			
					LDT2	0.25	24.2	98.3%	41	33.1	0.3%	0.1	2.59	0.61%	2.4	6.2	63.6	0.81%	1.3	0.1			
Architectural Coating	20	7	13.38	1873.2	LDA	0.25	29.7	93.3%	15	42.9	0.2%	0.0	2.59	3.92%	7.1	6.6	60.6	2.54%	1.8	0.2	71.8	0.1	11.3
					LDT1	0.50	24.5	99.7%	38	24.3	0.03%	0.0	2.59	0.14%	0.5	6.0	66.6	0.13%	0.2	0.0			
					LDT2	0.25	24.2	98.3%	19	33.1	0.3%	0.0	2.59	0.61%	1.1	6.2	63.6	0.81%	0.6	0.1			
Sub-Total Worker Trips Energy Consumption							Gasoline (gal)		4,836.4	Diesel (gal)		4.8	Electricity (kWh)		586.6	Hybrid (kWh; gal of gasoline)			176.7	18.5	4,836.4	4.8	763.2
Vendor Trips																							
Building Construction	230	11	8.33	21075	MHDT	0.5	5.2	8.8%	178	9.0	89.77%	1,057	0.96	0.28%	30.58	--	--	--	--	--	178.5	2,550.9	85.6
					HHDT	0.5	3.7	0.0%	1	6.0	84.94%	1,494	0.56	0.29%	55.03	--	--	--	--	--			
Sub-Total Vendor Trips Energy Consumption							Gasoline (gal)		178.5	Diesel (gal)		2,550.9	Electricity (kWh)		85.6	--	--	--	--	--	178	2,551	86
Hauling Trips																							
Grading	20	48	20	19200	HHDT	1.0	3.7	0.03%	1.7	6.0	84.94%	2,723	0.6	0.29%	100.27	--	--	--	--	--	1.7	2,723	100.27
Sub-Total Haul Trips Energy Consumption							Gasoline (gal)		1.706	Diesel (gal)		2,722.8	Electricity (kWh)		100	--	--	--	--	--	1.7	2,723	100
Total On-Road Construction Trips Genergy Usage									**Gasoline (gal)**	**5,017**		**Diesel (gal)**	**5,279**		**Electricity (kWh)**			**949**					

Sheet 4: Average Fuel Efficiency - San Bernarino County

EMFAC2021 San Bernardino County Fuel Efficiency Estimates for 2024

Table 1: 2024 SB County Average Vehicle Fuel Efficiency (Gasoline)

Vehicle Class	Population	Vehicle Miles Travelled Per Day	Gallons Per Day	Miles Per Gallon
HHDT	5.57	65,632.20	17,555.07	3.74
LDA	471,817.60	7,108,656,035.69	238,945,182.97	29.75
LDT1	40,777.15	490,527,517.74	20,006,019.37	24.52
LDT2	194,249.37	2,770,366,492.83	114,344,525.16	24.23
LHDT1	17,179.49	208,481,689.10	15,346,534.88	13.58
LHDT2	2,883.70	33,531,637.34	2,787,053.65	12.03
MCY	20,751.93	42,918,713.78	1,022,389.67	41.98
MDV	148,169.82	2,031,874,616.51	103,279,186.82	19.67
MH	3,401.97	9,880,592.44	2,022,448.20	4.89
MHDT	1,460.60	25,635,396.94	4,923,389.14	5.21
OBUS	370.02	5,168,863.66	1,012,113.04	5.11
SBUS	297.87	4,585,227.50	511,431.11	8.97
UBUS	54.72	1,718,010.10	132,909.22	12.93
TOTAL	901,419.81	12,733,410,425.82	504,350,738.30	25.25

Table 2: 2024 SB County Average Vehicle Fuel Efficiency (Diesel)

Vehicle Class	Population	Vehicle Miles Travelled Per Day	Gallons Per Day	Miles Per Gallon
HHDT	14,231.96	551,042,326.43	92,002,932.90	5.99
LDA	1,047.59	13,077,704.42	304,694.00	42.92
LDT1	10.72	55,107.22	2,270.24	24.27
LDT2	520.90	8,078,084.97	243,685.16	33.15
LHDT1	11,382.10	142,493,007.46	6,928,746.33	20.57
LHDT2	4,825.53	61,039,665.72	3,552,258.74	17.18
MCY	0.00	0.00	0.00	0.00
MDV	1,910.88	26,864,024.48	1,129,452.06	23.79
MH	1,336.40	3,946,369.35	385,834.26	10.23
MHDT	14,946.47	202,976,493.91	22,669,390.63	8.95
OBUS	210.55	4,437,514.63	600,064.55	7.40
SBUS	373.29	2,533,365.66	344,145.14	7.36
UBUS	4.56	147,096.84	14,214.29	10.35
TOTAL	50800.95	1016690761.08	128177688.31	7.93

Table 3: 2024 SB County Average Vehicle Fuel Efficiency (Electricity)

Vehicle Class	Population	Vehicle Miles Travelled Per Day	Energy Consumption (kWh/day)	Miles Per kWh
HHDT	48.63	1,514,395.86	2,724,993.94	0.56
LDA	31,787.74	432,233,324.20	157,443,334.27	2.75
LDT1	110.09	1,461,592.33	521,481.49	2.80
LDT2	2,793.87	29,638,346.88	10,212,887.57	2.90
LHDT1	52.74	1,282,659.76	718,973.21	1.78
LHDT2	13.65	314,553.55	176,464.27	1.78
MCY	0.00	0.00	0.00	0.00
MDV	2,356.18	25,944,442.91	9,231,611.31	2.81
MH	0.00	0.00	0.00	0.00
MHDT	46.14	737,631.43	772,374.81	0.96
OBUS	0.81	21,328.85	22,399.05	0.95
SBUS	2.21	18,416.71	21,295.26	0.86
UBUS	7.33	363,414.40	711,016.39	0.51
TOTAL	37,219.39	493,530,106.88	182,556,831.57	2.70

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: San Bernardino (SC)
Calendar Year: 2024
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/year for CVMT and EVMT, trips/year for Trips, kWh/year for Energy Consumption, tons/year for Emissions, 1000 gallons/year for Fuel Consumption

Region	Calendar Y	Vehicle Ca	Model Yea	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Cor	NOx_RUNI	NOx_IDLE	NOx_STRE	NOx_TOTE	PM2.5_RU	PM2.5_IDL	PM2.5_STI	PM2.5_TO	PM2.5_PM
San Bernar	2024	HHDT	Aggregate	Aggregate	Gasoline	5.565988	65632.2	65632.2	0	36416.12	0	0.891401	0	0.047136	0.938537	0.000297	0	8.74E-05	0.000384	0.000362
San Bernar	2024	HHDT	Aggregate	Aggregate	Diesel	14231.96	5.51E+08	5.51E+08	0	66909545	0	1100.505	307.9044	207.8081	1616.218	15.97858	0.155617	0	16.1342	5.337473
San Bernar	2024	HHDT	Aggregate	Aggregate	Electricity	48.62872	1514396	0	1514396	194680.8	2724994	0	0	0	0	0	0	0	0	0.014319
San Bernar	2024	HHDT	Aggregate	Aggregate	Natural Ga	2469.471	50027967	50027967	0	4431190	0	59.53307	7.282097	0	66.81517	0.099661	0.008354	0	0.108015	0.496318
San Bernar	2024	LDA	Aggregate	Aggregate	Gasoline	459317.1	7E+09	7E+09	0	7.41E+08	0	299.1504	0	197.2636	496.414	9.119045	0	1.574457	10.6935	15.4284
San Bernar	2024	LDA	Aggregate	Aggregate	Diesel	1047.589	13077704	13077704	0	1565577	0	2.521363	0	0	2.521363	0.210004	0	0	0.210004	0.028831
San Bernar	2024	LDA	Aggregate	Aggregate	Electricity	19287.28	3.2E+08	0	3.2E+08	33644011	1.24E+08	0	0	0	0	0	0	0	0	0.705456
San Bernar	2024	LDA	Aggregate	Aggregate	Plug-in Hyl	12500.46	2.23E+08	1.1E+08	1.12E+08	17936220	33900992	0.73851	0	2.198065	2.936574	0.148893	0	0.040042	0.188935	0.490961
San Bernar	2024	LDT1	Aggregate	Aggregate	Gasoline	40725.36	4.9E+08	4.9E+08	0	61050900	0	100.7008	0	31.55938	132.2602	1.111417	0	0.218372	1.329789	1.08052
San Bernar	2024	LDT1	Aggregate	Aggregate	Diesel	10.72176	55107.22	55107.22	0	10654.81	0	0.095142	0	0	0.095142	0.014046	0	0	0.014046	0.000121
San Bernar	2024	LDT1	Aggregate	Aggregate	Electricity	58.29951	952224.2	0	952224.2	100915	367637.1	0	0	0	0	0	0	0	0	0.002099
San Bernar	2024	LDT1	Aggregate	Aggregate	Plug-in Hyl	51.79076	921312	411943.9	509368.1	74311.71	153844.3	0.002754	0	0.009107	0.011861	0.000374	0	0.000113	0.000486	0.002031
San Bernar	2024	LDT2	Aggregate	Aggregate	Gasoline	192654.7	2.76E+09	2.76E+09	0	3.13E+08	0	220.3756	0	113.6475	334.0231	3.64959	0	0.664571	4.314161	6.079382
San Bernar	2024	LDT2	Aggregate	Aggregate	Diesel	520.8967	8078085	8078085	0	875930.8	0	0.444071	0	0	0.444071	0.043362	0	0	0.043362	0.017809
San Bernar	2024	LDT2	Aggregate	Aggregate	Electricity	1199.247	15005146	0	15005146	2127908	5793225	0	0	0	0	0	0	0	0	0.033081
San Bernar	2024	LDT2	Aggregate	Aggregate	Plug-in Hyl	1594.626	27438602	12805401	14633201	2288040	4419663	0.08562	0	0.280397	0.366017	0.013723	0	0.00408	0.017803	0.060492
San Bernar	2024	LHDT1	Aggregate	Aggregate	Gasoline	17179.49	2.08E+08	2.08E+08	0	83695263	0	41.43836	0.229057	58.97993	100.6473	0.251041	0	0.030508	0.281549	0.459623
San Bernar	2024	LHDT1	Aggregate	Aggregate	Diesel	11382.1	1.42E+08	1.42E+08	0	46817398	0	272.6614	8.465781	0	281.1272	4.062291	0.107991	0	4.170283	0.471215
San Bernar	2024	LHDT1	Aggregate	Aggregate	Electricity	52.74031	1282660	0	1282660	240916.8	718973.2	0	0	0	0	0	0	0	0	0.002828
San Bernar	2024	LHDT2	Aggregate	Aggregate	Gasoline	2883.702	33531637	33531637	0	14048858	0	5.632717	0.03883	10.05596	15.72751	0.034029	0	0.003693	0.037722	0.073925
San Bernar	2024	LHDT2	Aggregate	Aggregate	Diesel	4825.532	61039666	61039666	0	19848614	0	90.04689	3.512275	0	93.55916	1.607242	0.045855	0	1.653097	0.201854
San Bernar	2024	LHDT2	Aggregate	Aggregate	Electricity	13.65084	314553.6	0	314553.6	59087.53	176464.3	0	0	0	0	0	0	0	0	0.000693
San Bernar	2024	MCY	Aggregate	Aggregate	Gasoline	20751.93	42918714	42918714	0	14401839	0	27.60697	0	2.20262	29.80959	0.08256	0	0.048899	0.131458	0.04731
San Bernar	2024	MDV	Aggregate	Aggregate	Gasoline	147141.1	2.02E+09	2.02E+09	0	2.34E+08	0	256.9034	0	119.9245	376.8279	2.791361	0	0.533298	3.324659	4.460497
San Bernar	2024	MDV	Aggregate	Aggregate	Diesel	1910.883	26864024	26864024	0	3071199	0	4.450935	0	0	4.450935	0.242104	0	0	0.242104	0.059225
San Bernar	2024	MDV	Aggregate	Aggregate	Electricity	1327.49	16604057	0	16604057	2355234	6410536	0	0	0	0	0	0	0	0	0.036606
San Bernar	2024	MDV	Aggregate	Aggregate	Plug-in Hyl	1028.69	17967703	8627317	9340386	1476011	2821075	0.057684	0	0.180884	0.238568	0.0114	0	0.003259	0.014659	0.039612
San Bernar	2024	MH	Aggregate	Aggregate	Gasoline	3401.971	9880592	9880592	0	111288.9	0	3.976062	0	0.051305	4.027367	0.011777	0	4.29E-05	0.01182	0.032674
San Bernar	2024	MH	Aggregate	Aggregate	Diesel	1336.398	3946369	3946369	0	43700.2	0	17.09166	0	0	17.09166	0.529214	0	0	0.529214	0.017401
San Bernar	2024	MHDT	Aggregate	Aggregate	Gasoline	1460.602	25635397	25635397	0	9556159	0	11.90358	0.046973	4.504197	16.45475	0.025321	0	0.004975	0.030296	0.084775
San Bernar	2024	MHDT	Aggregate	Aggregate	Diesel	14946.47	2.03E+08	2.03E+08	0	57172237	0	175.313	61.50415	105.0881	341.9053	2.192106	0.09799	0	2.290096	0.67123
San Bernar	2024	MHDT	Aggregate	Aggregate	Electricity	46.13646	737631.4	0	737631.4	185958.6	772374.8	0	0	0	0	0	0	0	0	0.002439
San Bernar	2024	MHDT	Aggregate	Aggregate	Natural Ga	195.6757	2964797	2964797	0	564869.1	0	0.330411	0.438671	0	0.769082	0.002361	0.001151	0	0.003512	0.009804
San Bernar	2024	OBUS	Aggregate	Aggregate	Gasoline	370.0192	5168864	5168864	0	2420894	0	2.496521	0.008634	1.052153	3.557308	0.004647	0	0.000814	0.005461	0.017093
San Bernar	2024	OBUS	Aggregate	Aggregate	Diesel	210.552	4437515	4437515	0	726190.1	0	9.279316	0.877598	1.309884	11.4668	0.207597	0.001773	0	0.20937	0.014675
San Bernar	2024	OBUS	Aggregate	Aggregate	Electricity	0.809762	21328.85	0	21328.85	5297.961	22399.05	0	0	0	0	0	0	0	0	7.05E-05
San Bernar	2024	OBUS	Aggregate	Aggregate	Natural Ga	32.78529	582103.1	582103.1	0	85202.41	0	0.084277	0.016304	0	0.10058	0.000485	3.92E-05	0	0.000524	0.001925
San Bernar	2024	SBUS	Aggregate	Aggregate	Gasoline	297.8692	4585227	4585227	0	389612.9	0	2.401988	0.099394	0.288133	2.789515	0.005274	0	0.000217	0.005492	0.010109
San Bernar	2024	SBUS	Aggregate	Aggregate	Diesel	373.2941	2533366	2533366	0	1767533	0	22.37491	4.268373	0.502989	27.14628	0.126933	0.005116	0	0.132049	0.008378
San Bernar	2024	SBUS	Aggregate	Aggregate	Electricity	2.2132	18416.71	0	18416.71	8957.6	21295.26	0	0	0	0	0	0	0	0	5.34E-05
San Bernar	2024	SBUS	Aggregate	Aggregate	Natural Ga	398.76	3273431	3273431	0	1888113	0	2.436986	0.743547	0	3.180534	0.014873	0.001968	0	0.016841	0.010825
San Bernar	2024	UBUS	Aggregate	Aggregate	Gasoline	54.72012	1718010	1718010	0	71573.92	0	0.076281	0	0.032335	0.108616	0.002001	0	1.63E-05	0.002017	0.00391
San Bernar	2024	UBUS	Aggregate	Aggregate	Diesel	4.556959	147096.8	147096.8	0	5960.502	0	0.036723	0	0	0.036723	0.000478	0	0	0.000478	0.000646
San Bernar	2024	UBUS	Aggregate	Aggregate	Electricity	7.328345	363414.4	0	363414.4	9585.475	711016.4	0	0	0	0	0	0	0	0	0.003528
San Bernar	2024	UBUS	Aggregate	Aggregate	Natural Ga	243.3602	10891849	10891849	0	318315.2	0	5.489735	0	0	5.489735	0.021206	0	0	0.021206	0.095691

PM2.5_PM	PM2.5_TO	PM10_RUI	PM10_IDLI	PM10_STR	PM10_TOT	PM10_PM	PM10_PM	PM10_TOT	CO2_RUNI	CO2_IDLE	CO2_STRE	CO2_TOTE	CH4_RUNE	CH4_IDLE	CH4_STRE	CH4_TOTE	N2O_RUNI	N2O_IDLE	N2O_STRE	N2O_TOTE
0.002367	0.003113	0.000323	0	9.5E-05	0.000418	0.001447	0.006764	0.008628	164.3557	0	2.123951	166.4796	0.026396	0	2.94E-06	0.026399	0.021521	0	0.001	0.022521
16.12336	37.59503	16.70106	0.162653	0	16.86372	21.34989	46.06674	84.28035	970930.7	58995.88	0	1029927	0.370982	1.161846	0	1.532828	152.9705	9.294826	0	162.2654
0.023903	0.038223	0	0	0	0	0.057278	0.068296	0.125573	0	0	0	0	0	0	0	0	0	0	0	0
3.408404	4.012737	0.10839	0.009086	0	0.117476	1.98527	9.738298	11.84104	62723.79	6491.394	0	69215.18	100.3751	17.18757	0	117.5626	12.78665	1.323313	0	14.10997
19.93829	46.06019	9.917793	0	1.712365	11.63016	61.71359	56.96655	130.3103	2174339	0	56776.41	2231115	17.87987	0	55.53018	73.41005	35.05001	0	26.77632	61.82633
0.037859	0.276695	0.2195	0	0	0.2195	0.115326	0.108169	0.442994	3410.896	0	0	3410.896	0.016316	0	0	0.016316	0.537388	0	0	0.537388
0.538946	1.244402	0	0	0	0	2.821824	1.539846	4.36167	0	0	0	0	0	0	0	0	0	0	0	0
0.332009	1.011905	0.161935	0	0.04355	0.205484	1.963844	0.948597	3.117926	33587.65	0	1280.912	34868.56	0.105448	0	0.807873	0.913321	0.139618	0	0.415206	0.554824
1.676954	4.087262	1.208739	0	0.237493	1.446232	4.32208	4.791296	10.55961	183525.8	0	6065.672	189591.5	4.97334	0	8.624823	13.59816	6.954863	0	2.86634	9.821203
0.000213	0.01438	0.014681	0	0	0.014681	0.000486	0.000609	0.015776	25.41419	0	0	25.41419	0.000846	0	0	0.000846	0.004004	0	0	0.004004
0.001604	0.003703	0	0	0	0	0.008397	0.004583	0.01298	0	0	0	0	0	0	0	0	0	0	0	0
0.001387	0.003905	0.000406	0	0.000123	0.000529	0.008125	0.003964	0.012617	125.4963	0	5.660906	131.1572	0.000388	0	0.003305	0.003694	0.000508	0	0.00168	0.002188
8.960381	19.35392	3.969246	0	0.722777	4.692023	24.31753	25.60109	54.61064	1050349	0	29923.32	1080273	9.433899	0	27.89501	37.32891	18.81791	0	12.75485	31.57277
0.025457	0.086629	0.045323	0	0	0.045323	0.071237	0.072735	0.189295	2727.933	0	0	2727.933	0.005265	0	0	0.005265	0.429787	0	0	0.429787
0.02523	0.058311	0	0	0	0	0.132323	0.072087	0.204409	0	0	0	0	0	0	0	0	0	0	0	0
0.041144	0.119439	0.014925	0	0.004438	0.019363	0.241967	0.117553	0.378883	3898.822	0	189.4999	4088.322	0.012083	0	0.10189	0.113973	0.015832	0	0.051832	0.067664
6.27386	7.015033	0.27303	0	0.033181	0.306211	1.838494	17.92531	20.07002	142426.4	741.9489	2367.143	145535.5	1.292743	0.721298	3.126385	5.140425	2.334613	0.018739	4.706435	7.059787
4.288056	8.929554	4.24597	0.112874	0	4.358844	1.88486	12.25159	18.49529	77017.64	546.191	0	77563.83	0.786213	0.020916	0	0.807129	12.13416	0.086053	0	12.22021
0.0193	0.022127	0	0	0	0	0.011311	0.055142	0.066453	0	0	0	0	0	0	0	0	0	0	0	0
1.177249	1.288896	0.03701	0	0.004016	0.041026	0.295698	3.36357	3.700294	25890.94	144.6039	394.8649	26430.41	0.120774	0.122877	0.515062	0.758712	0.353233	0.003151	0.789887	1.146272
2.143018	3.997969	1.679914	0.047928	0	1.727842	0.807417	6.122909	8.658168	39395.47	370.2768	0	39765.75	0.304029	0.008868	0	0.312897	6.206773	0.058337	0	6.26511
0.005522	0.006215	0	0	0	0	0.002774	0.015776	0.01855	0	0	0	0	0	0	0	0	0	0	0	0
0.198701	0.377469	0.088252	0	0.052039	0.140292	0.189239	0.567717	0.897248	8919.071	0	776.5363	9695.607	8.053281	0	2.814833	10.86811	1.894786	0	0.130168	2.024954
6.787179	14.57234	3.035761	0	0.579985	3.615746	17.84199	19.39194	40.84967	948758.7	0	27888.36	976647.1	10.1034	0	27.78478	37.88818	19.09593	0	11.09654	30.19246
0.090552	0.391881	0.253051	0	0	0.253051	0.2369	0.258719	0.74867	12643.65	0	0	12643.65	0.021555	0	0	0.021555	1.992012	0	0	1.992012
0.027915	0.064521	0	0	0	0	0.146423	0.079757	0.22618	0	0	0	0	0	0	0	0	0	0	0	0
0.026882	0.081153	0.012399	0	0.003545	0.015943	0.158448	0.076805	0.251196	2625.055	0	153.29	2778.345	0.008184	0	0.066077	0.074261	0.010773	0	0.033775	0.044548
0.162049	0.206543	0.012808	0	4.66E-05	0.012855	0.130698	0.462997	0.60655	19175.61	0	3.830248	19179.44	0.118366	0	0.00458	0.122946	0.254045	0	0.005631	0.259676
0.064559	0.611173	0.553142	0	0	0.553142	0.069602	0.184455	0.807199	4319.221	0	0	4319.221	0.014272	0	0	0.014272	0.680495	0	0	0.680495
0.42044	0.53551	0.027539	0	0.005411	0.03295	0.339098	1.201256	1.573304	45920.19	285.8021	483.885	46689.88	0.307312	0.137451	0.493698	0.938461	0.603331	0.003969	0.346957	0.954257
3.330716	6.292042	2.291223	0.102421	0	2.393644	2.684919	9.516333	14.5949	242518.6	11253.88	0	253772.4	0.149009	0.052072	0	0.201081	38.2089	1.773053	0	39.98195
0.00605	0.00849	0	0	0	0	0.009757	0.017287	0.027044	0	0	0	0	0	0	0	0	0	0	0	0
0.048597	0.061913	0.002568	0.001251	0	0.003819	0.039218	0.138847	0.181884	2613.593	352.4242	0	2966.018	1.52778	1.195068	0	2.722848	0.532798	0.071844	0	0.604642
0.086973	0.109527	0.005054	0	0.000886	0.00594	0.068372	0.248494	0.322806	9464.426	50.56406	83.1614	9598.151	0.060737	0.026089	0.092815	0.17964	0.120193	0.000718	0.080312	0.201223
0.103485	0.32753	0.216984	0.001853	0	0.218837	0.058698	0.295672	0.573207	6537.223	180.1983	0	6717.421	0.016643	0.002936	0	0.019579	1.029942	0.02839	0	1.058332
0.000179	0.00025	0	0	0	0	0.000282	0.000513	0.000795	0	0	0	0	0	0	0	0	0	0	0	0
0.009795	0.012244	0.000528	4.27E-05	0	0.00057	0.0077	0.027985	0.036255	562.6407	13.10991	0	575.7506	0.34176	0.045694	0	0.387454	0.114698	0.002673	0	0.117371
0.08287	0.09847	0.005736	0	0.000236	0.005973	0.040435	0.236771	0.283179	4545.378	280.3361	24.32992	4850.044	0.063907	0.262585	0.03057	0.357063	0.132838	0.009191	0.026251	0.16828
0.045786	0.186213	0.132672	0.005347	0	0.13802	0.033511	0.130817	0.302348	3543.42	309.1123	0	3852.532	0.018302	0.001031	0	0.019333	0.558267	0.048701	0	0.606968
0.000166	0.00022	0	0	0	0	0.000213	0.000475	0.000689	0	0	0	0	0	0	0	0	0	0	0	0
0.059161	0.086827	0.016176	0.00214	0	0.018316	0.0433	0.169033	0.230649	5993.446	613.4854	0	6606.932	15.3027	2.019246	0	17.32195	1.221803	0.125063	0	1.346866
0.061132	0.067059	0.002176	0	1.77E-05	0.002194	0.01564	0.174662	0.192496	1257.027	0	3.38859	1260.415	0.001784	0	0.003491	0.005275	0.009915	0	0.004736	0.01465
0.006237	0.007361	0.0005	0	0	0.0005	0.002585	0.01782	0.020904	159.1218	0	0	159.1218	0.000331	0	0	0.000331	0.02507	0	0	0.02507
0.007711	0.011239	0	0	0	0	0.014111	0.022032	0.036143	0	0	0	0	0	0	0	0	0	0	0	0
0.450795	0.567692	0.022165	0	0	0.022165	0.382763	1.287986	1.692914	22105.13	0	0	22105.13	28.90501	0	0	28.90501	4.506274	0	0	4.506274

ROG_RUNI	ROG_IDLE	ROG_STRE	ROG_TOTE	ROG_DIUR	ROG_HOTS	ROG_RUNI	ROG_TOTA	TOG_RUNI	TOG_IDLE	TOG_STRE	TOG_TOTE	TOG_DIUR	TOG_HOTS	TOG_RUNI	TOG_TOTA	CO_RUNEX	CO_IDLEX	CO_STREX	CO_TOTEX	SOx_RUNE
0.169154	0	1.52E-05	0.169169	0.024462	0.00609	0.053879	0.253601	0.246829	0	1.66E-05	0.246845	0.024462	0.00609	0.053879	0.331277	8.807836	0	0.111	8.918836	0.001625
7.987134	25.01423	0	33.00136	0	0	0	33.00136	9.092744	28.47679	0	37.56954	0	0	0	37.56954	39.65122	364.2886	0	403.9399	9.194133
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.378714	0.297585	0	2.676299	0	0	0	2.676299	103.5163	17.60043	0	121.1167	0	0	0	121.1167	500.8074	56.0731	0	556.8805	0
65.84704	0	245.1067	310.9538	271.5089	73.20481	182.0654	837.733	96.08385	0	268.361	364.4449	271.5089	73.20481	182.0654	891.2241	5832.734	0	2397.481	8230.215	21.49556
0.351279	0	0	0.351279	0	0	0	0.351279	0.399908	0	0	0.399908	0	0	0	0.399908	4.406783	0	0	4.406783	0.03232
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.325976	0	3.209951	3.535927	2.519429	0.832723	0.751136	7.639215	0.475663	0	3.514493	3.990156	2.519429	0.832723	0.751136	8.093443	54.67877	0	24.43141	79.11019	0.332048
22.27842	0	45.76136	68.03979	65.00121	15.75473	46.85137	195.6471	32.50489	0	50.10288	82.60777	65.00121	15.75473	46.85137	210.2151	1075.004	0	431.5322	1506.537	1.81434
0.01822	0	0	0.01822	0	0	0	0.01822	0.020743	0	0	0.020743	0	0	0	0.020743	0.116107	0	0	0.116107	0.000241
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.001216	0	0.013299	0.014515	0.006145	0.002012	0.001737	0.02441	0.001774	0	0.014561	0.016335	0.006145	0.002012	0.001737	0.02623	0.205085	0	0.101222	0.306307	0.001241
36.82045	0	127.8042	164.6247	119.3109	29.8322	81.25467	395.0225	53.72553	0	139.9295	193.655	119.3109	29.8322	81.25467	424.0528	2769.242	0	1206.292	3975.534	10.38377
0.113349	0	0	0.113349	0	0	0	0.113349	0.12904	0	0	0.12904	0	0	0	0.12904	1.053881	0	0	1.053881	0.025849
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.037792	0	0.409479	0.447271	0.21007	0.065865	0.059651	0.782857	0.055147	0	0.448328	0.503474	0.21007	0.065865	0.059651	0.83906	6.363614	0	3.116602	9.480216	0.038544
6.453052	2.623951	15.31016	24.38716	20.71308	4.835095	27.01348	76.94882	9.416278	3.828863	16.7627	30.00784	20.71308	4.835095	27.01348	82.5695	260.5389	23.24191	275.1471	558.9278	1.40803
16.9267	0.450316	0	17.37701	0	0	0	17.37701	19.26992	0.512655	0	19.78257	0	0	0	19.78257	53.0289	3.732449	0	56.76135	0.729781
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.551551	0.445318	2.495282	3.49215	3.101839	0.720843	3.821745	11.13658	0.804821	0.649807	2.732019	4.186648	3.101839	0.720843	3.821745	11.83107	28.34711	3.913167	45.07109	77.33137	0.255958
6.545576	0.190915	0	6.736491	0	0	0	6.736491	7.451703	0.217344	0	7.669047	0	0	0	7.669047	17.6054	1.582402	0	19.1878	0.373292
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53.03532	0	20.79274	73.82805	39.83373	57.05191	60.09122	230.8049	63.51685	0	22.60441	86.12126	39.83373	57.05191	60.09122	243.0981	631.7582	0	122.4619	754.2201	0.088174
42.22544	0	138.9064	181.1318	122.5615	29.21362	86.09177	418.9987	61.57929	0	152.0846	213.6639	122.5615	29.21362	86.09177	451.5308	2512.121	0	1035.116	3547.238	9.379446
0.464064	0	0	0.464064	0	0	0	0.464064	0.528306	0	0	0.528306	0	0	0	0.528306	7.46929	0	0	7.46929	0.119805
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.025462	0	0.264154	0.289616	0.157716	0.05101	0.044794	0.543136	0.037154	0	0.289215	0.326369	0.157716	0.05101	0.044794	0.579889	4.278807	0	2.010515	6.289322	0.025951
0.499091	0	0.018326	0.517417	6.02378	1.437919	0.032707	8.011823	0.728272	0	0.020065	0.748337	6.02378	1.437919	0.032707	8.242743	14.56968	0	0.398474	14.96815	0.18957
0.307276	0	0	0.307276	0	0	0	0.307276	0.349813	0	0	0.349813	0	0	0	0.349813	1.378021	0	0	1.378021	0.040927
1.494315	0.527661	2.665909	4.687886	1.732351	0.373716	2.950649	9.744602	2.180502	0.769962	2.918835	5.869299	1.732351	0.373716	2.950649	10.92602	38.80125	7.555727	56.48075	102.8377	0.453968
3.208133	1.121091	0	4.329223	0	0	0	4.329223	3.652215	1.276276	0	4.928491	0	0	0	4.928491	14.01081	38.15363	0	52.16444	2.296506
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.021829	0.017075	0	0.038904	0	0	0	0.038904	1.559211	1.219655	0	2.778866	0	0	0	2.778866	6.610848	2.182609	0	8.793458	0
0.298329	0.09889	0.490656	0.887874	0.459982	0.102062	0.467191	1.917108	0.435321	0.1443	0.537206	1.116827	0.459982	0.102062	0.467191	2.146061	7.779226	0.766311	9.986178	18.53171	0.093565
0.358319	0.063202	0	0.421522	0	0	0	0.421522	0.407919	0.071951	0	0.47987	0	0	0	0.47987	1.227459	0.946042	0	2.1735	0.061904
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.004883	0.000653	0	0.005536	0	0	0	0.005536	0.348791	0.046634	0	0.395425	0	0	0	0.395425	1.55565	0.073312	0	1.628961	0
0.316939	1.141302	0.175189	1.63343	0.24923	0.054663	0.142871	2.080194	0.462477	1.665386	0.19181	2.319672	0.24923	0.054663	0.142871	2.766436	6.388062	8.822422	3.967685	19.17817	0.044936
0.394031	0.022202	0	0.416232	0	0	0	0.416232	0.448574	0.025275	0	0.473849	0	0	0	0.473849	0.940732	0.425522	0	1.366254	0.033554
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.218645	0.028851	0	0.247496	0	0	0	0.247496	15.61753	2.060788	0	17.67832	0	0	0	17.67832	50.60646	3.738563	0	54.34502	0
0.005028	0	0.012408	0.017436	0.008979	0.002207	0.007358	0.03598	0.007336	0	0.013586	0.020922	0.008979	0.002207	0.007358	0.039466	0.991143	0	0.486432	1.477576	0.012427
0.007127	0	0	0.007127	0	0	0	0.007127	0.008113	0	0	0.008113	0	0	0	0.008113	0.006767	0	0	0.006767	0.001508
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.494007	0	0	0.494007	0	0	0	0.494007	29.58813	0	0	29.58813	0	0	0	29.58813	403.8539	0	0	403.8539	0

SOx_IDLEX	SOx_STRE)	SOx_TOTE:	NH3_RUNI	Fuel Consumption
0	2.1E-05	0.001646	0.002778	17.55507
0.558656	0	9.752789	130.5873	92002.93
0	0	0	0	0
0	0	0	38.57561	8000.219
0	0.561293	22.05685	266.7237	235268.3
0	0	0.03232	0.044689	304.694
0	0	0	0	0
0	0.012663	0.344711	4.749089	3676.847
0	0.059965	1.874305	20.53448	19992.19
0	0	0.000241	0.000188	2.270239
0	0	0	0	0
0	5.6E-05	0.001297	0.019072	13.83037
0	0.295823	10.6796	111.1806	113913.4
0	0	0.025849	0.027604	243.6852
0	0	0	0	0
0	0.001873	0.040417	0.592046	431.1085
0.007335	0.023402	1.438766	10.31225	15346.53
0.005175	0	0.734957	25.83403	6928.746
0	0	0	0	0
0.00143	0.003904	0.261292	1.662775	2787.054
0.003509	0	0.376801	11.7962	3552.259
0	0	0	0	0
0	0.007677	0.095851	0.414544	1022.39
0	0.275705	9.655151	79.76031	102986.2
0	0	0.119805	0.091799	1129.452
0	0	0	0	0
0	0.001515	0.027467	0.399419	292.973
0	3.79E-05	0.189608	0.488896	2022.448
0	0	0.040927	0.574337	385.8343
0.002825	0.004784	0.461577	1.270958	4923.389
0.106567	0	2.403073	47.97325	22669.39
0	0	0	0	0
0	0	0	3.464216	342.8264
0.0005	0.000822	0.094887	0.256134	1012.113
0.001706	0	0.06361	1.021887	600.0646
0	0	0	0	0
0	0	0	0.680158	66.54798
0.002771	0.000241	0.047948	0.227446	511.4311
0.002927	0	0.036481	0.271743	344.1451
0	0	0	0	0
0	0	0	3.82484	763.6605
0	3.35E-05	0.01246	0.08522	132.9092
0	0	0.001508	0.035672	14.21429
0	0	0	0	0
0	0	0	11.64602	2555.015

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Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

April 8, 2022 Project No. 22-7455

Vanita Soni Puri
1423 Georgina Ave.,
Santa Monica, CA 90402

Subject: Preliminary Geotechnical Investigation Report, Northwest Corner of E. Colton Avenue and N. Wabash Avenue, Redlands, California 92374, APN 0168-291-02.

Vanita,

In accordance with your request and authorization, TGR Geotechnical, Inc. (TGR) has performed a preliminary geotechnical investigation for the proposed development at the subject site in the city of Redlands, California. The subject site is an approximately 9-acre, undeveloped parcel of land covered in grass and vegetation. It is our understanding that the proposed development will consist of 103 single family homes with associated streets, driveways, parking, and a central common open park space. This report presents the findings of our geotechnical investigation, including site seismicity, settlement potential, infiltration rates and provides geotechnical design recommendations for the proposed improvements. The work was performed in general accordance with our proposal dated March 7, 2022.

Based on our investigation the proposed development is feasible from a geotechnical viewpoint provided the recommendations presented in this report are implemented during design and construction.

If you have any questions regarding this report, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

TGR GEOTECHNICAL, INC.

Robert Aguilar
Staff Engineer

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SANJAY GOVIL
No. GE2382
EXP. 6/30/2022
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ATTACHMENTS

Plate 1 – Boring Location Map

Figure 1 – Site Location Map
Figure 2 – Regional Geology Map
Figure 3 – Regional Fault Map
Figure 4 – Seismic Hazard Zone Map

Table 1 – Percolation Test Worksheet

Appendix A – References
Appendix B – Log of Borings
Appendix C – Laboratory Testing Procedures and Results
Appendix D – Site Seismic Design and Deaggregated Parameters
Appendix E – Standard Grading Specifications

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INTRODUCTION

Site Descriptions and Proposed Project Development

The subject site is located on the northwest corner of E. Colton Avenue and N. Wabash Avenue in the city of Redlands, California (Figure 1). The subject site is an approximately 9-acre, undeveloped parcel of land covered in grass and vegetation. It is our understanding that the proposed development will consist of 103 single family homes with associated streets, driveways, parking, and a central common open park space. No grading plans were available at the time of this report. However, it is our understanding that minor cuts and fills will be required to reach design grades.

Scope of Work

The scope of work for this preliminary geotechnical investigation included the following:

- Site reconnaissance to assess current site conditions, mark boring locations and call Dig-Alert for utility clearance.
- Sampling and logging nine (9) borings utilizing a hollow stem drill rig to approximate depths ranging from 3 to 9 feet at the subject site to evaluate subsurface soil conditions. All borings encountered refusal due to cobbles. The borings were backfilled with cuttings and surface tamped.
- Percolation testing of the near surface soils at two (2) locations from depths of 5 to 9 feet below existing grade. The testing procedures followed the County of San Bernardino guidelines.
- Laboratory testing of selected samples to include in-situ moisture and dry density, maximum density and optimum moisture content, shear, consolidation, passing No. 200 sieve, corrosion series and R-value.
- Engineering analysis including infiltration rates, site seismicity, seismic settlement, foundation design and soils engineering/earthwork with respect to the suitability of the proposed development.
- Preparation of this report summarizing current subsurface soil conditions, findings, and presenting our recommendations for the proposed development.

Field Investigation

Field exploration was performed on March 15th, 2022 by members from our firm who logged the borings and obtained representative samples, which were subsequently transported to the laboratory for further review and testing. The approximate locations of the borings are indicated on the enclosed Boring Location Map (Plate 1).

The subsurface conditions were explored by drilling, sampling, and logging nine (9) borings with a truck mounted hollow stem auger drill rig. Borings B-1 through B-9 were advanced to approximate depths ranging from 3 to 9 feet below existing grade. All borings encountered refusal in cobbles and/or boulders. Subsequent to drilling, all borings were backfilled with excavated soil and surface tamped. The log of borings presenting soil conditions and descriptions are presented in Appendix B.

The drill rig was equipped with a sampling apparatus to allow for recovery of driven modified California Ring Sampler (CRS), 3-inch outside diameter, and 2.42-inch inside diameter and SPT samples.

The samples were driven using an automatic 140-pound hammer falling freely from a height of 30 inches. The blow counts for CRS were converted to equivalent SPT blow counts. Soil descriptions were entered on the logs in general accordance with the Unified Soil Classification System (USCS). Driven samples and bulk samples of the earth materials encountered at selected intervals were recovered from the borings. The locations and depths of the soil samples recovered are indicated on the boring logs in Appendix B.

Two (2) percolation test borings, B-5/P-1 and P-2, were advanced to an approximate depth of 9 feet below existing ground surface and percolation testing was performed at depths of approximately 5 to 9 feet below existing grade. Subsequent to percolation testing the borings were backfilled with excavated soils and surface tamped.

Percolation Testing

Upon completion of drilling and sampling Borings B-5/P-1 and P-2 were converted into a field percolation test well. Field percolation testing was performed in general accordance with the with the San Bernardino Technical Guidance for WQMP for sandy soils.

The boreholes were converted to field percolation test wells by placing approximately two inches of gravel at the bottom of the borehole, installing three-inch diameter PVC pipes and backfilling the annular space with gravel. A correction factor was applied to account for the placement of gravel.

Infiltration test rates were determined utilizing the referenced County of San Bernardino guidelines. Results of the infiltration testing are summarized in Table 1 below:

Table 1 – Infiltration Rates

Test Location	Test Depth (feet)	Infiltration Rate (Inches/hour)
B-5/P-1	5-9	10.45
P-2	5-9	7.98

Suitability Assessment Safety Factor

Factor values (v), for Factor Category A, were assigned according to the San Bernardino Technical Guidance Document for WQMP, VII.4.

Table 2 (below) presents assigned factor values and the calculated Suitability Assessment Safety Factor (Σp) in Worksheet H from the San Bernardino Technical Guidance Document for WQMP Appendix VII.

Table 2 – Worksheet H

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w * v
A	Suitability Assessment	Soil assessment methods	0.25	2	0.50
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.25

The above values should be used in conjunction with Factor Category B parameters (to be determined by others) as specified in Worksheet H of the San Bernardino Technical Guidance Document for WQMP Appendix VII to evaluate the combined safety factor that should be applied to the tested infiltration rates.

Laboratory Testing

Laboratory tests were performed on representative samples to verify the field classification of the recovered samples and to evaluate the geotechnical properties of the subsurface soils. The following tests were performed:

- In-situ Moisture Content (ASTM D2216) and Dry Density (ASTM D7263);
- Maximum Dry Density and Optimum Moisture Content (ASTM D1557);
- Direct Shear Strength (ASTM D3080);
- Consolidation (ASTM D2435);
- Expansion Potential (ASTM D4829);
- Passing No. 200 Sieve (ASTM 1140);
- R-value (CAL 301); and
- Corrosion series:
    1. Soluble Sulfate (CAL.417A);
    2. Soluble Chlorides (CAL.422);
    3. Minimum Resistivity (CAL.643); and
    4. pH (CAL 747)

Laboratory tests for geotechnical characteristics were performed in general accordance with the ASTM procedures. The results of the in-situ moisture content and density tests are shown on the borings logs. The results of other laboratory tests are presented in Appendix C.

GEOTECHNICAL FINDINGS

Geology

Regional Geologic Setting

The project site is located in the east central portion of the Redlands 7.5-minute quadrangle, San Bernardino County, California. Per the Geologic Map of the Harrison Mountain/north ½ of Redlands quadrangle, California (Dibblee, 2004), the subject site is underlain by Quaternary alluvium, consisting of gravel and sand of stream channels. Figure 2 presents the Regional Geology Map.

Earth Units

Based on our subsurface investigation, the subject area is generally underlain by approximately 5 feet of light brown silty sand, with some gravel in a dry condition. The silty sand is underlain by sand, gravel and cobbles to an approximate depth of 9 feet below existing grade, the maximum depth explored. Detailed descriptions of the earth units encountered in our borings are presented in the log of the borings. (Appendix B)

Groundwater

Subsurface water was not encountered to a depth of approximately 9 feet below existing grade during the subsurface exploration.

USGS groundwater data from wells nearest to the subject site indicate a historic high groundwater of between 49 feet below existing grade and 1601 feet above NGVD 1929 (USGS 340346117080001 001S002W30C001S).

Seasonal and long-term fluctuations in the groundwater may occur as a result of variations in subsurface conditions, rainfall, run-off conditions and other factors. Therefore, variations from our observations may occur. Static groundwater is not anticipated to impact the proposed development.

Static groundwater is not anticipated to impact the proposed development.

Expansive Soil

Onsite soils have a tested expansion index of 0, correlating to a “very low” expansion potential. The recommendations provided in this report account for the expansion potential of the onsite soils.

Hydro Collapse

Laboratory testing indicates near surface soils undergo approximately 1% to 2% hydro collapse when inundated under load, correlating to a “low” potential for hydro collapse. The recommendations in this report account for the hydro collapse potential of near surface soils.

Cement Type and Corrosion

Based on laboratory testing concrete used should be designed in accordance with the provisions of ACI 318-14, Chapter 19 for Exposure Class S0: Cement with a minimum unconfined compressive strength of 2,500 psi, and for Exposure Class C1 (Moderate) – Concrete exposed to moisture but not a significant source of chlorides, per ACI 318-14 Table 19.3.1.1.

Corrosion tests indicate a mild corrosion potential for ferrous metals exposed to site soils.

TGR does not practice corrosion engineering. If needed, a qualified specialist should review the site conditions and evaluate the corrosion potential of the site soil to the proposed improvements and to provide the appropriate corrosion mitigations for the project.

Seismic Review

Faulting and Seismicity

The subject site, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. The principal source of seismic activity is movement along the northwest-trending regional faults such as the San Andreas, San Jacinto and Elsinore fault zones. These fault systems produce approximately 5 to 35 millimeters per year of slip between the plates.

We consider the most significant geologic hazard to be the potential for moderate to strong seismic shaking that is likely to occur at the subject site. The subject site is located in the highly seismic Southern California region within the influence of several faults that are considered to be Holocene-active or pre-Holocene faults. A Holocene-active fault is defined by the State of California as a fault that has exhibited surface displacement within the Holocene time (about the last 11,700 years). A pre-Holocene fault is defined by the State as a fault whose history of past movement is older than 11,700 years ago and does not meet the criteria for a Holocene-active fault.

These Holocene-active and pre-Holocene faults are capable of producing potentially damaging seismic shaking at the site. It is anticipated that the subject site will periodically experience ground acceleration as the result of small to moderate magnitude earthquakes. Other active faults without surface expression (blind faults) or other potentially active seismic sources that are not currently zoned and may be capable of generating an earthquake are known to be present under in the region.

The subject site is not included within any Earthquake Fault Zones as created by the Alquist-Priolo Earthquake Fault Zoning Act (Hart, 1997). Our review of geologic literature pertaining to the site area indicates that there are no known active or potentially active faults located within or immediately adjacent to the subject property.

The nearest fault to the subject site is the Redlands fault mapped approximately 0.7 miles southeast of the site. Other nearby faults include the Reservoir Canyon fault mapped approximately 1.6 miles to the southeast of the site, the Crafton Hills fault mapped approximately 2.9 miles southeast of the site, the Western Heights fault mapped approximately 3.1 miles southeast of the site, the South Branch San Andreas fault mapped approximately 3.1 miles northeast of the site, the Chicken Hill fault mapped approximately 4.3 miles southeast of the site, the Live Oak Canyon fault mapped approximately 4.4 miles southwest of the site, the Mill Creek fault mapped approximately 5.1 miles northeast of the site and the Loma Linda fault mapped approximately 5.6 miles to the southwest of the site. The Regional Fault Map, Figure 3, shows the location of the subject site in respect to the regional faults.

Secondary Seismic Hazards

Surface Fault Rupture and Ground Shaking

Since no known faults are located within the site, surface fault rupture is not anticipated. However, due to the close proximity of known active and potentially active faults, severe ground shaking should be expected during the life of the proposed structures.

Liquefaction

Liquefaction is a seismic phenomenon in which loose, saturated, fine-grained granular soils behave similarly to a fluid when subjected to high-intensity ground shaking. Liquefaction occurs when these ground conditions exist: 1) Shallow groundwater; 2) Low density, fine, clean sandy soils; and 3) High-intensity ground motion. Effects of liquefaction can include sand boils, settlement, and bearing capacity failures below foundations.

A review of the San Bernardino County General Plan: Geologic Hazard Overlays, Map FH31C indicates that the subject site is not located within an area mapped as having a potential for earthquake induced liquefaction (Figure 4).

Based on the above and depth to groundwater, potential for liquefaction is considered to be negligible.

Seismically Induced Settlement

Ground accelerations generated from a seismic event can produce settlements in sands or in granular earth materials both above and below the groundwater table. This phenomenon is often referred to as seismic settlement and is most common in relatively clean sands, although it can also occur in other soil materials. Based on the nature and density of site soils encountered, seismic settlement is anticipated to be negligible.

Landsliding

Landsliding involves downhill motion of earth materials during or subsequent to earth shaking. Historically, landslides triggered by earthquakes have been a significant cause of damage. Areas that are most susceptible to earthquake induced landslides are areas with steep slopes in poorly cemented or highly fractured bedrock, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits.

A review of the San Bernardino County General Plan: Geologic Hazard Overlays, Map FH31C, this property is not located within a mapped zone of landsliding and adjacent areas are situated on relatively flat topography. Based on the above, the general landslide susceptibility is considered to be negligible.

Lateral Spreading

Seismically induced lateral spreading involves primarily movement of earth materials due to earth shaking. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. The topography in the vicinity of the subject site is relatively flat. Based on the above and absence of liquefaction, the potential for lateral spreading at the subject site is considered very low.

DISCUSSIONS AND CONCLUSIONS

General

Based on our field exploration, laboratory testing and engineering analysis, it is our opinion that the proposed structure and proposed grading will be safe against hazard from landslide, settlement, or slippage and the proposed construction will have no adverse effect on the geologic stability of the adjacent properties provided our recommendations presented in this report are followed.

Conclusions

Based on our findings and analyses, the subject site is likely to be subjected to moderate to severe ground shaking due to the proximity of known active and potentially active faults. This may reasonably be expected during the life of the structure and should be designed accordingly.

The primary conditions affecting the proposed project site development are as follows:

- Potential for caving during excavation.
- The site is underlain by alluvium composed of gravels, cobbles, and boulders in a sandy matrix. As such, oversized materials are anticipated to be encountered during grading operations.

The engineering evaluation performed concerning site preparation and the recommendations presented are based on information provided to us and obtained by us during our office and fieldwork. This report is prepared for the development of 103 single family homes with associated streets, driveways, parking, and a central common open park space. In the event that any significant changes are made to the proposed development, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the recommendations of this report are verified or modified in writing by TGR.

RECOMMENDATIONS

Seismic Design Parameters

When reviewing the 2019 California Building Code the following data should be incorporated into the design.

Parameter	Value
Latitude (degree)	34.0638
Longitude (degree)	-117.1400
Site Class	D – Stiff Soil
Site Coefficient, F_a	1.0
Site Coefficient, F_v	N/A
Mapped Spectral Acceleration at 0.2-sec Period, S_s	1.914 g
Mapped Spectral Acceleration at 1.0-sec Period, S_1	0.789 g
Spectral Acceleration at 0.2-sec Period Adjusted for Site Class, S_{MS}	2.914 g
Spectral Acceleration at 1.0-sec Period Adjusted for Site Class, S_{M1}	N/A
Design Spectral Acceleration at 0.2-sec Period, S_{DS}	1.276 g
Design Spectral Acceleration at 1.0-sec Period, S_{D1}	N/A

Site Specific Response Spectra

The USGS Unified Hazard tool, the USGS RTGM Calculator and the USGS App for Deterministic Spectra Acceleration were utilized to develop site specific ground motion spectra. The analysis was performed utilizing the following attenuation relationships that are part of NGA as required by 2019 CBC code requirements.

- Campbell & Bozorgnia (2014)
- Boore, Stewart, Seyhan & Atkinson (2014)
- Chiou & Youngs (2014)
- Abrahamson, Silva & Kamal (2014)

The results of the Site Specific Response Spectra are incorporated in Table 1 and on Figure 1 in Appendix D. The results include deterministic spectra at 5% damping, maximum rotated component at 0.84 fractile and the probabilistic spectra, maximum rotated component at 5% damping for a return period of 2475 year and subsequently multiplied by risk coefficient to obtain the MCER probabilistic spectral acceleration. The Vs30 utilized was 260 m/s.

The probabilistic response spectrum was determined using the OSHPD generated seismic values and raw output generated from the U.S. Geological Survey Unified Hazard Tool. The spectral response acceleration data generated from the U.S. Geological Survey Unified Hazard Tool was entered into the U.S. Geological Survey Risk-Targeted Ground Motion Calculator tool for each time period. The data is presented on Table 2 in Appendix D.

The deterministic response spectrum was determined using the greatest Deaggregation Contributor from the U.S. Geological Survey Unified Hazard Tool. The largest contributing fault parameters were entered into the Pacific Earthquake Engineering Research Center NGAW2 tool with a user defined sigma + 5% damping. For the deterministic analysis for the subject site, the fault utilized was the San Andreas (San Bernardino S) fault, with a characteristic magnitude M of 7.47 and a fault distance R of 5.81 km. The data is presented on Table 3 in Appendix D.

The above generated spectral accelerations were compared against the minimum code requirements in ASCE7-16 (Chapters 11 and 21) resulting in the final design response spectra which is presented in Table 1 and on Figure 1 in Appendix D.

Based on Table 1 and Figure 1, the recommended Site Specific S_{DS} and S_{D1} are as follows:

S_{DS} = 1.211
S_{D1} = 1.409

Mapped values may be used in lieu of site-specific values to design structures on Site Class D sites with an S1 greater than or equal to 0.2, provided the value of the seismic response coefficient Cs is determined by Eq. (12.8-2) for values of T ≤ 1.5Ts and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for TL ≥ T > 1.5Ts or Eq. (12.8-4) for T > TL.

The structural consultant should review the above parameters and the 2019 California Building Code to evaluate the seismic design.

Conformance to the criteria presented in the above table for seismic design does not constitute any type of guarantee or assurance that significant structural damage or ground failure will not occur during a large earthquake event. The intent of the code is “life safety” and not to completely prevent damage of the structure, since such design may be economically prohibitive.

Foundation Design Recommendations

The proposed residential structures may be supported on continuous and/or spread footings. Bearing capacity recommendations for shallow foundations are presented below. These recommendations assume that the footings will be supported on a minimum of two (2) feet of engineered fill.

For foundations supported on two (2) feet of engineered fill with minimum ninety (90) percent relative compaction at near optimum moisture content, an allowable bearing pressure of 2,500 pounds per square foot may be used in design.

The allowable bearing pressure for shallow foundations supported on minimum ninety (90) percent compacted fill shall be equal to 2,000 pounds per square foot. The recommended minimum footing depth is twelve (12) inches for single story structures and eighteen (18) inches for 2-story structures.

The minimum recommended continuous footing width is fifteen (15) inches for single story structures, eighteen (18) inches for 2-story structures and twenty-four (24) inches for pad footings. A minimum reinforcement of two (2) No. 4 steel bar top and two (2) No. 4 steel bar bottom is required for continuous footings from a geotechnical viewpoint. Foundation design details such as concrete strength, reinforcements, etc should be established by the Structural Engineer.

A one-third (1/3) increase on the aforementioned bearing pressure may be used in design for short-term wind or seismic loads.

The total and differential static settlement is anticipated to be 1 inch and 0.5 inches over 30 feet or less.

Resistance to lateral loads including wind and seismic forces may be provided by frictional resistance between the bottom of concrete and the underlying fill soils and by passive pressure against the sides of the foundations. A coefficient of friction of 0.43 may be used between concrete foundation and underlying soil. The recommended passive pressure of the engineered fill may be taken as an equivalent fluid pressure of 300 pounds per cubic foot (3,000 psf max).

Footings located near property lines where the lateral removal cannot be achieved shall be designed for a reduced bearing capacity of 1,500 pounds per square foot and the passive resistance shall be ignored.

Slab-On-Grade

Slab-on-grade should be a minimum of five (5) inches thick and reinforced with a minimum of No. 4 reinforcing bar on 18-inch centers in two horizontally perpendicular directions. Reinforcing should be properly supported to ensure placement near the vertical midpoint of the slab. "Hooking" of the reinforcement is not considered an acceptable method of positioning the steel. The slab should not be structurally connected to the buildings.

Subgrade material for the slab-on-grade should be compacted to a minimum of ninety (90) percent of the maximum laboratory dry density to a minimum depth of two (2) feet. Prior to placement of concrete, the subgrade soils should be moistened to near optimum moisture content and verified by our field representative.

The actual thickness and reinforcement of the slab shall be designed by the structural engineer per the 2019 California Building Code.

For moisture sensitive flooring, the floor slab should be underlain by an impermeable polyethylene membrane (Stego Wrap, Moistop Plus, or any equivalent meeting the requirements of ASTM D1745) as a capillary break. The membrane shall be a minimum 10-mil thick and overlain and underlain by a minimum of 2-inch thick layer of moistened (not saturated) sand to both protect the membrane and provide proper concrete curing. The polyethylene membrane joints should be lapped not less than 6 inches.

Flatwork

Flatwork should be a minimum of four (4) inches thick should be reinforced with a minimum of No. 3 reinforcing bar on 24-inch centers in two horizontally perpendicular directions. Reinforcing should be properly supported to ensure placement near the vertical midpoint of the slab. "Hooking" of the reinforcement is not considered an acceptable method of positioning the steel. The subgrade material should be compacted to a minimum of ninety (90) percent of the maximum laboratory dry density (ASTM D1557) to a minimum depth of one (1) foot. Prior to placement of concrete, the subgrade soils should be moistened to near percent of optimum moisture content and verified by our field representative. The actual thickness and reinforcement of the slab shall be designed by the structural engineer and should include the anticipated loading condition.

Retaining Wall Recommendations

The following soil parameters may be used for the design of the retaining wall with level backfill and a maximum height of six (6) feet:

Conditions	Parameters
Active (Level)	35 psf/ft
Passive	300 (maximum 3,000 psf)
Friction Coefficient	0.43

- Unrestrained retaining wall, such as a cantilever wall, the active earth pressure shall be used.
- Any import backfill shall be granular non-expansive select fill with a minimum sand equivalent of 30 The import fill should be tested and approved by TGR prior to backfill.
- An allowable coefficient of friction between properly compacted on-site fill soil and concrete of 0.43 may be used with the dead-load forces.
- Passive pressure and frictional resistance could be combined in determining the total lateral resistance. However, one of them shall be reduced by 50 percent.
- The passive pressure in the upper 6 inches of soil not confined by slabs or pavement should be neglected.

Retaining structures should be provided with a drainage system to prevent buildup of hydrostatic pressure behind the walls. Provisions should be made to collect and dispose of excess water away from the wall. Wall drainage may be provided by a perforated pipe encased in gravel or crushed rock and enclosed by geo-synthetic filter fabric. We do not recommend omitting the drains behind walls.

In addition to the above lateral forces due to retained earth, surcharge due to improvements, such as an adjacent structure, should be considered in the design of the retaining wall. A minimum vertical surcharge load of 300 psf should be used in design of walls due to adjacent traffic unless the traffic is kept at least 6 feet from the walls. Loads applied within a 1:1 projection from any surcharging structure on the stem of the wall shall be considered as lateral surcharge.

For uniform lateral surcharge conditions applied to free-to-deflect walls and restrained walls, we recommend utilizing a minimum horizontal load equal to 33 percent and 50 percent of the vertical load, respectively, and should be applied uniformly over the entire height of the wall. This horizontal load should be applied below the 1:1 projection plane. To minimize the surcharge load from an adjacent footing, deepened footings may be considered.

Retaining wall footings should have a minimum embedment of twenty-four (24) inches below the lowest adjacent grade. The retaining walls footings shall be supported on a minimum two (2) feet of compacted engineered fill compacted to a minimum ninety (90) percent relative compaction as per ASTM D1557.

Shrinkage/Subsidence

Removal and recompaction of the near surface soils is estimated to result in shrinkage ranging from 5 to 10 percent. Based on our previous experience with similar projects, additional volume loss can be anticipated due to the presence of oversized materials in the near surface soils. Minor ground subsidence is expected to occur in the soils below the zone of removal, due to settlement and machinery working. The subsidence is estimated to be between one and two tenths of a foot.

Site Development Recommendations

General

During earthwork construction, all site preparation and the general procedures of the contractor should be observed, and the fill selectively tested by a representative of TGR. If unusual or unexpected conditions are exposed in the field, they should be reviewed by this office and if warranted, modified and/or additional recommendations will be offered. During demolition of the existing buildings, large concrete slab and associated site work, voids created from removal of buried elements (footings, pipelines, septic pits, etc.) shall be backfilled with engineered fill to a minimum ninety (90) percent relative compaction per ASTM D1557 under the observation of TGR.

Grading

All grading should conform to the guidelines presented in the California Building Code (2019 edition), except where specifically superseded in the text of this report. Prior to grading, TGR's representative should be present at the pre-construction meeting to provide grading guidelines, if needed, and review any earthwork. Oversize particles may be encountered during grading. All particles greater than 4-inches shall be removed and disposed offsite.

Oversized materials may be crushed to 1" minus and mixed with onsite soil in a controlled manner as recommended by the geotechnical consultant and used as engineered fill.

The footings and slab-on-grade shall be supported on a minimum two (2) feet of engineered fill. A minimum one (1) foot of engineered fill is recommended under flatwork and pavement. Site soils may be reused as engineered fill provided, they are free of oversized particles and the recommendations presented in this report are implemented. Exposed bottoms should be scarified a minimum of 6-inches, moisture conditioned to near optimum moisture and compacted to a minimum ninety (90) percent relative compaction. Subsequently, site fill soils should be re-compacted to a minimum of ninety (90) percent relative compaction at near optimum moisture content. The lateral extent of removals beyond the building/structure/footing limits should be equal to at least 5 feet.

The depth of over-excavation should be reviewed by the Geotechnical Consultant during the actual construction. Any subsurface obstruction buried structural elements, and unsuitable material encountered during grading, should be immediately brought to the attention of the Geotechnical Consultant for proper exposure, removal and processing, as recommended.

Fill Placement

Prior to any fill placement TGR should observe the exposed surface soils. The site soils may be re-used as engineered fill provided, they are free of organic content and particle size greater than 4-inches. All particles greater than 4-inches shall be removed and disposed offsite. Fill shall be moisture conditioned to near optimum moisture and compacted to a minimum relative compaction of ninety (90) percent in accordance with ASTM D1557. Any import soils shall be non-expansive and approved by TGR Geotechnical Inc.

Compaction

Prior to fill placement, the exposed surface should be scarified to a minimum depth of six (6) inches, fill placed in eight (8) inch loose lifts moisture conditioned to near optimum moisture and compacted to a minimum relative compaction of ninety (90) percent in accordance with ASTM D1557.

Trenching

All excavations should conform to CAL-OSHA and local safety codes.

Temporary Excavation and Shoring

Due the dry, granular nature of onsite soils, all cuts shall be properly shored or sloped back to at least 1.H:1V (Horizontal: Vertical) or flatter. Some sloughing may be anticipated due to the granular nature of site soils. The exposed slope face should be kept moist (but not saturated) during construction to reduce local sloughing. No surcharge loads should be permitted within a horizontal distance equal to the height of cut from the toe of excavation unless the cut is properly shored. Excavations that extend below an imaginary plane inclined at 45 degrees below the edge of any nearby adjacent existing site facilities should be properly shored to maintain foundation support at the adjacent structures.

Utility Trench Backfill

All utility trench backfills in structural areas and beneath hardscape features should be brought to near optimum moisture content and compacted to a minimum relative compaction of ninety (90) percent of the laboratory standard. Flooding/jetting is not recommended.

Sand backfill, (unless trench excavation material), should not be allowed in parallel exterior trenches adjacent to and within an area extending below a 1:1 plane projected from the outside bottom edge of the footing. All trench excavations should minimally conform to CAL-OSHA and local safety codes. Soils generated from utility trench excavations may be used provided it is moisture conditioned and compacted to ninety (90) percent minimum relative compaction.

Drainage

Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope or retaining wall. 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/parking or other approved area. Roof gutters and down spouts should be utilized to control roof drainage. Down spouts should outlet a minimum of 5 feet from the proposed structure or into an approved subsurface drainage system. 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.

Preliminary Pavement Design

The Caltrans method of design was utilized to develop the following asphalt pavement section. The section was developed based on a tested “R-Value” for compacted site subgrade soils of 73.

Traffic indices of 4.5, 5 and 6 were assumed for use in the evaluation of the asphalt pavement sections. The traffic indices are subject to approval by controlling authorities and shall be approved by the project civil engineer.

ASPHALT PAVEMENT SECTION			
Traffic Index	Asphalt (Inch)	Aggregate Base (Inch)	Total (Inch)
4.5	3.0	4.0	7.0
5.0	3.0	6.0	9.0
6.0	4.0	6.0	10.0

Aggregate base material for Asphalt Pavement should consist of CAB/CMB complying with the specifications in Section 200-2.2/200-2.4 of the current "Standard Specifications for Public Works Construction" and should be compacted to at least ninety-five (95) percent of the maximum dry density (ASTM D1557). The surface of the base should exhibit a firm and unyielding condition just prior to the placement of asphalt concrete paving. The asphalt concrete shall be compacted to a minimum of ninety-five (95) percent relative compaction.

The pavement subgrade should be constructed in accordance with the recommendations presented in the grading section of this report.

The R-value and the associated pavement section should be confirmed at the completion of site grading.

Geotechnical Review of Plans

All grading and foundation plans should be reviewed and accepted by the geotechnical consultant prior to construction. If significant time elapses since preparation of this report, the geotechnical consultant should verify the current site conditions, and provide any additional recommendations (if necessary) prior to construction.

Geotechnical Observation/Testing During Construction

Per sections 1705.6 and table 1705.6 of the 2019 California Building Code, periodic special inspection shall be performed to:

- Verify materials below shallow foundations are adequate to achieve the design bearing capacity;
- Verify excavations are extended to the proper depth and have reached proper material;
- Verify classification and test compacted materials; and
- Prior to placement of compacted fill, inspect subgrade and verify that the site has been prepared properly.

Per sections 1705.6 and table 1705.6 of the 2019 California Building Code, continuous special inspection shall be performed to:

- Verify use of proper materials, densities and lift thickness during placement and compaction of compacted fill.

The geotechnical consultant should also perform observation and/or testing at the following stages:

- During any grading and fill placement;
- After foundation excavation and prior to placing concrete;
- Prior to placing slab and flatwork concrete;
- During placement of aggregate base and asphalt or Portland cement concrete; and
- When any unusual soil conditions are encountered during any construction operation subsequent to issuance of this report.

Limitations

This report was prepared for a specific client and a specific project, based on the client's needs, directions and requirements at the time.

This report was necessarily based upon data obtained from a limited number of observances, site visits, soil and/or other samples, tests, analyses, histories of occurrences, spaced subsurface exploration and limited information on historical events and observations. Such information is necessarily incomplete. Variations can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time.

This report is not authorized for use by and is not to be relied upon by any party except the client with whom TGR contracted for the work. Use or reliance on this report by any other party is that party's sole risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify TGR from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of TGR.



B-9 APPROXIMATE LOCATION OF EXPLORATORY BORING

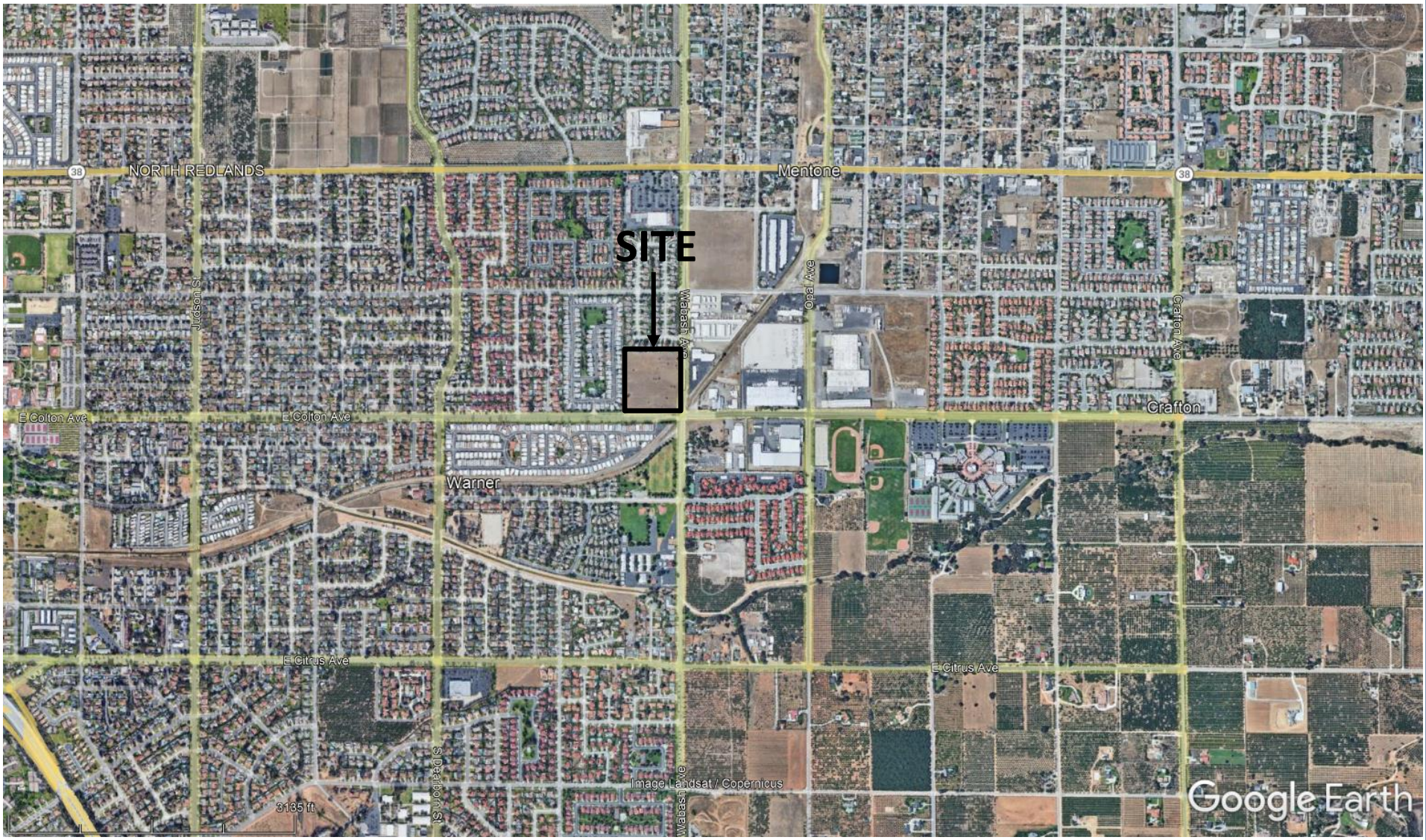
P-2 APPROXIMATE LOCATION OF PERCOLATION BORING

TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

BORING LOCATION MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

PLATE 1

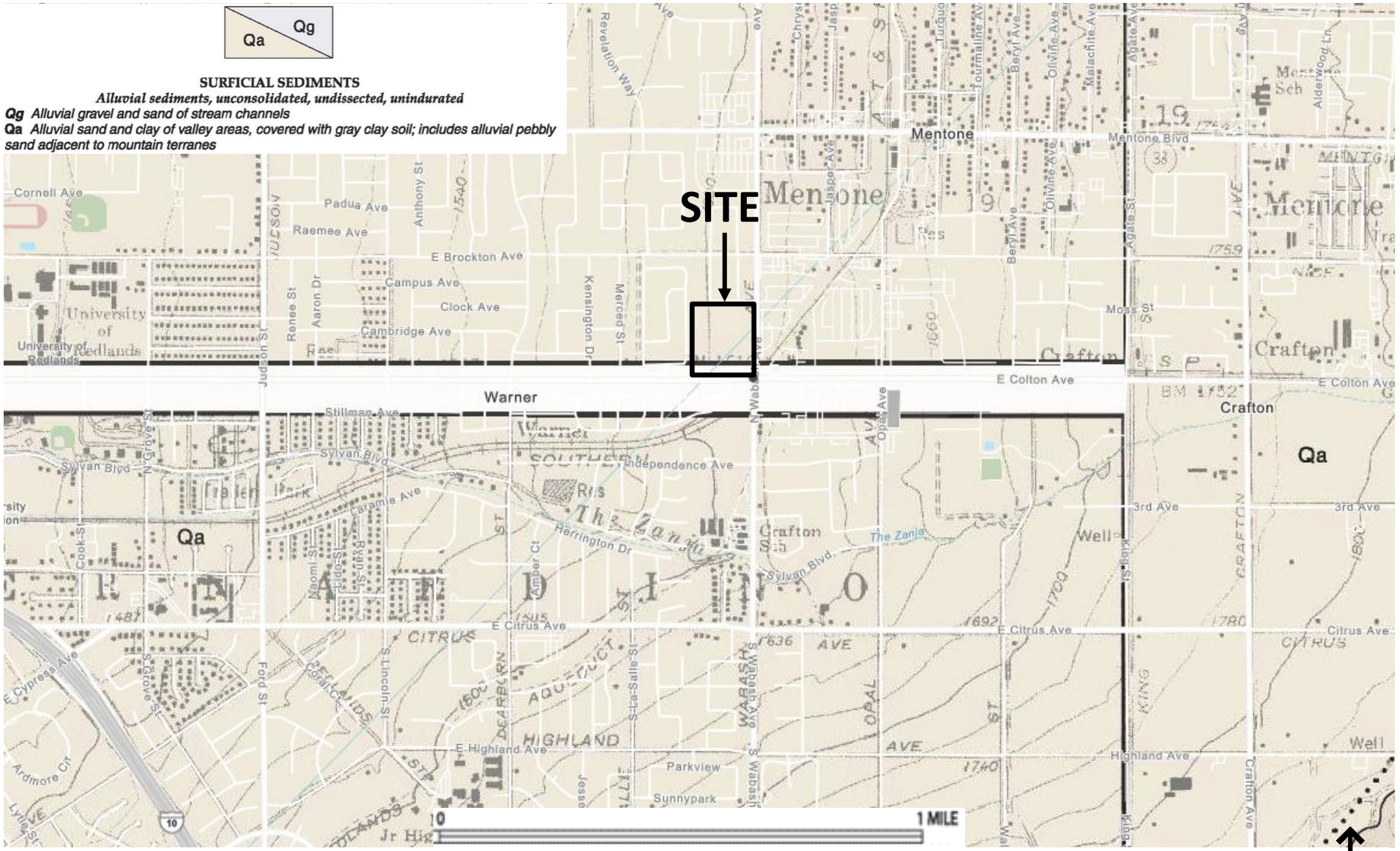


TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

SITE LOCATION MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 1



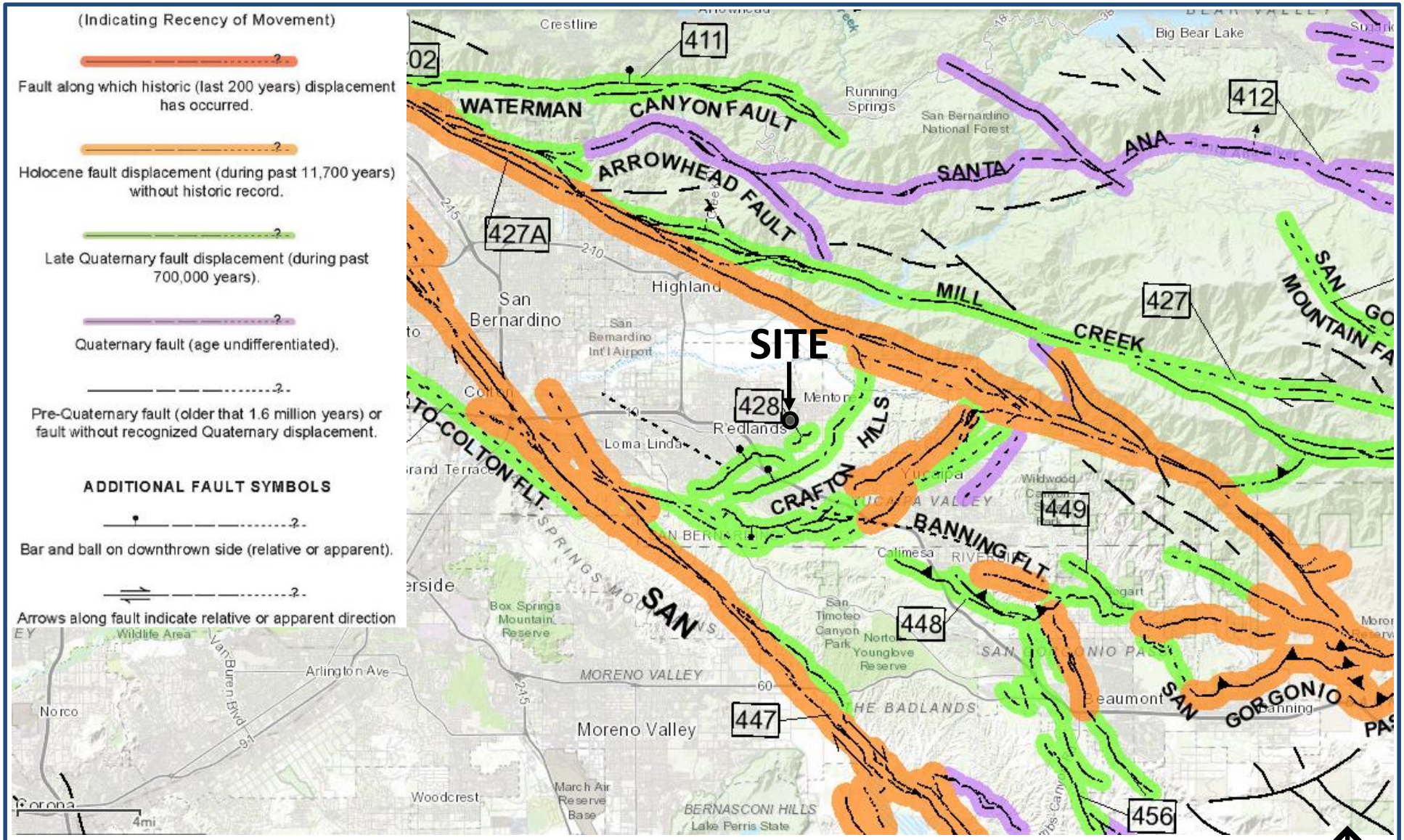
Modified From: Dibblee, T.W., and Minch, J.A., 2004, Geologic map of the Harrison Mountain/north 1/2 of Redlands quadrangles, San Bernardino and Riverside County, California: Dibblee Geological Foundation, DF-126, scale 1:24,000.

TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

REGIONAL GEOLOGY MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 2



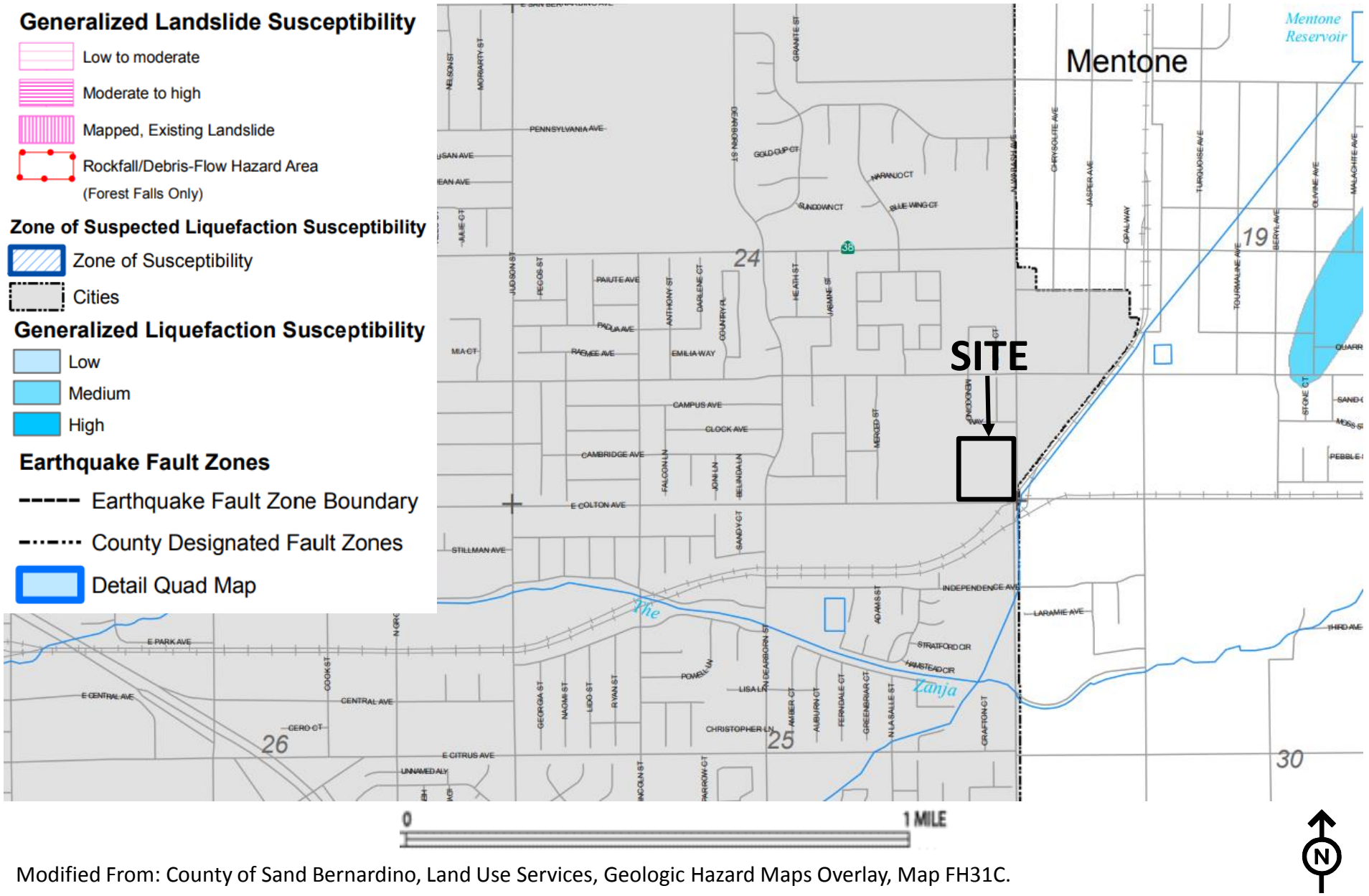
Modified From: Jennings, C. W., 2010, Fault Activity Map of California and Adjacent Areas, California Division of Mines and Geology, Geologic Data Map Series, No. 6, Scale 1:750,000.

TGR
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Environmental
Hydrogeology
Material Testing
Construction Inspection

REGIONAL FAULT MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 3



Modified From: County of Sand Bernardino, Land Use Services, Geologic Hazard Maps Overlay, Map FH31C.

TGR
Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

GEOLOGIC HAZARDS MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 4

Test Hole	Total Depth (in)	Initial Depth (in)	Final Depth (in)	ΔWater Level (in)	Initial Time (min)	Final Time (min)	Δ Time (min)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Gravel Factor	Infiltration Rate (in/hr)
P-1/B-5	108	70.20	96.96	26.76	0.0	5.0	5.0	37.80	11.04	24.42	0.54	13.13
	108	62.76	89.88	27.12	0.0	5.0	5.0	45.24	18.12	31.68	0.54	10.44
	108	63.60	91.44	27.84	0.0	5.0	5.0	44.40	16.56	30.48	0.54	11.11
	108	62.64	89.76	27.12	0.0	5.0	5.0	45.36	18.24	31.80	0.54	10.40
	108	64.08	91.32	27.24	0.0	5.0	5.0	43.92	16.68	30.30	0.54	10.93
	108	63.00	90.00	27.00	0.0	5.0	5.0	45.00	18.00	31.50	0.54	10.45
P-2	108	64.44	92.52	28.08	0.0	5.0	5.0	43.56	15.48	29.52	0.54	11.55
	108	64.56	89.88	25.32	0.0	5.0	5.0	43.44	18.12	30.78	0.54	10.01
	108	63.84	85.20	21.36	0.0	5.0	5.0	44.16	22.80	33.48	0.54	7.80
	108	62.76	84.36	21.6	0.0	5.0	5.0	45.24	23.64	34.44	0.54	7.68
	108	64.20	84.96	20.76	0.0	5.0	5.0	43.80	23.04	33.42	0.54	7.60
	108	63.60	85.44	21.84	0.0	5.0	5.0	44.40	22.56	33.48	0.54	7.98

$$I_t = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

ΔH = Change in height

Δt = Time interval

r = Radius

I_t Infiltration Rate

H_{ave} Average Head Height over the time interval

APPENDIX A
REFERENCES

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APPENDIX A

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APPENDIX B
LOG OF BORINGS

TGR GEOTECHNICAL
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THE FOLLOWING DESCRIBES THE TERMS AND SYMBOLS USED ON THE LOG OF BORINGS TO SUMMARIZE THE RESULTS OBTAINED IN THE FIELD INVESTIGATION AND SUBSEQUENT LABORATORY TESTING

DENSITY AND CONSISTENCY

The consistency of fine grained soils and the density of coarse grained soils are described on the basis of the Standard Penetration Test as follows:

COARSE GRAINED SOILS		ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (Tsf)	FINE GRAINED SOILS	
Very Loose	< 4	< 0.25	Very Soft	< 2
Loose	4 – 10	0.35 – 0.50	Soft	2 – 4
Medium	10 – 30	0.50 – 1.0	Firm (Medium)	4 – 8
Dense	30 – 50	1.0 – 2.0	Stiff	8 – 15
Very Dense	> 50	2.0 – 4.0	Very Stiff	15 – 30
		> 4.0	Hard	> 30

PARTICLE SIZE DEFINITION (As per ASTM D2487 and D422)

Boulder	⇒ Larger than 12 inches	Coarse Sands	⇒ No. 10 to No. 4 sieve
Cobbles	⇒ 3 to 12 inches	Medium Sands	⇒ No. 40 to No. 10 sieve
Coarse Gravel	⇒ 3/4 to 3 inches	Fine Sands	⇒ No. 200 to 40 sieve
Fine Gravel	⇒ No. 4 to 3/4 inches	Silt	⇒ 5µm to No. 200 sieve
		Clay	⇒ Smaller than 5µm

SOIL CLASSIFICATION

Soils and bedrock are classified and described based on their engineering properties and characteristics using ASTM D2487 and D2488.

Percentage description of minor components:

Trace	1 – 10%	Some	20 – 35%
Little	10 – 20%	And or y	25 – 50%

Stratified soils description:

Parting	0 to 1/16 inch thick	Layer	½ to 12 inches thick
Seam	1/16 to ½ inch thick	Stratum	> 12 inches thick

SOIL CLASSIFICATION CHART

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

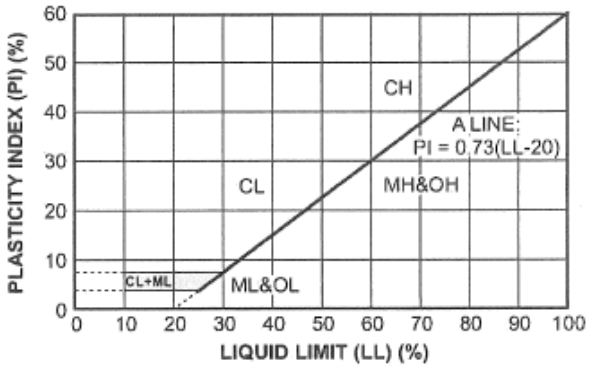
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



PARTICLE SIZE LIMITS

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	
	3"	¾"	NO. 4	NO. 10	NO. 40	NO. 200

TGR Geotechnical Environmental Hydrogeology Material Testing Construction Inspection

LOG OF BORING EXPLANATION

LOG OF EXPLORATORY BORING B-1

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1604**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1604	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, medium dense, very fine to fine grained sand.			
1600	5			■	39		SP	SAND- grey and white, dry, dense, fine to coarse grained, fine to coarse grained gravel, cobbles.	1	117	Consol
1595	10							Total Depth: 8 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1590											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 2

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-2

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1606**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1605								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			EI, Corrosion, R-Value
	5							...Same as above, some cobbles.			
1600					46		SM		2	109	
								Total Depth: 6.5 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
	10										
1595											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 3

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-3

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1611**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								Total Depth: 3 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1605	5										
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 4

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-4

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1603**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1600											
	5			■	46		SP	SAND- light brown, slightly moist, very dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles.	3	117	
								Total Depth: 6.5 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											
	10										
1590											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 5

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-5/P-1

Sheet **1** of **1**

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1607**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1605											
	5			■	50		SP	SAND- light brown, dry, very dense, fine grained sand, fine to coarse grained gravel, some silt.	2	113	-200= 5.7%
1600			■				SP		2		-200= 10.2%
	10							Total Depth: 9 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 6

TGR GEOTECHNICAL, INC.

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

LOG OF EXPLORATORY BORING B-6

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1611**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								...Same as above, cobbles.			
1605	5				53		SPG	Gravelly SAND- grey brown, dry, very dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles.	2	115	Consol
								Total Depth: 7 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 7

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-7

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1605**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1600	5				59		SM	...Same as above, cobbles.	2	103	
								Total Depth: 7 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 8

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-8

Sheet **1** of **1**

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1608**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
1605							SM	NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			Max, Shear
	5				14		SP	SAND- grey brown, dry, medium dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles, some silt.	2	107	Consol
1600								Total Depth: 8 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
	10										
1595											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 9

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-9

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1611**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								Total Depth: 3 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1605	5										
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 10

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING P-2

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1606**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1605								Surface is grass and vegetation. NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
	5										
1600					16		SP	SAND- light brown, dry, medium dense, fine grained sand, fine to coarse grained gravel, cobbles.	2	117	-200= 10.3%
	10							Total Depth: 9 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 11

TGR GEOTECHNICAL, INC.

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

APPENDIX C
LABORATORY TEST RESULTS

TGR GEOTECHNICAL
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APPENDIX C

Laboratory Testing Procedures and Results

In-Situ Moisture and Dry Density Determination (ASTM D2216 and D7263): Moisture content and dry density determinations were performed on relatively undisturbed samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from "undisturbed" or disturbed samples.

Maximum Density and Optimum Moisture Content (ASTM D1557): The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM Test Method D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-8 @ 0-5 feet	Silty Sand	123.5	7.0

Direct Shear Strength (ASTM D3080): Direct shear test was performed on selected remolded samples, which were soaked for a minimum of 24 hours under a surcharge equal to the applied normal force during testing. After transfer of the sample to the shear box, and reloading the sample, pore pressures set up in the sample due to the transfer were allowed to dissipate for a period of approximately 1-hour prior to application of shearing force. The sample was tested under various normal loads, a motor-driven, strain-controlled, direct-shear testing apparatus at a strain rate of less than 0.001 to 0.5 inches per minute (depending upon the soil type). The test results are presented in the test data and in the table below:

Sample Location	Sample Description	Friction Angle (degrees)	Apparent Cohesion (psf)
B-8 @ 0-5 feet	Silty Sand (Remolded)	33	114

Consolidation Tests (ASTM D2435): Consolidation test were performed on selected, relatively undisturbed ring samples. Samples were placed in a consolidometer and loads were applied in geometric progression. The percent consolidation for each load cycle was recorded as the ratio of the amount of vertical compression to the original 1-inch height. The consolidation pressure curves are presented in the test data.

Expansion Potential (ASTM D4829): The expansion potential of selected materials was evaluated by the Expansion Index Test, ASTM D4829. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch thick by 4-inch diameter specimens are loaded to an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached. The results of these tests are presented in the table below:

Sample Location	Sample Description	Expansion Index	Expansion Potential
B-2 @ 0-5 feet	Silty Sand	0	Very Low

Soluble Sulfate (CAL 417A): The soluble sulfate content of selected sample was determined by standard geochemical methods. The test results are presented in the test data and in the table below:

Sample Location	Sample Description	Water Soluble Sulfate in Soil, (% by Weight)	Sulfate Content (ppm)	Exposure Class*
B-2 @ 0-5 feet	Silty Sand	0.0123	123	S0

* Based on the current version of ACI 318-14 Building Code, Table No. 19.3.1.1; Exposure Categories and Classes.

Corrosivity Tests (CAL 422, CAL 643 and CAL 747): Electrical conductivity, pH, and soluble chloride tests were conducted on representative samples and the results are provided in the test data and in the table below:

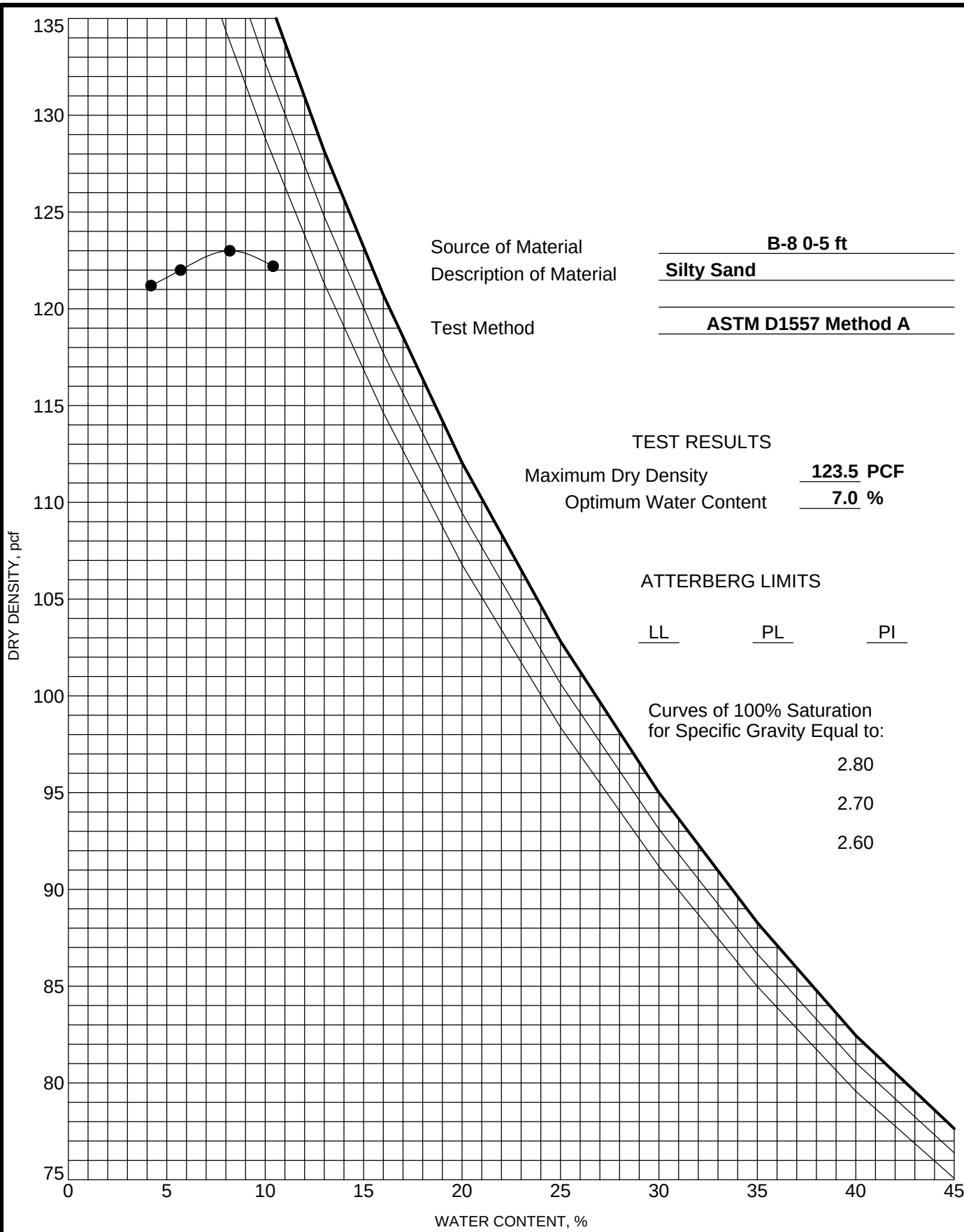
Sample Location	Sample Description	Soluble Chloride (CAL 422) (ppm)	Electrical Resistivity (CAL 643) (ohm-cm)	pH (CAL 747)	Potential Degree of Attack on Steel
B-2 @ 0-5 feet	Silty Sand	65	11,000	7.8	Mild

Passing No. 200 Sieve (ASTM D1140): Typical materials were washed over No. 200 sieve. The test results are presented in the boring logs and in the table below:

Sample Location	% Passing No. 200 Sieve
B-5/P-1 @ 5 feet	5.7
B-5/P-1 @ 8.5-9 feet	10.2
P-2 @ 5 feet	10.3

R-Value: The resistance “R”-Value was determined by the California Materials Method No. 301 for subgrade soils. One sample was prepared, and exudation pressure and “R”-Value determined. The graphically determined “R”-Value at exudation pressure of 300 psi is summarized in the table below:

Sample Location	Sample Description	R-Value
B-2 @ 0-5 feet	Silty Sand	73



Source of Material: **B-8 0-5 ft**

Description of Material: **Silty Sand**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **123.5 PCF**

Optimum Water Content: **7.0 %**

ATTERBERG LIMITS

LL PL PI

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

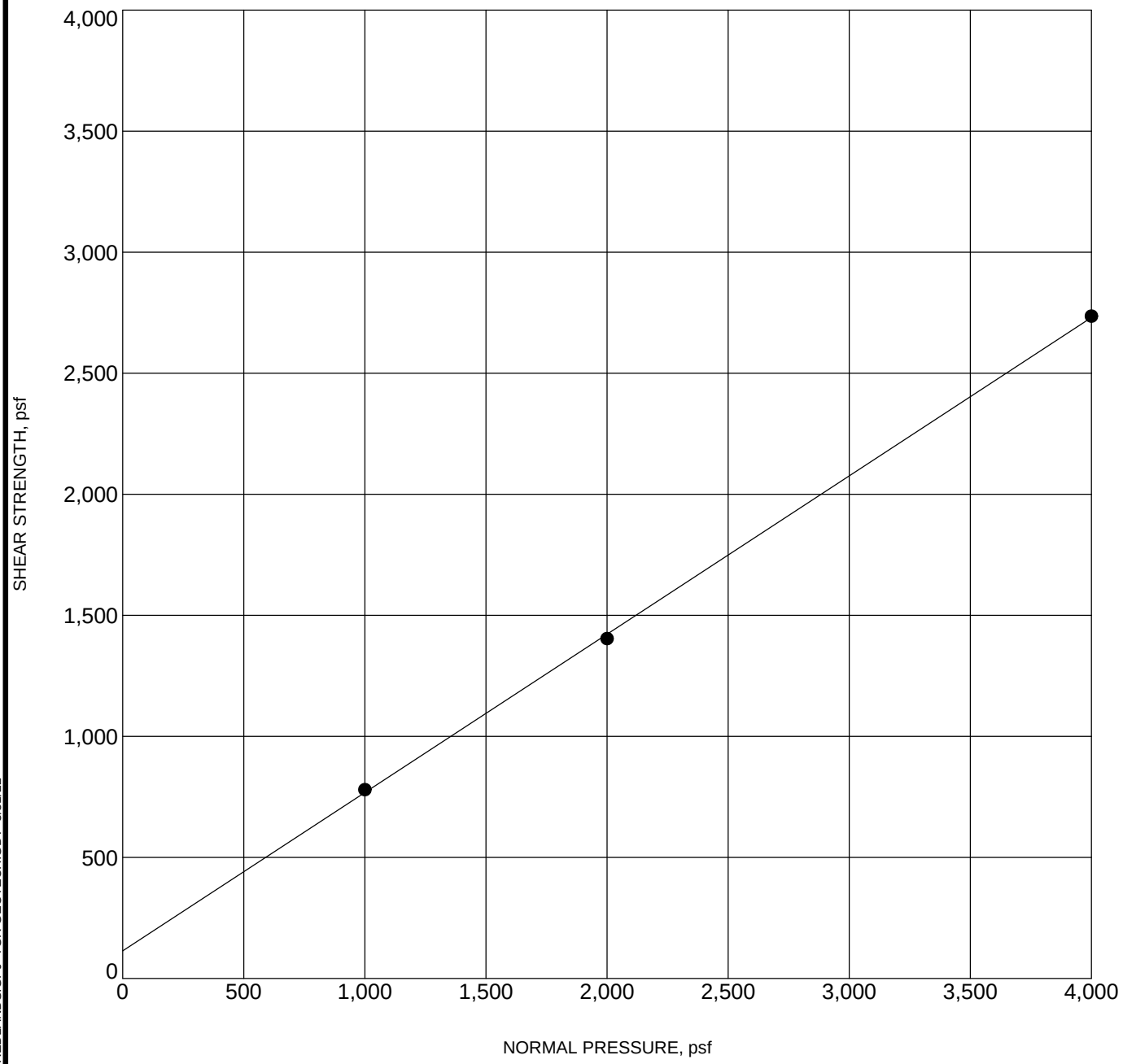
US COMPACTION 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
Santa Ana, CA 92704
Telephone: 714-641-7189
Fax: 714-641-7190

MOISTURE-DENSITY RELATIONSHIP

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands



Specimen Identification		Classification	γ_d	MC%	c	ϕ
● **B-8**	**0-5**	**Silty Sand - Remolded - 90% RC**	**111**	**7**	**114**	**33**

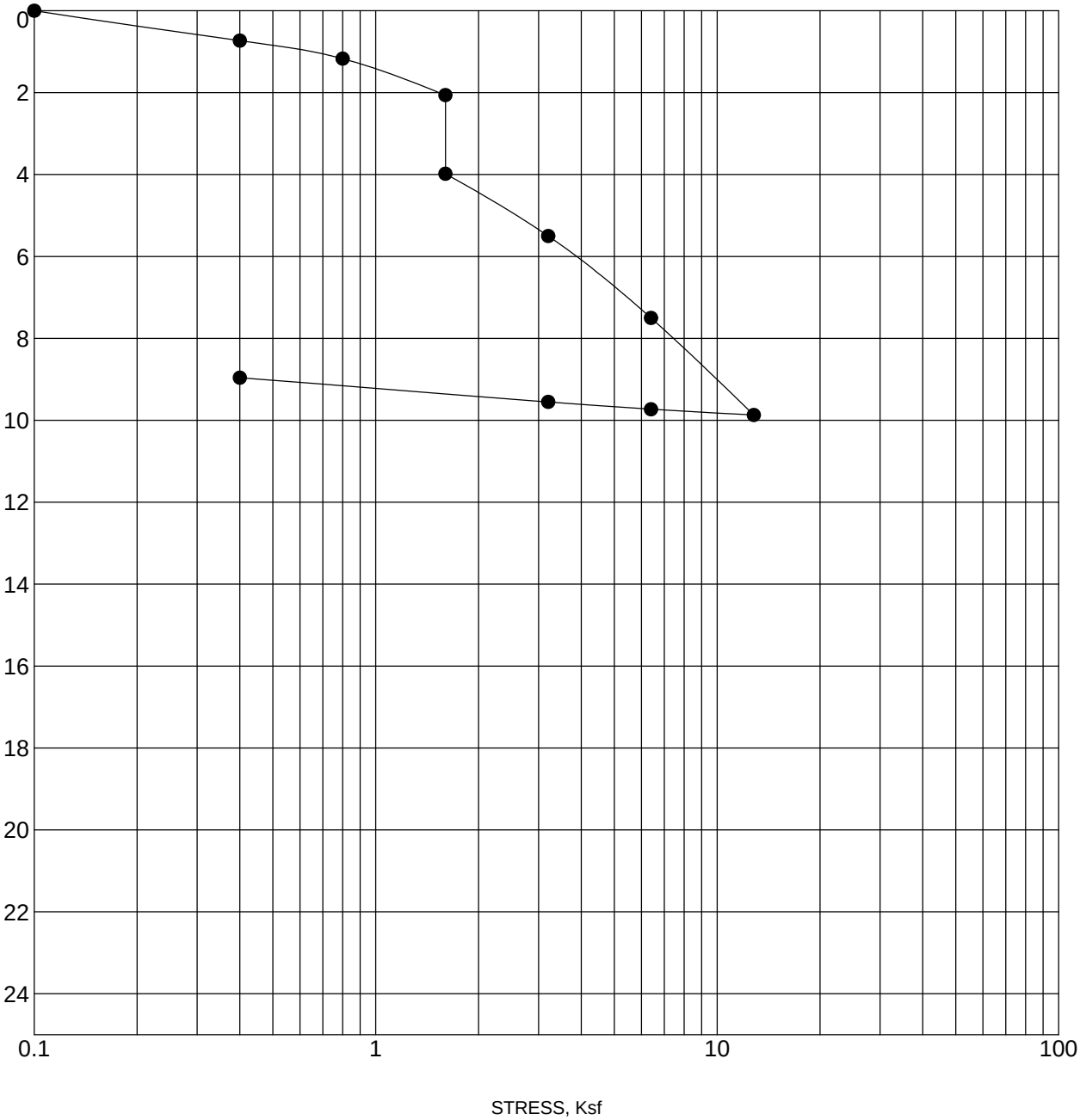
TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
Santa Ana, CA 92704
Telephone: 714-641-7189
Fax: 714-641-7190

DIRECT SHEAR TEST

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands

US DIRECT SHEAR 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22



Specimen Identification		Classification	γ_d	MC%
● **B-1** **5.0**		**Sand**	**117**	**1**

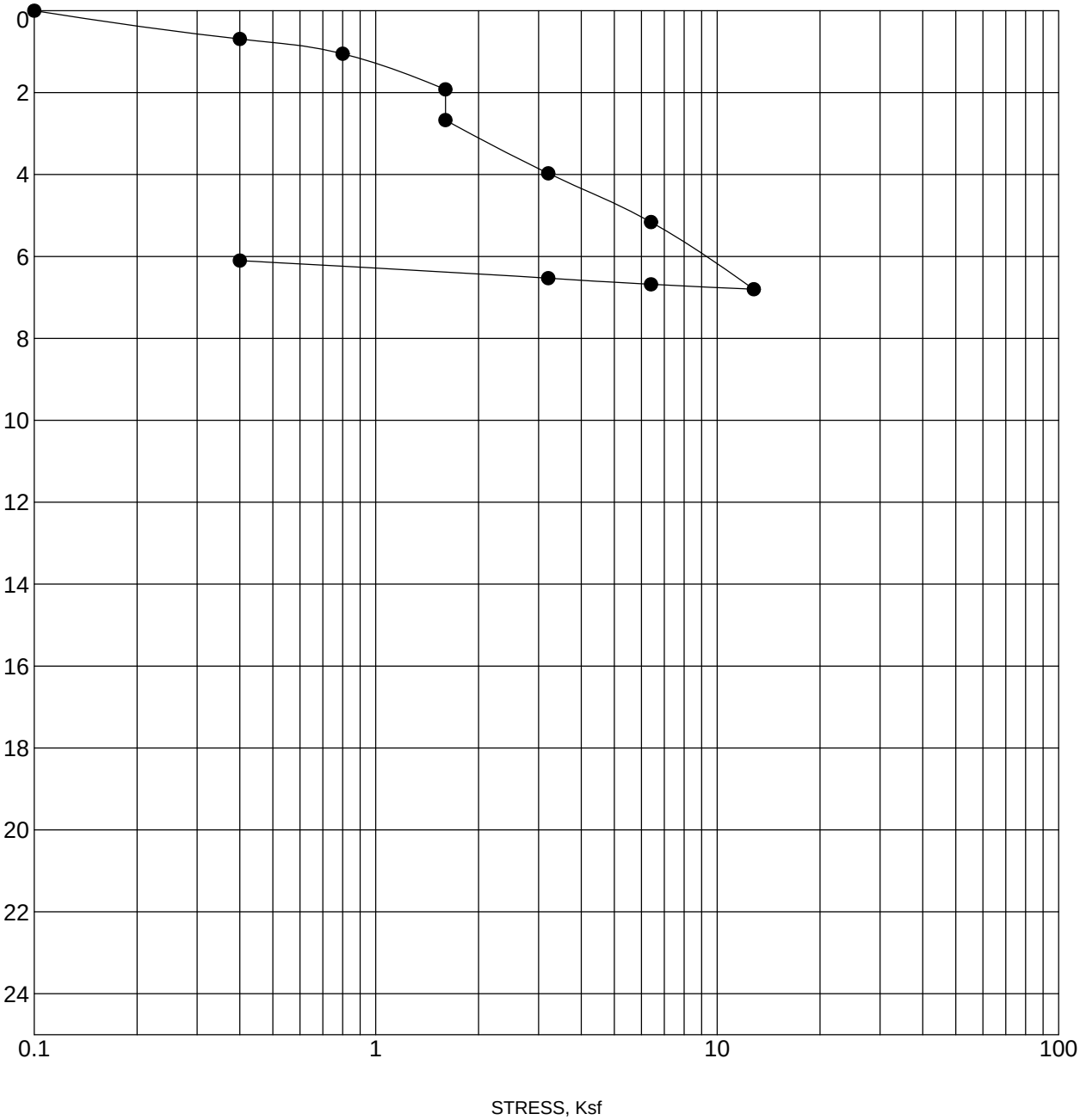
TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
Santa Ana, CA 92704
Telephone: 714-641-7189
Fax: 714-641-7190

CONSOLIDATION TEST

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands

US CONSOL STRAIN 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 4/6/22



Specimen Identification		Classification	γ_d	MC%
● **B-6** **5.0**		**Gravelly Sand**	**115**	**2**

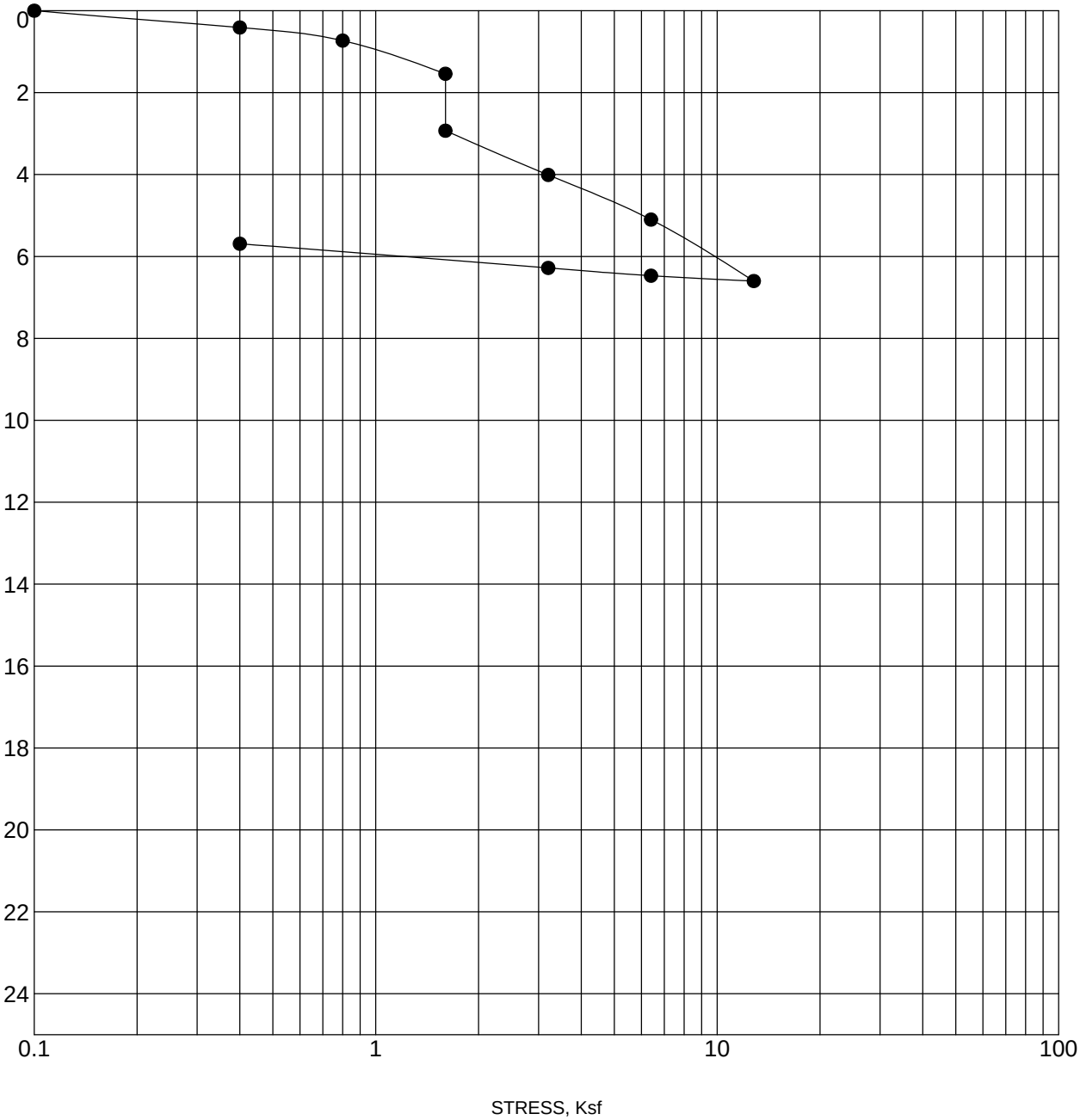
TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
Santa Ana, CA 92704
Telephone: 714-641-7189
Fax: 714-641-7190

CONSOLIDATION TEST

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands

US CONSOL STRAIN 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 4/5/22



Specimen Identification		Classification	γ_d	MC%
● **B-8** **5.0**			**107**	**2**

TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
Santa Ana, CA 92704
Telephone: 714-641-7189
Fax: 714-641-7190

CONSOLIDATION TEST

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands

US CONSOL STRAIN 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 4/5/22

ANAHEIM TEST LAB, INC

196 Technology Dr., Unit D
Irvine, CA 92618
Phone (949) 336-6544

TO:

TGR GEOTECHNICAL
3037 S. HARBOR BLVD.
SANTA ANA, CA 92704

DATE: 3/31/2022

P.O. NO: VERBAL

LAB NO: C-5800

SPECIFICATION: CTM-643/417/422

MATERIAL: Soil

Project No.: 22-7455
Project: Colton - Redlands
Sample ID: B2 @ 0-5'

ANALYTICAL REPORT

CORROSION SERIES

SUMMARY OF DATA

pH	MIN. RESISTIVITY per CT. 643 ohm-cm	SOLUBLE SULFATES per CT. 417 ppm	SOLUBLE CHLORIDES per CT. 422 ppm
7.8	11,000	123	65

RESPECTFULLY SUBMITTED

WES BRIDGER LAB MANAGER

ANAHEIM TEST LAB, INC

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949) 336-6544

TO:

TGR GEOTECHNICAL
3037 S. HARBOR BLVD.
SANTA ANA, CA. 92704

DATE: 3/24/2022

P.O. NO.: VERBAL

LAB NO.: C-5801

SPECIFICATION: CTM- 301

MATERIAL: Brown, Silty Sand w. trace F. Gravel

Project No.: 22-7455
Project: Colton - Redlands
Sample ID: B2 @ 0-5'

ANALYTICAL REPORT
"R" VALUE

BY EXUDATION	BY EXPANSION
73	N/A

RESPECTFULLY SUBMITTED

WES BRIDGER LAB MANAGER

"R" VALUE CA 301

Client: TGR Geotechnical **ATL No.:** C 5801 **Date:** 3/24/2022

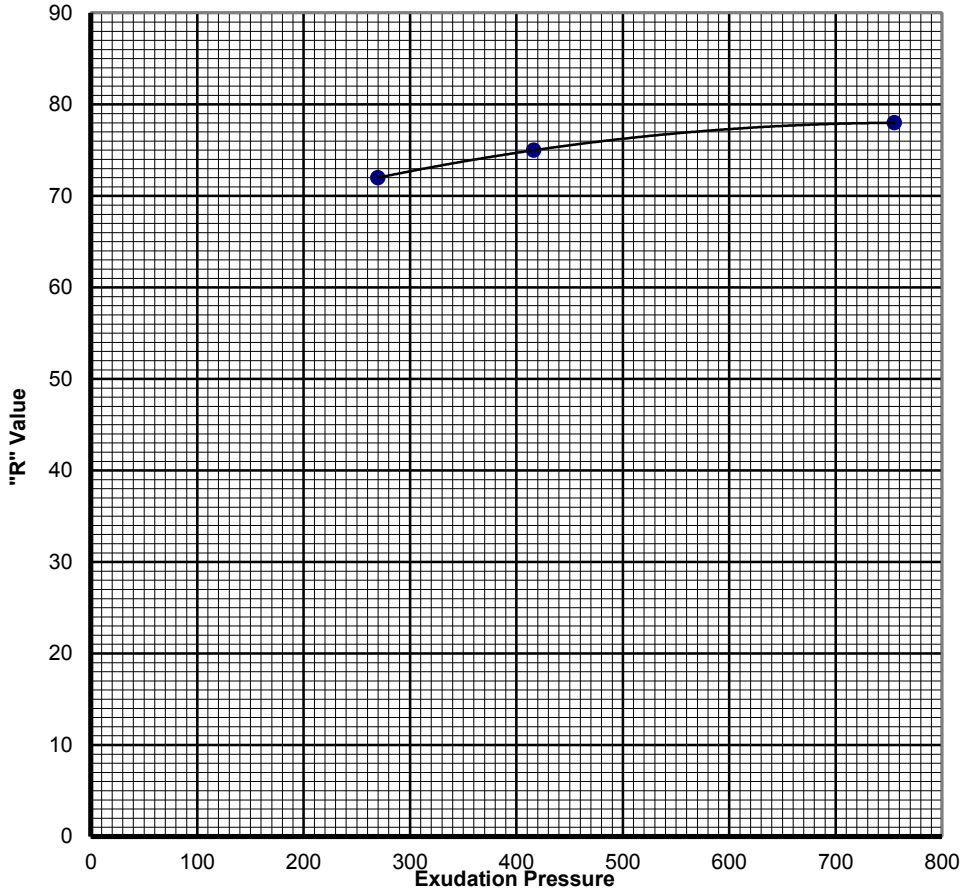
Client Reference No.: 22-7455

Sample: B2 @ 0-5' **Soil Type:** Brown, Silty Sand w. trace F. Gravel

.

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	350	350	350	
Initial Moisture Content	%	1.7	1.7	1.7	
Moisture at Compaction	%	9.3	8.7	9.1	
Briquette Height	in.	2.52	2.44	2.48	
Dry Density	pcf	124.0	125.5	124.8	
EXUDATION PRESSURE	psi	270	755	416	
EXPANSION PRESSURE	psf	26	139	87	
Ph at 1000 pounds	psi	18	15	17	
Ph at 2000 pounds	psi	33	28	30	
Displacement	turns	3.74	3.33	3.62	
"R" Value		72	78	75	
CORRECTED "R" VALUE		72	78	75	

Final "R" Value	
BY EXUDATION: @ 300 psi	**73**
BY EXPANSION: TI = 5.0	**N/A**



APPENDIX D
SITE SEISMICITY AND DEAGGREGATED PARAMETERS

TGR GEOTECHNICAL
DBE & 8(a) firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

TABLE 1

SITE SPECIFIC GROUND MOTION ANALYSIS

22-7455 E. Colton Avenue and N. Wabash Avenue, Redlands

SA Period (sec)	Probabilistic Spectral Acceleration MCER (g)	Deterministic Spectral Acceleration (g)	Is Largest Deterministic Spectral Acceleration <1.5*Fa	Deterministic MCER	Site Specific MCER	2/3 of Site Specific MCER	80% Code Design	Site Specific Design Response Spectrum
	Rotated Maximum	Rotated Maximum 84th Percentile						
0	1.1374	0.7488		0.7488	0.7488	0.4992	0.4083	0.4992
0.1	1.8975	1.1212		1.1212	1.1212	0.7475	0.7055	0.7475
0.2	2.4849	1.5300		1.5300	1.5300	1.0200	1.0208	1.0208
0.3	2.8575	1.8442		1.8442	1.8442	1.2295	1.0208	1.2295
0.5	2.9634	2.0185		2.0185	2.0185	1.3457	1.0208	1.3457
0.75	2.6198	1.8138	No	1.8138	1.8138	1.2092	1.0208	1.2092
1	2.3673	1.6567		1.6567	1.6567	1.1045	1.0520	1.1045
2	1.4688	1.0058		1.0058	1.0058	0.6705	0.5260	0.6705
3	1.0626	0.7045		0.7045	0.7045	0.4697	0.3507	0.4697
4	0.8120	0.5124		0.5124	0.5124	0.3416	0.2630	0.3416
5	0.6435	0.3854		0.3854	0.3854	0.2569	0.2104	0.2569

Code Sds	1.276	Crs =	0.914	Code Ss =	1.914
Code Sd1	1.315	Cr1 =	0.891	Code S1 =	0.789
To	0.21	Code Fa =	1	Sms =	1.914
Ts	1.03	Code Fv =	2.5	Sm1 =	1.9725
TL	8				
Input					

Site Specific S_{DS} = 1.211

Site Specific S_{D1} = 1.409

FIGURE 1
Site Specific Design Response Spectra
22-7455 E. Colton Avenue and N. Wabash Avenue, Redlands

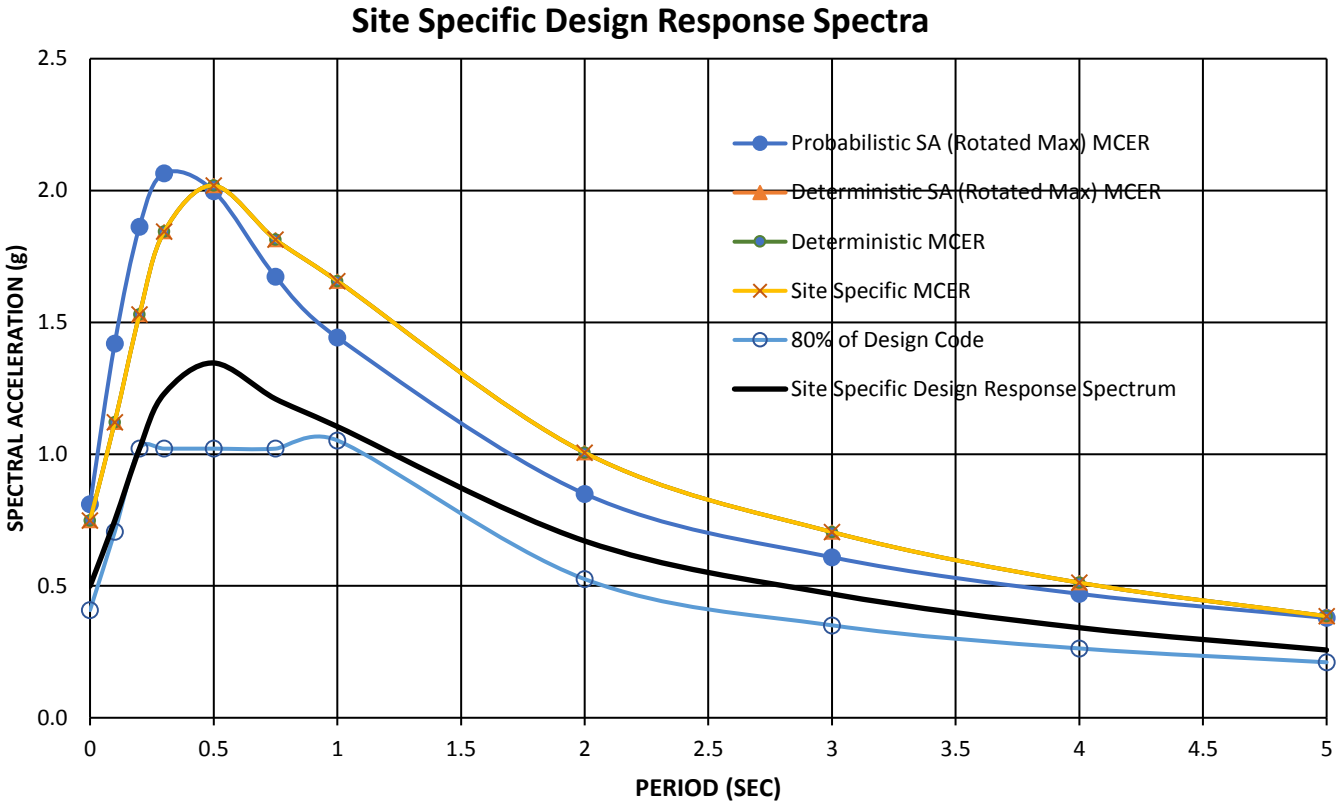


TABLE 2

Probabilistic Response Spectrum ASCE 7-16 Method 2

22-7455 E. Colton Avenue and N. Wabash Avenue, Redlands

Period (g)	UHGM (g)	RTGM (g)	Max Dir Scale factor	Max Dir RTGM (g)
0	1.059	1.034	1.1	1.137
0.1	1.740	1.725	1.1	1.898
0.2	2.276	2.259	1.1	2.485
0.3	2.611	2.540	1.125	2.858
0.5	2.694	2.522	1.175	2.963
0.75	2.326	2.117	1.2375	2.620
1	2.026	1.821	1.3	2.367
2	1.226	1.088	1.35	1.469
3	0.863	0.759	1.4	1.063
4	0.640	0.560	1.45	0.812
5	0.489	0.429	1.5	0.644

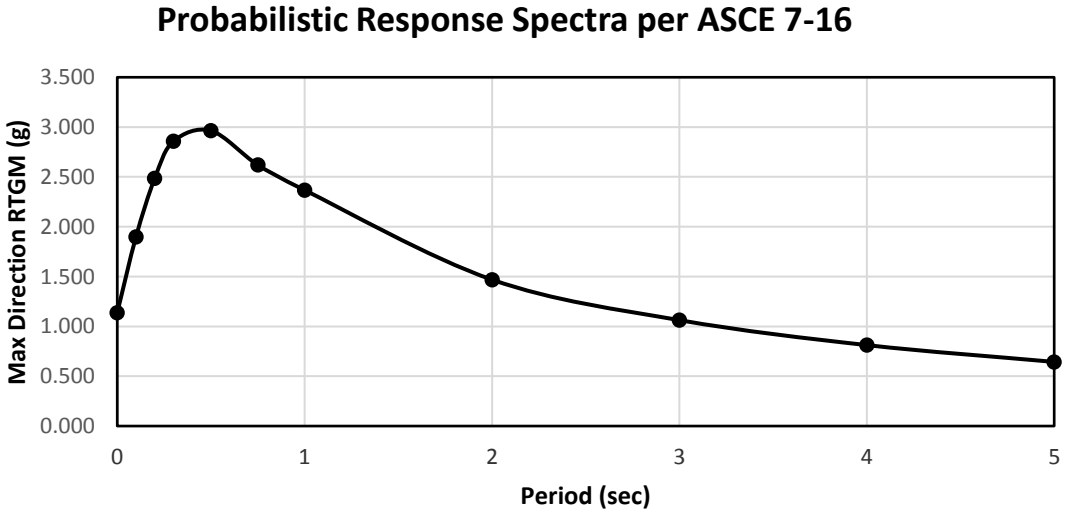
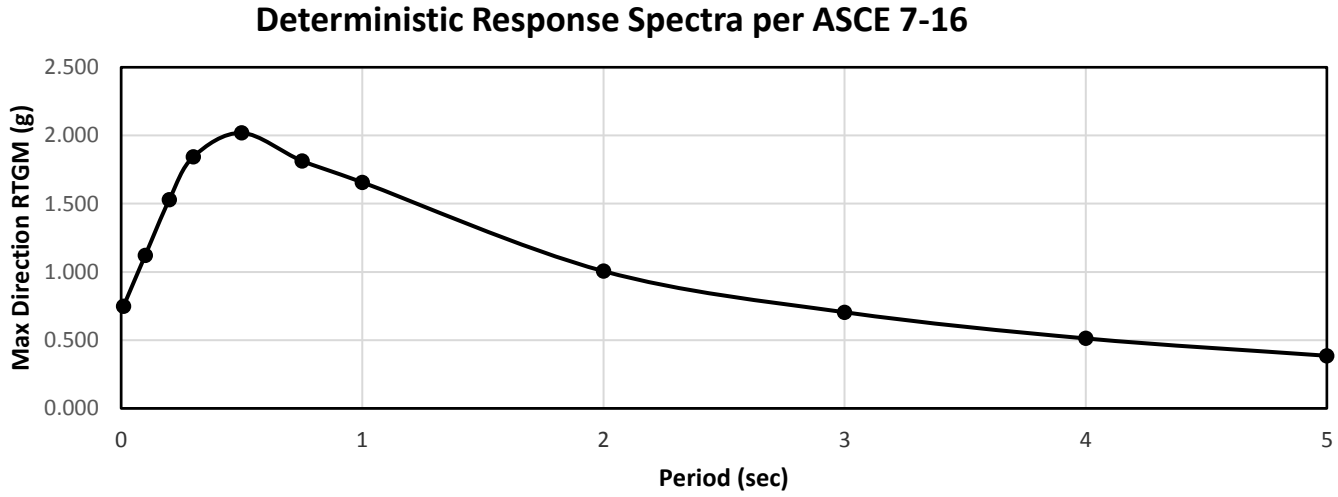


TABLE 3

Deterministic Response Spectrum ASCE 7-16 - San Andreas (San Bernardino S)

22-7455 E. Colton Avenue and N. Wabash Avenue, Redlands

Period (g)	84th-Percentile Spectral Acceleration (g)	Max Dir Scale factor	Max Dir Deterministic SA (g)
0.01	0.681	1.1	0.749
0.1	1.019	1.1	1.121
0.2	1.391	1.1	1.530
0.3	1.639	1.125	1.844
0.5	1.718	1.175	2.019
0.75	1.466	1.2375	1.814
1	1.274	1.3	1.657
2	0.745	1.35	1.006
3	0.503	1.4	0.704
4	0.353	1.45	0.512
5	0.257	1.5	0.385



PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

San Andreas (San Bernardino S) fault

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric

Weighted average of the natural logarithm of the spectral values

GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1
Damping ratio (%)	5

Modification factors are calculated in Sheet DSF

ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

Input variables | **Errors and warnings**

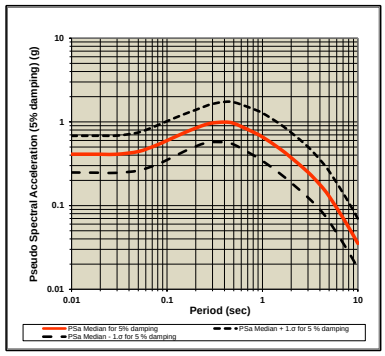
M_w	7.47
R_{RUP} (km)	5.81
R_{JB} (km)	5.81
R_x (km)	5.81
Ry0 (km)	999 *If unknown use 999*
V_{S30} (m/sec)	260
U (BSSA13)	1 *1: Unspecified fault mech.*
F_{RV}	0 *1: reverse fault*
F_{NM}	0 *1: normal fault*
F_{HW}	0 *1: hanging wall side*
Dip (deg)	90
Z_{TOR} (km)	999 *If unknown use 999*
Z_{HYP} (km)	7.48 *If unknown use 999*
$Z_{1.0}$ (km)	999 *If unknown use 999*
$Z_{2.5}$ (km)	999 *If unknown use 999*
W (km)	11.52 *If unknown use 999*
Vs30Flag	measured *Choose options for V_{s30} from the list*
F_{AS}	no *Aftershock effect is not applicable.*
Region	California *Choose region from the list*

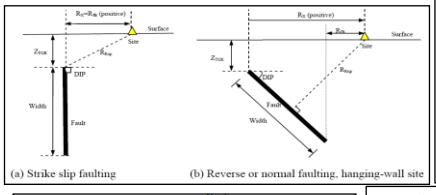
Calculated Variables/Flags

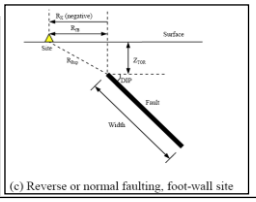
ΔDPP	0 *Always 0 for median calcs.*
PGA_r (g)	0.347
Z_{BOT} (km) (CB14)	15 *Enter for default W calcs*
SS	1 *auto calculated*
$V_{s30Flag}$	1 *measured*
F_{AS}	0 *Aftershock effect is not applicable.*
Region	0 *California*
Option for Sa value	1 *Weighted average of the natural logarithm of the spectral values*

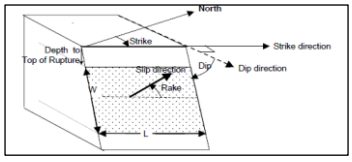
RotD50 Horizontal Component of PGA, PGV and *IMs*

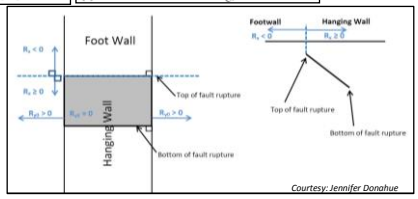
GMP	T (s)	Baseline: 5% Damping: PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	User defined: 5% Damping: PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.4113299	0.6807387	0.248542	0.001021	0.41133	0.6807387	0.248542	0.001021
	0.02	0.4106372	0.6825476	0.247049	0.004077	0.410637	0.6825476	0.247049	0.004077
	0.03	0.4109585	0.6858812	0.246233	0.009181	0.410548	0.6851953	0.245987	0.009172
	0.05	0.4420571	0.7465188	0.261768	0.027434	0.442057	0.7465188	0.261768	0.027434
	0.075	0.5175297	0.8840625	0.302962	0.072264	0.518565	0.8858306	0.303567	0.072409
	0.1	0.5962087	1.015328	0.349754	0.148001	0.597997	1.019377	0.350803	0.148445
	0.15	0.735682	1.2287286	0.440478	0.410903	0.737153	1.2311861	0.441359	0.411725
	0.2	0.8403639	1.3881876	0.508729	0.834437	0.842045	1.390964	0.509747	0.836106
	0.25	0.9204193	1.5271272	0.554749	1.428013	0.924101	1.5332357	0.556968	1.433725
	0.3	0.9690804	1.6377524	0.573418	2.165054	0.970049	1.6393901	0.573991	2.167219
	0.4	0.9912308	1.7296257	0.568064	3.936961	0.993213	1.733085	0.5692	3.944835
	0.5	0.9592081	1.7162152	0.53611	5.952771	0.960167	1.7179314	0.536646	5.958724
	0.75	0.7823989	1.4657097	0.417646	10.92489	0.782399	1.4657097	0.417646	10.92489
	1	0.6608729	1.2757199	0.342358	16.4053	0.660212	1.2744442	0.342016	16.3889
	1.5	0.4828805	0.9530981	0.244648	26.97047	0.483363	0.9540512	0.244893	26.99744
	2	0.3740868	0.7465504	0.18745	37.14486	0.373339	0.7450573	0.187075	37.07057
	3	0.2510145	0.5037736	0.125073	56.07997	0.250764	0.5032698	0.124948	56.02389
	4	0.1779982	0.3537962	0.089553	70.69715	0.17782	0.3534424	0.089463	70.62645
	5	0.1293917	0.2577257	0.064961	80.29949	0.129004	0.2569525	0.064766	80.0586
	7.5	0.062502	0.1241545	0.031465	87.27359	0.062377	0.1239062	0.031402	87.09905
	10	0.0354445	0.0697478	0.018012	87.98629	0.035303	0.0694688	0.01794	87.63435
PGA (g)	0	0.4089755	0.6763637	0.247294	0.001015	0.41133	0.6807387	0.248542	0.001021
PGV (cm/s)	-1	68.706356	121.29546	38.91789	0.170555	NA	NA	NA	NA











Courtesy: Jennifer Donahue

Definition of Parameters

Damping ratio = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
PSA = Pseudo-absolute acceleration response spectrum (g)
PGA = Peak ground acceleration (g)
PGV = Peak ground velocity (cm/s)
S_d = Relative displacement response spectrum (cm)
M_w = Moment magnitude
R_{RUP} = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
R_{JB} = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
R_X = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
R_{Y0} = The horizontal distance off the end of the rupture measured parallel to strike (km)
V_{S30} = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
U = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
F_{RV} = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
F_{NM} = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
F_{HW} = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
Dip = Average dip of rupture plane (degrees)
Z_{TOR} = Depth to top of coseismic rupture (km)
Z_{HYP} = Hypocentral depth from the earthquake
$Z_{1.0}$ = Depth to Vs=1 km/sec
$Z_{2.5}$ = Depth to Vs=2.5 km/sec
W = Fault rupture width (km)
$V_{s30flag}$ = 1 for measured, 0 for inferred Vs30
F_{AS} = 0 for mainshock; 1 for aftershock
Region = Specific regions considered in the models, Click on Region to see codes
ΔDPP = Directivity term, direct point parameter; uses 0 for median predictions
PGA_r (g) = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
Z_{BOT} (km) = The depth to the bottom of the seismogenic crust
Z_{BOR} (km) = The depth to the bottom of the rupture plane
SS = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTS	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	11.52			15.000		
$Z_{1.0}$ (km)	999.000	0.475			0.485	
$\delta Z_{1.0}$ (km)	0.000		0.000			
$Z_{2.5}$ (V_{S30}=1100)(km)	999.000			0.398		
$Z_{2.5}$ (V_{S30})(km)	999.000			2.070		
Z_{HYP} (km)	7.48			10.227		
Z_{TOR} (km)	999.00			0.000	0.000	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

San Jacinto (San Jacinto Valley) fault

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	**Geometric**

Weighted average of the natural logarithm of the spectral values

GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1
Damping ratio (%)	5

Modification factors are calculated in Sheet DSF

ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

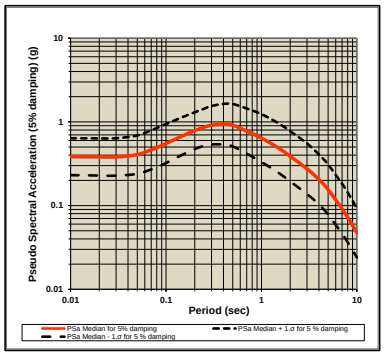
RotD50 Horizontal Component of PGA, PGV and *IMs*

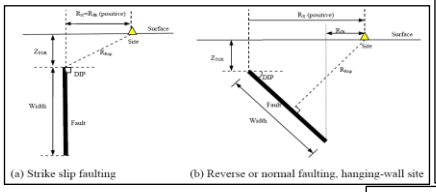
Input variables	Errors and warnings
M_w	
8.01	
R_{RUP} (km)	
9.81	
R_{JB} (km)	
9.81	
R_x (km)	
9.81	
Ry0 (km)	*If unknown use 999*
999	
V_{S30} (m/sec)	
260	
U (BSSA13)	*1: Unspecified fault mech.*
1	
F_{RV}	*1: reverse fault*
0	
F_{NM}	*1: normal fault*
0	
F_{HW}	*1: hanging wall side*
0	
Dip (deg)	
90	
Z_{TOR} (km)	*If unknown use 999*
999	
Z_{HYP} (km)	*If unknown use 999*
10.27	
$Z_{1.0}$ (km)	*If unknown use 999*
999	
$Z_{2.5}$ (km)	*If unknown use 999*
999	
W (km)	*If unknown use 999*
15.81	
Vs30Flag	
measured	*Choose options for V_{s30} from the list*
F_{AS}	
no	*Aftershock effect is not applicable.*
Region	
California	*Choose region from the list*

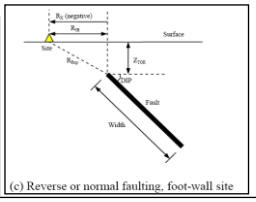
Calculated Variables/Flags

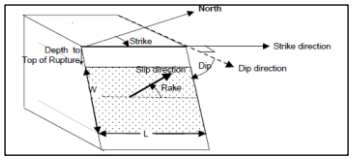
ΔDPP	*Always 0 for median calcs.*
0	
PGA_r (g)	
0.318	
Z_{BOT} (km) (CB14)	*Enter for default W calcs*
15	
SS	
1	*auto calculated*
$V_{s30Flag}$	
1	*measured*
F_{AS}	
0	*Aftershock effect is not applicable.*
Region	
0	*California*
Option for Sa value	
1	*Weighted average of the natural logarithm of the spectral values*

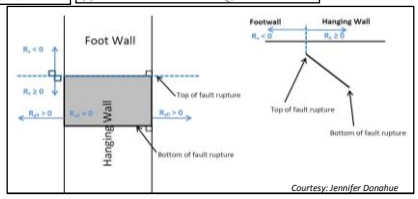
GMP	T (s)	Baseline: 5% Damping: PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	User defined: 5% Damping: PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.3835155	0.6366977	0.231011	0.000952	0.383515	0.6366977	0.231011	0.000952
	0.02	0.3813894	0.6359577	0.228723	0.003787	0.381389	0.6359577	0.228723	0.003787
	0.03	0.3809259	0.6378317	0.227497	0.00851	0.380545	0.6371939	0.227269	0.008502
	0.05	0.4063868	0.6883907	0.239908	0.02522	0.406387	0.6883907	0.239908	0.02522
	0.075	0.4756873	0.8148786	0.277684	0.066422	0.477114	0.8173232	0.278517	0.066621
	0.1	0.5492158	0.9389254	0.321259	0.136336	0.550863	0.9417422	0.322223	0.136745
	0.15	0.6806703	1.1405579	0.406215	0.380177	0.682712	1.1439796	0.407434	0.381317
	0.2	0.7829452	1.297868	0.472315	0.777424	0.784511	1.3004638	0.47326	0.778978
	0.25	0.8592518	1.4306566	0.516066	1.333113	0.86183	1.4349486	0.517615	1.337112
	0.3	0.9100874	1.543215	0.53671	2.033255	0.911908	1.5463014	0.537784	2.037322
	0.4	0.9345762	1.6349049	0.534241	3.711941	0.936445	1.6381747	0.535309	3.719365
	0.5	0.9116648	1.6344062	0.508523	5.657721	0.912576	1.6360407	0.509031	5.663379
	0.75	0.7493947	1.4054866	0.399571	10.46404	0.749395	1.4054866	0.399571	10.46404
	1	0.6401862	1.2366468	0.331411	15.89178	0.639546	1.2354102	0.33108	15.87589
	1.5	0.4887143	0.964879	0.247535	27.29631	0.489203	0.9658439	0.247783	27.32361
	2	0.3883103	0.7749882	0.194564	38.55717	0.387534	0.7734382	0.194175	38.48006
	3	0.2755349	0.5529874	0.13729	61.55814	0.275259	0.5524344	0.137152	61.49658
	4	0.205369	0.4081994	0.103323	81.56825	0.205164	0.4077912	0.10322	81.48668
	5	0.1553114	0.3093533	0.077974	96.38508	0.155001	0.3087346	0.077818	96.19231
	7.5	0.0819255	0.1627376	0.041243	114.3953	0.081598	0.1620866	0.041078	113.9377
	10	0.0473547	0.0931848	0.024065	117.5518	0.047165	0.092812	0.023968	117.0816
PGA (g)	0	0.3813813	0.632705	0.229889	0.000947	0.383515	0.6366977	0.231011	0.000952
PGV (cm/s)	-1	68.879089	121.68825	38.98757	0.170983	NA	NA	NA	NA











Courtesy: Jennifer Donahue

Definition of Parameters

Damping ratio = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
PSA = Pseudo-absolute acceleration response spectrum (g)
PGA = Peak ground acceleration (g)
PGV = Peak ground velocity (cm/s)
S_d = Relative displacement response spectrum (cm)
M_w = Moment magnitude
R_{RUP} = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
R_{JB} = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
R_x = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
R_{y0} = The horizontal distance off the end of the rupture measured parallel to strike (km)
V_{S30} = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
U = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
F_{RV} = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
F_{NM} = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
F_{HW} = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
Dip = Average dip of rupture plane (degrees)
Z_{TOR} = Depth to top of coseismic rupture (km)
Z_{HYP} = Hypocentral depth from the earthquake
$Z_{1.0}$ = Depth to Vs=1 km/sec
$Z_{2.5}$ = Depth to Vs=2.5 km/sec
W = Fault rupture width (km)
$V_{s30flag}$ = 1 for measured, 0 for inferred Vs30
F_{AS} = 0 for mainshock; 1 for aftershock
Region = Specific regions considered in the models, Click on Region to see codes
ΔDPP = Directivity term, direct point parameter; uses 0 for median predictions
PGA_r (g) = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
Z_{BOT} (km) = The depth to the bottom of the seismogenic crust
Z_{BOR} (km) = The depth to the bottom of the rupture plane
SS = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTS	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	15.81			15.000		
$Z_{1.0}$ (km)	999.000	0.475			0.485	
$\delta Z_{1.0}$ (km)	0.000		0.000			
$Z_{2.5}$ (V_{S30}=1100)(km)	999.000			0.398		
$Z_{2.5}$ (V_{S30})(km)	999.000			2.070		
Z_{HYP} (km)	10.27			10.227		
Z_{TOR} (km)	999.00			0.000	0.000	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

E. Colton Avenue and N. Wabash Avenue, Redlands

Latitude, Longitude: 34.0638, -117.1400



Date	3/22/2022, 12:45:04 PM
Design Code Reference Document	ASCE7-16
Risk Category	III
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.914	MCE_R ground motion. (for 0.2 second period)
S_1	0.789	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.914	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.276	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.819	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.901	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	2.587	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.831	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.914	Factored deterministic acceleration value. (0.2 second)
S1RT	1.018	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	1.143	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.789	Factored deterministic acceleration value. (1.0 second)
PGAd	0.819	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.914	Mapped value of the risk coefficient at short periods
C_{R1}	0.891	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

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U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Dynamic: Conterminous U.S. 2014 (upd…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.0638

Time Horizon

Return period in years

2475

Longitude

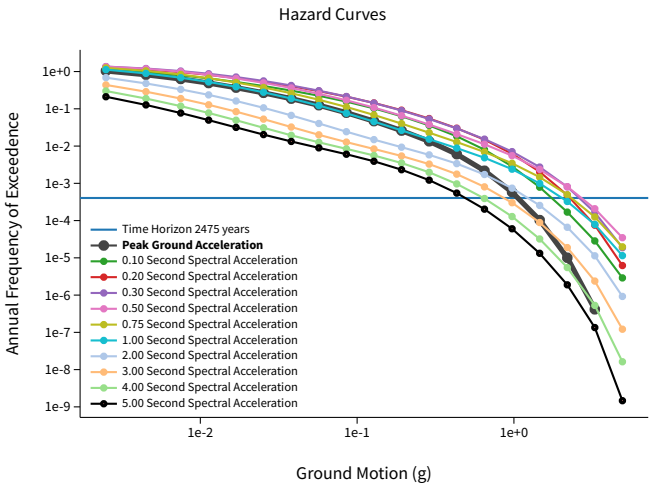
Decimal degrees, negative values for western longitudes

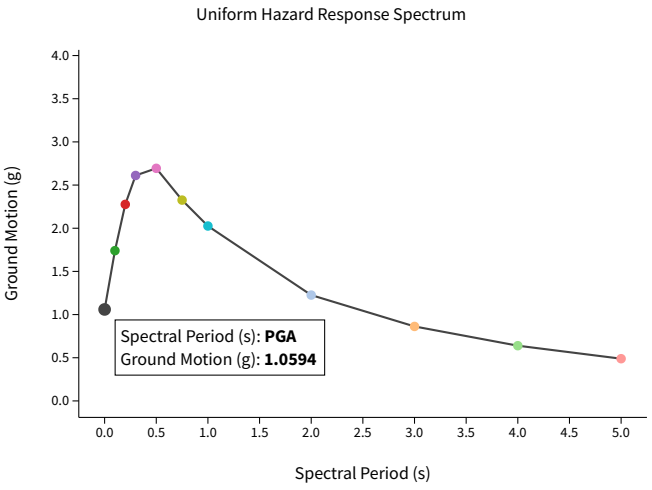
-117.14

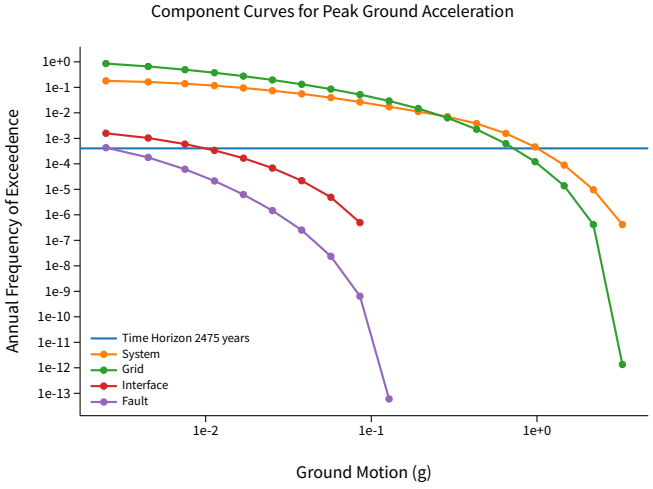
Site Class

259 m/s (Site class D)

Hazard Curve





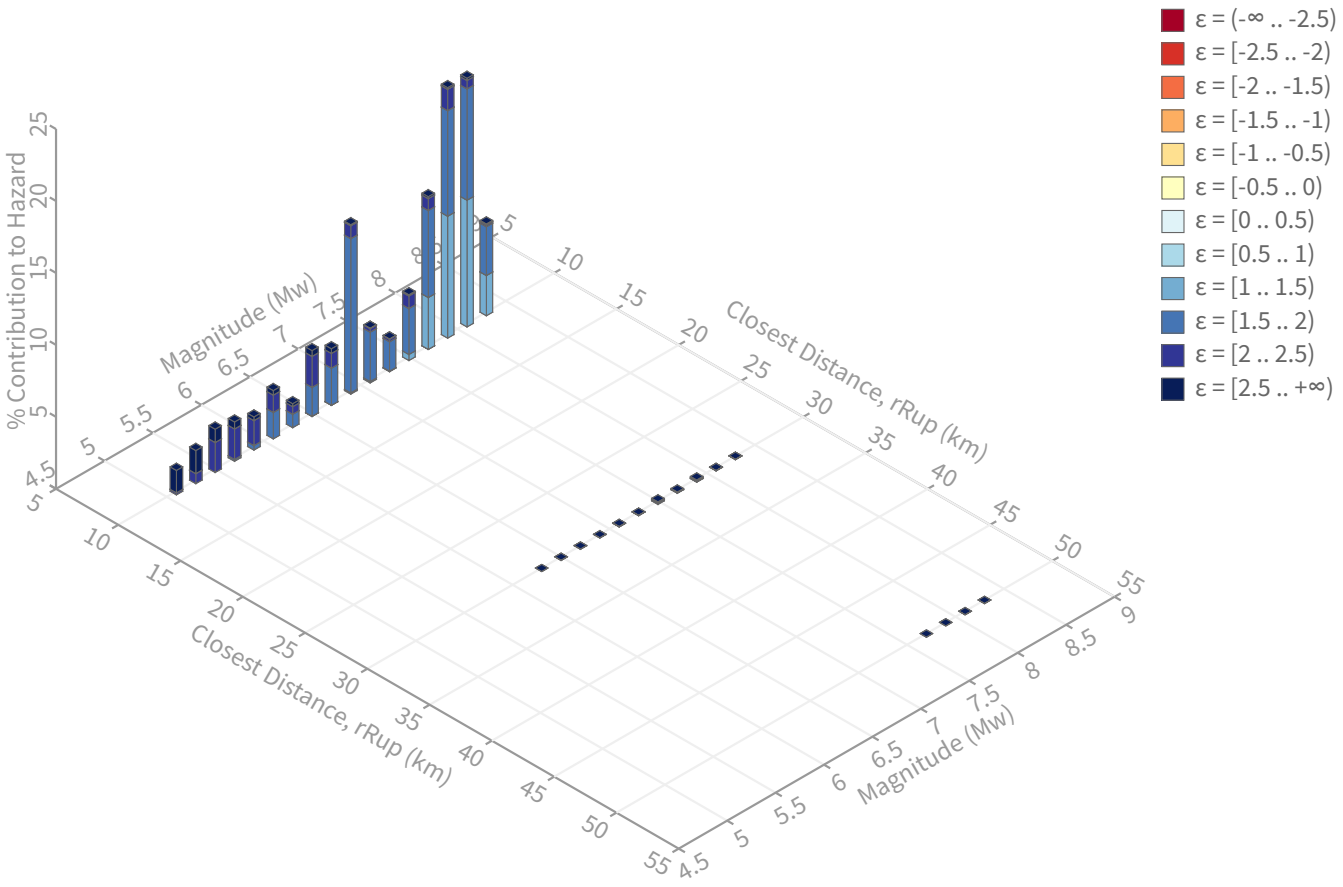


View Raw Data

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 1.0593831 g

Recovered targets

Return period: 3321.3976 yrs
Exceedance rate: 0.00030107808 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.03 %

Mean (over all sources)

m: 7.27
r: 7.32 km
ε₀: 1.8 σ

Mode (largest m-r bin)

m: 7.91
r: 7.19 km
ε₀: 1.6 σ
Contribution: 17.39 %

Mode (largest m-r-ε₀ bin)

m: 6.84
r: 5.81 km
ε₀: 1.81 σ
Contribution: 10.71 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							41.52
San Andreas (San Bernardino S) [1]		5.81	7.46	1.67	117.117°W	34.111°N	22.38	26.23
San Jacinto (San Jacinto Valley) rev [0]		9.81	8.02	1.78	117.215°W	34.002°N	225.08	7.41
San Andreas (North Branch Mill Creek) [1]		7.08	7.94	1.40	117.111°W	34.123°N	21.83	3.54
San Andreas (San Bernardino S) [2]		6.03	6.79	1.89	117.099°W	34.104°N	39.89	1.39
UC33brAvg_FM32	System							41.39
San Andreas (San Bernardino S) [1]		5.81	7.47	1.66	117.117°W	34.111°N	22.38	26.35
San Jacinto (San Jacinto Valley) rev [0]		9.81	8.01	1.78	117.215°W	34.002°N	225.08	7.39
San Andreas (North Branch Mill Creek) [1]		7.08	7.95	1.40	117.111°W	34.123°N	21.83	3.64
San Andreas (San Bernardino S) [2]		6.03	6.81	1.88	117.099°W	34.104°N	39.89	1.23
UC33brAvg_FM31 (opt)	Grid							8.54
PointSourceFinite: -117.140, 34.122		8.07	5.70	2.26	117.140°W	34.122°N	0.00	1.70
PointSourceFinite: -117.140, 34.122		8.07	5.70	2.26	117.140°W	34.122°N	0.00	1.70
PointSourceFinite: -117.140, 34.113		7.45	5.65	2.20	117.140°W	34.113°N	0.00	1.32
PointSourceFinite: -117.140, 34.113		7.45	5.65	2.20	117.140°W	34.113°N	0.00	1.32
UC33brAvg_FM32 (opt)	Grid							8.54
PointSourceFinite: -117.140, 34.122		8.07	5.70	2.26	117.140°W	34.122°N	0.00	1.70
PointSourceFinite: -117.140, 34.122		8.07	5.70	2.26	117.140°W	34.122°N	0.00	1.70
PointSourceFinite: -117.140, 34.113		7.45	5.65	2.20	117.140°W	34.113°N	0.00	1.32
PointSourceFinite: -117.140, 34.113		7.45	5.65	2.20	117.140°W	34.113°N	0.00	1.32

APPENDIX E
STANDARD GRADING GUIDELINES

TGR GEOTECHNICAL
DBE & 8(a) firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

STANDARD GRADING SPECIFICATIONS

These specifications present the usual and minimum requirements for grading operations performed under the observation and testing of TGR Geotechnical, Inc.

No deviation from these specifications will be allowed, except where specifically superseded in the Preliminary Geotechnical Investigation report, or in other written communication signed by the Soils Engineer or Engineering Geologist.

1.0 GENERAL

- The Soils Engineer and Engineering Geologist are the Owner's or Builder's representatives on the project. For the purpose of these specifications, observation and testing by the Soils Engineer includes that observation and testing performed by any person or persons employed by, and responsible to, the licensed Geotechnical Engineer or Geologist signing the grading report.

- All clearing, site preparation or earthwork performed on the project shall be conducted by the Contractor under the observation of the Geotechnical Engineer.

- It is the Contractor's responsibility to prepare the ground surface to receive the fills to the satisfaction of the Geotechnical Engineer and to place, spread, mix, water and compact the fill in accordance with the specifications of the Geotechnical Engineer. The Contractor shall also remove all material considered unsatisfactory by the Geotechnical Engineer.

- It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment will be shut down to permit completion of Compaction. Sufficient watering apparatus will also be provided by the Contractor, with due consideration for the fill material, rate of placement and time of year.

- A final report will be issued by the Geotechnical Engineer and Engineering Geologist attesting to the Contractor's conformance with these specifications.

2.0 SITE PREPARATION

- All vegetation and deleterious material such as rubbish shall be disposed of off-site. The removal must be concluded prior to placing fill.

- The Civil Engineer shall locate all houses, sheds, sewage disposal systems, large trees or structures on the site, or on the grading plan to the best of his knowledge prior to preparing the ground surface.

- Soil, alluvium or rock materials determined by the Geotechnical Engineer as being unsuitable for placement in compacted fills shall be removed and wasted from the site. Any material incorporated as part of a compacted fill must be approved by the Geotechnical Engineer.

- After the ground surface to receive fill has been cleared, it shall be scarified, disced or bladed by the Contractor until it is uniform and free from ruts, hollows, hummocks or other uneven features which may prevent uniform compaction.

  The scarified ground surface shall then be brought to optimum moisture content, mixed as required, and compacted as specified. If the scarified zone is greater than twelve inches in depth, the excess shall be removed and placed in lifts restricted to six inches. Prior to placing fill, the ground surface to receive fill shall be inspected, tested and approved by the Geotechnical Engineer.

- Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines or others not located prior to grading are to be removed or treated in a manner prescribed by the Geotechnical Engineer.

3.0 COMPACTED FILLS

- Any material imported or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable by the Geotechnical Engineer. Roots, tree branches and other matter missed during clearing shall be removed from the fill as directed by the Geotechnical Engineer.
- Rock fragments less than six inches in diameter may be utilized in the fill, provided:

- They are not placed in concentrated pockets.
- There is a sufficient percentage of fine-grained material to surround the rocks.
- The distribution of the rocks is observed by the Geotechnical Engineer.

- Rocks greater than six inches in diameter shall be taken off-site, or placed in accordance with the recommendations of the Geotechnical Engineer in areas designated as suitable for rock disposal. Details for rock disposal such as location, moisture control, percentage of the rock placed, etc., will be referred to in the "Conclusions and Recommendations" section of the Geotechnical Report, if applicable.

  If rocks greater than six inches in diameter were not anticipated in the Preliminary Geotechnical report, rock disposal recommendations may not have been made in the "Conclusions and Recommendations" section. In this case, the Contractor shall notify the Geotechnical Engineer if rocks greater than six inches in diameter are encountered. The Geotechnical Engineer will then prepare a rock disposal recommendation or request that such rocks be taken off-site.

- Material that is spongy, subject to decay, or otherwise considered unsuitable shall not be used in the compacted fill.

- Representative samples of materials to be utilized as compacted fill shall be analyzed in the laboratory by the Geotechnical Engineer to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the Geotechnical Engineer as soon as possible.

- Material used in the compacting process shall be evenly spread, watered or dried, processed and compacted in thin lifts not to exceed six inches in thickness to obtain a uniformly dense layer. The fill shall be placed and compacted on a horizontal plane, unless otherwise approved by the Geotechnical Engineer.

- If the moisture content or relative compaction varies from that required by the Geotechnical Engineer, the Contractor shall rework the fill until it is approved by the Geotechnical Engineer.

- Each layer shall be compacted to 90 percent of the maximum dry density in compliance with the testing method specified by the controlling governmental agency; (in general, ASTM D1557 will be used.)

  If compaction to a lesser percentage is authorized by the controlling governmental agency because of a specific land use of expansive soil conditions, the area to receive fill compacted to less than 90 percent shall either be delineated on the grading plan or appropriate reference made to the area in the grading report.

- All fill shall be keyed and benched through all topsoil, colluvium, alluvium or creep material, into sound bedrock or firm material where the slope receiving fill exceeds a ratio of five horizontal to one vertical, in accordance with the recommendations of the Geotechnical Engineer.

- The key for side hill fills shall be a minimum of 15 feet within bedrock or firm materials, unless otherwise specified in the Preliminary report. (See details)

- Drainage terraces and subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency, or with the recommendation of the Geotechnical Engineer and Engineer Geologist.

- The Contractor will be required to obtain a minimum relative compaction of 90 percent out to the finish slope face of fill slopes, buttresses and stabilization fills. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure which produces the required compaction.

The Contractor shall prepare a written detailed description of the method or methods he will employ to obtain the required slope compaction. Such documents shall be submitted to the Geotechnical Engineer for review and comments prior to the start of grading.

If a method other than overbuilding and cutting back to the compacted core is to be employed, slope tests will be made by the Geotechnical Engineer during construction of the slopes to determine if the required compaction is being achieved. Where failing tests occur or other field problems arise, the contractor will be notified by the Geotechnical Engineer.

If the method of achieving the required slope compaction selected by the Contractor fails to produce the necessary results, the Contractor shall rework or rebuild such slopes until the required degree of compaction is obtained, at no additional cost to the Owner or Geotechnical Engineer.

- All fill slopes should be planted or protected from erosion by methods specified in the preliminary report or by means approved by the governing authorities.

- Fill-over-cut slopes shall be properly keyed through topsoil, colluvium or creep material into rock or firm materials; and the transition shall be stripped of all soil prior to placing fill. (See detail)

4.0 CUT SLOPES

- The Engineering Geologist shall inspect all cut slopes excavated in rock, lithified or formation material at vertical intervals not exceeding ten feet.

- If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these

conditions shall be analyzed by the Engineering Geologist and Geotechnical Engineer; and recommendations shall be made to treat these problems.

- Cut slopes that face in the same direction as the prevailing drainage shall be protected from slope wash by a non-erosive interceptor swale placed at the top of the slope.

- Unless otherwise specified in the soils and geological report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

- Drainage terraces shall be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Geotechnical Engineer or Engineering Geologist.

5.0 GRADING CONTROL

- Inspection of the fill placement shall be provided by the Geotechnical Engineer during the progress of grading.

- In general, density tests should be made at intervals not exceeding two feet of fill height or every 500 cubic yards of fill placed. This criteria will vary depending on soil conditions and the size of the job. In any event, an adequate number of field density tests shall be made to verify that the required compaction of being achieved.
- Density tests should be made on the surface material to receive fill as required by the Geotechnical Engineer.

- All cleanout, processed ground to receive fill, key excavations, subdrains and rock disposal must be inspected and approved by the Geotechnical Engineer (and often by the governing authorities) prior to placing any fill. It shall be the Contractor's responsibility to notify the Geotechnical Engineer and governing authorities when such areas are ready for inspection.

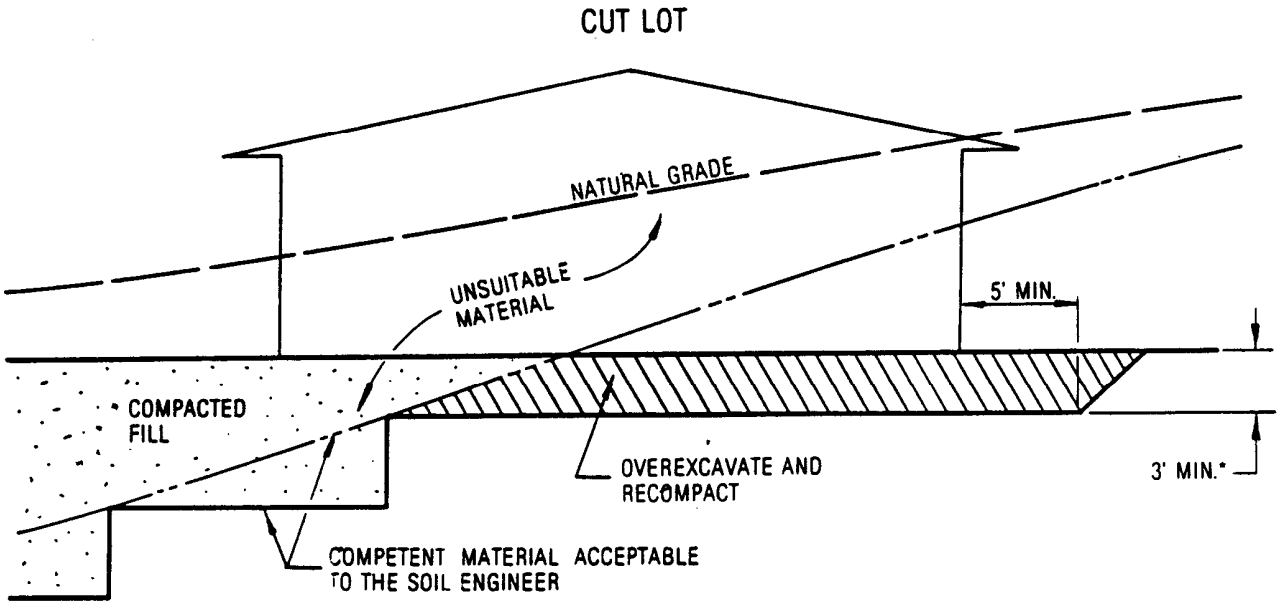
6.0 CONSTRUCTION CONSIDERATIONS

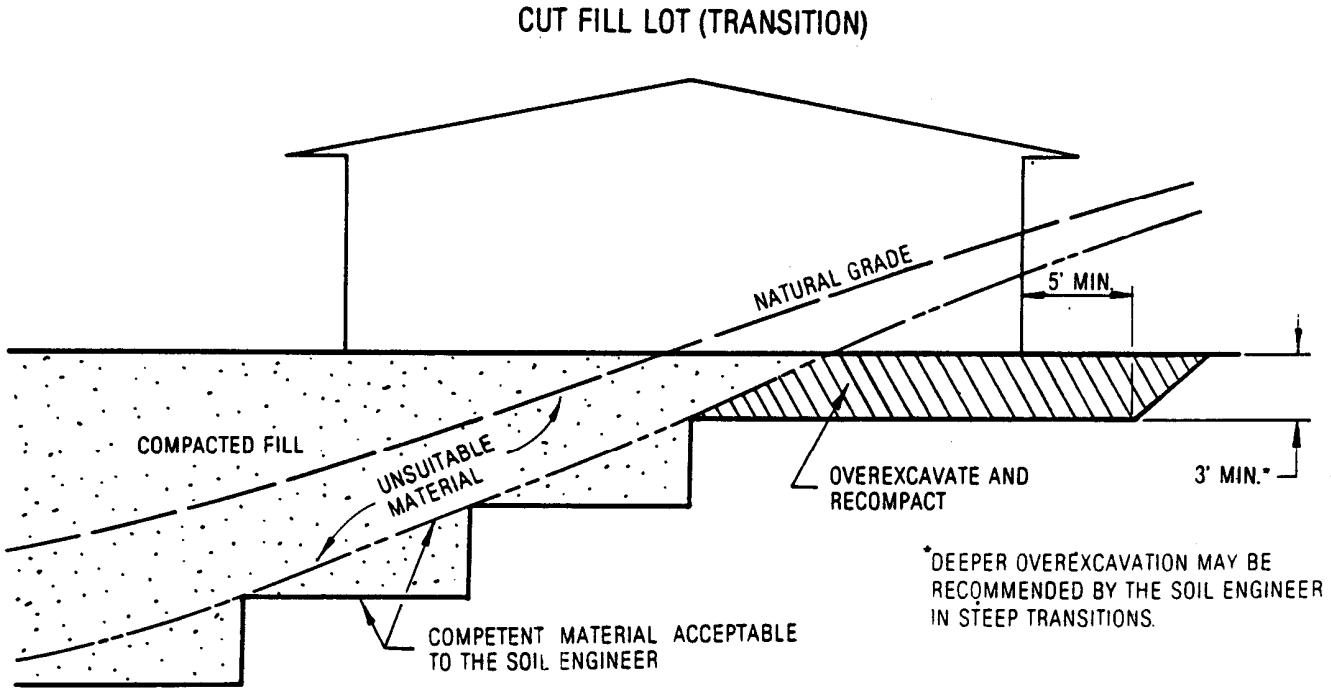
- Erosion control measures, when necessary, shall be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls.

- Upon completion of grading and termination of observations by the Geotechnical Engineer, no further filling or excavating, including that necessary for footings, foundations, large tree wells, retaining walls, or other features shall be performed without the approval of the Geotechnical Engineer or Engineering Geologist.

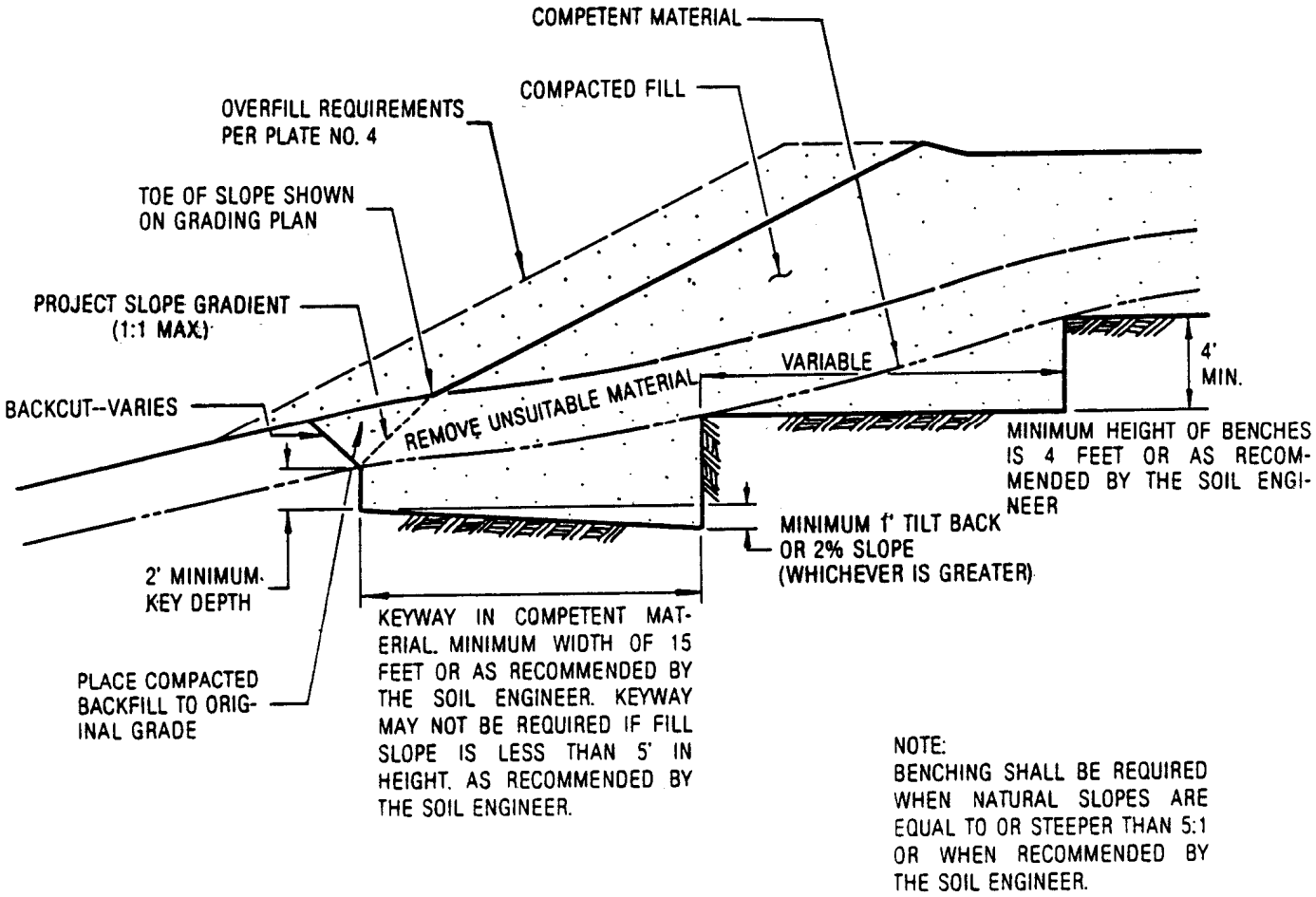
- Care shall be taken by the Contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of a permanent nature on or adjacent to the property.

TYPICAL OVEREXCAVATION OF DAYLIGHT LINE



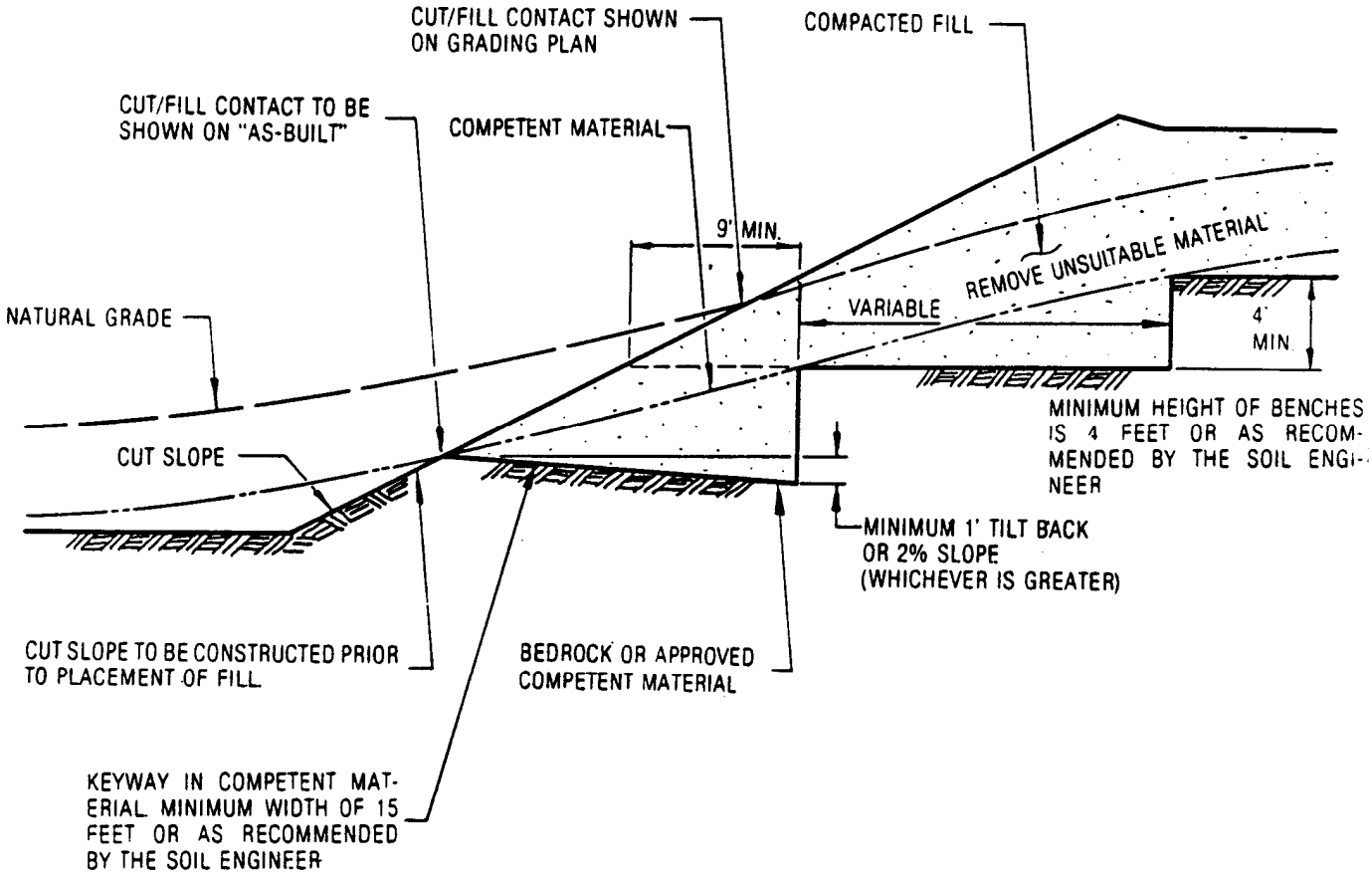


TYPICAL FILL OVER NATURAL SLOPE

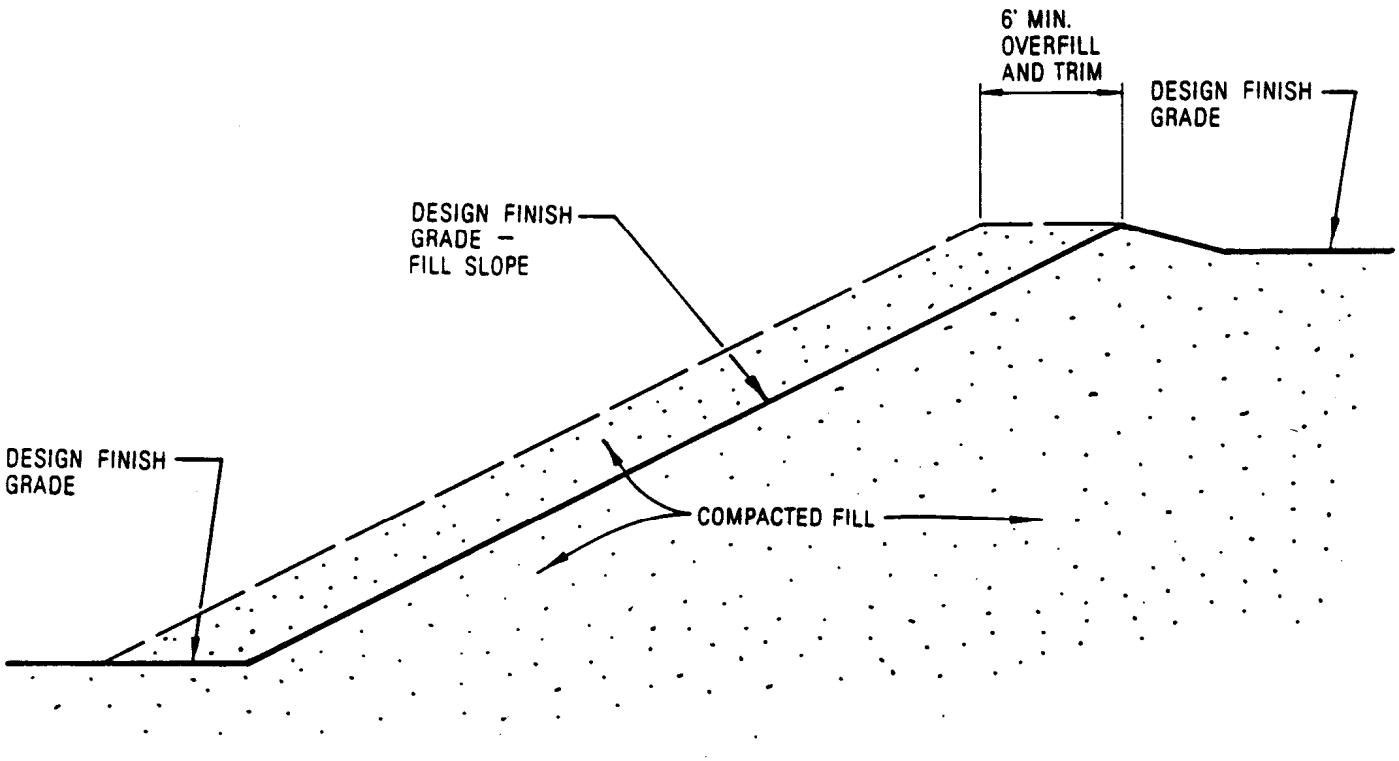


NOTE:
BENCHING SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO OR STEEPER THAN 5:1 OR WHEN RECOMMENDED BY THE SOIL ENGINEER.

TYPICAL FILL-OVER-CUT SLOPE



TYPICAL FILL SLOPE CONSTRUCTION



NOTES:

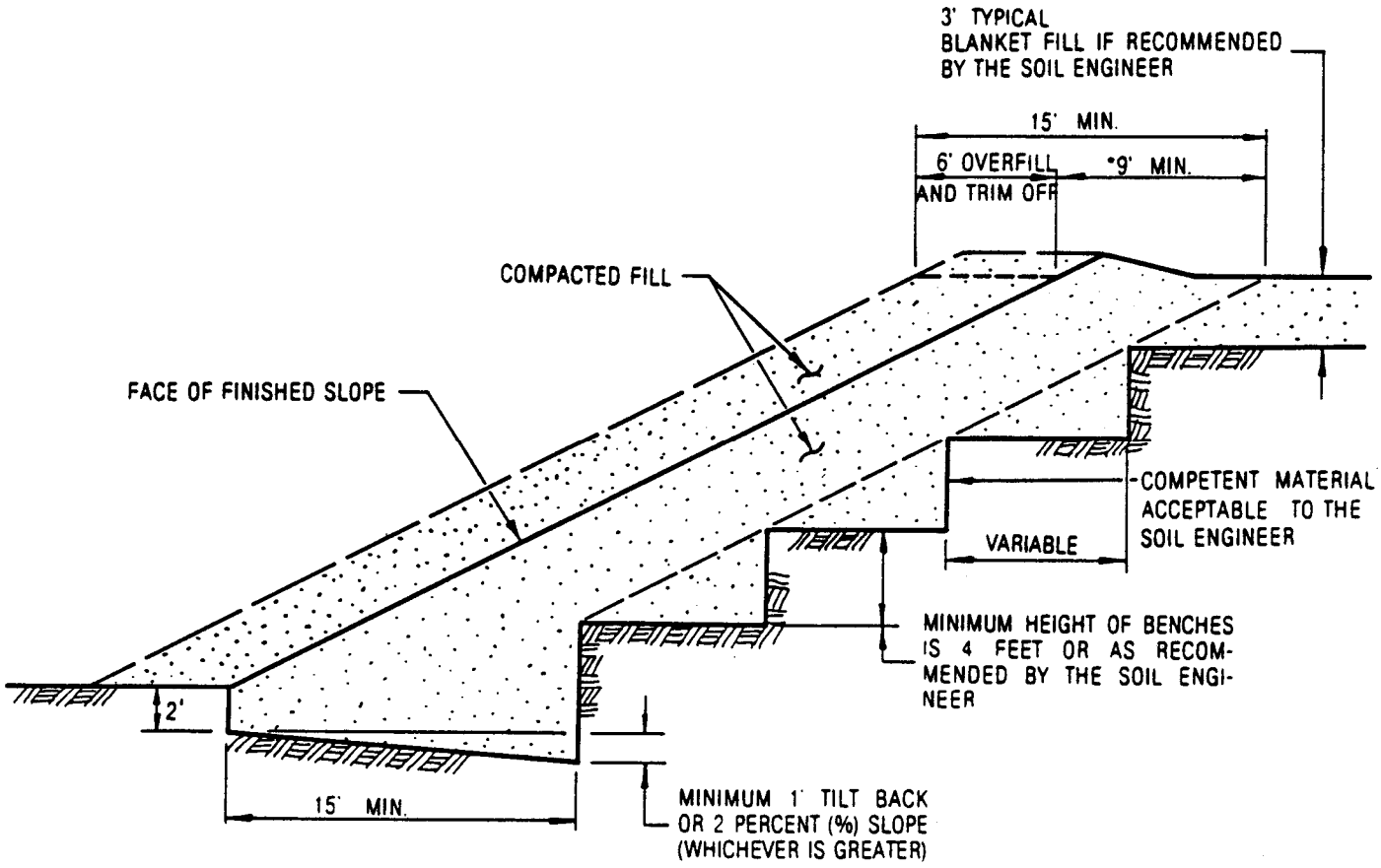
1. ALL FILL SLOPES, INCLUDING BUTTRESS AND STABILIZATION FILLS, SHALL BE OVERFILLED A MINIMUM OF SIX FEET HORIZONTALLY WITH COMPACTED FILL AND TRIMMED TO THE DESIGN FINISH GRADE.

   EXCEPTIONS:

   A. FILL SLOPE OVER CUT SLOPE.
   B. FILL SLOPE ADJACENT TO EXISTING IMPROVEMENTS.

2. THE EXCEPTIONS ABOVE WHICH DO NOT HAVE THE 6 FOOT SLOPE OVERFILL AND TRIM SHALL BE COMPACTED AS STATED IN THE PROJECT SPECIFICATIONS.

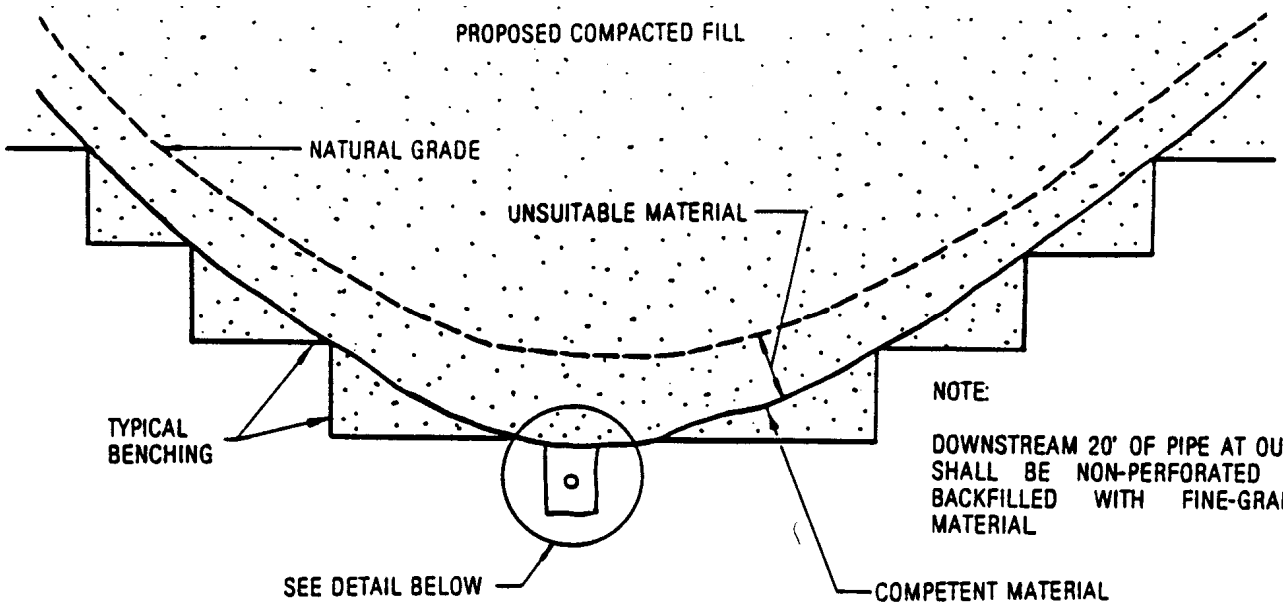
TYPICAL STABILIZATION FILL



NOTE:
SEE PLATE 6 FOR TYPICAL SUBDRAIN DETAILS FOR STABILIZATION FILLS. IF RECOMMENDED BY THE SOIL ENGINEER.

*GREATER THAN 9' IF RECOMMENDED BY THE SOIL ENGINEER: 15' WHERE NO 6' OVERFILL

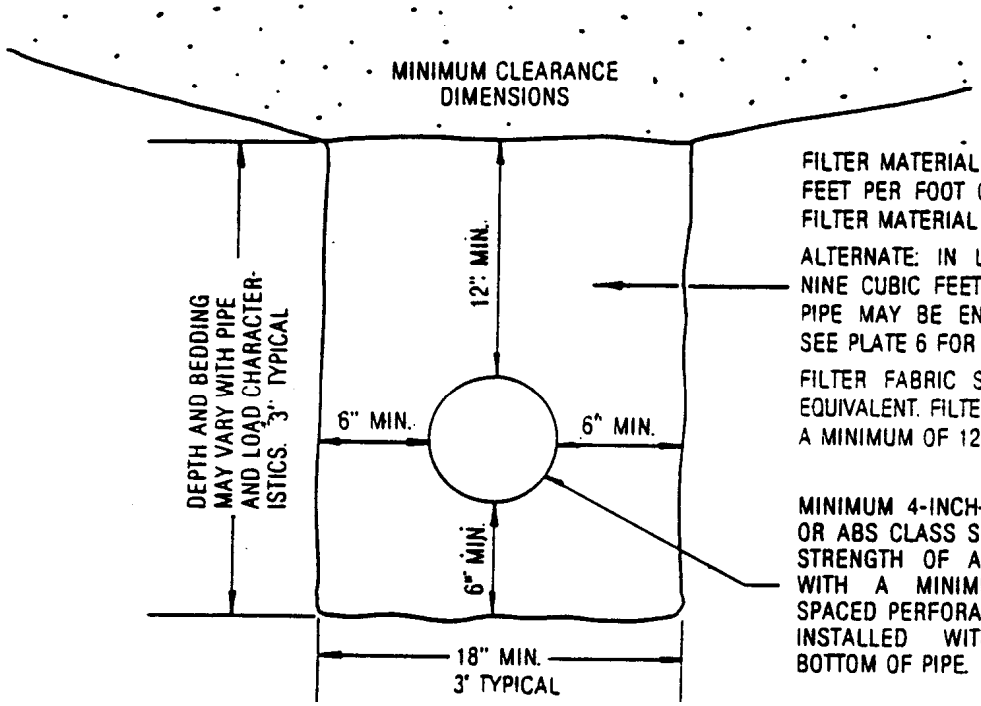
TYPICAL CANYON SUBDRAIN



NOTE:

DOWNSTREAM 20' OF PIPE AT OUTLET SHALL BE NON-PERFORATED AND BACKFILLED WITH FINE-GRAINED MATERIAL

NOTES:
PIPE SHALL BE A MINIMUM OF 4 INCHES DIAMETER AND RUNS OF 500 FEET OR MORE USE 6-INCH DIAMETER PIPE, OR AS RECOMMENDED BY THE SOIL ENGINEER



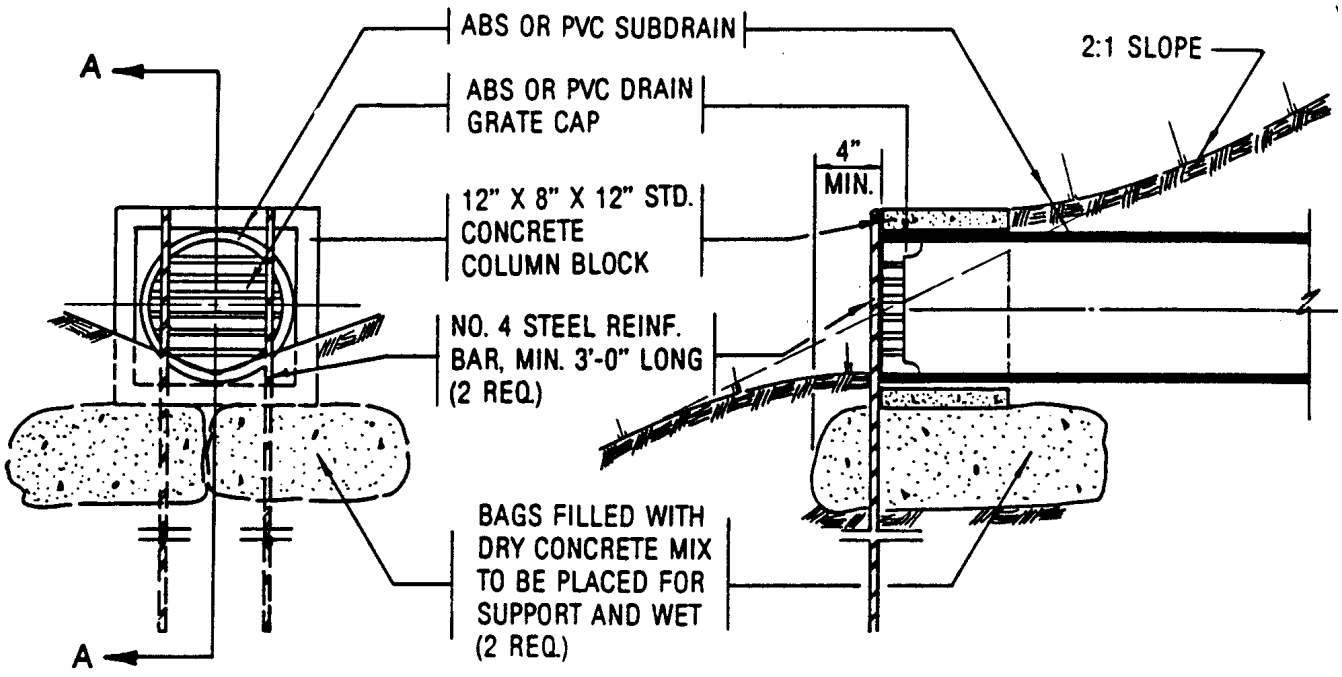
FILTER MATERIAL – MINIMUM OF NINE CUBIC FEET PER FOOT OF PIPE. SEE PLATE 6 FOR FILTER MATERIAL SPECIFICATION.

ALTERNATE: IN LIEU OF FILTER MATERIAL NINE CUBIC FEET OF GRAVEL PER FOOT OF PIPE MAY BE ENCASED IN FILTER FABRIC. SEE PLATE 6 FOR GRAVEL SPECIFICATIONS.

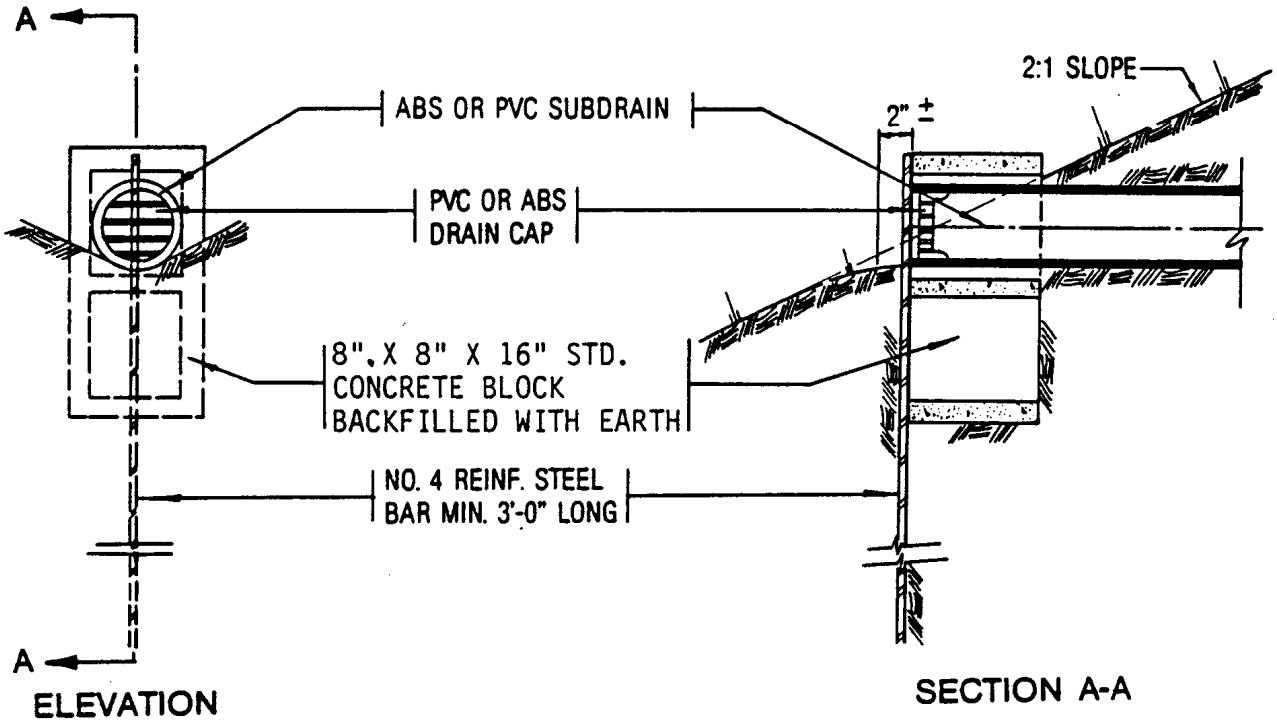
FILTER FABRIC SHALL BE MIRAFI 140 OR EQUIVALENT. FILTER FABRIC SHALL BE LAPPED A MINIMUM OF 12 INCHES ON ALL JOINTS.

MINIMUM 4-INCH-DIAMETER, PVC SCH. 40 OR ABS CLASS SDR-35 WITH A CRUSHING STRENGTH OF AT LEAST 1000 POUNDS, WITH A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE, INSTALLED WITH PERFORATIONS ON BOTTOM OF PIPE.

SUBDRAIN OUTLET MARKER

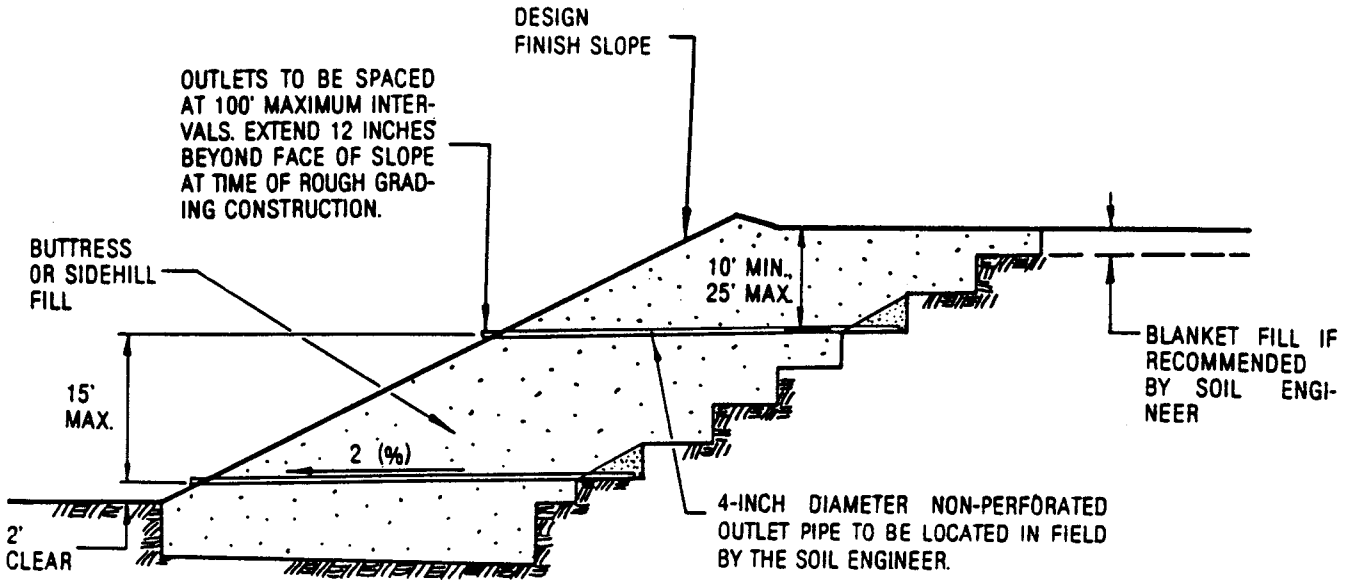


SUBDRAIN OUTLET MARKER FOR 6" AND 8" PIPES



SUBDRAIN OUTLET MARKER – 4" PIPE

TYPICAL STABILIZATION AND BUTTRESS FILL SUBDRAIN



FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO MA STD. PLAN 323)

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

SIEVE SIZE	MAXIMUM PERCENTAGE PASSING
1½"	100
NO. 4	50
NO. 200	8

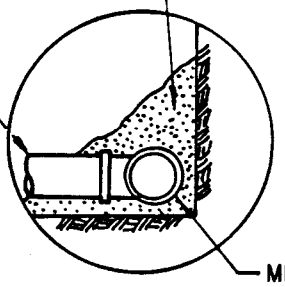
SAND EQUIVALENT = MINIMUM OF 50

FILTER MATERIAL – MINIMUM OF FIVE CUBIC FEET PER FOOT OF PIPE. SEE ABOVE FOR FILTER MATERIAL SPECIFICATION.

ALTERNATIVE: IN LIEU OF FILTER MATERIAL, FIVE CUBIC FEET OF GRAVEL PER FOOT OF PIPE MAY BE ENCASED IN FILTER FABRIC. SEE ABOVE FOR GRAVEL SPECIFICATION.

FILTER FABRIC SHALL BE MIRAFI 140 OR EQUIVALENT. FILTER FABRIC SHALL BE LAPPED A MINIMUM OF 12 INCHES ON ALL JOINTS.

OUTLET PIPE TO BE CONNECTED TO SUBDRAIN PIPE WITH TEE OR ELBOW



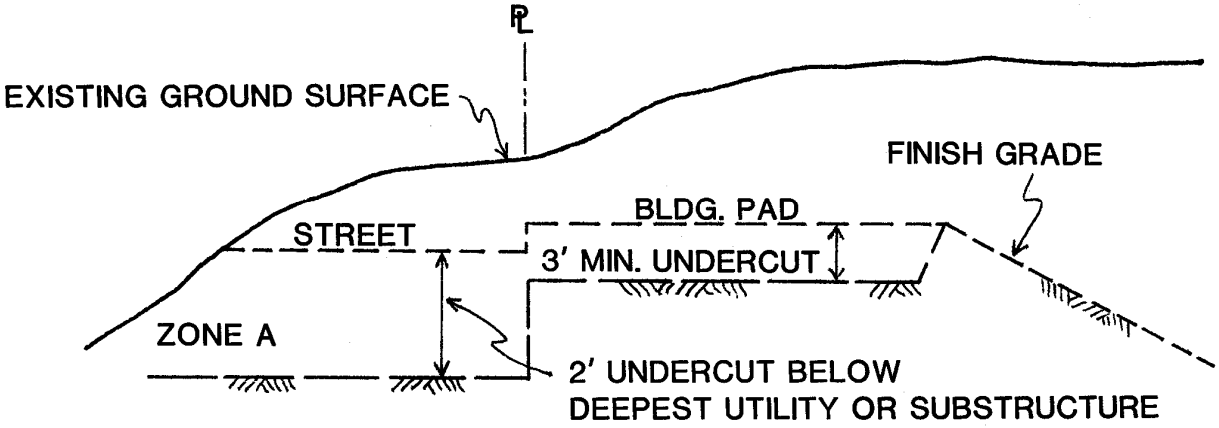
MINIMUM 4-INCH DIAMETER PVC SCH 40 OR ABS CLASS SDR 35 WITH A CRUSHING STRENGTH OF AT LEASE 1,000 POUNDS, WITH A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE INSTALLED WITH PERFORATIONS ON BOTTOM OF PIPE. PROVIDE CAP AT UPSTREAM END OF PIPE. SLOPE AT 2 PERCENT TO OUTLET PIPE.

NOTES:

1. TRENCH FOR OUTLET PIPES TO BE BACKFILLED WITH ON-SITE SOIL.

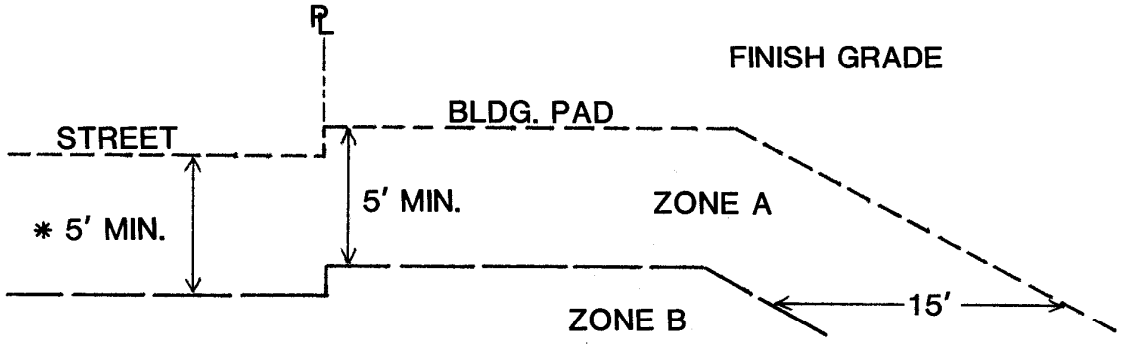
TYPICAL CUT AND FILL GRADING DETAILS

TYPICAL GRADING WITHIN PROPOSED DEEP BEDROCK CUT AREAS



NO SCALE

TYPICAL GRADING WITHIN PROPOSED FILL AREAS



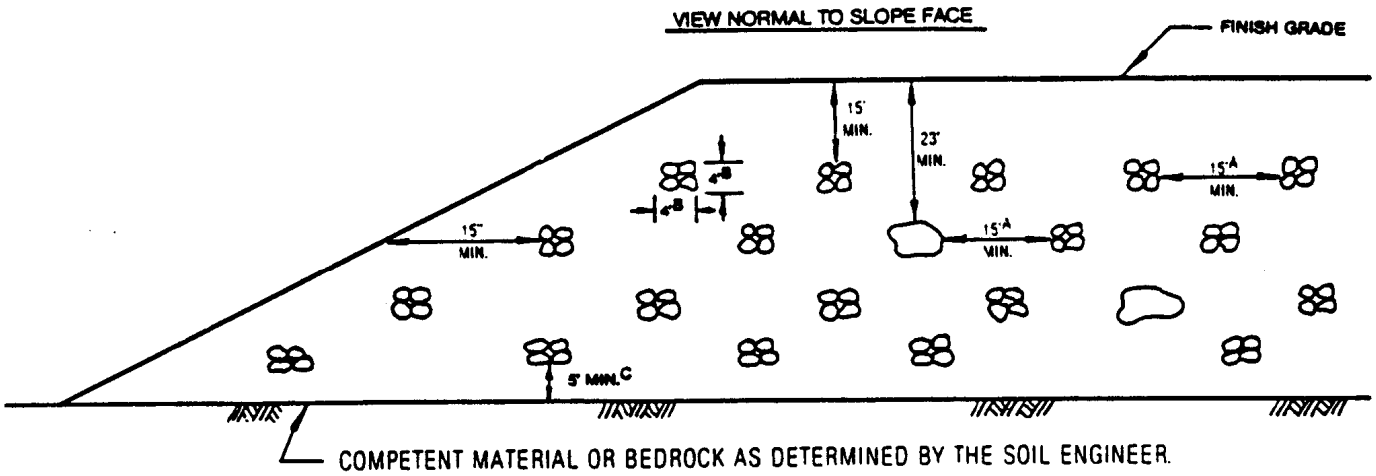
LEGEND

ZONE A ....."SOIL" FILL PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS PRESENTED IN SECTION 11.2.3 OF THIS REPORT

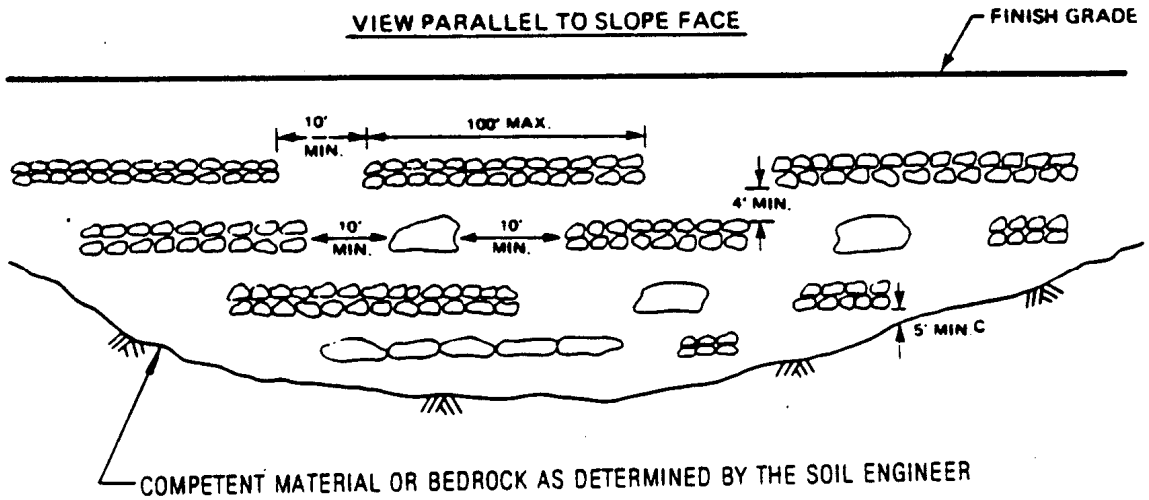
ZONE B ....."SOIL-ROCK" AND/OR "ROCK" FILL PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS PRESENTED IN SECTION 11.2.3 OF THIS REPORT

* 5′ OR 1′ BELOW DEEPEST UTILITY, WHICHEVER IS GREATER

TYPICAL OVERSIZE ROCK DISPOSAL – "SOIL-ROCK" FILL



NOTE:
ORIENTATION OF WINDROWS MAY VARY BUT SHALL BE AS RECOMMENDED BY SOIL ENGINEER.



NOTES:

A. ONE EQUIPMENT WIDTH OR A MINIMUM OF 15 FEET.
B. HEIGHT AND WIDTH MAY VARY DEPENDING ON ROCK SIZE AND TYPE OF EQUIPMENT.
C. IF APPROVED BY THE SOIL ENGINEER, WINDROWS MAY BE PLACED DIRECTLY ON COMPETENT MATERIALS OR BEDROCK PROVIDING ADEQUATE SPACE IS AVAILABLE FOR COMPACTION.
D. VOIDS IN WINDROW TO BE FILLED BY FLOODING GRANULAR SOIL INTO PLACE. GRANULAR SOIL SHALL MEAN ANY SOIL WHICH HAS A UNIFIED SOIL CLASSIFICATION SYSTEM (UBC 29-1) DESIGNATION OF SM, SP, SW, GM, GP, OR GW.
E. AFTER FILL BETWEEN WINDROWS IS PLACED AND COMPACTED WITH THE LIFT OF FILL COVERING WINDROW, WINDROW SHALL BE PROOF-ROLLED WITH D-9 DOZER OR EQUIVALENT.
F. OVERSIZED ROCK IS DEFINED AS LARGER THAN 12" IN SIZE.

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PHASE I ENVIRONMENTAL SITE ASSESSMENT

Northwest Corner of East Colton Avenue & Wabash Avenue
Assessor's Parcel Number: 0168-291-02
Redlands, California 92374

Prepared for:

Vanita Soni Puri
1423 Georgina Avenue
Santa Monica, California 90402

Prepared by:

Hazard Management Consulting, Inc.
211 W. Avenida Cordoba, Suite 200
San Clemente, CA 92672
(949) 361-3902

May 25, 2023

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Executive Summary

Hazard Management Consulting, Inc. (HMC) is pleased to submit this Environmental Site Assessment (ESA) for the property referenced above in the City of Redlands, California (Subject Property) (Figures 1 & 2). This ESA was prepared to evaluate the Subject Property for potential Recognized Environmental Conditions (RECs) that may be present and was conducted as part of your due diligence efforts prior to redevelopment of the Subject Property for residential development. The Subject Property consists of one parcel, occupying approximately 9.01 acres of undeveloped vacant land.

The Subject Property is relatively flat with an elevation of approximately 1,610 feet above mean sea level (msl) with a regional slope to the west. The Subject Property is located in the City of Redlands, California and is set in a mixed-use type setting with residential, commercial, and industrial activities.

The Subject Property is in an area zoned for Single Family Residential (R-1) use and is bound:

- to the north by single-family residential development;
- on the east by Wabash Avenue, followed by Power Components (851 N. Wabash Avenue), and Mission Steel (881 N. Wabash Avenue);
- to the south by East Colton Avenue, followed by single-family residential development, Orange Blossom Trail, and a public park; and,
- to the west by single-family residential development.

Key findings of this Phase I ESA are as follows:

- The Subject Property consists of one parcel, occupying approximately 9.01 acres of undeveloped vacant land. The Subject Property is relatively flat with an elevation of approximately 1,610 feet above mean sea level (msl) with a regional slope to the west. The Subject Property is located in the City of Redlands, California and is set in a mixed-use type setting with residential, commercial, and industrial activities.

- The Subject Property is located in the Bunker Hill Subbasin which consists of the alluvial materials that underlie the San Bernardino Valley. Based on information obtained from a nearby Leaking Underground Storage Tank (LUST) case at a facility located approximately 2,207 feet north of the Subject Property, groundwater was reported at depths of approximately 110 to 150 feet below ground surface (bgs) and flows in a westerly direction.

- The Subject Property has historically been utilized as agricultural land as a citrus grove from as early as 1938 to at least 1995. The Subject Property has remained vacant undeveloped land from at least 2002 to present. The Subject Property vicinity was historically vacant or agricultural land and has been developed with single-family residential development to the north, south, and west, and light industrial buildings to the east.

- The Subject Property is located on the northwest corner of E. Colton Avenue and N. Wabash Avenue and consists of one parcel occupying approximately 9.01 acres. The Subject Property was observed to be a vacant lot and was covered with vegetation. No hazardous materials were observed to be in use at the Subject Property. There was no evidence of underground storage tanks (USTs), above ground storage tanks (ASTs), or wells observed at the Subject Property. One Southern California Edison transformer vault was observed near the southeast corner of the Subject Property and appeared to be in good condition with no signs of stains or leaks.

- While there were facilities reported to utilize hazardous chemicals or have had releases in the vicinity of the Subject Property, none of the facilities are expected to have impacted the Subject Property. There were no RECs identified from the review of records for off-site sources.

- Based on the results of this investigation, the likelihood of a vapor intrusion condition at the Subject Property is low.

- There are no structures present at the Subject Property and it is unlikely that asbestos-containing materials are present at the Subject Property.

Conclusions

We have performed a Phase I Environmental Site Assessment in accordance with ASTM E1527-21 Guidelines for the property at the northwest corner of East Colton Avenue & Wabash Avenue, Assessor's Parcel Number: 0168-291-02, in Redlands, California. Based on the results of this assessment HMC has found no evidence of RECs, HRECs, or CRECs.

Recommendations

Based on the findings of this ESA, HMC recommends that you consider shallow soil sampling for the presence of agricultural chemicals such as pesticides and herbicides. While there is a low likelihood that such materials are still present given the amount of time that has transpired since the citrus groves were present, it has been our experience that the local regulatory agencies are frequently asking for such analysis as part of permitting and entitlement.

PHASE I ENVIRONMENTAL SITE ASSESSMENT
Northwest Corner of East Colton Avenue & Wabash Avenue
Assessor's Parcel Number: 0168-291-02
Redlands, California 92374

1. INTRODUCTION

Hazard Management Consulting, Inc. (HMC) is pleased to submit this Environmental Site Assessment (ESA) for the property referenced above in the City of Redlands, California (Subject Property) (Figures 1 & 2). This ESA was prepared to evaluate the Subject Property for potential Recognized Environmental Conditions (RECs) that may be present and was conducted as part of your due diligence efforts prior to redevelopment of the Subject Property for residential development. The Subject Property consists of one parcel, occupying approximately 9.01 acres of undeveloped vacant land.

The Subject Property is relatively flat with an elevation of approximately 1,610 feet above mean sea level (msl) with a regional slope to the west. The Subject Property is located in the City of Redlands, California and is set in a mixed-use type setting with residential, commercial, and industrial activities.

1.1. Objective

In accordance with the ASTM E 1527-21 Standard Practice for Environmental Subject Property Assessments, the objective of the ESA is to assess, to the extent feasible under the standard, the likelihood that Recognized Environmental Conditions (RECs), as defined by ASTM, are present at the Subject Property.

A Recognized Environmental Condition "means (1) the presence of hazardous substances or petroleum products in, on, or at the subject property due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the subject property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the subject property under conditions that pose a material threat of a future release to the environment" (ASTM Standard Practice E1527-21). The term REC is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Performance of a Phase I ESA is intended to reduce, but not eliminate, uncertainty

regarding the potential for Recognized Environmental Conditions in connection with a property, within reasonable limits of time and cost.

All Appropriate Inquires (AAI) as defined in the Final Rule (40 CFR, Part 312), must be conducted by persons seeking the landowner liability protections under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) prior to acquiring a property or seeking or receiving federal brownfields grants under the authorities of CERCLA. The purpose of AAI, as defined in the AAI Final Rule, is to identify releases and threatened releases of hazardous substances, which cause or threaten to cause the incurrence of response costs. The U.S. Environmental Protection Agency (EPA) has stated that ASTM Standard E-1527-21 is consistent with the Standards and Practices for AAI, and is compliant with the statutory criteria for AAI.

1.2. Scope of Services, Methodology and Limitations

The findings of this ESA must be viewed in recognition of certain limiting conditions. The scope of work commissioned for this project does not represent an exhaustive study, but rather a reasonable inquiry, consistent with good commercial practice, in general accordance with ASTM Practice E-1527-21.

The scope of work for this ESA included the following activities:

- A reconnaissance visit to document the current condition of the Subject Property and neighboring facilities.
- Review of a regulatory database report.
- Review of previously prepared reports for the Subject Property.
- Submittal of questionnaires to the current Owner and User of the report.
- Review of historical references including aerial photographs, city directories, Sanborn Maps and topographic maps.
- On-line research and file review requests concerning the Subject Property and suspect off-site sources at the Nevada Division of Environmental Protection Bureau of Sustainable Materials Management, Bureau of Corrective Actions, and GeoMap Website.
- Preparation of this report of findings.

In the course of this assessment, HMC has relied on information provided by outside parties, such as regulatory agencies, previous reports and interview sources. For the purpose of this assessment, such third-party information is assumed to be accurate unless contradictory evidence is noted, and HMC does not express or imply any warranty regarding information provided by third-party sources.

2. SUBJECT PROPERTY DESCRIPTION

2.1. Subject Property Setting

The Subject Property consists of one parcel, occupying approximately 9.01 acres of undeveloped vacant land. The Subject Property is relatively flat with an elevation of approximately 1,610 feet above mean sea level (msl) with a regional slope to the west. The Subject Property is located in the City of Redlands, California and is set in a mixed-use type setting with residential, commercial, and industrial activities.

The Subject Property is in an area zoned for Single Family Residential (R-1) use and is bound:

- to the north by single-family residential development;
- on the east by Wabash Avenue, followed by Power Components (851 N. Wabash Avenue), and Mission Steel (881 N. Wabash Avenue);
- to the south by East Colton Avenue, followed by single-family residential development, Orange Blossom Trail, and a public park; and,
- to the west by single-family residential development.

Southern California Gas Company (SoCal Gas) reportedly provides natural gas and electrical services to the Subject Property. Water and sewer services are provided to the Subject Property by the City of Redlands.

2.2. Regional Geology and Hydrogeology

The Subject Property is located in the Bunker Hill Subbasin which consists of the alluvial materials that underlie the San Bernardino Valley. This subbasin is bounded by contact with consolidated rocks of the San Gabriel Mountains, San Bernardino Mountains, and Crafton Hills, and by several faults. The southern boundary is the Banning fault, the east boundary is the Redlands fault, the San Andreas fault is roughly the northern boundary, the Glen Helen fault abuts the northwest boundary, and the southwest boundary is the San Jacinto fault. The Santa Ana River, Mill Creek, and Lytle Creek are the main tributary streams in the subbasin (SBVWCD 2000). The range in annual precipitation is 13 to 31 inches.

The water-bearing material in the subbasin consists of Holocene and Pleistocene age alluvial deposits of sand, gravel, and boulders interspersed with deposits of silt and clay. The water-bearing material has been divided into upper and lower aquifers (Hardt and Hutchinson 1980). In the central part of the subbasin, a poorly permeable clay layer separates the aquifers, creating confined conditions in the lower aquifer under about 25 square miles of the valley. Maximum thickness of the upper aquifer is approximately 350 feet, and maximum thickness of the lower aquifer is approximately 650 feet. Groundwater generally converges toward the Santa Ana River in the southwestern part of the subbasin and discharges over the San Jacinto fault at Colton Narrows (USGS 1989). Wells yield up to 5,000 gpm and average about 1,245 gpm. Specific yield of these deposits ranges from 7 – 21 percent and average 13 percent (WE 2000). In general, the far eastern and northwestern portions of the Bunker Hill Subbasin show the largest decreases while the rest of the subbasin shows mostly stable or increasing ground water elevations. Average changes in ground water level elevations between Fall 1998 and Fall 1999 ranged up to an increase of about three feet (SBVWCD 2000).

The Groundwater beneath the Subject Property is regulated by the California Regional Water Quality Control Board (RWQCB) who assigns various uses for waters of the State as presented in their basin plan (RWQCB, 1995). Based on information obtained from a nearby Leaking Underground Storage Tank (LUST) case at a facility located approximately 2,207 feet north of the Subject Property, groundwater was reported at depths of approximately 110 to 150 feet below ground surface (bgs) and flows in a westerly direction.

2.3. Interviews and User Provided Information

The User of this report is Vanita Soni Puri who is the current owner of the Subject Property and would be considered a “User” of the report per ASTM definitions. We requested all available information from the User.

2.4. Title Records

A Commitment for Title Insurance (Report) prepared by First American Title Company was provided to HMC for review. The Report was dated October 14, 2021, and the Title was indicated to be vested in: Vanita Soni Puri, Trustee of The Vanita Soni Puri 2012 Irrevocable Trust Dated November 28, 2012, as to an Undivided One-Third Interest; Varun Soni, Trustee of The Varun Soni 2012 Irrevocable Trust Dated November 28, 2012, as to an Undivided One-Third Interest; and Vaneesh Soni, Trustee of The Vaneesh Soni 2012 Irrevocable Trust Dated November 28, 2012, as to an Undivided One-Third Interest; as

Tenants in Common. The Report had information on property taxes, easements and liens but no relevant information on environmental features, recordings or information indicative of an environmental concern.

2.5. User Knowledge

The User of this report Vanita Soni Puri and their investors and lender. We were able to interview Ms. Vanita Soni Puri regarding their knowledge and information regarding the Subject Property. Ms. Puri indicated they had no prior knowledge or unique information regarding the Subject Property and was unaware of any litigation, or remedial actions at the Subject Property or any Land Use Restrictions. Ms. Puri provided information regarding utility providers to the Subject Property and indicated that the Subject Property was vacant undeveloped land that was previously utilized for agriculture.

2.6. Owner/Occupant Knowledge

The Owner of the Subject Property is Vanita Soni Puri. Information regarding the Owner's knowledge of the Subject Property is described in Section 2.5.

2.7. Environmental Liens or Activity and Use Limitations

HMC is unaware of any liens or AULs at the Subject Property.

3. SUBJECT PROPERTY USE AND HISTORY

Past usage of the Subject Property was assessed through a review of historical aerial photographs, topographic maps and an EDR search of city directories and prior reports. Review of the Sanborn Map collection indicates that Sanborn Maps were not produced for the Subject Property.

3.1. Aerial Photograph Review

Aerial photographs covering the Subject Property were obtained from Environmental Data Resources, Inc. (EDR). Photographs were available from the period 1938 through 2020. Copies of the aerial photographs are included in Appendix B. A summary of the observations noted from the aerial photographs are as follows:

1938-1968 In these photographs the Subject Property and Subject Property vicinity were noted to be agricultural or vacant land. One industrial building was observed to the east of the Subject Property across N. Wabash Avenue.

1975-1985 In these photographs the Subject Property was observed to be agricultural

land utilized for citrus groves. The Subject Property vicinity was observed to be developed with residential structures to the south, vacant or agricultural land to the west and north, and industrial buildings to the east.

1989-1995 In these photographs the Subject Property was observed to be agricultural land utilized for citrus groves. The Subject Property vicinity was observed to be developed with residential structures to the north, south, and west, and industrial buildings to the east.

2002-2020 In these photographs the Subject Property was observed to be vacant undeveloped land. No significant changes were observed in the Subject Property vicinity.

3.2. Topographic Maps

Historical topographic maps were also reviewed as part of this effort and aided in interpreting the overall history of the subject property. No additional information was gathered from review of the topographic maps.

3.3. Sanborn Maps

Sanborn maps are maps that were created for the insurance industry to document business activities in metropolitan areas of the country and were used in underwriting. They often times contain detailed information about a Subject Property. While they were prepared for insurance underwriting and were not environmental maps per se, they often times contain information that is useful in evaluating the historical use of a Subject Property. Sanborn maps were not generated for the Subject Property.

3.4. EDR City Directory Review

EDR performed a search of the City Directory records for the Subject Property address and nearby properties at approximately five-year intervals. Review of this report indicated that there were no directory listings for the Subject Property.

3.5. City of Redlands

A public records request was submitted to the City of Redlands Building and Safety Department (RBSD) requesting information pertaining to building permits and inspection records. RBSD indicated that there were no records available pertaining to building records for the Subject Property. One notice of violation was issued to the Subject

Property in November 2012 regarding overgrown vegetation. The violation was subsequently corrected and no information regarding environmental issues at the Subject Property was available.

3.6. Summary

The Subject Property has historically been utilized as agricultural land as a citrus grove from as early as 1938 to at least 1995. The Subject Property has remained vacant undeveloped land from at least 2002 to present. The Subject Property vicinity was historically vacant or agricultural land and has been developed with single-family residential development to the north, south, and west, and light industrial buildings to the east.

4. PRIOR INVESTIGATIONS

Prior investigations were not reportedly produced for the Subject Property.

5. SUBJECT PROPERTY RECONNAISSANCE

Mr. Gage Costales of HMC, conducted a Subject Property and vicinity reconnaissance on May 9, 2023. The reconnaissance was conducted in order to identify visible evidence of RECs at the Subject Property and to assess possible off-site conditions that may impact the Subject Property. Mr. Costales was unaccompanied during the Subject Property reconnaissance.

The Subject Property is located on the northwest corner of E. Colton Avenue and N. Wabash Avenue and consists of one parcel occupying approximately 9.01 acres. The Subject Property was observed to be a vacant lot and was covered with vegetation. No hazardous materials were observed to be in use at the Subject Property. There was no evidence of underground storage tanks (USTs), above ground storage tanks (ASTs), or wells observed at the Subject Property. One Southern California Edison transformer vault was observed near the southeast corner of the Subject Property and appeared to be in good condition with no signs of stains or leaks.

Selected photographs illustrating the property and nearby off-site conditions are included in Appendix A. Summaries of the Subject Property and observations are detailed below.

Description and Use of Subject Property:	The Subject Property consists of a 9.01-acre parcel and was observed to be vacant undeveloped land with vegetation growth throughout.
Underground and Aboveground Storage Tanks:	There was no evidence of USTs or ASTs observed at the Subject Property.
Hazardous Materials, Hazardous Wastes or Petroleum Products:	There was no evidence of hazardous materials usage at the Subject Property.
Drains, Drain lines and Sumps:	No drainage features were observed at the Subject Property. Drainage at the Subject Property generally consists of sheet flow to storm drains located on E. Colton Avenue and N. Wabash Avenue.
Pits, Ponds, Lagoons	There were no ponds or lagoons observed on the Subject Property.
Industrial Wastewater:	Industrial wastewater is not generated at the Subject Property.
Stains:	Staining was not observed at the Subject Property.
Wells:	There were no water wells, monitoring wells, or oil/gas wells observed at the Subject Property.
Transformers:	One Southern California Edison transformer vault was observed near the southeast corner of the Subject Property and appeared to be in good condition with no signs of stains or leaks.
Other Features:	There were no other features of note observed at the Subject Property.

There were no RECs found from the current use of the Subject Property.

5.1. Site Vicinity

The Subject Property consists of one parcel, occupying approximately 9.01 acres of undeveloped vacant land. The Subject Property is relatively flat with an elevation of approximately 1,610 feet above mean sea level (msl) with a regional slope to the west. The Subject Property is located in the City of Redlands, California and is set in a mixed-use type setting with residential, commercial, and industrial activities.

The Subject Property is in an area zoned for Single Family Residential (R-1) use and is bound:

- to the north by single-family residential development;
- on the east by Wabash Avenue, followed by Power Components (851 N. Wabash Avenue), and Mission Steel (881 N. Wabash Avenue);
- to the south by East Colton Avenue, followed by single-family residential development, Orange Blossom Trail, and a public park; and,
- to the west by single-family residential development.

No facilities were observed in the vicinity that pose a REC to the Subject Property from a visual basis.

6. REGULATORY AGENCY DATABASE RESEARCH

Regulatory agency database information was obtained from a standard radius Site Assessment (ASTM) report by Environmental Data Resources, Inc. The center of the search was in the approximate center of the Subject Property. Search distances for specific databases were one-quarter to one mile as specified in the ASTM 1527-21 standard. The database search includes over 70 federal, state, local, and proprietary records. A complete copy of this report is included in Appendix B.

6.1. Database Records Concerning the Target Property

The Subject Property was not listed in any regulatory databases.

6.2. Database Records Concerning the Subject Property Vicinity

We reviewed the database report for off-Site potential sources within the relevant search distance. In review of the many entries on the database, we reviewed the following factors that affect the ability of a facility to affect the Subject Property:

- Distance from the Subject Property,
- Location from the Subject Property with regard to the direction of groundwater flow,
- Nature of the release and whether the release has affected soil, groundwater or both,
- Status of the investigation (e.g. open or closed)

Groundwater was noted to flow in a westerly direction at another nearby facility, therefore facilities located adjacent to or to the east were further considered. Only those

facilities judged using these factors are discussed below. The following presents a summary of our findings:

Location	Address	Dist.	Direction	Lists	REC	RATIONALE
Mission Steel Fabrication	881 N. Wabash Ave.	18’	East	HWTS, CERS HAZ WASTE, HAZNET, SAN BERN CO. PERMIT, CERS, RCRA NONGEN/NLR	NO	This facility is reported on the listed databases as a hazardous waste generator and chemical storage facility. This facility has received multiple administrative violations which were corrected and subsequently returned to compliance. There are no records of spills or releases reported at this facility. The listings for this facility would not constitute an REC.
Larry Jacinto Construction, Inc.	988 N. Wabash Ave.	107’	Northeast	HWTS, RCRA-SQG, FINDS, ECHO, HAZNET, SAN BERN CO. PERMIT	NO	This facility is reported on the listed databases as a small quantity generator of hazardous waste. This facility was reported to have a permit to operate a petroleum AST in September 2006. There are no records of violations, spills or releases reported at this facility. The listings for this facility would not constitute an REC.
Loran, Inc.	1705 E. Colton Ave.	292’	East	RCRA-SQG, SAN BERN CO. PERMIT, CERS, PFAS ECHO	NO	This facility is reported on the listed databases as being a generator of hazardous waste in 2014. There are no records of violations, spills or releases reported at this facility. The facility is listed in the PFAS ECHO database. Despite EPA taking steps toward classifying PFAS as a hazardous substance, they have not done so yet. So, by definition, PFAS are not considered a REC within the constructs of a Phase I ESA but are a relevant issue of note. No records of a release of PFAS were reported at this facility. The listings for this facility would not constitute an REC.
C & S Powder Coating	1717 E. Colton Ave.	451’	East	HWTS, CERS HAZ WASTE, HAZNET, SAN BERN CO. PERMIT, CERS	NO	This facility is reported on the listed databases as a hazardous waste generator and chemical storage facility. There are no records of violations, spills or releases reported at this facility.

						The listings for this facility would not constitute an REC.
Richmond Technology, Inc.	1897 E. Colton Ave.	978’	East	EMI, SAN BERN CO. PERMIT, CERS, HWTS, HIST UST, HAZNET, NPDES, RCRA NONGEN/NLR, PFAS ECHO	NO	This facility is reported on the listed databases as a hazardous waste generator. The facility was reported to utilize three USTs for the storage of ethyl alcohol and propyl alcohol from 1968 to 1982. The facility is listed in the PFAS ECHO database. Despite EPA taking steps toward classifying PFAS as a hazardous substance, they have not done so yet. So, by definition, PFAS are not considered a REC within the constructs of a Phase I ESA but are a relevant issue of note. There are no records of violations, spills or releases at this facility. The listing for this facility would not constitute an REC.
Vines RV & Boat Storage	1897 E. Colton Ave.	1012’	East	HWTS, HAZNET, SAN BERN CO. PERMIT, CERS	NO	This facility is reported on the listed databases as a hazardous waste generator. The facility is reported with one administrative violation that was corrected and subsequently returned to compliance. There are no records of spills or releases at the facility. The listings for this facility would not constitute an REC.
P&R Paper Supply Company	1898 E. Colton Ave.	1180’	East	HWTS, HAZNET, NPDES, SAN BERN CO. PERMIT, CIWQS, CERS	NO	This facility is reported on the listed databases as a hazardous waste generator and chemical storage facility. The facility is reported with multiple administrative violations that were corrected and subsequently returned to compliance. There are no records of spills or releases at the facility. The listings for this facility would not constitute an REC.

Orphan Sites

Orphan Sites are those properties that are included on various agency lists, but for which the records do not have sufficient address information for the database program to map

the property. No orphan site listed in the EDR report were found to be in the vicinity of the Subject Property.

6.3. Summary of Off-Site Issues

While there were facilities reported to utilize hazardous chemicals or have had releases in the vicinity of the Subject Property, none of the facilities are expected to have impacted the Subject Property. There were no RECs identified from the review of records for off-site sources.

7. LOCAL AGENCY AND OTHER RECORDS REVIEW

7.1. Tribal Records

The Subject Property is not located in a tribal area therefore there were no tribal records to review.

7.2. Oil and Gas Wells

The State of California Geologic Energy Management Division online mapping website was reviewed for the location of active, plugged, or abandoned oil wells in the vicinity of the Subject Property. No oil wells were listed as having been drilled at the Subject Property in the vicinity of the Subject Property.

7.3. State of California

The State of California Geotracker and EnviroStor websites were also reviewed for information on potential on site facilities that are being investigated or remediated under either RWQCB or DTSC oversight. No active sites were listed on these databases that were not listed in the EDR review.

7.4. San Bernardino County Fire Protection District

HMC submitted a records request to the San Bernardino County Fire Protection District (SBCFPD). SBCFPD indicated there are no records available for the Subject Property.

8. VAPOR INTRUSION, ASBESTOS AND OTHER CONCERNS

8.1. Vapor Intrusion

Based on the results of this investigation, the likelihood of a vapor intrusion condition at the Subject Property is low.

8.2. Asbestos

There are no structures present at the Subject Property and it is unlikely that asbestos-containing materials are present at the Subject Property.

8.3. Radon

The Subject Property is listed as being located in Zone 2 with regards to radon indicating that radon maybe present at concentrations ranging 2-4 pico curies / liter.

8.4. Mold

No evidence of mold or water damage was observed at the Subject Property.

8.5. PFAS (per- and polyfluoroalkyl substances)

Despite EPA taking steps toward classifying PFAS as a hazardous substance, they have not done so yet. So, by definition, PFAS are not considered a REC within the constructs of a Phase I ESA but are a relevant issue of note. No evidence of sources of materials that could release PFAS were observed at the Subject Property.

9. SUMMARY OF FINDINGS

Key findings of this Phase I ESA are as follows:

- The Subject Property consists of one parcel, occupying approximately 9.01 acres of undeveloped vacant land. The Subject Property is relatively flat with an elevation of approximately 1,610 feet above mean sea level (msl) with a regional slope to the west. The Subject Property is located in the City of Redlands, California and is set in a mixed-use type setting with residential, commercial, and industrial activities.

- The Subject Property is located in the Bunker Hill Subbasin which consists of the alluvial materials that underlie the San Bernardino Valley. Based on information obtained from a nearby Leaking Underground Storage Tank (LUST) case at a facility located approximately 2,207 feet north of the Subject Property, groundwater was reported at depths of approximately 110 to 150 feet below ground surface (bgs) and flows in a westerly direction.

- The Subject Property has historically been utilized as agricultural land as a citrus grove from as early as 1938 to at least 1995. The Subject Property has remained vacant undeveloped land from at least 2002 to present. The Subject Property vicinity was historically vacant or agricultural land and has been developed with

single-family residential development to the north, south, and west, and light industrial buildings to the east.

- The Subject Property is located on the northwest corner of E. Colton Avenue and N. Wabash Avenue and consists of one parcel occupying approximately 9.01 acres. The Subject Property was observed to be a vacant lot and was covered with vegetation. No hazardous materials were observed to be in use at the Subject Property. There was no evidence of underground storage tanks (USTs), above ground storage tanks (ASTs), or wells observed at the Subject Property. One Southern California Edison transformer vault was observed near the southeast corner of the Subject Property and appeared to be in good condition with no signs of stains or leaks.

- While there were facilities reported to utilize hazardous chemicals or have had releases in the vicinity of the Subject Property, none of the facilities are expected to have impacted the Subject Property. There were no RECs identified from the review of records for off-site sources.
- Based on the results of this investigation, the likelihood of a vapor intrusion condition at the Subject Property is low.

- There are no structures present at the Subject Property and it is unlikely that asbestos-containing materials are present at the Subject Property.

10. DATA GAPS

We did not encounter any data gaps during this assessment.

11. CONCLUSIONS

We have performed a Phase I Environmental Site Assessment in accordance with ASTM E1527-21 Guidelines for the property at the northwest corner of East Colton Avenue & Wabash Avenue, Assessor's Parcel Number: 0168-291-02, in Redlands, California. Based on the results of this assessment HMC has found no evidence of RECs, HRECs, or CRECs.

12. RECOMMENDATIONS

Based on the findings of this ESA, HMC recommends that you consider shallow soil sampling for the presence of agricultural chemicals such as pesticides and herbicides. While there is a low likelihood that such materials are still present given the amount of time that has transpired since the citrus groves were present, it has been our experience that the local regulatory agencies are frequently asking for such analysis as part of permitting and entitlement.

13. QUALIFICATIONS

Mark S. Cousineau, NREP

Mr. Mark S. Cousineau, principal with HMC, has a diverse professional background in environmental management, which includes working as a generator, regulator, consultant, and corporate advisor in hazardous waste and other environmental issues.

Mr. Cousineau's technical background is focused in the area of overseeing large-scale environmental investigations and regulatory compliance management related to site assessments, subsurface investigations, facility surveys, and site remediation. To projects such as these, Mr. Cousineau brings expertise in evaluating complex sites and developing solutions to solve the technical, operational, regulatory, financial and timing issues. In addition, Mr. Cousineau routinely assists clients in developing environmental business plans for single assets and multi-site real estate portfolios and has designed and implemented several tenant audit programs involving the proactive management of environmental risk caused by on-site commercial and industrial tenant activities.

Mr. Cousineau has provided litigation support and has served, as a court-appointed expert on environmental issues, is a Member of the National Registry of Environmental Professionals, holds a M.S. in Environmental Sciences from California State University Fullerton and a B.S. in Chemistry from University California San Diego.

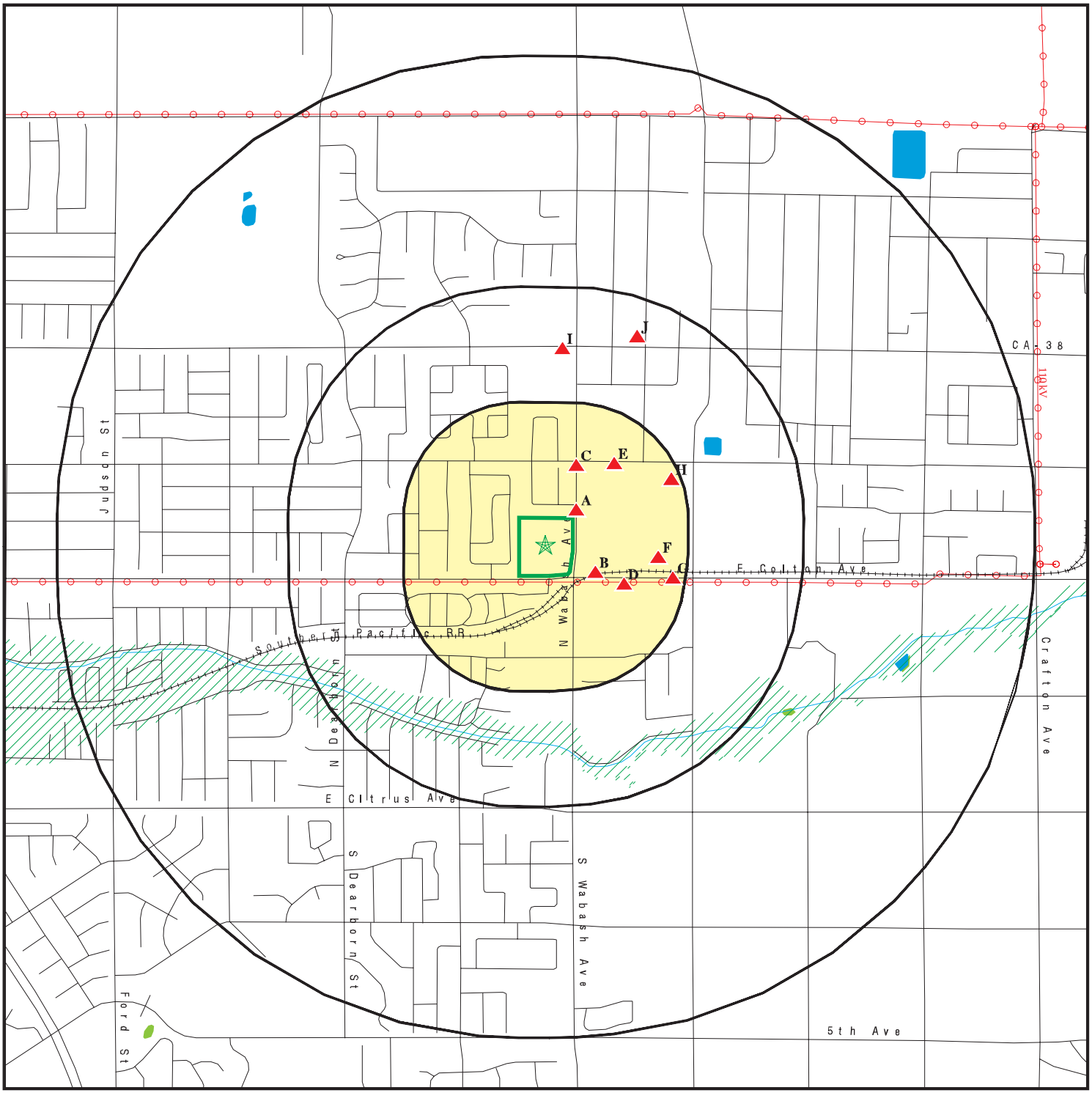
As signatory to this report, I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in § 312.10 of this part. I have the specific qualifications based on education, training, and experience to assess the property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312."



Mark Cousineau, NREP
Principal

TABLES

OVERVIEW MAP - 7326657.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

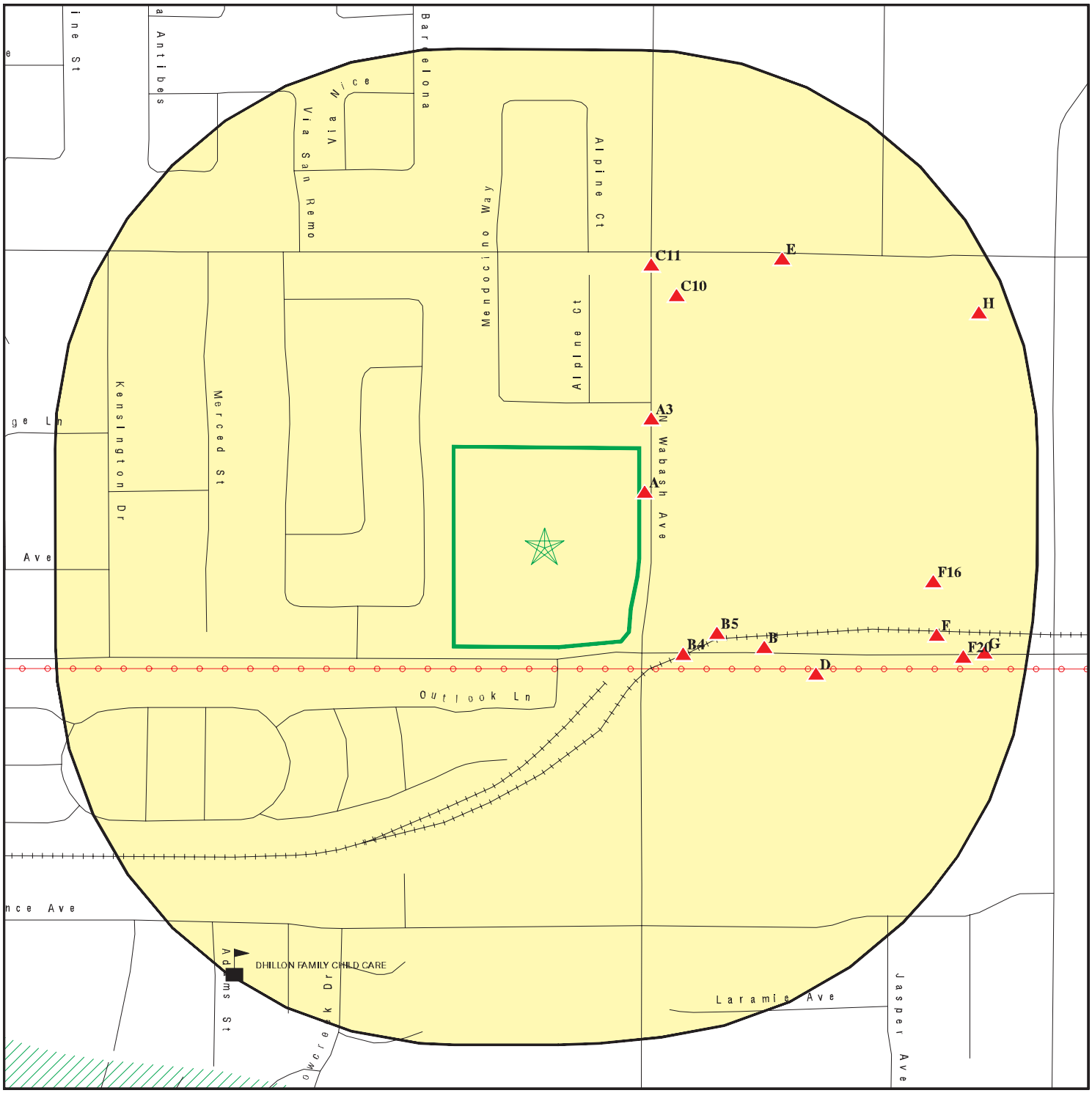
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This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Not Reported	CLIENT:	Hazard Management Consulting
ADDRESS:	Not Reported REDLANDS CA 92374	CONTACT:	Gage Costales
		INQUIRY #:	7326657.2s
LAT/LONG:	34.063828 / 117.140061	DATE:	May 03, 2023 1:58 pm

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DETAIL MAP - 7326657.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

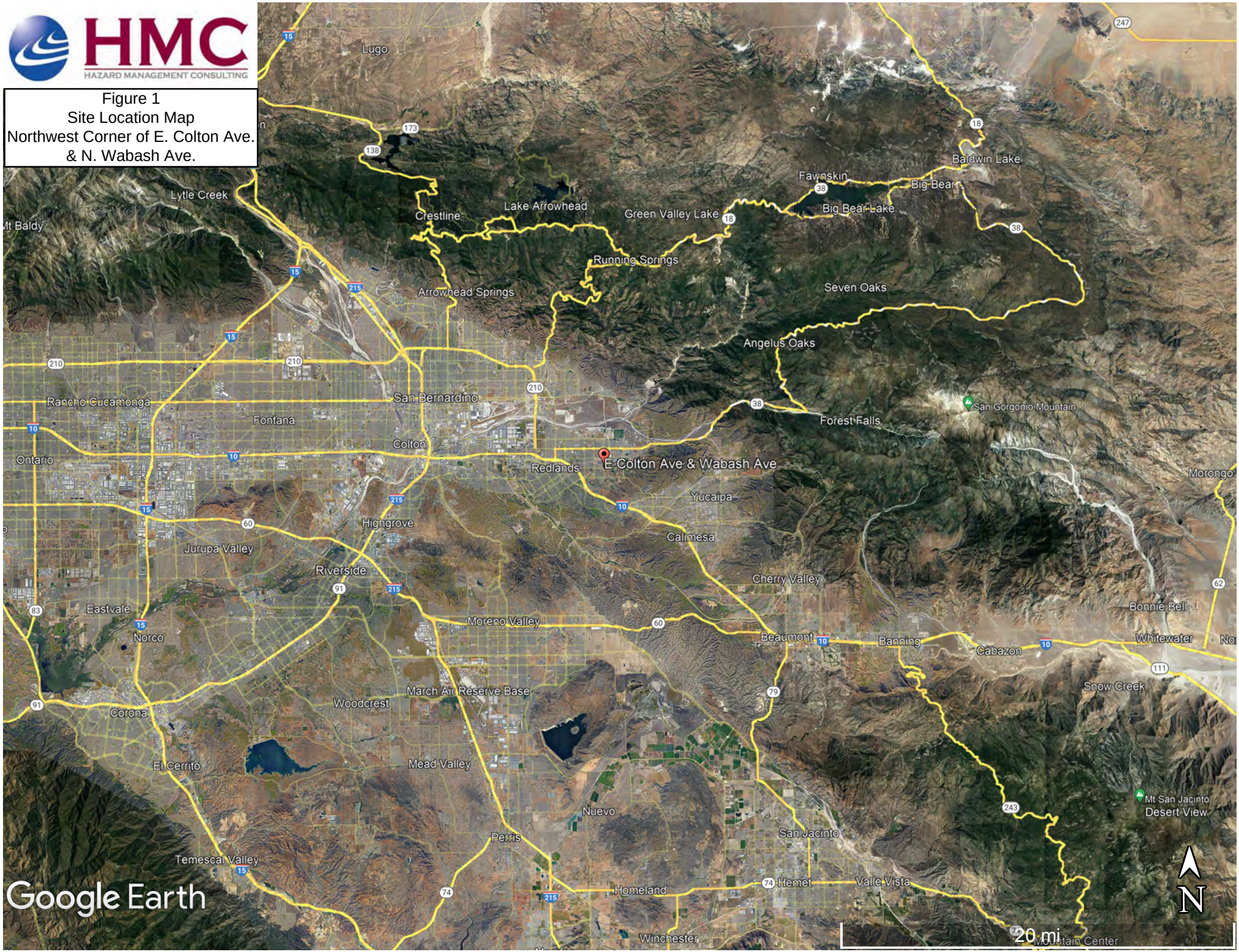
SITE NAME: Not Reported ADDRESS: Not Reported REDLANDS CA 92374 LAT/LONG: 34.063828 / 117.140061	CLIENT: Hazard Management Consulting CONTACT: Gage Costales INQUIRY #: 7326657.2s DATE: May 03, 2023 2:01 pm

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FIGURES

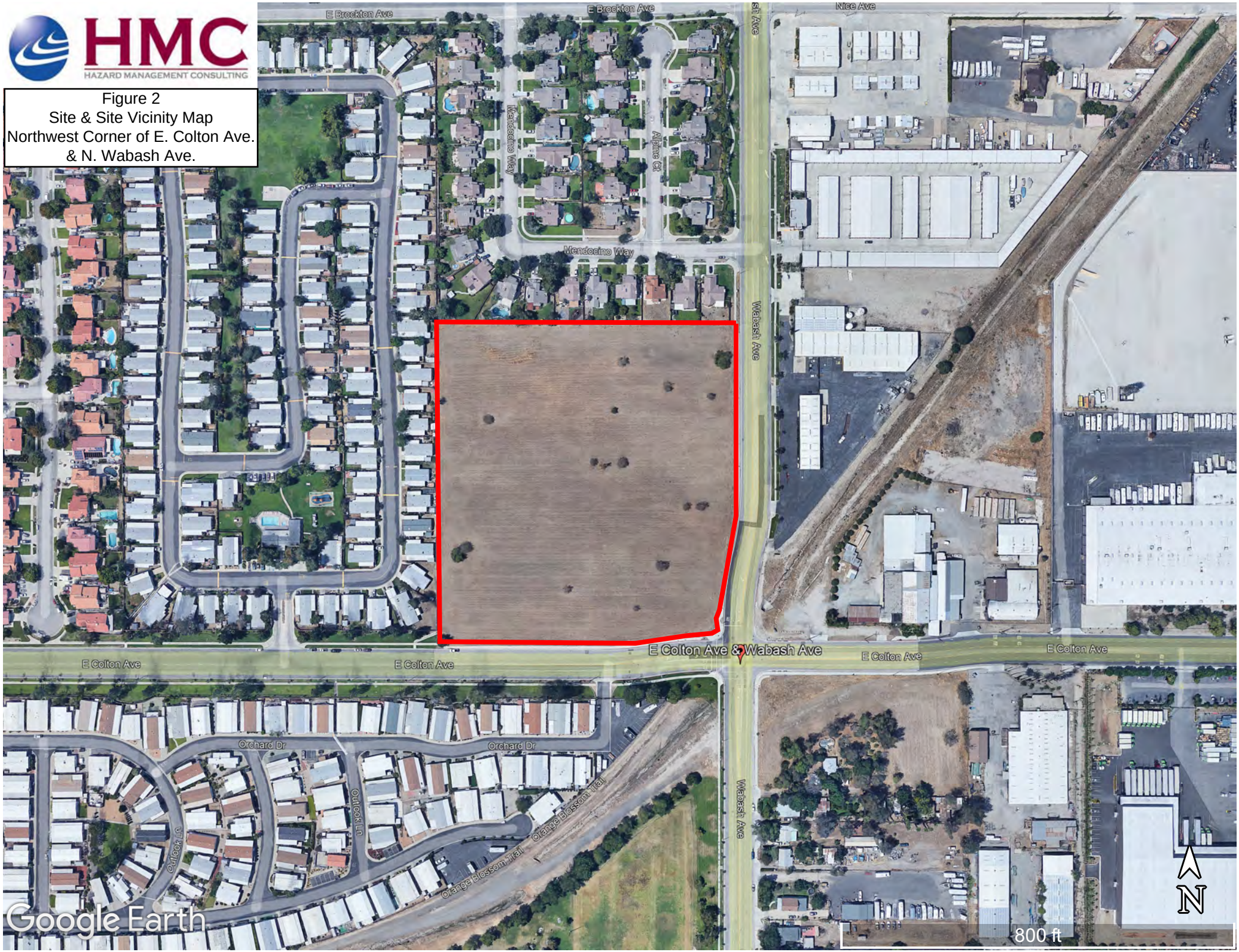
HMC
HAZARD MANAGEMENT CONSULTING

Figure 1
Site Location Map
Northwest Corner of E. Colton Ave.
& N. Wabash Ave.



HMC
HAZARD MANAGEMENT CONSULTING

Figure 2
Site & Site Vicinity Map
Northwest Corner of E. Colton Ave.
& N. Wabash Ave.



APPENDIX A



Looking at Site from North East Corner



Looking West on Site



Looking West on Site



Looking East on Site



South Side of Site



West Side of Site



Storage Facility NE of Site



Residential Development South of Site



Unnamed Industrial Business East of Site



Transformer Vault on SE Corner of Site



Transformer Vault on SE Corner of Site



Looking West on E. Colton Ave.

APPENDIX B

Not Reported
Not Reported
REDLANDS, CA 92374

Inquiry Number: 7326657.5
May 08, 2023

The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Executive Summary

Findings

City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, LLC. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. This Report is provided on an "AS IS", "AS AVAILABLE" basis. **NO WARRANTY EXPRESS OR IMPLIED IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, LLC AND ITS SUBSIDIARIES, AFFILIATES AND THIRD PARTY SUPPLIERS DISCLAIM ALL WARRANTIES, OF ANY KIND OR NATURE, EXPRESS OR IMPLIED, ARISING OUT OF OR RELATED TO THIS REPORT OR ANY OF THE DATA AND INFORMATION PROVIDED IN THIS REPORT, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES REGARDING ACCURACY, QUALITY, CORRECTNESS, COMPLETENESS, COMPREHENSIVENESS, SUITABILITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NON-INFRINGEMENT, MISAPPROPRIATION, OR OTHERWISE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, LLC OR ITS SUBSIDIARIES, AFFILIATES OR THIRD PARTY SUPPLIERS BE LIABLE TO ANYONE FOR ANY DIRECT, INCIDENTAL, INDIRECT, SPECIAL, CONSEQUENTIAL OR OTHER DAMAGES OF ANY TYPE OR KIND (INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS, LOSS OF USE, OR LOSS OF DATA), ARISING OUT OF OR IN ANY WAY CONNECTED WITH THIS REPORT OR ANY OF THE DATA AND INFORMATION PROVIDED IN THIS REPORT.** Any analyses, estimates, ratings, environmental risk levels, or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only an assessment performed by a qualified environmental professional can provide findings, opinions or conclusions regarding the environmental risk or conditions in, on or at any property.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available business directory data at approximately five year intervals.

RECORD SOURCES

The EDR City Directory Report accesses a variety of business directory sources, including Haines, InfoUSA, Polk, Cole, Bresser, and Stewart. Listings marked as EDR Digital Archive access Cole and InfoUSA records. The various directory sources enhance and complement each other to provide a more thorough and accurate report.

EDR is licensed to reproduce certain City Directory works by the copyright holders of those works. The purchaser of this EDR City Directory Report may include it in report(s) delivered to a customer.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	*Target Street*	*Cross Street*	*Source*
2020	☑	☐	EDR Digital Archive
2017	☑	☐	Cole Information
2014	☑	☐	Cole Information
2010	☑	☐	Cole Information
2005	☑	☐	Cole Information
2000	☑	☐	Cole Information
1995	☑	☐	Cole Information
1992	☑	☐	Cole Information
1986	☑	☐	Haines Criss-Cross Directory
1980	☑	☐	Haines Criss-Cross Directory
1976	☑	☐	Haines Criss-Cross Directory
1971	☑	☐	Haines Criss-Cross Directory
1965	☑	☐	Luskey Brothers & Co. Publications

FINDINGS

TARGET PROPERTY STREET

Not Reported
REDLANDS, CA 92374

Year	*CD Image*	*Source*

E COLTON AVE

2020	pg A1	EDR Digital Archive
2017	pg A2	Cole Information
2014	pg A5	Cole Information
2010	pg A8	Cole Information
2005	pg A11	Cole Information
2000	pg A14	Cole Information
1995	pg A17	Cole Information
1992	pg A20	Cole Information
1986	pg A21	Haines Criss-Cross Directory
1980	pg A22	Haines Criss-Cross Directory
1976	pg A23	Haines Criss-Cross Directory
1971	pg A24	Haines Criss-Cross Directory
1965	pg A25	Luskey Brothers & Co. Publications

FINDINGS

CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

E COLTON AVE 2020

1522	ANITA LEDESMA
	JASON MONTIJO
	JUAN MORA
1526	HELEN GUZMAN
	JENNIFER BAHAMON
	KEVIN LESCANO
	PETE GUZMAN
1530	MICHAEL HORTA
	TAMI HORTA
1531	CLINT MEELKER
	JOHANNA MEELKER
1534	CHARLES READMAN
	MARY READMAN
	TERESA CORREA
1538	ANDREW ROMAN
1605	BRIAN PETRASEK
1609	AUGUSTINE SANDOVAL
	EMILY GONZALES
1615	ALBERT TOMA
	ANTHONY TOMA
	SAMIRA TOMA
1623	JONATHAN MENDOZA
1627	JAMES RAGER
	KAYTY RAGER
	KRISTEN RAGER
1633	ANITA THURMAN
	JABARI OLIVE
	MARIO THURMAN
1637	MARYANN OHLMS
	PAUL OHLMS
1641	BILLY JOHNSON
	RAQUEL JOHNSON
	REFUJIO JOHNSON
	TYLER LEBLANC
1700	PACIFIC BEND INC
1705	JRW FOUNDATION SYSTEMS
1717	C & S POWDER COATING
	FROGS METAL WORK
1721	A & O HOME IMPROVEMENT SPCLST
	REDLANDS RANCH
1897	VINES RV & BOAT STORAGE
	VINES STORAGE
1898	P & R PAPER SUPPLY CO

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2017

1522	MORA, JUAN C
1526	ARCHIQUETTE, JHENNY
1530	HORTA, MICHAEL E
1534	READMAN, CHARLES J
1538	VARGAS, MARY M
1605	PETRASEK, BRIAN R
1615	TOMA, SAMIR
1619	OLEK, MICHAEL J
1623	BEAGLE, BRYAN P
1627	RAGER, JAMES I
1633	OLIVE, JABARI D
1637	OHLMS, PAUL J
1641	PORTERFIELD, KYLER R
1700	INDUSTRIAL STORAGE SOLUTIONS
1705	NIGHTSCAPING INC
	PREMIER 1 RECYCLING
1711	SHUTTERS TO GO
1717	C & S POWER COATING
1721	ABARCA, JAIME D
	ABLE, JENNIFER
	AHUMADA, NASH
	ALVEREZ, ANTONY
	ANDERSON, TRACY M
	AQUINO, ANTOLIN
	ARANDA, MATTHEW P
	AUSTIN, CHUCK R
	AVERILL, RICK D
	BAINTER, CHRISTOPHER S
	BARRIOS, ALFRED
	BERRY, MARIA E
	BOAMAN, DARLENE
	BRYAN, JONATHAN A
	BURROLA, SYLVIA C
	CARDOZA, JESSE E
	CARROLL, MICHEAL E
	COBURN, HUGH O
	COOK, BRIAN
	COUTAIN, QUINTINA L
	DENNERT, GARY B
	DICKSON, KATHERINE G
	DONOVAN, GLORIA
	DUNNINGAN, RICHARD E
	ECHNOZ, JAMES A
	ELLIS, JASON
	FAIVA, SIOSAIA T
	FANTOCONE, GEORGE M
	FARMER, RANDALL
	FLORES, CHRISTOPHER J
	FRAZIER, JAMES P
	FREYER, MICHELLE

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2017 (Cont'd)

1721 GARCIA, RENEE M
GIZAW, AYELE
GOSF, MYRNA
GRAVES, TRISTAN C
GUTIERREZ, ALFRED
HERNANDEZ, EFRAIN
HUEZO, ANTONIO
HUTCHINSON, DENNIS L
IRWIN, RENE A
ISLAS, CARLOS E
ISOM, JOSHUA A
ISOM, TIMOTHY M
JIMENEZ, HECTOR M
JOHNS, WALTER R
JOHNSON, GARY L
JONES, BOBBIE J
KAZOR, DEBRA S
KAZOR, JEFF A
KYSAR, JENNIFER D
LAKE, WILLIAM
LAMBERT, ERIC C
LEE, JEFFERY W
LEE, VERONICA
LESLIE, JERRIE R
LEWIS, JACK L
LYNES, CHARLES R
MADER, DOUGLAS W
MARKS, MICHAEL L
MARTINEZ, MARIA O
MARTINEZ, VICTOR E
MCHARDY, RICHARD E
MCKENNELL, MARY
MELGAR, MARVIN
MENA, JOSE G
MILLER, TERRY H
MONGE, NORMA
MONTGOMERY, EMMA
MONTOYA, ANTONIO M
MOYES, RICK S
MULHORN, JEFFREY J
NEWMAN, DEBORAH
NORCROSS, JAMIE A
OESTERBLAD, TONY A
OSCAR, MORENO
PENN, DONNA J
PFEIL, LOIS
PONCE-LOPEZ, SERGIO P
POOLE, JERRY D
POPICK, STEVEN M
RANDELL, W

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2017 (Cont'd)

1721	RANDOLPH, MITCHELL
	REDLANDS RANCH
	RIOS, MARCO A
	RIVAS, CLAUDIO B
	RODRIGUEZ, ANELLY M
	ROLLINS, MELBA L
	SANPEDRO, MARIA
	SKIDMORE, KATHY E
	SMITH, ALICE C
	SMITH, SARAH K
	SOLIS, RICARDO S
	STAMANT, JACK S
	TAYLOR, ALVIN
	TELLERIA, MIKE A
	THIBAULT, KATHRYN
	TRANSUE, JERRY M
	VASQUEZ, HENRY H
	VENNER, TINA M
	WALLACE, MARTIN A
	WEEMS, JEFFREY M
	WELCH, KENNETH S
	WEST, MARTIN C
	WILSON, STEVEN P
	WRIGHT, TRACEY Y
1897	VINES STORAGE
1898	P & R PAPER SUPPLY COMPANY INC

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2014

1522	MORA, JUAN C
1526	GUZMAN, PETE T
1530	HORTA, MICHAEL E
1531	OCCUPANT UNKNOWN,
1534	READMAN, CHARLES J
1538	VARGAS, BERNARDO B
1601	VIGIL, COURTNEY
1605	PETRASEK, BRIAN R
1609	GONZALES, E
1615	TOMA, ALBERT M
1619	CASEY, SUSAN L
1623	BEAGLE, BRYAN P
1627	OCCUPANT UNKNOWN,
1633	OLIVE, JABARI D
1637	OHLMS, PAUL J
1641	JOHNSON, BILLY J
1717	C & S POWDER COATING
1721	ABARCA, JAIME D
	ALVAREZ, ANTONIO A
	AVERILL, RICK D
	BERRY, MARIA E
	BOAMAN, DARLENE
	BROWN, SEAN
	BRYAN, JONATHAN A
	BURROLA, SYLVIA C
	BYRAM, JEFFREY A
	CANDELARIA, CORINE D
	CAPELO, SALVADOR R
	CARDOZA, JESSE E
	CARROLL, MICHEAL E
	CASKEY, KIMBERLY
	CASTRO, ADRIANA E
	CHILSON, EILEEN K
	COBURN, HUGH O
	COOK, JANICE E
	CORREA, MARK A
	COUTAIN, QUINTINA L
	CROCKETT, JENNIFER
	DAVIS, JEFFREY
	DENNERT, PAUL M
	DICKSON, KATHERINE G
	DONOVAN, GLORIA
	DUNNINGAN, RICHARD E
	DUZAN, LARRY G
	FANTOCONE, GEORGE M
	FARMER, RANDALL
	FLORES, CHRISTOPHER J
	GARCIA, RENEE M
	GIDCUMV, LORRAINE
	GOFF, SARAH C

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2014 (Cont'd)

1721 GREBER, WALTER
GUHL, HEATHER
HICKOK, BRIAN D
HODGES, RICK O
HOSKIN, RAYMOND M
HUEZO, DEBORAH S
HUTCHINSON, DENNIS L
ISOM, TIMOTHY M
JENSEN, MATTHEW J
JIMENEZ, HECTOR M
JOHNS, WALTER R
JOHNSON, MARY L
JONES, BOBBIE J
KILLIAN, HEIDI H
KLICKOVICH, DONALD
KYSAR, JENNIFER D
LEE, DENISE A
LEE, MICHAEL
LEWIS, JACK L
LOPEZ, SAMUEL A
LYNES, CHARLES R
MADER, DOUGLAS W
MARKS, MICHAEL L
MARTINEZ, VICTOR E
MCALISTER, MAX A
MCHARDY, RICHARD E
MCKENNELL, MARY
MELGAR, MARVIN
MILLER, TERRY H
MONTOYA, ANTONIO M
MORENO, JOSEPH A
MOUNAS, ISSA S
MULHORN, JEFFREY J
NEWMAN, DEBORAH A
OBRIEN, DANIEL S
PATRICIA, A R
PENN, DONNA J
PEREZ, BELEN P
PHAVONG, SINDY
PONCE-LOPEZ, SERGIO P
POPICK, STEVEN M
POWELL, CARRIE
RADOVIC, LISETTE M
RANDELL, W
REDLANDS RANCH
REISS, KRISTINE
RIFE, AMBER
RIOS, MARCO A
RODRIGUEZ, A M
ROLLINS, MELBA L

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2014 (Cont'd)

1721	SCHMITT, SUSAN M
	SEELEY, CHARLTON A
	SHIMIZU, WAYNE
	SKIDMORE, KATHY E
	SMITH, SARAH K
	STEPHENS, SAMUEL S
	TAYLOR, ALVIN
	TELLERIA, MIKE A
	TOWNSEND, SHILO C
	TRANSUE, JERRY M
	UGALDE, JORGE
	VASQUEZ, HENRY H
	VENNER, TINA M
	WAITE, GEORGE R
	WELCH, KENNETH S
	WEST, MARTIN C
	WILSON, STEVEN P
	WRIGHT, TRACEY Y
	YGLESIAS, ROBERT R
	ZAMORA, RAUL
1897	VINES STORAGE
1898	P & R PAPER SUPPLY COMPANY INC

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2010

1522	MORA, JUAN G
1526	GUZMAN, PETE T
1531	MEELKER, BERT C
1534	READMAN, CHARLES J
1538	VARGAS, BERNARDO B
1601	FLOWERS, DARRELL L
1605	MAINES, WILLIAM W
1609	SANDOVAL, AUGUSTINE J
1615	TOMA, ALBERT M
1619	CASEY, SUSAN L
1623	SHERER, MARK L
1627	OCCUPANT UNKNOWN,
1633	ANITAS HAIR EXTENSIONS
	OLIVE, JABARI
1637	OHLMS, PAUL J
1641	OCCUPANT UNKNOWN,
1705	LORAN INC
	NIGHTSCAPING
1721	ADAMO, ANDREA R
	AHUMADA, NASH
	ALDRIDGE, SHERMAN R
	ALVAREZ, MARTIN A
	ANDERSON, BRITTINI
	ASBERRY, WILLIE J
	BARRERA, MARCO A
	BERRY, MARIA E
	BERTRAND, SAM P
	BRYAN, LESLIE A
	BURROLA, JULIAN K
	CAPELO, SALVADOR R
	CARDOZA, JESSE E
	CISNEROS, JAMI
	COBURN, HUGH O
	CORREA, MARK A
	COUSINS, DEBBIE S
	DELGADO, JOE M
	DENNERT, PAUL M
	DICKSON, KATHERINE G
	DUNNINGAN, LOIS F
	EARL, RICHARD D
	FANTOCONE, GEORGE M
	FARMER, RANDALL
	FINEST AUTO SVC
	FISHER, NEIL E
	FLORES, CAROL
	FUQUA, DENNY B
	GARCIA, ROSALINDA
	GARZA, JULIE R
	GILL, JOSEPH P
	GOFF, NATHAN

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2010 (Cont'd)

1721	GUNTER, ROBERT F
	HALL, MARK A
	HARPER, CHRIS
	HERNANDEZ, DAVID
	HICKOK, BRIAN D
	HODGES, RICK O
	HUFF, DIANE S
	HUTCHINSON, DENNIS L
	ISOM, TIMOTHY M
	JENSEN, MATTHEW J
	JIMENEZ, MICHAEL T
	JONES, BOBBIE J
	KANE, DEBI M
	KILLIAN, HEIDI H
	KINJI, SI
	LEE, DENISE A
	LOPEZ, SAMUEL A
	LYNES, STEVEN
	MARKS, MICHAEL L
	MARTENS, WILLIAM T
	MARTIN, PHILIP C
	MCALISTER, MAX A
	MCDOWELL, CHERYL
	MCHARDY, RICHARD E
	MILLER, TERRY H
	MONTOYA, ANTONIO M
	MYERS, HOLLY L
	NORBERG, SHERRY R
	NORCROSS, JAMIE A
	OLIVAREZ, STEPHEN N
	OWEN, LEE V
	PATRICIA, A R
	PENN, DONNA J
	PETTY, MICHELE L
	PHAVONG, STEPHANY S
	POOLE, JERRY D
	POPICK, STEVEN M
	PRICE, HARRY A
	RADOVIC, LISETTE M
	RANDALL, WILLIAM G
	REDLANDS RANCH
	REE, JACK D
	REISS, KRISTINE
	REYES, JUAN
	RIFE, JULIE A
	RIOS, MARCO
	RODRIGUEZ, A M
	ROLLINS, MELBA L
	SAN, PEDRO M
	SCHMITT, SUSAN M

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2010 (Cont'd)

1721	SEMAR, SYLVIA M
	SHELTON, JACKIE L
	SHREVE, JEFF T
	SKIDMORE, KATHY E
	SPARKMAN, TOMMY W
	STUCKY, DARRELL V
	STUTTE, NOEL E
	SULLIVAN, ROBERT J
	THOMAS, DIANA
	TRANSUE, WILLARD J
	TURNER, LAWRENCE C
	UGALDE, MARIA G
	VENNER, TINA M
	WAITE, ROBERTA P
	WEBSTER, EVA N
	WEEMS, ANAMARIE
	WELCH, KENNETH S
	WEST, MARTIN C
	WILSON, KARI
	WISDOM, DELORIS K
	WITHAM, RICHARD
	WRIGHT, TRACEY Y
	YGLESIAS, ROBERT R
	YOSHI, IZUMI
1897	VINES STORAGE LLC

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2005

1522	OCCUPANT UNKNOWN,
1526	PEASE, JONATHAN
1530	HORTA, MICHAEL E
1531	MEELKER, BERT C
1534	READMAN, CHARLES J
	TRI CITY SOLUTIONS
1538	VARGAS, BERNARDO
1601	FLOWER, DARRELL L
1605	HECHT, MICHAEL C
1609	GONZALES, PAUL B
1615	TOMA, ALBERT M
1619	CASEY, SUSAN L
1623	SHERER, MARK L
1627	OCCUPANT UNKNOWN,
1633	THURMAN, ANITA F
1637	OHLMS, PAUL J
1641	OCCUPANT UNKNOWN,
1694	ROMLIA, SIMEON
1695	KEAN, VIRGINIA
1705	NIGHTSCAPING
1721	ADAMSON, ARLENE
	AHUMADA, NASH G
	ALDRIDGE, SHERMAN R
	ASBERRY, HAZEL
	AVERILL, DONNEL
	BARRANCO, EDUARDO J
	BEATY, TRACI W
	BERTRAND, SAMUEL P
	BOYLE, D
	BRAY, JONATHAN
	BROWN, DEBBIE
	BRYAN, LESLIE A
	BURROLA, JULIAN K
	CAPELO, SALVADOR R
	CARNERO, STELLA H
	CHAVEZ, IDA M
	COLLINS, JEAN V
	COLOMBEL, STEPHEN A
	CONSULTING LLC
	CORREA, MARK A
	COUSINS, BERTRAM S
	CURBING CREATIONS
	CUTIE PAWS GROOMING
	DANNY EARL ENTERPRISES
	DAVIS, SAMUEL H
	DELGADO, JOE M
	DENNERT, PAUL M
	DICKSON, KATHERINE G
	DISON, CURTIS S
	DYNAMIC COMPUTERS PLUS

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2005 (Cont'd)

1721 EARL, RICHARD D
FANTOCONE, GEORGE M
FIVE IRON CONSULTING LLC
GERSTEIN, EARLE I
GILSEN, TIMOTHY J
GOFF, MYRNA R
GUERRERO, ROBERT P
GUNTER, ROBERT F
HENDERSON, JODIE A
HICKMAN, HARRY
HICKOK, BRIAN D
HINTON, DERRICK L
HOLLAND, JAMES M
HUFF, DIANE S
HUTCHINSON, BEVERLY
HUTTO, SYDNEY S
ISOM, TIMOTHY M
JENNINGS, BARBARA J
JENSEN, MATTHEW J
KELLY, B
LEE, DENISE
LEWIS, JACK L
MARKS, MICHAEL L
MARTIN, SCOTT A
MCALISTER, MAX A
MCCORMICK, ALEEN W
MCHARDY, RICHARD E
MILLER, ERIC C
MONTOYA, ANTONIO
MORNING, GERALDINE
MULLINS, BRIAN E
NORBERG, SHERRY
OLIVAREZ, STEPHEN N
ORTIZ, FIDEL
OWEN, TERESA N
PARK, LARRY A
PENAR, JAMES D
PENN, DONNA J
PEREZ, BLANCA E
PETTY, MICHAEL A
POWER, MIKE R
PRICE, CARL L
PRINTING GUYS
RACINE, MICHELLE
RANDALL, WILLIAM G
REDLANDS RANCH
REE, JACK D
REEDER, ANNA B
REYES, JORGE
REYNOZA, GENE J

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2005 (Cont'd)

1721	RIFE, JULIE A
	RODNEY, CLYDE
	RODRIGUEZ, A M
	ROLLINS, MELBA
	ROMERO, KAREN L
	SCHMITT, SUSAN M
	SEDANO, JOHN
	SEMAR, SYLVIA M
	SERTICK, RUTHANNE
	SHELTON, JACKIE L
	SHREVE, JEFF T
	SOULIOTES, DAVID
	STAMANT, JACK J
	STUTTE, NOEL E
	SUMMERS, PAUL R
	TRANSUE, WILLARD J
	TURCOTTE, THOMAS A
	VALENZUELA, MARTIN
	VASQUEZ, MANUEL C
	VAZQUEZ, M
	WAITE, ROBERTA P
	WEBSTER, JERRYNN Y
	WELCH, KENNETH D
	WEST, MARTIN C
	WHITE, LADONNA I
	WIGGINS, LONNIE P
	WILSON, STEVEN P
	WISDOM, DELORIS K
1898	P & R PAPER SUPPLY CO

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2000

1526	GUZMAN, PETE
1527	OCCUPANT UNKNOWN,
1530	HORTA, MICHAEL E
1531	MEELKER, BERT H
1534	CONNER, TERESA
	READMAN, CHARLES J
1601	FLOWERS, DARRELL
1605	OCCUPANT UNKNOWN,
1609	OCCUPANT UNKNOWN,
1615	LEMMON, JOHN M
1619	OCCUPANT UNKNOWN,
1623	OCCUPANT UNKNOWN,
1627	OCCUPANT UNKNOWN,
1633	UPCRAFT, DENNIS N
1637	OCCUPANT UNKNOWN,
1641	OCCUPANT UNKNOWN,
1701	OCCUPANT UNKNOWN,
1705	LORAN INCORPORATED
	NIGHTSCAPING
1721	AHEARN, AUDREY
	AHUMADA, IGNACIO C
	AHUMADA, NASH G
	ALDRIDGE, SHERMAN
	ANCENO, MIGUEL A
	ARVIZU, RENE M
	AVERILL, RICHARD D
	BAKER, ARDIS
	BARRERA, HILMA E
	BEATY, TRACI W
	BELTRAN, ARMANDO
	BERTRAND, SAMUEL P
	BISHOP, KENNETH P
	BOWELL, DAVID W
	BRETT, ANDREW N
	BROWN, SUSAN
	CAMERON, JERRY
	CARRION, CRAIGE
	CORMIER, EDWARD J
	CRANK, SHAWN L
	CRUTCHER, EDDY L
	CUMMINGS, RAYMOND
	DENNERT, PAUL M
	DICKSON, B R
	DOWNARD, LAURIE P
	DUFF, ROY P
	DULAY, TINA
	EASTERLINGS, KELLY
	EDWARDS, JAY C
	FANTOCONE, ERNEST F
	FARRIS, A

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2000 (Cont'd)

1721 FERGSON, MALETTE L
FISHER, NEIL E
FLORES, DEBRA
FRANKLIN, SUSAN J
FRANTZ, DONALD L
GERMAN, FELIX
GERSTEIN, EARLE I
GILSEN, TIMOTHY
GRAY, GARY P
GRIFFIN, SHANN D
HILL, SANDRA S
HOMMERDING, ERNEST
HUTCHINSON, DENNIS
HUTTO, SYDNEY
ILER, NANCY L
ISOM, TIM
JENKINS, RUBY D
JUAREZ, MARTINA
KNUDSUIG, M D
LANE, JAMES
LAWRENCE, B L
LEDESMA, JOSE L
LEWIS, JACK L
LIEBGOTT, JAY
LOZANO, MARIA R
LUTZ, ROBERT D
MALDONADO, ROGER A
MAPLES, HICKS
MARIANI, C A
MARKS, MICHAEL
MARTIN, GILBERT
MCALISTER, MAX A
MCCLELLAN, THOMAS
MCCORMICK, ALEEN
MCDONALD, KARL O
MICHAM, M
MILLER, PAULA J
MITCHELL, BEVERLY
MORAN, SHARON A
MULLINS, BRIAN
MURRAY, ROBERT H
NEAZER, CHARLES W
NORBERG, SHERRY
ORR, RODGER G
PEREZ, BLANCA E
PERRONE, DIANE
PETTY, M
PORTILLO, CARLOS J
PRECIADO, MARTHA
PREW, WALTER C

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 2000 (Cont'd)

1721	RABIDOU, JUDY E
	RASCON, TRACY A
	REDLANDS RANCH
	REE, JACK D
	ROBBINS, RICHARD
	ROBERSON, PAMELA M
	RODRIQUEZ, HENRY B
	SALAZAR, J
	SCHMITT, SUSAN
	SHELTON, JACKIE
	SIAHAYA, ODO
	SILBER, DORIS J
	SIMMER, EARLENE J
	SOLOMON, G
	SPARKS, MICHAEL G
	SPENCER, KERRY
	STAINBROOK, SANDRA
	STUTTE, NOEL E
	SWEET, LINDA A
	TEEGARDEN, JACK L
	TERRELL, KEITH
	THOMAS, PAMELA
	TRANSUE, W J
	TUCKER, ROGER D
	VALENZUELA, P L
	VASQUEZ, ANGEL T
	VERA, FABIAN
	VOGG, EILEEN M
	WAITE, ROBERTA
	WATERS, M
	WELCH, KENNETH D
	WEST, MARTIN C
	WILKINSON, F
	WILKINSON, TAMMY
	WISDOM, DELORIS
1800	FARNAN J M COMPANY INCORPORATED
	SAMPSON STEEL
1897	SIMCO

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 1995

1522	CARRILLO, EMILIO
1526	ARMSTRONG, ARLENE J
1530	OCCUPANT UNKNOWNN
1531	MEELKER, BERT H
1534	CONNER, TERESA
1538	LEE, ROY D
	REDLANDS LEGAL SVC
1601	FLOWERS, DARRELL
1605	OCCUPANT UNKNOWNN
1609	GONZALES, EMILY
1615	OCCUPANT UNKNOWNN
1619	OCCUPANT UNKNOWNN
1623	OCCUPANT UNKNOWNN
1627	SU, HENRY H
1633	BUCHFELLER, JOEL
1641	GARCIA, RAMON C
1705	LORAN INC
1721	ALDRIDGE, SHERMAN
	ARANDO, ESTEBAN
	ARVIZU, V
	AVALOS, ARMANDO
	AVERETT, DARLENE L
	AVERILL, RICHARD D
	BACA, ELFEGO C
	BARAJAS, B
	BEDWELL, PATTY L
	BERGERON, ANNETTE L
	BISHOP, KENNETH P
	BRETT, ANDREW N
	BROWN, S
	BRUNER, CHARLES R
	CARRILLO, RITA
	CAVALIER, THOMAS W
	CHASE, CHARLES L
	CORMIER, EDWARD J
	CRUTCHER, EDDY
	CRUTHIRDS, MORGAN
	CUMMINGS, RAYMOND
	DAVIS, LEONARD F
	DELANEY, DAVID W
	DELGADO, JOE
	DESROCHERS, ROBERT J
	DICKSON, B R
	DOEZIE, JACK E
	DUFF, ROY
	EDWARDS, JAY C
	FITCH, THOMAS H
	FLORES, A V
	FOLEY, DIANE
	FRANKEN, K L

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 1995 (Cont'd)

1721 FRISCHE, MONIQUE
GAINES, M M
GERSTEIN, EARLE I
GILSEN, TIMOTHY
GIMPLE, TINA
GLESSNER, RAYMOND
GRAY, GARY P
HERNANDEZ, NANCY A
HODSON, ROBERTA
HOMMERDING, ERNEST
HUTTO, SYDNEY
ILER, NANCY L
INGRAM, TIMOTHY M
ISOM, TIM
JACOBSEN, ANKER
JOHNSON, DAN
JONES, EVA
JORE, MICHAEL A
LAIRD, WILLIAM W
LAMB, DONALD E
LANIER, CRAIG
LEE, L
MARBLE, JERRY
MARKS, MICHAEL
MCCARTHY, GLADYS E
MCCORMICK, ALEEN
MCDONALD, KARL
MIER, HENRY F
MILLER, LYLE E
MINTON, JAMES
MITCHELL, BEVERLY
MOORE, CHAD G
MOSTELLER, NED
NERI, ARNOLD
NORBERG, MICHAEL
NORTON, DANIEL B
ORR, RODGER G
PAGLIUSO, ROBERT L
PARKER, DEBRA
PETTY, M
PRECIADO, MARTHA
PREW, WALTER C
RADZIK, AL
REDLANDS RANCH
REDMOND, SAMUEL P
RODNEY, JUDITH
RODRIQUEZ, HENRY B
ROGERS, RICHARD
ROYBAL, RICK
SAAVEDRA, PHILLIP R

Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 1995 (Cont'd)

1721	SALAZAR, J
	SALDANA, PHILLIP E
	SANROMAN, DIANNE
	SCHMITT, SUSAN
	SHORT, E I
	SIAHAYA, ODO
	SIFUENTES, PAUL W
	SILBER, DORIS
	SMITH, JOSEPH A
	SPEARMAN, CAROLYN J
	STAINBROOK, SANDRA
	STONE, GREGORY W
	TAITT, GEORGE B
	TATGE, REES
	TATOE, GENA
	TEEGARDEN, JACK L
	TERRELL, KEITH
	TUCKER, MATTHEW J
	TUCKER, ROGER D
	VERA, LISA
	VILLA, FRANK R
	WELCH, KENNETH D
	WILKINSON, F
	ZEPEDA, M
1898	P & R PAPER SUPPLY CO

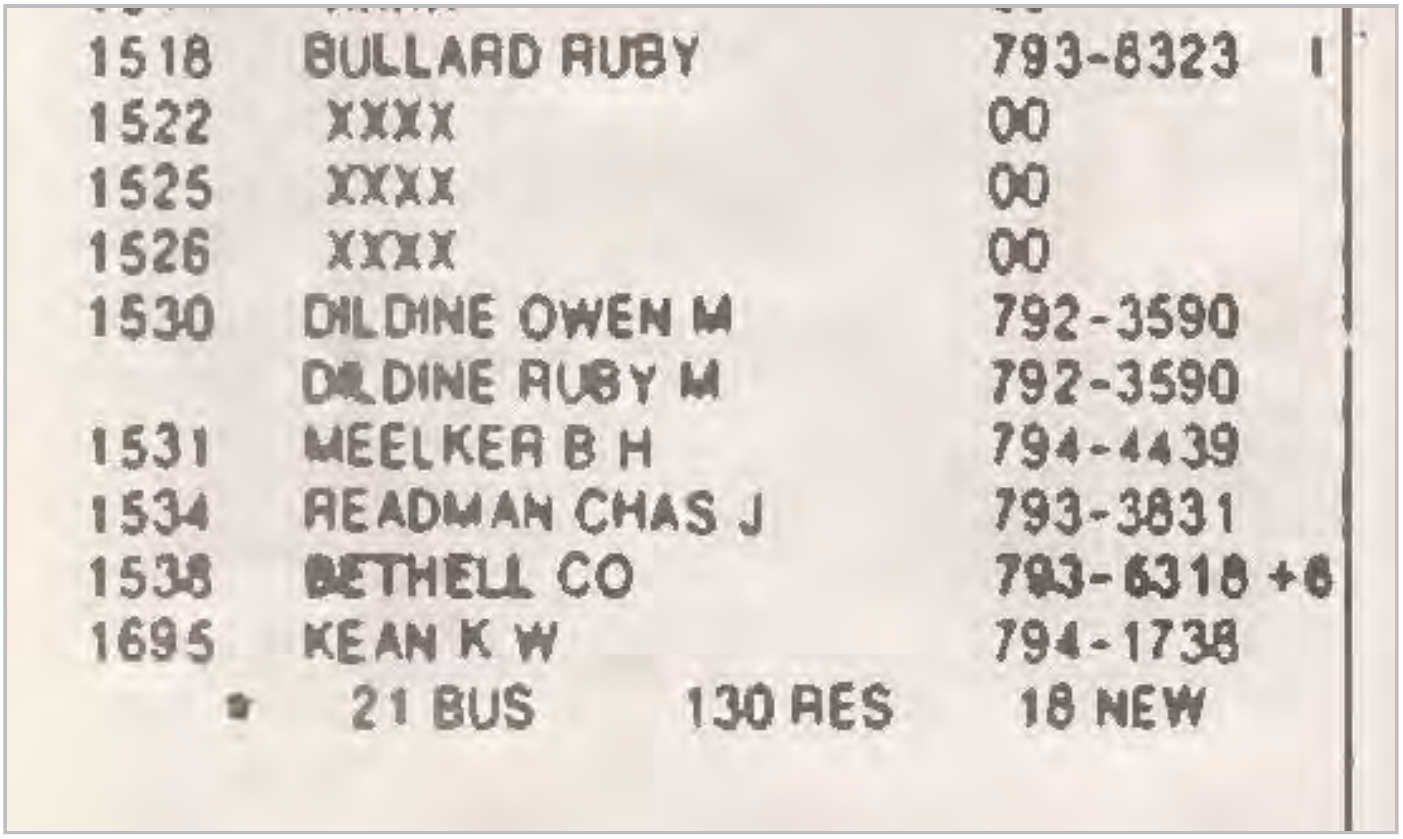
Target Street	Cross Street	Source
✓	-	Cole Information

E COLTON AVE 1992

1530	DILDINE, OWEN M
1531	MEELKER, BERT H
1601	FLOWERS, DARRELL
1619	GAMMILL, RICHARD R
1623	SHERER, MARKEN
1633	BUCHFELLER, JOEL
1641	GARCIA, RAMON C
1705	LORAN INCORPORATED
1721	BROWN, S
	CORMIER, EDWARD L
	CUSTOM MOBILE HOMES
	FITCH, THOMAS
	FOLEY, DIANE
	GAINES, M M
	HANCOCK, E D
	HOMMERDING, ERNIE
	REDLND RANCH
	SUHMITT, SUSAN
	WOW PRODUCTIONS

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

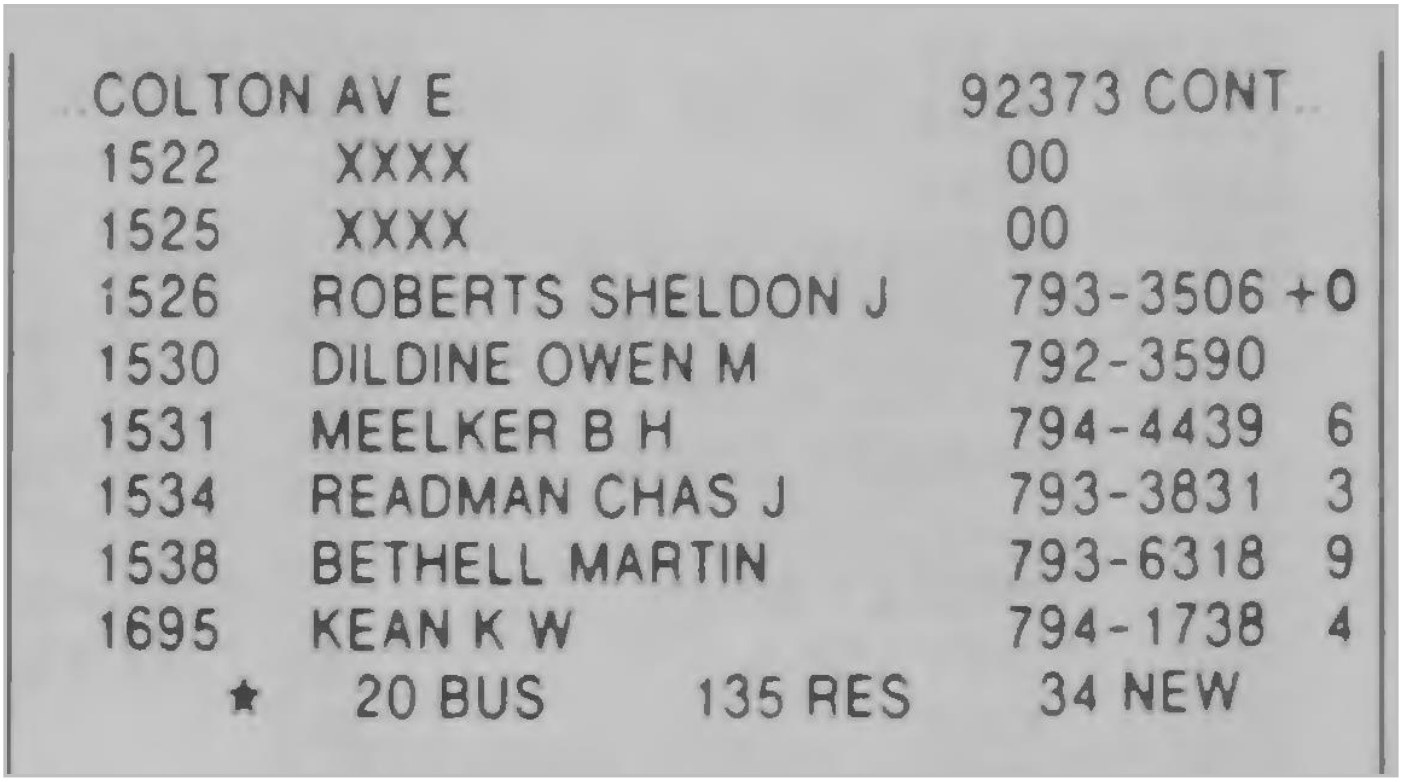
E COLTON AVE 1986



1518	BULLARD RUBY	793-8323	I
1522	XXXX	00	
1525	XXXX	00	
1526	XXXX	00	
1530	DILDINE OWEN M	792-3590	
	DILDINE RUBY M	792-3590	
1531	MEELKER B H	794-4439	
1534	READMAN CHAS J	793-3831	
1538	BETHELL CO	793-6318	+6
1695	KEAN K W	794-1738	
	21 BUS 130 RES	18 NEW	

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

E COLTON AVE 1980



COLTON AV E		92373 CONT	
1522	XXXX	00	
1525	XXXX	00	
1526	ROBERTS SHELDON J	793-3506	+0
1530	DILDINE OWEN M	792-3590	
1531	MEELKER B H	794-4439	6
1534	READMAN CHAS J	793-3831	3
1538	BETHELL MARTIN	793-6318	9
1695	KEAN K W	794-1738	4
★	20 BUS 135 RES	34 NEW	

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

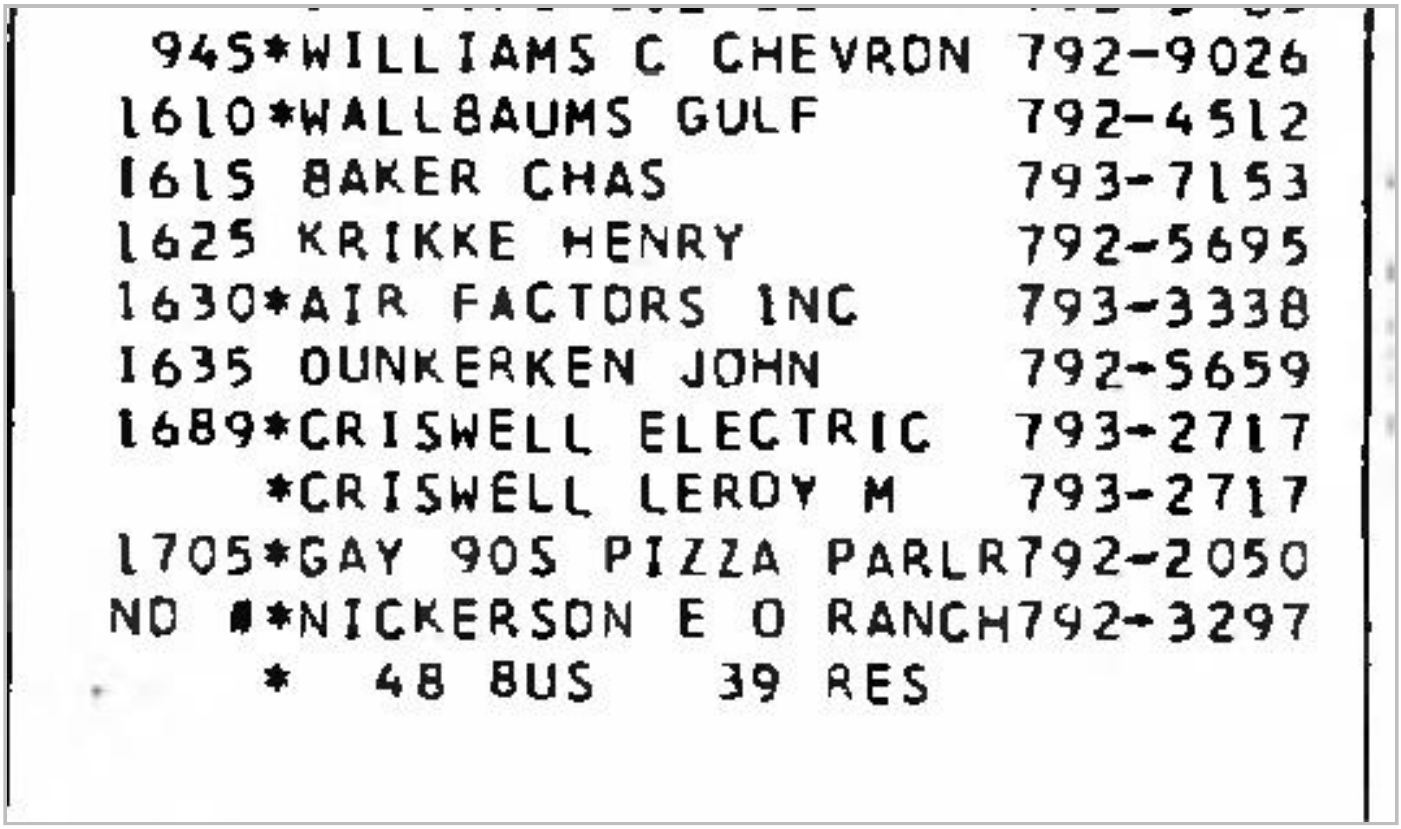
E COLTON AVE 1976

1518	GONZOLEZ PASTOR	792-0604
1522	LARSEN FRANKLIN D	792-0787
1525	XXXX	OO
1526	ARMSTRONG A J	792-7215 5
1530	DILDINE OWEN M	792-3590
1531	MEELKER B H	794-4439+6
1534	READMAN CHAS J	793-3831 3
1695	XXXX	OO
1705	*LORAN INCORPORATED	794-2121
	*NIGHTSCAPING	794-2121
1901	SNYDER LYDIA	794-3625
2300	PATTERSON EDMUND JR	794-1333

* 23 BUS 127 RES 44 NEW

Target Street	Cross Street	Source
✓	-	Haines Criss-Cross Directory

E COLTON AVE 1971



```
 945*WILLIAMS C CHEVRON 792-9026
1610*WALLBAUMS GULF     792-4512
1615 BAKER CHAS         793-7153
1625 KRIKKE HENRY       792-5695
1630*AIR FACTORS INC    793-3338
1635 OUNKERKEN JOHN     792-5659
1689*CRISWELL ELECTRIC  793-2717
     *CRISWELL LEROY M  793-2717
1705*GAY 90S PIZZA PARLR792-2050
NO #*NICKERSON E O RANCH792-3297
     *  48 BUS   39 RES
```

Target Street	Cross Street	Source
✓	-	Luskey Brothers & Co.

E COLTON AVE 1965



1518 *Ruyle BN Mrs 792–617
1518 Stouffer Betty..... 792–617
1522 *Moyer RE 3 792–700
1525 No Return

Dearborn St Ints

1526 *Armstrong AC 2 792–721
1534 Wilson MA 792–712
1538 Hyser GF 2 793–520

Wahash Av Ints

N Opal Av Ints

1711 Dahlman Prodts Co rubber prodt 794–234

Agate Av Ints

Walnut Rd Ints

2001 San Dimas Grain & Milling Co. 794–119

N Grafton Av Ints

Not Reported

Not Reported

REDLANDS, CA 92374

Inquiry Number: 7326657.3

May 03, 2023

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

05/03/23

Site Name:	Client Name:
Not Reported	Hazard Management Consulting
Not Reported	211 W. Avenida Cordoba
REDLANDS, CA 92374	San Clemente, CA 92672
EDR Inquiry # 7326657.3	Contact: Gage Costales

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Hazard Management Consulting were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 666C-4F9B-98D7

PO # NA

Project Puri - Colton & Wabash

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 666C-4F9B-98D7

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

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Not Reported

Not Reported

REDLANDS, CA 92374

Inquiry Number: 7326657.4

May 03, 2023

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

05/03/23

Site Name:	Client Name:
Not Reported	Hazard Management Consulting
Not Reported	211 W. Avenida Cordoba
REDLANDS, CA 92374	San Clemente, CA 92672
EDR Inquiry # 7326657.4	Contact: Gage Costales

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Hazard Management Consulting were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	NA	**Latitude:**	34.063828 34° 3' 50" North
Project:	Puri - Colton & Wabash	**Longitude:**	-117.140061 -117° 8' 24" West
		UTM Zone:	Zone 11 North
		UTM X Meters:	487075.35
		UTM Y Meters:	3769241.98
		Elevation:	1607.34' above sea level

Maps Provided:

2018	1967
2015	1954
2012	1901
1996	1899
1988	
1980	
1975	
1973	

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2018 Source Sheets



Redlands
2018
7.5-minute, 24000



Yucaipa
2018
7.5-minute, 24000

2015 Source Sheets



Redlands
2015
7.5-minute, 24000



Yucaipa
2015
7.5-minute, 24000

2012 Source Sheets



Redlands
2012
7.5-minute, 24000



Yucaipa
2012
7.5-minute, 24000

1996 Source Sheets



Redlands
1996
7.5-minute, 24000
Aerial Photo Revised 1994



Yucaipa
1996
7.5-minute, 24000
Aerial Photo Revised 1994

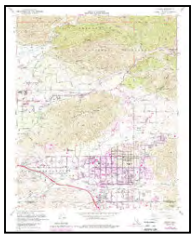
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1988 Source Sheets



Redlands
1988
7.5-minute, 24000
Aerial Photo Revised 1985



Yucaipa
1988
7.5-minute, 24000
Aerial Photo Revised 1985

1980 Source Sheets



Yucaipa
1980
7.5-minute, 24000
Aerial Photo Revised 1978



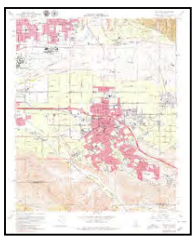
Redlands
1980
7.5-minute, 24000
Aerial Photo Revised 1978

1975 Source Sheets



Redlands
1975
7.5-minute, 24000
Aerial Photo Revised 1975

1973 Source Sheets



Redlands
1973
7.5-minute, 24000
Aerial Photo Revised 1973



Yucaipa
1973
7.5-minute, 24000
Aerial Photo Revised 1973

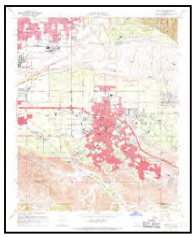
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1967 Source Sheets

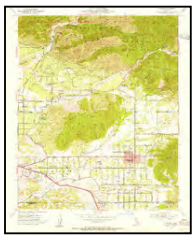


Yucaipa
1967
7.5-minute, 24000
Aerial Photo Revised 1966



Redlands
1967
7.5-minute, 24000
Aerial Photo Revised 1966

1954 Source Sheets



Yucaipa
1954
7.5-minute, 24000
Aerial Photo Revised 1952



Redlands
1954
7.5-minute, 24000
Aerial Photo Revised 1952

1901 Source Sheets

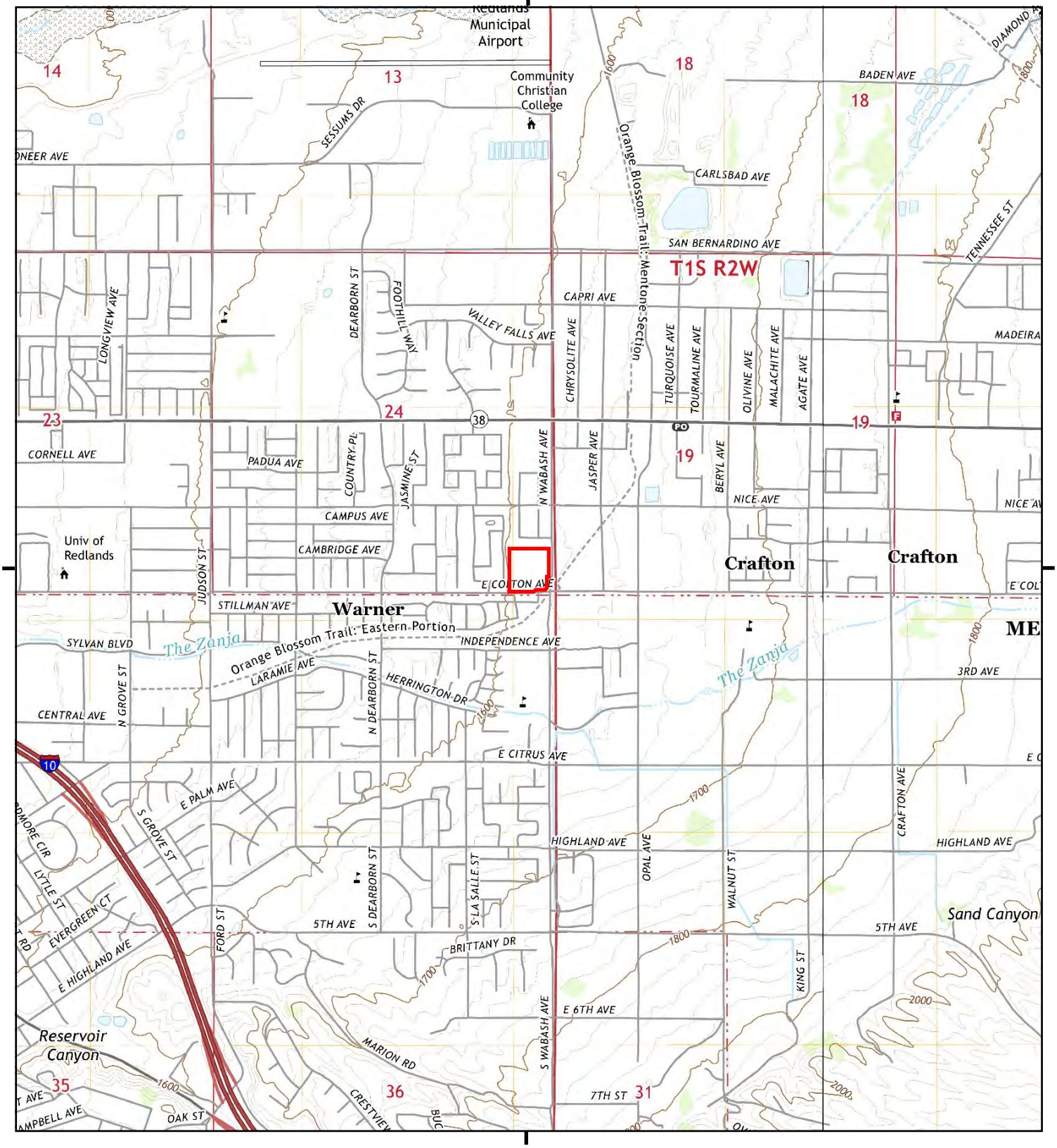


Redlands
1901
15-minute, 62500

1899 Source Sheets



Redlands
1899
15-minute, 62500



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NW N NE
W E
SW S SE

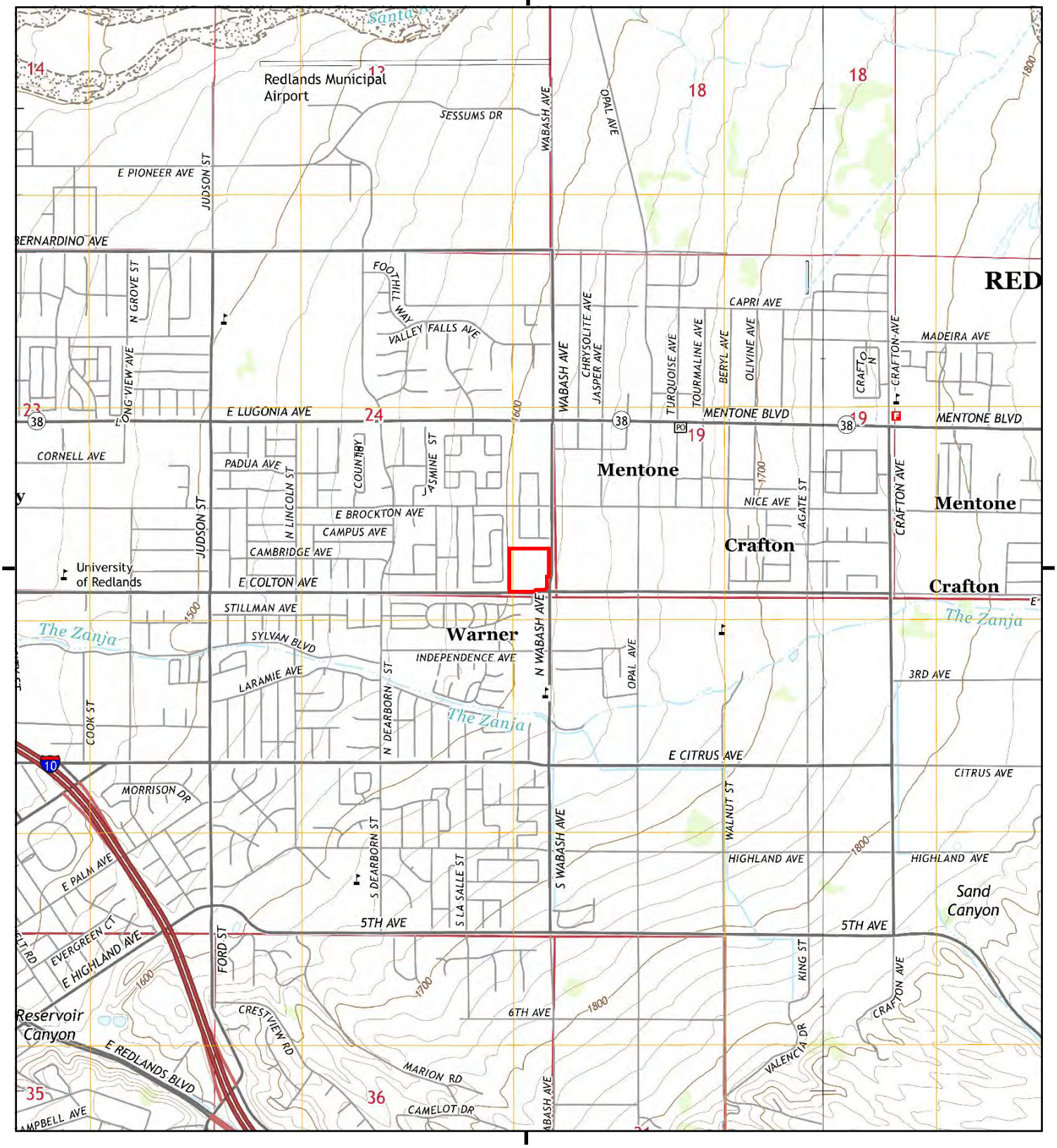
TP, Redlands, 2018, 7.5-minute
E, Yucaipa, 2018, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N

Historical Topo Map

2015



This report includes information from the following map sheet(s).

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W E
SW S SE

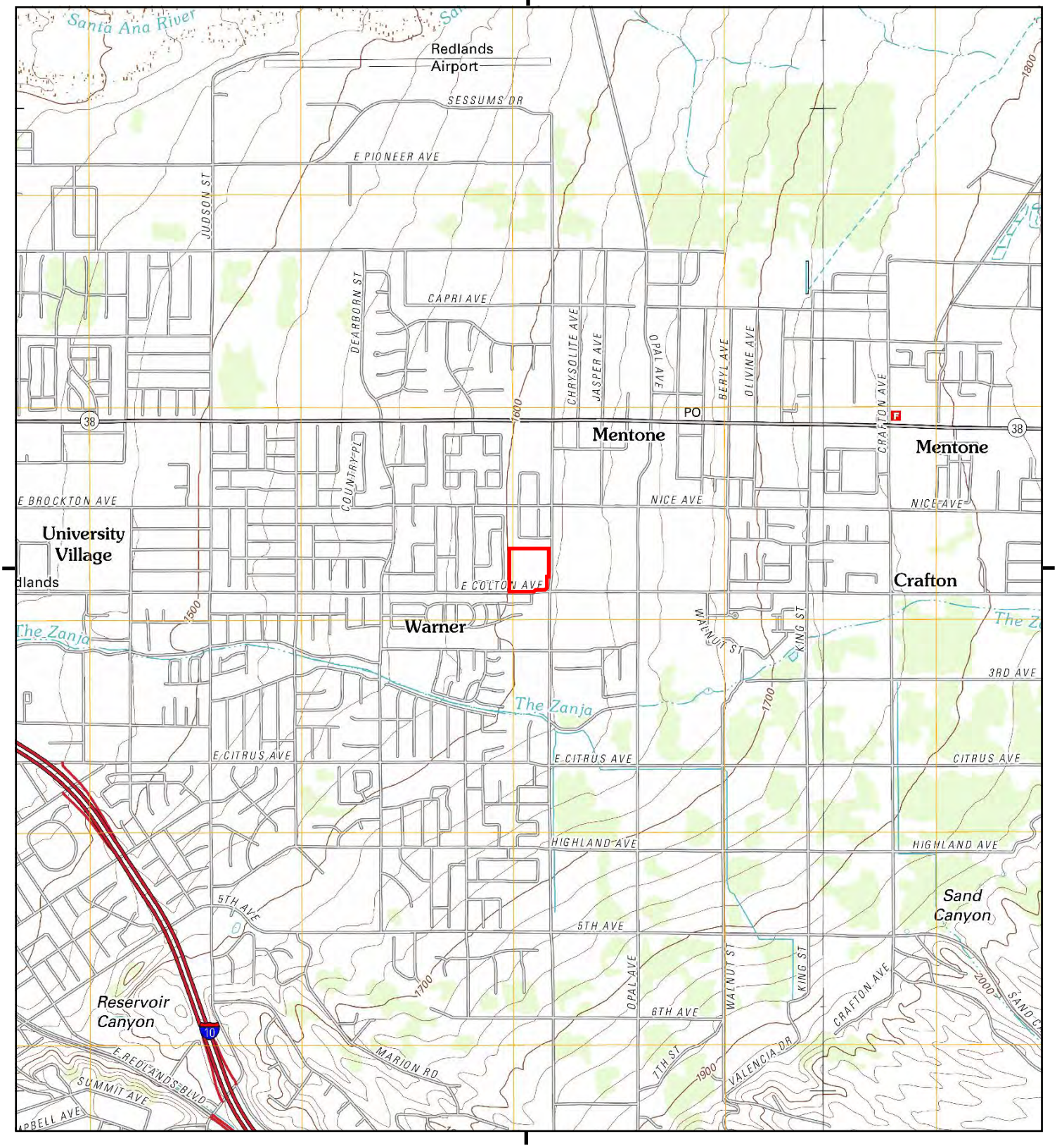
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E, Yucaipa, 2015, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N

Historical Topo Map

2012



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W E
SW S SE

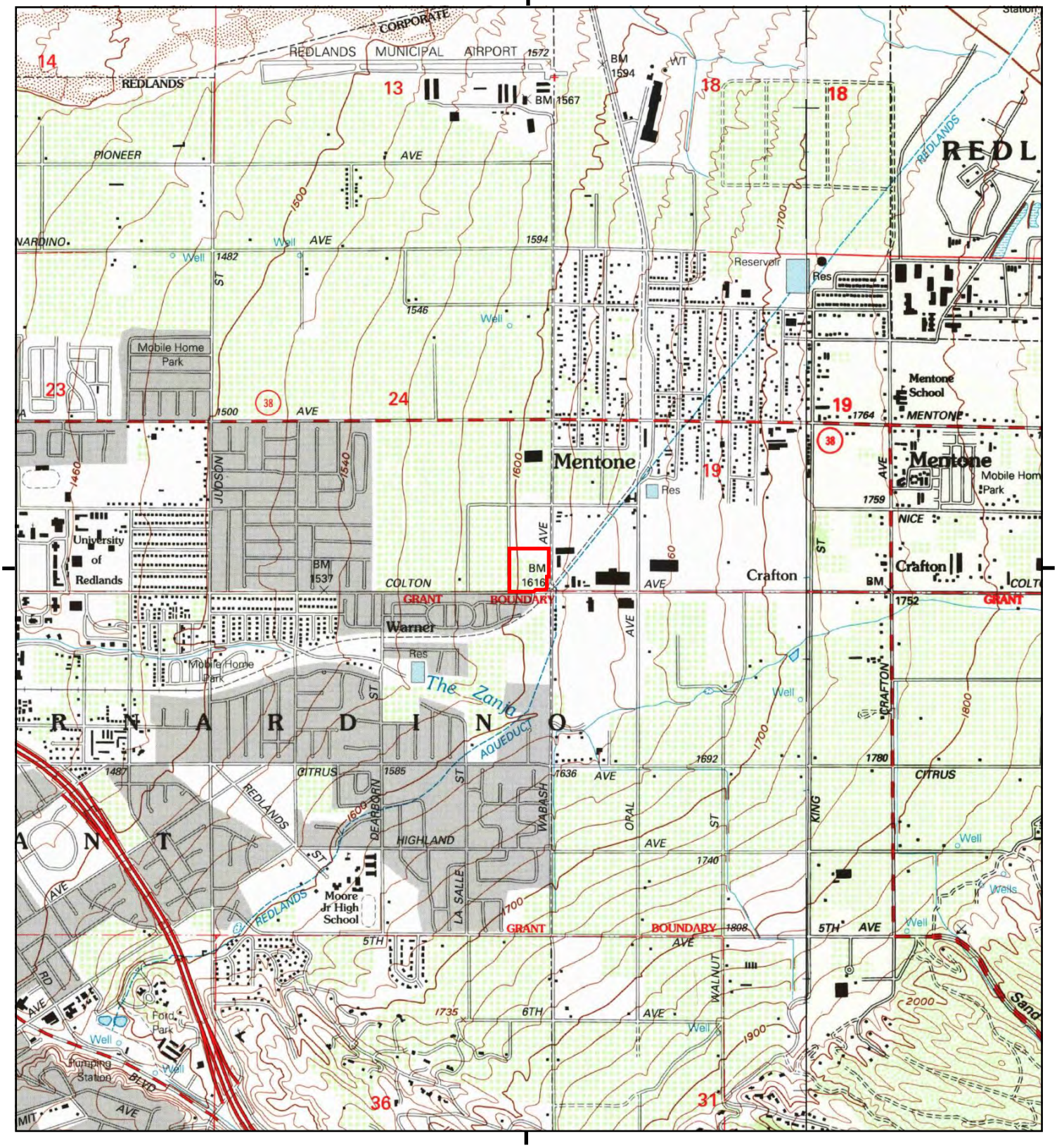
TP, Redlands, 2012, 7.5-minute
E, Yucaipa, 2012, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N

Historical Topo Map

1996



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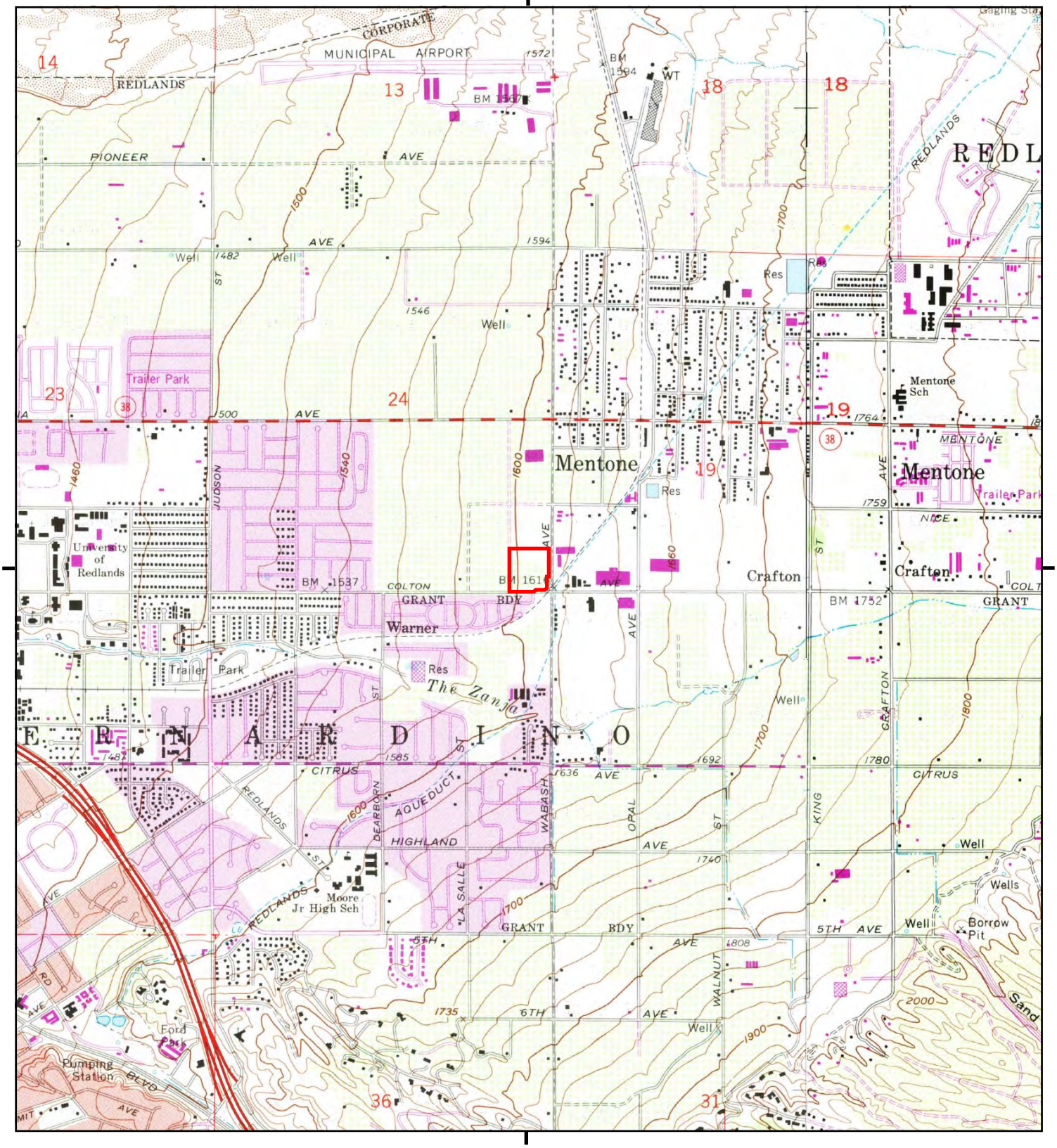
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Redlands, 1996, 7.5-minute
E, Yucaipa, 1996, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N



This report includes information from the following map sheet(s).

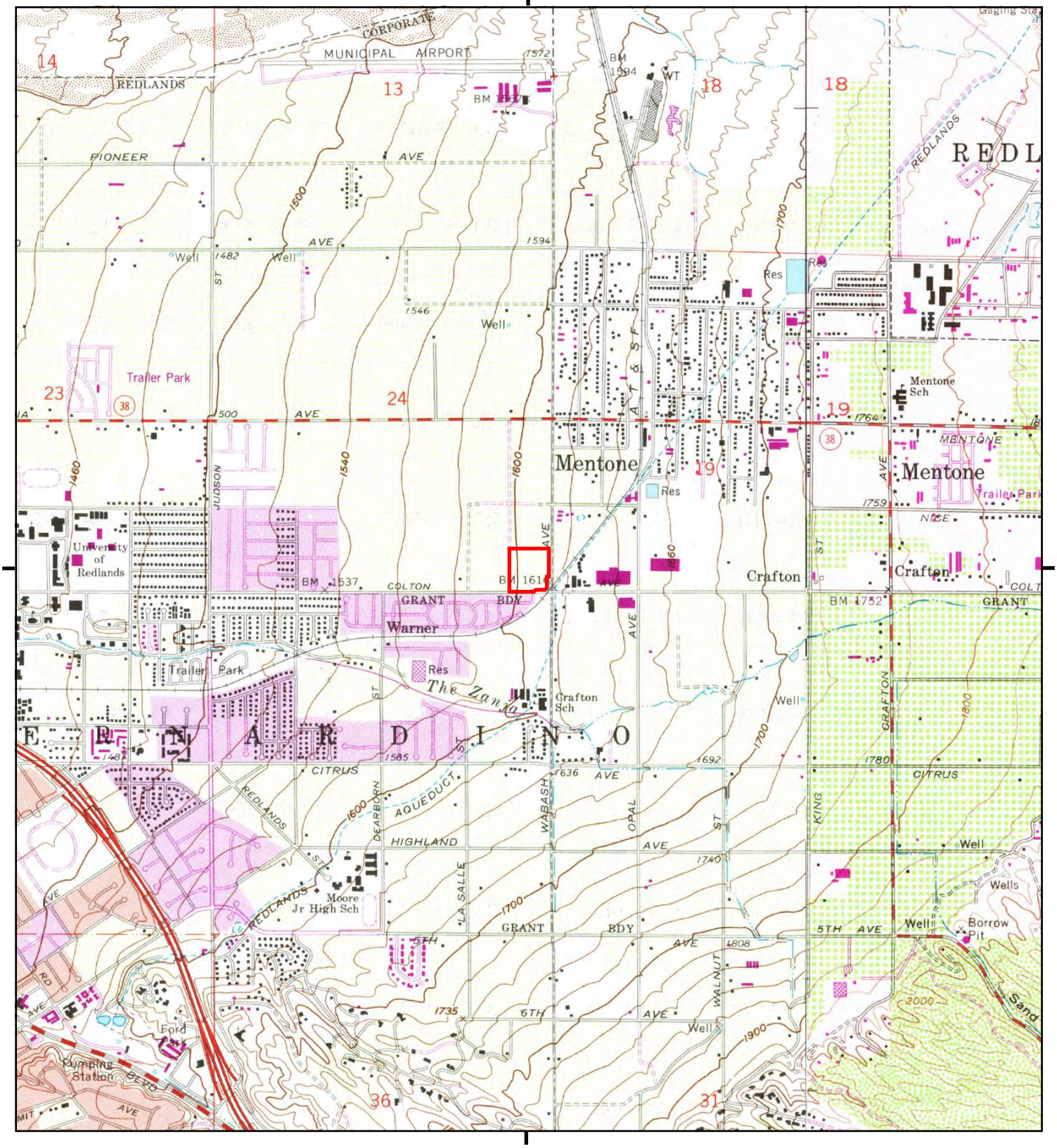
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Redlands, 1988, 7.5-minute
E, Yucaipa, 1988, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

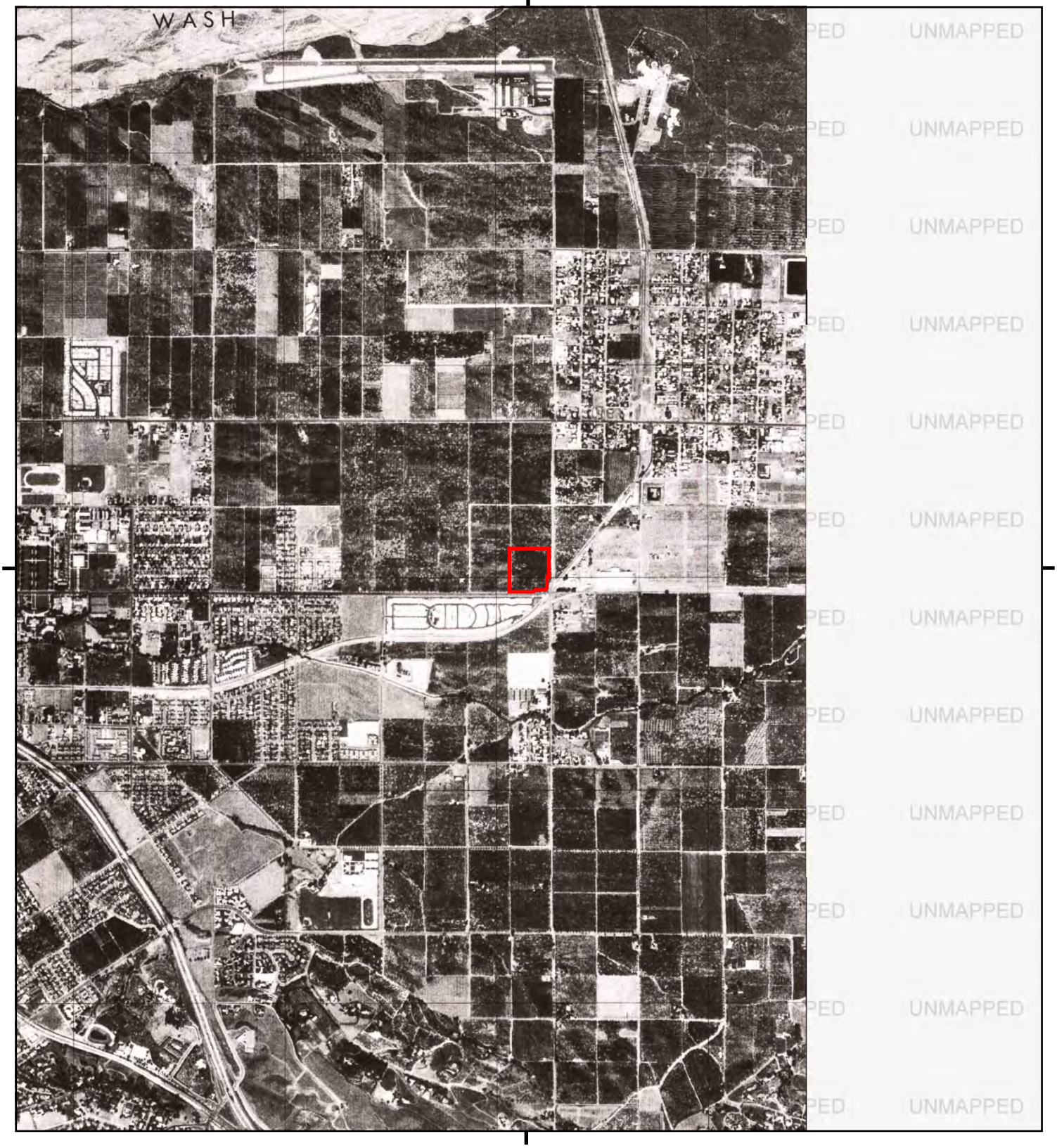
TP, Redlands, 1980, 7.5-minute
E, Yucaipa, 1980, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N

Historical Topo Map

1975



This report includes information from the following map sheet(s).

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NW N NE
W E
SW S SE

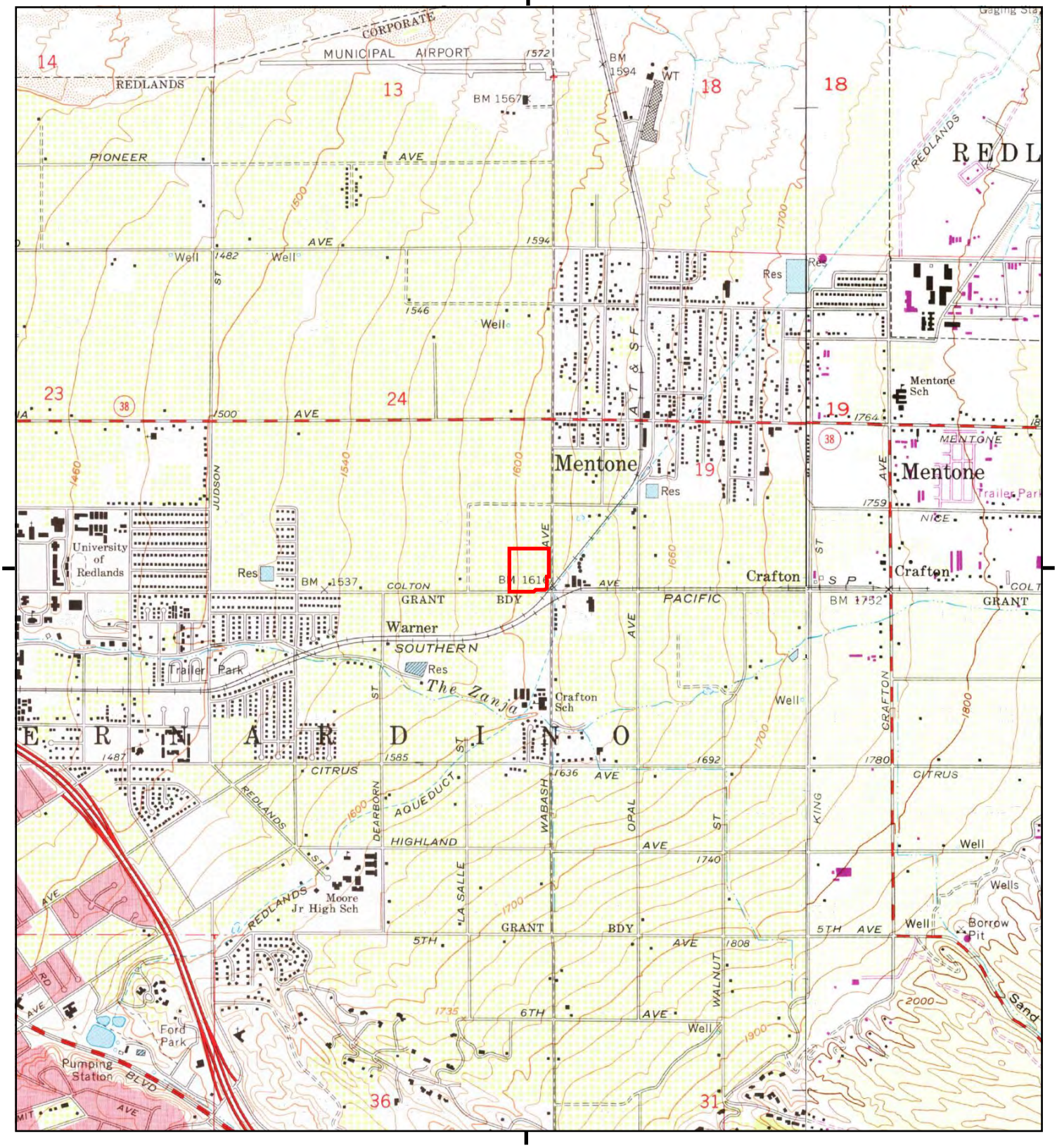
TP, Redlands, 1975, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N

Historical Topo Map

1973



This report includes information from the following map sheet(s).

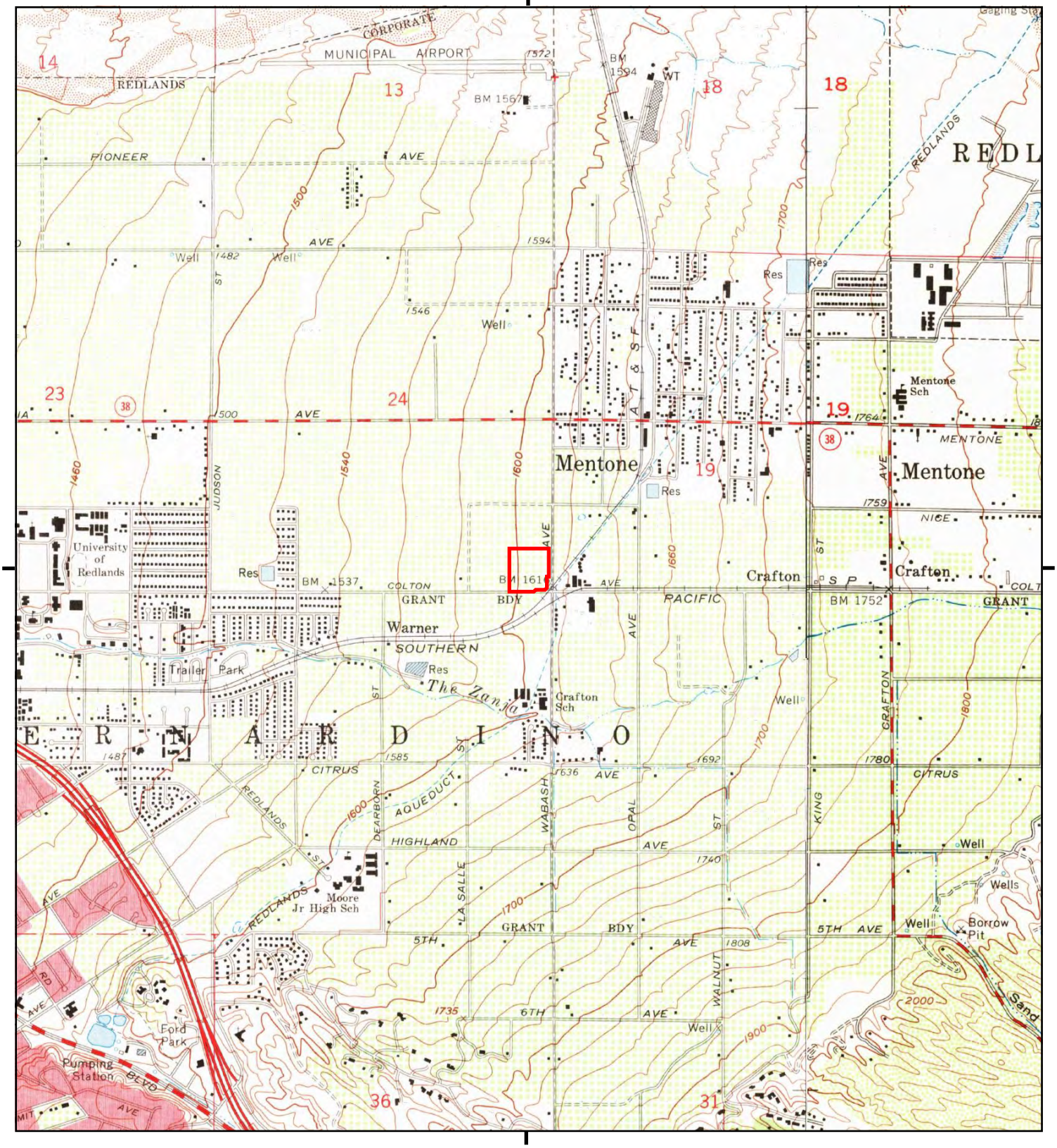
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Redlands, 1973, 7.5-minute
E, Yucaipa, 1973, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N



This report includes information from the following map sheet(s).

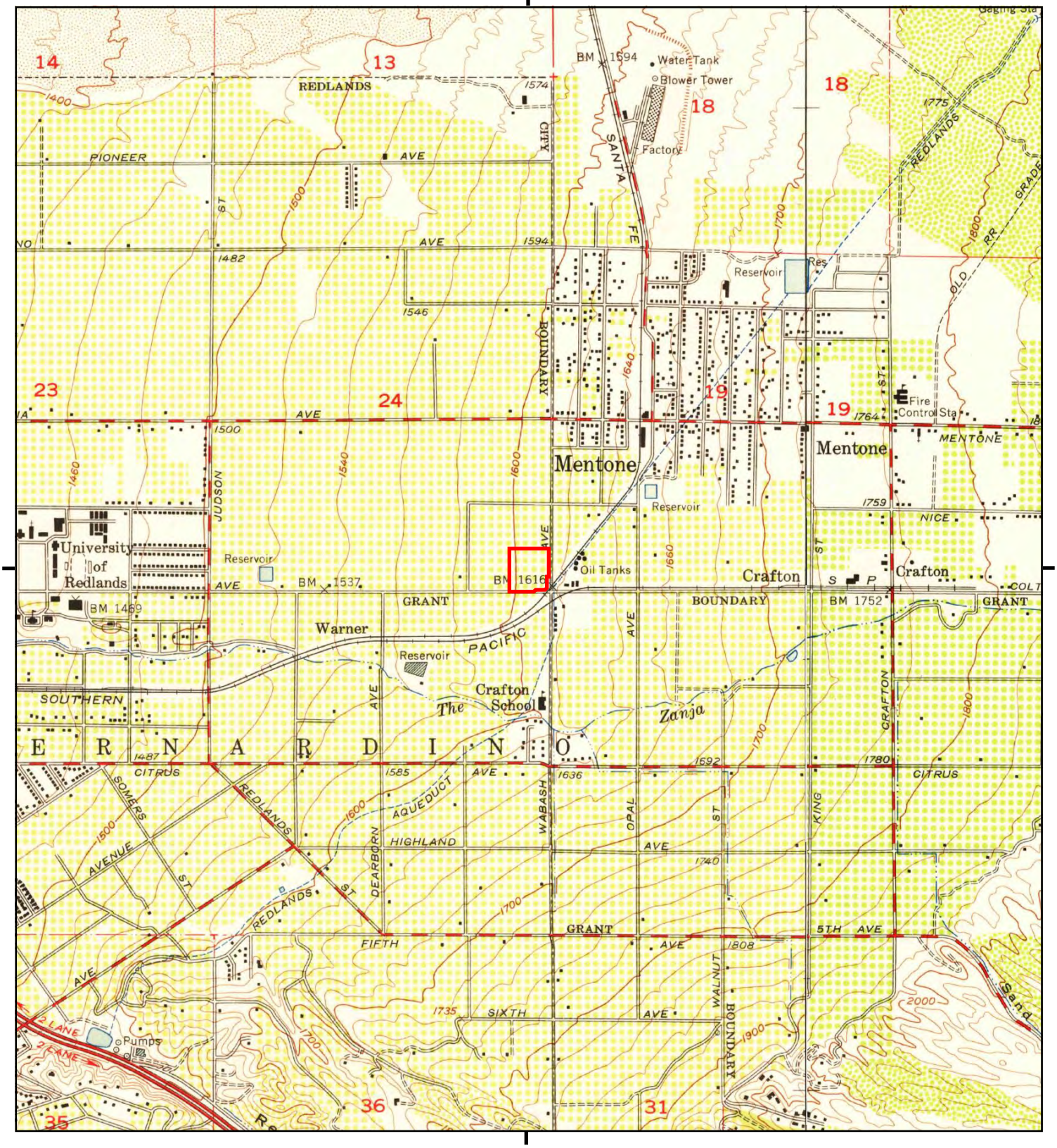
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Redlands, 1967, 7.5-minute
E, Yucaipa, 1967, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N



This report includes information from the following map sheet(s).

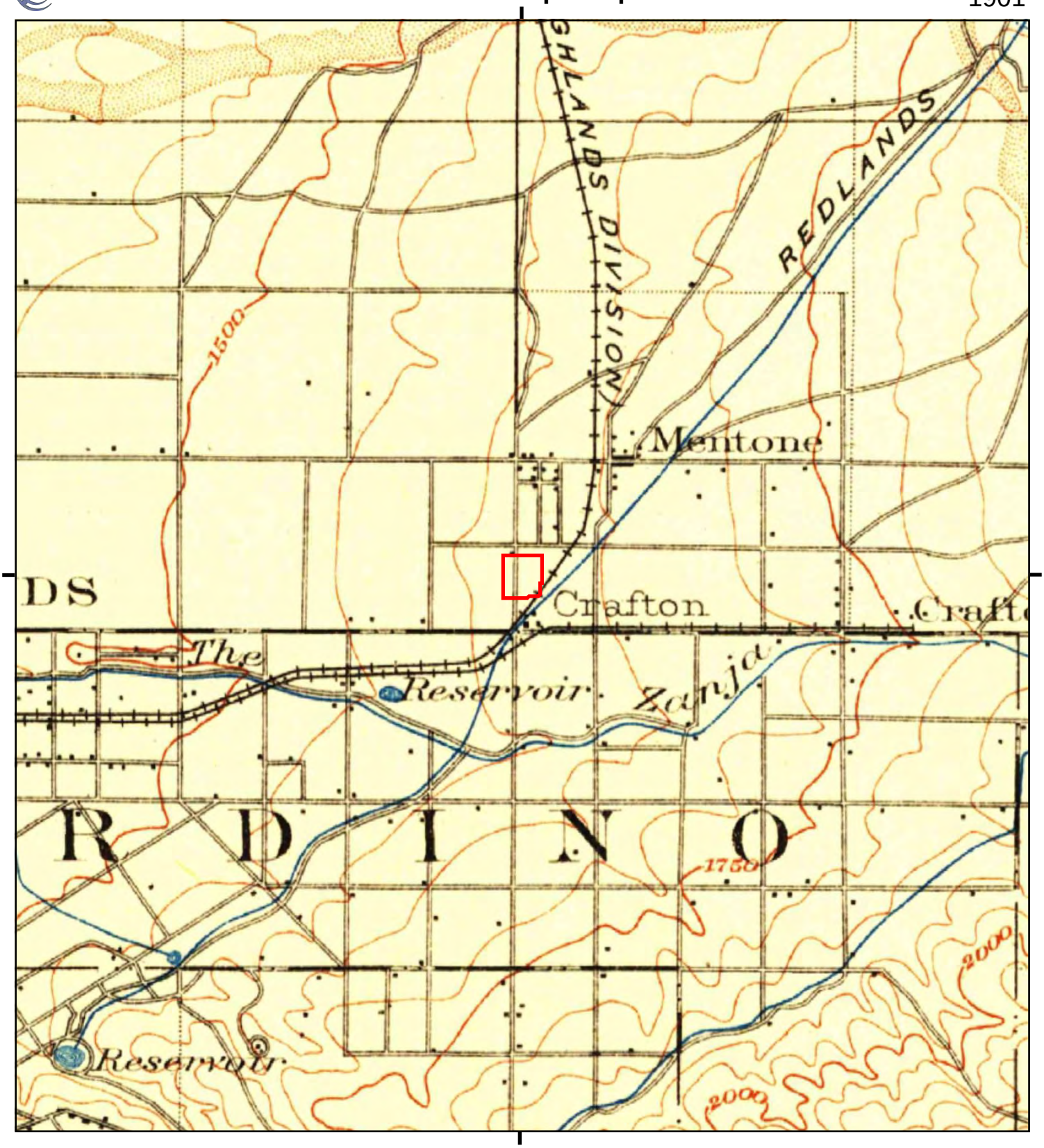
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Redlands, 1954, 7.5-minute
E, Yucaipa, 1954, 7.5-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N



This report includes information from the following map sheet(s).

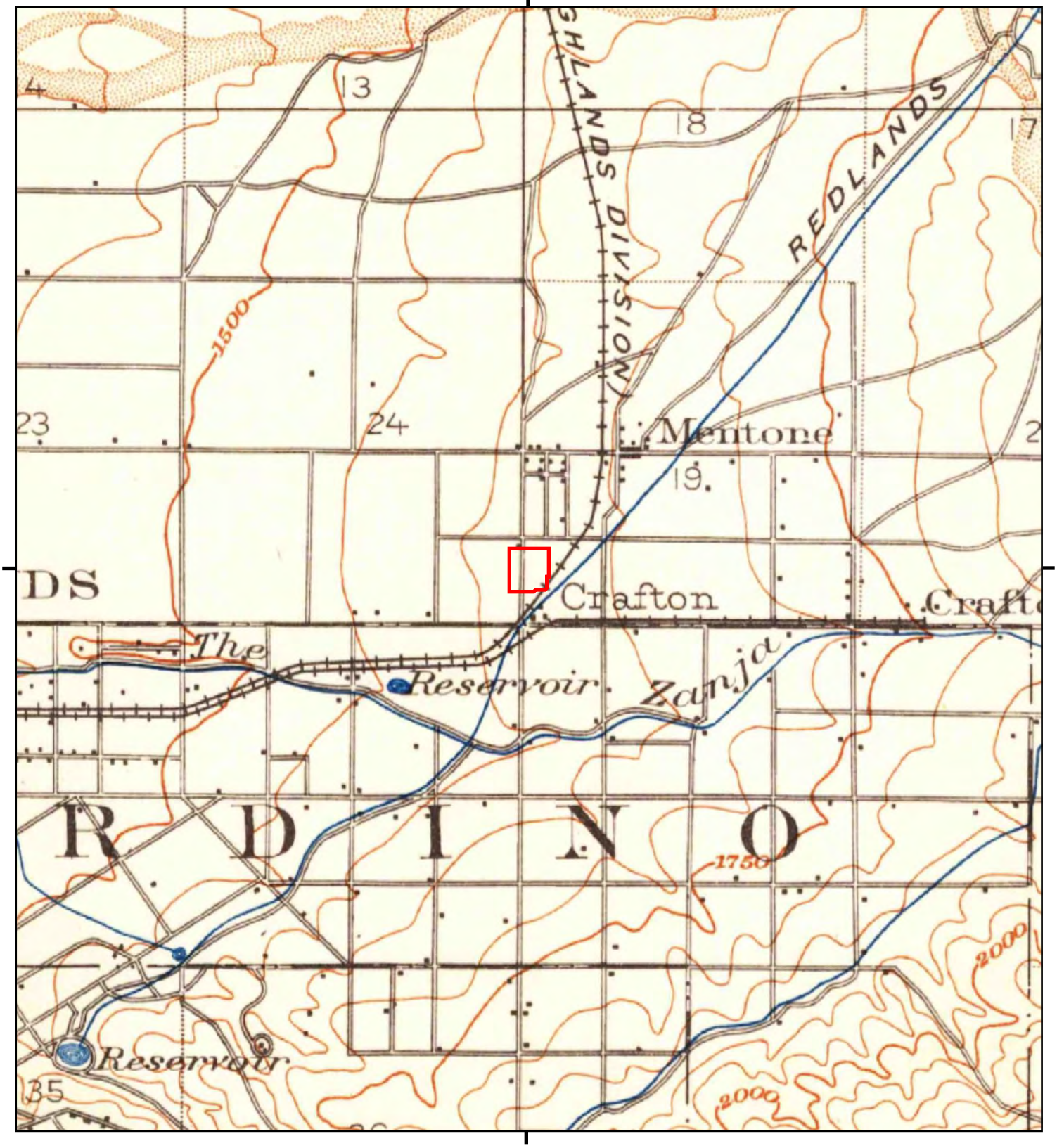
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Redlands, 1901, 15-minute

SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Redlands, 1899, 15-minute

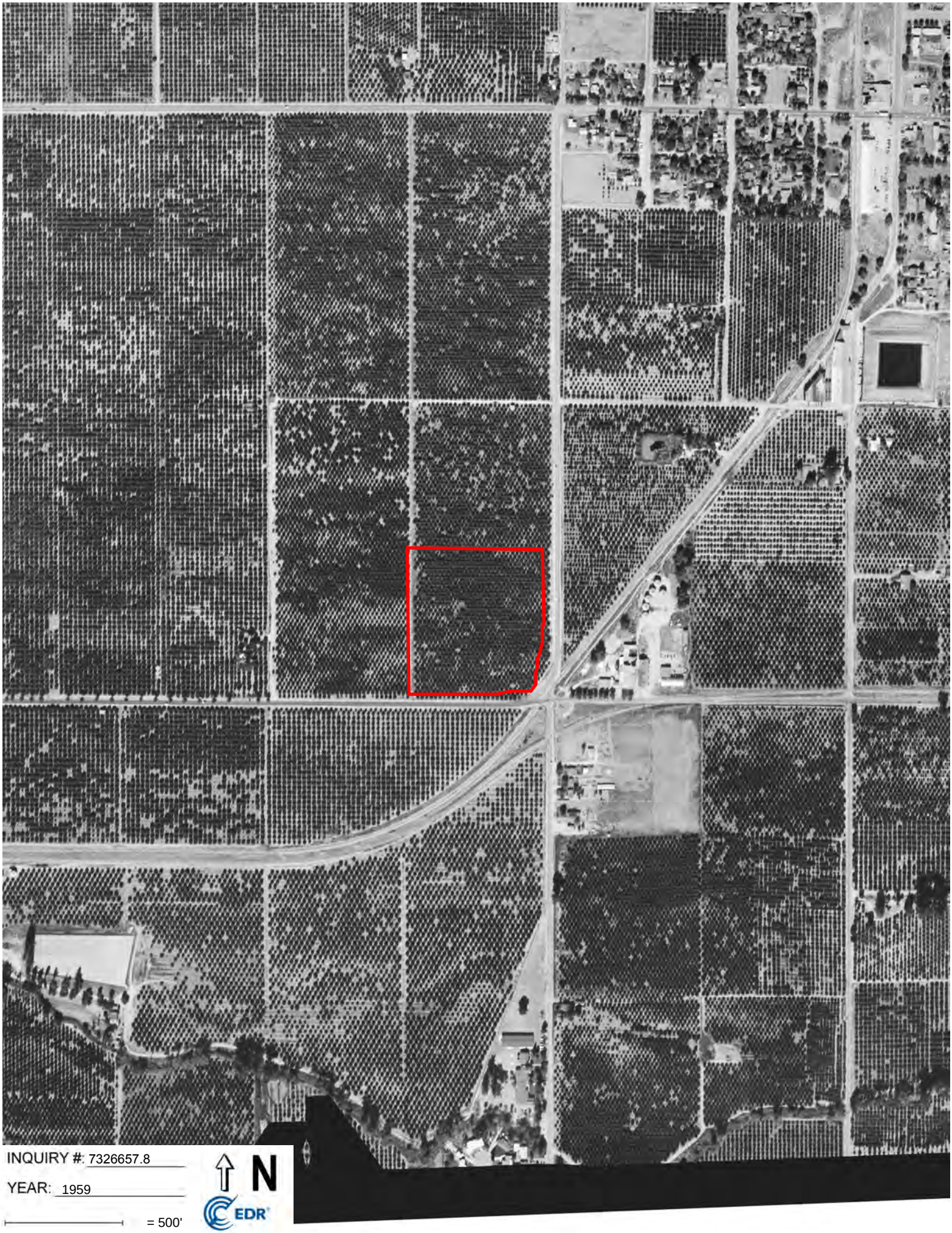
SITE NAME: Not Reported
ADDRESS: Not Reported
REDLANDS, CA 92374
CLIENT: Hazard Management Consulting

N


INQUIRY #: 7326657.8
YEAR: 1953
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 1949
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 1938
= 500'
N
EDR



INQUIRY #: 7326657.8

YEAR: 1959

= 500'

N

EDR


INQUIRY #: 7326657.8
YEAR: 1968
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 1966
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 1995
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 1989
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 1985
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 1975
= 500'
N
EDR

Not Reported

Not Reported

REDLANDS, CA 92374

Inquiry Number: 7326657.8

May 03, 2023

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

05/03/23

Site Name:

Not Reported
Not Reported
REDLANDS, CA 92374
EDR Inquiry # 7326657.8

Client Name:

Hazard Management Consulting
211 W. Avenida Cordoba
San Clemente, CA 92672
Contact: Gage Costales

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Search Results:

Year	Scale	Details	Source
2020	1"=500'	Flight Year: 2020	USDA/NAIP
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2002	1"=500'	Acquisition Date: January 01, 2002	USGS/DOQQ
1995	1"=500'	Acquisition Date: January 01, 1995	USGS/DOQQ
1989	1"=500'	Flight Date: August 15, 1989	USDA
1985	1"=500'	Flight Date: July 28, 1985	USDA
1975	1"=500'	Flight Date: August 01, 1975	USGS
1968	1"=500'	Flight Date: August 11, 1968	USDA
1966	1"=500'	Flight Date: April 16, 1966	USGS
1959	1"=500'	Flight Date: October 15, 1959	USDA
1953	1"=500'	Flight Date: February 16, 1953	USDA
1949	1"=500'	Flight Date: June 29, 1949	USDA
1938	1"=500'	Flight Date: July 04, 1938	USDA

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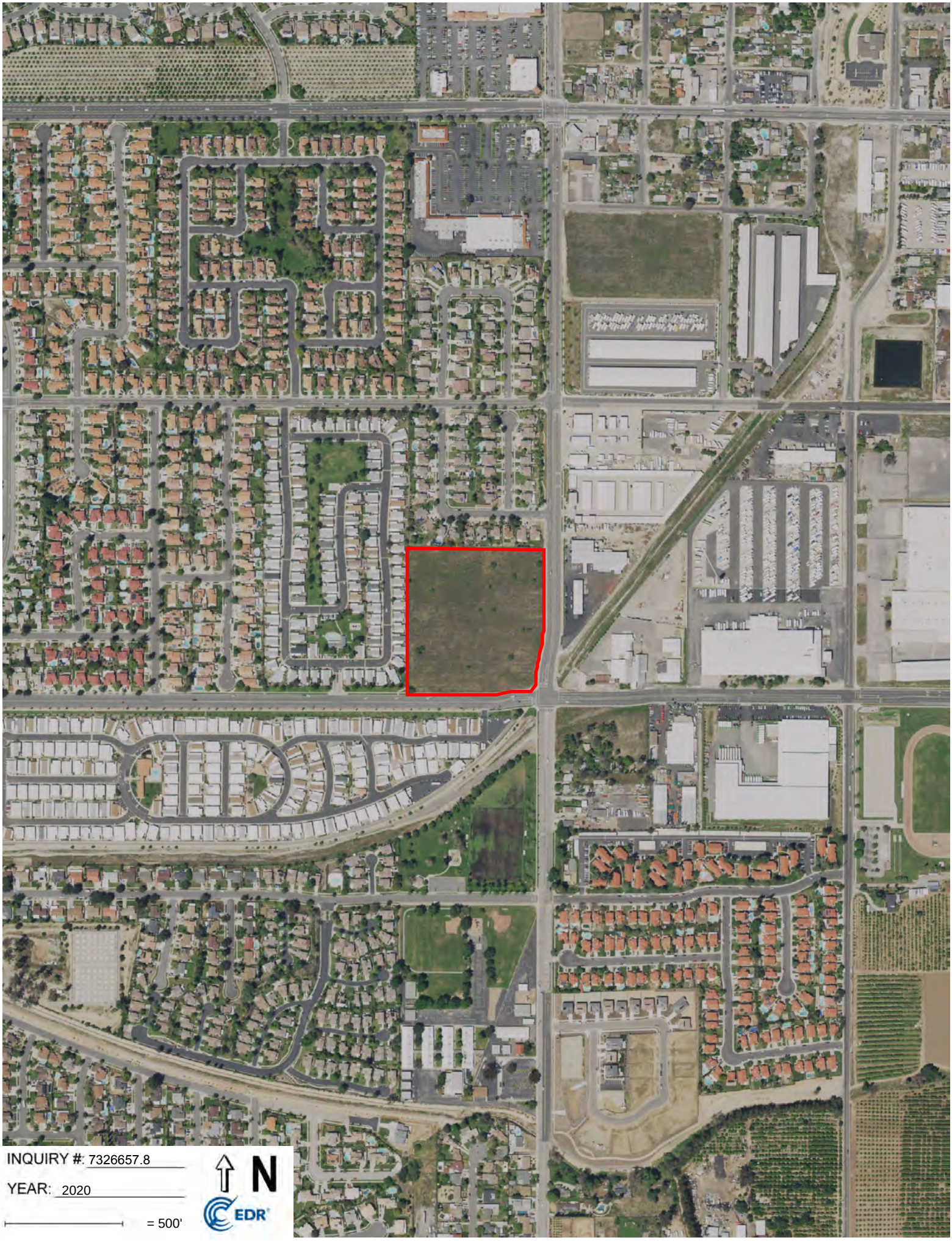
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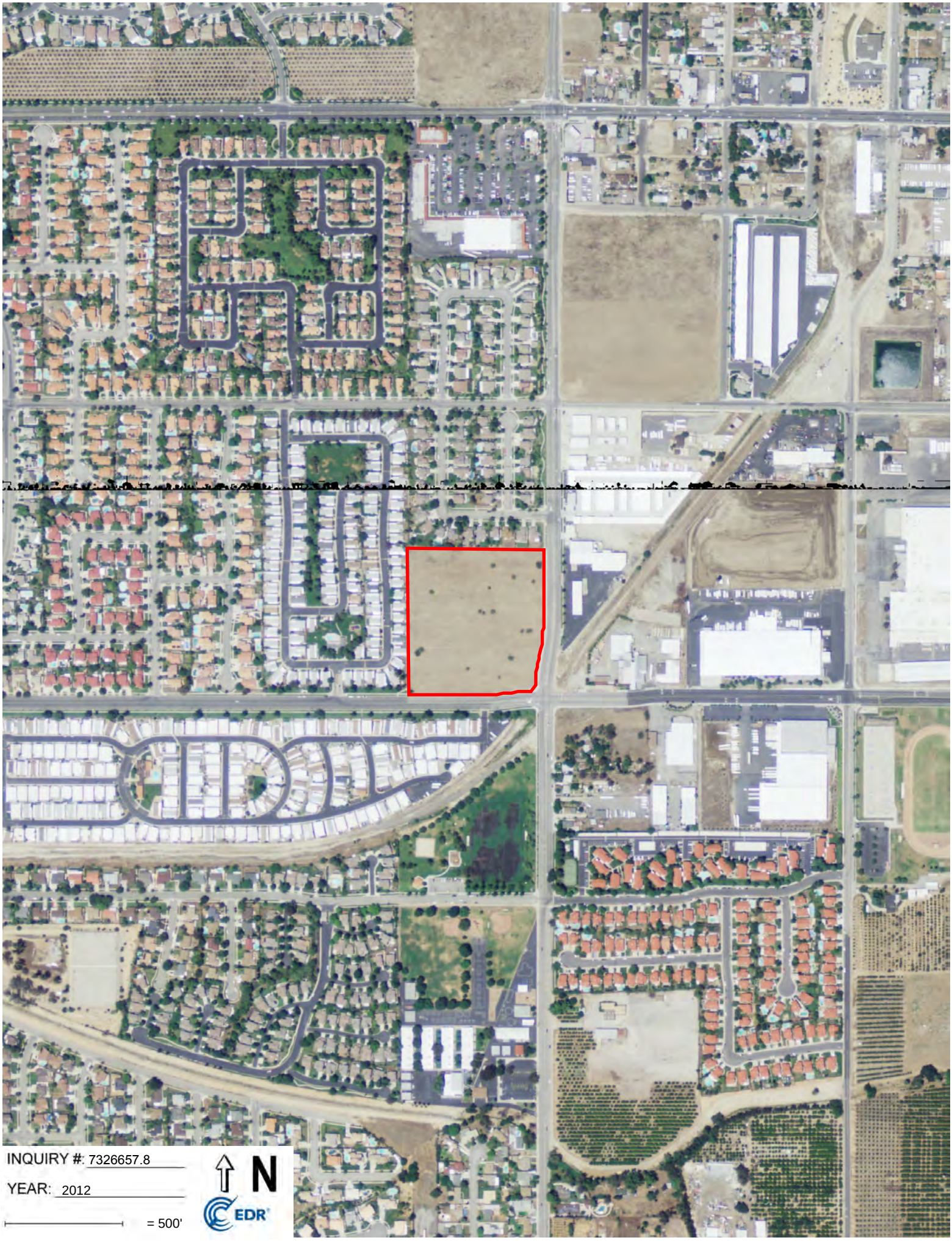
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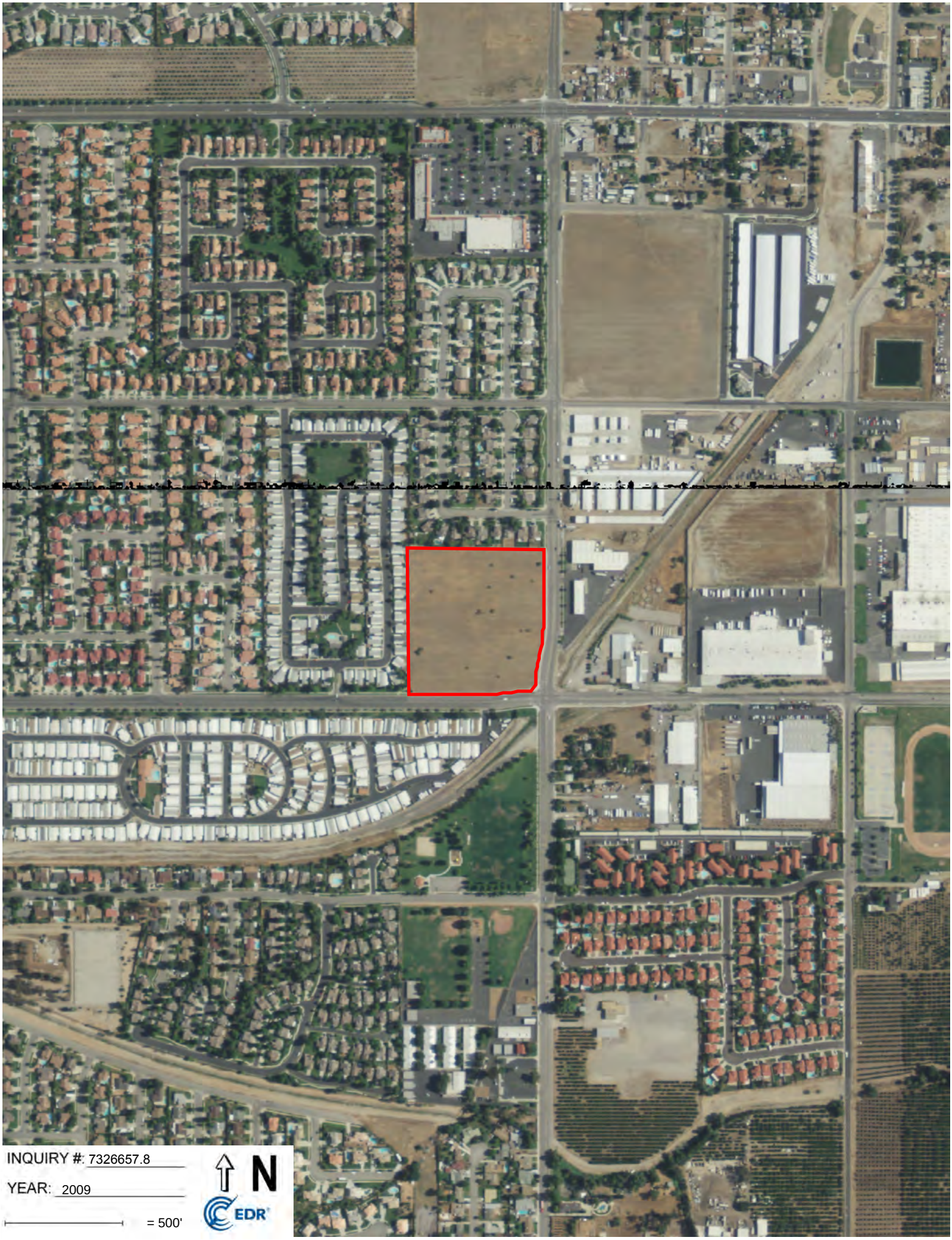
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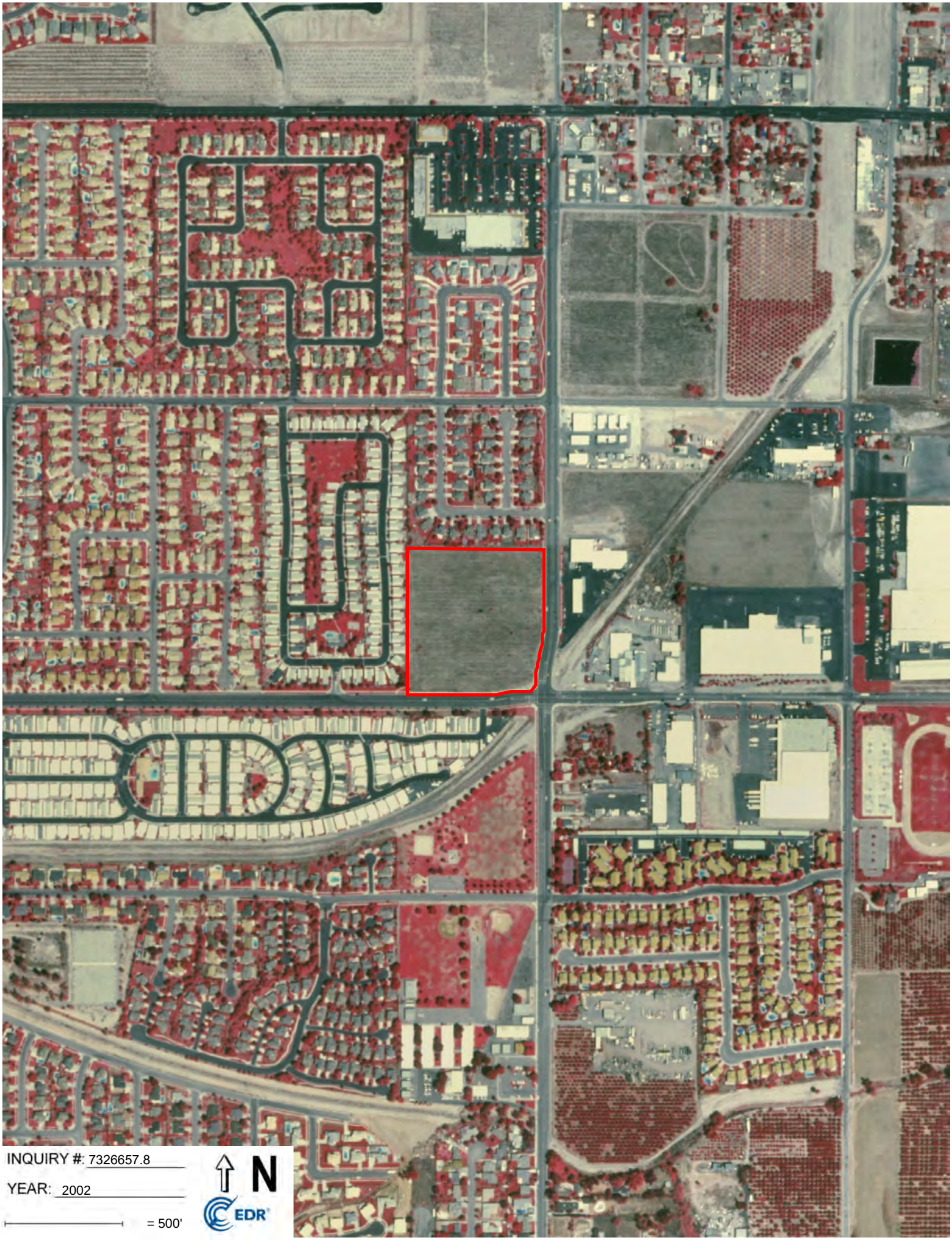

INQUIRY #: 7326657.8
YEAR: 2020
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 2016
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 2012
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 2009
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 2006
= 500'
N
EDR


INQUIRY #: 7326657.8
YEAR: 2002
= 500'
N
EDR

Not Reported
Not Reported
REDLANDS, CA 92374

Inquiry Number: 7326657.2s
May 03, 2023

EDR Summary Radius Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

NOT REPORTED
REDLANDS, CA 92374

COORDINATES

Latitude (North):	34.0638280 - 34° 3' 49.78''
Longitude (West):	117.1400610 - 117° 8' 24.21''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	487075.1
UTM Y (Meters):	3769047.2
Elevation:	1608 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	TP
Source:	U.S. Geological Survey

Target Property:	E
Source:	U.S. Geological Survey

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140603, 20140530
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
NOT REPORTED
REDLANDS, CA 92374

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	MISSION STEEL FABRIC	881 N WABASH AVE	CERS HAZ WASTE, HAZNET, San Bern. Co. Permit,...	Higher	18, 0.003, ENE
A2	BEYOND STEEL FABRICA	881 N WABASH AVE	RCRA NonGen / NLR	Higher	18, 0.003, ENE
A3	LARRY JACINTO CONSTR	988 WABASH	RCRA-SQG, FINDS, ECHO, HAZNET, San Bern. Co....	Higher	107, 0.020, NE
B4	LORAN INC		PFAS ECHO	Higher	194, 0.037, SE
B5	LORAN INC	1705 EAST COLTON ANE	RCRA-SQG, San Bern. Co. Permit, CERS	Higher	292, 0.055, ESE
B6	C AND S POWDER COATI	1717 E COLTON AVE	RCRA NonGen / NLR	Higher	451, 0.085, ESE
B7	C AND S POWDER COATI	1717 E COLTON AVE	CERS HAZ WASTE, HAZNET, San Bern. Co. Permit,...	Higher	451, 0.085, ESE
B8	SWAIN OIL TRANSPORT,	1717B E. COLTON AVE	RCRA NonGen / NLR	Higher	452, 0.086, ESE
B9	SWAIN OIL TRANSPORT,	1717B EAST COLTON AV	RCRA NonGen / NLR	Higher	452, 0.086, ESE
C10	LARRY JACINTO CONSTR		US MINES	Higher	523, 0.099, NNE
C11	TEXAS ROCK PLANT	988 WABASH	US MINES, ABANDONED MINES	Higher	610, 0.116, NNE
D12	PACIFIC BEND INC	1700 E COLTON AVE	RCRA NonGen / NLR	Higher	636, 0.120, ESE
D13	PACIFIC BEND INC	1700 E COLTON AVE	RCRA NonGen / NLR	Higher	636, 0.120, ESE
E14	PAUL HALL TRUCKING	1756 NICE AVE	RCRA NonGen / NLR	Higher	788, 0.149, NE
E15	AT&T MOBILITY - HWY	1758 NICE AVE	San Bern. Co. Permit	Higher	796, 0.151, NE
F16	RICHMOND TECHNOLOGY		PFAS ECHO	Higher	978, 0.185, East
F17	VINES RV & BOAT STOR	1897 E COLTON AVE	HAZNET, San Bern. Co. Permit, CERS, HWTS	Higher	1012, 0.192, ESE
F18	RICHMOND TECH INC	1897 COLTON AV	EMI, San Bern. Co. Permit, CERS	Higher	1012, 0.192, ESE
F19	RICHMOND TECHNOLOGY	1897 E COLTON AVE	HIST UST, RCRA NonGen / NLR, HAZNET, NPDES, HWTS	Higher	1012, 0.192, ESE
F20	WEE THREE	SE CORNER COLTON & O	SWEEPS UST, CA FID UST	Higher	1112, 0.211, ESE
G21	DIGMOR EQUIP & ENGR	1898 E COLTON	RCRA-SQG, FINDS, ECHO	Higher	1179, 0.223, ESE
G22	P&R PAPER SUPPLY CO	1898 E COLTON AVE	RCRA NonGen / NLR	Higher	1180, 0.223, ESE
G23	P&R PAPER SUPPLY COM	1898 E COLTON AVENUE	HAZNET, NPDES, San Bern. Co. Permit, CIWQS, CERS,...	Higher	1180, 0.223, ESE
H24	WESTERN FRUIT GROWER	1199 OPAL AVE	AST, CERS HAZ WASTE, HIST UST, CERS TANKS, HAZNET,...	Higher	1214, 0.230, ENE
H25	INT'L PAVEMENT SOLUT	1199 OPAL AVE	AST	Higher	1214, 0.230, ENE
H26	INTERNATIONAL PAVING	1199 OPAL AVE	RCRA NonGen / NLR	Higher	1214, 0.230, ENE
I27	CIRCLE K #1971	1702 MENTONE BLVD	LUST, CERS	Higher	1853, 0.351, NNE
I28	CIRCLE K #1971	1702 MENTONE BLVD	LUST, Cortese	Higher	1853, 0.351, NNE
I29	CRV RECYCLING SOLUTI	1786 E LUGONIA AVE	SWRCY, HAZNET, HWTS	Higher	1943, 0.368, North
J30	MENTONE SERVICE STAT	1759 MENTONE BLVD	LUST, SWEEPS UST, Cortese, HIST CORTESE, San Bern....	Higher	2207, 0.418, NNE
J31	MENTONE ARCO	1759 MENTONE BLVD	LUST, WMUDS/SWAT, CERS HAZ WASTE, HIST UST, CERS...	Higher	2207, 0.418, NNE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal RCRA generators

RCRA-SQG: A review of the RCRA-SQG list, as provided by EDR, and dated 03/06/2023 has revealed that there are 3 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LARRY JACINTO CONSTR EPA ID:: CAD983599861	***988 WABASH***	***NE 0 - 1/8 (0.020 mi.)***	***A3***	***9***
LORAN INC EPA ID:: CAD982517419	***1705 EAST COLTON ANE***	***ESE 0 - 1/8 (0.055 mi.)***	***B5***	***10***
DIGMOR EQUIP & ENGR EPA ID:: CAD981376486	***1898 E COLTON***	***ESE 1/8 - 1/4 (0.223 mi.)***	***G21***	***14***

Lists of state and tribal leaking storage tanks

LUST: A review of the LUST list, as provided by EDR, has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K #1971 Database: LUST, Date of Government Version: 03/06/2023 Status: Completed - Case Closed Global Id: T0607100461	***1702 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.351 mi.)***	***I27***	***15***
CIRCLE K #1971 Database: LUST REG 8, Date of Government Version: 02/14/2005	***1702 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.351 mi.)***	***I28***	***15***

Facility Status: Preliminary site assessment underway
Global ID: T0607100461

MENTONE SERVICE STAT ***1759 MENTONE BLVD*** ***NNE 1/4 - 1/2 (0.418 mi.)*** ***J30*** ***16***
Database: LUST REG 8, Date of Government Version: 02/14/2005
Facility Status: Preliminary site assessment workplan submitted
Global ID: T0607100577

MENTONE ARCO ***1759 MENTONE BLVD*** ***NNE 1/4 - 1/2 (0.418 mi.)*** ***J31*** ***17***
Database: LUST, Date of Government Version: 03/06/2023
Status: Completed - Case Closed
Global Id: T0607100577

Lists of state and tribal registered storage tanks

AST: A review of the AST list, as provided by EDR, has revealed that there are 2 AST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WESTERN FRUIT GROWER	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***14***
Database: AST, Date of Government Version: 07/06/2016				
INT'L PAVEMENT SOLUT	1199 OPAL AVE	ENE 1/8 - 1/4 (0.230 mi.)	H25	15
Database: AST, Date of Government Version: 07/06/2016				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: A review of the WMUDS/SWAT list, as provided by EDR, and dated 04/01/2000 has revealed that there is 1 WMUDS/SWAT site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MENTONE ARCO	***1759 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.418 mi.)***	***J31***	***17***

SWRCY: A review of the SWRCY list, as provided by EDR, and dated 12/02/2022 has revealed that there is 1 SWRCY site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CRV RECYCLING SOLUTI	***1786 E LUGONIA AVE***	***N 1/4 - 1/2 (0.368 mi.)***	***I29***	***16***
Cert Id: RC308154.001				

EXECUTIVE SUMMARY

Local Lists of Hazardous waste / Contaminated Sites

CERS HAZ WASTE: A review of the CERS HAZ WASTE list, as provided by EDR, and dated 01/05/2023 has revealed that there are 3 CERS HAZ WASTE sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MISSION STEEL FABRIC	***881 N WABASH AVE***	***ENE 0 - 1/8 (0.003 mi.)***	***A1***	***9***
C AND S POWDER COATI	***1717 E COLTON AVE***	***ESE 0 - 1/8 (0.085 mi.)***	***B7***	***10***
WESTERN FRUIT GROWER	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***14***

Local Lists of Registered Storage Tanks

SWEEPS UST: A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WEE THREE	***SE CORNER COLTON & O***	***ESE 1/8 - 1/4 (0.211 mi.)***	***F20***	***13***
Status: A				
Tank Status: A				
Comp Number: 57682				

HIST UST: A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 2 HIST UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RICHMOND TECHNOLOGY	***1897 E COLTON AVE***	***ESE 1/8 - 1/4 (0.192 mi.)***	***F19***	***13***
Facility Id: 00000019669				
WESTERN FRUIT GROWER	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***14***
Facility Id: 00000007391				

CA FID UST: A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there is 1 CA FID UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WEE THREE	***SE CORNER COLTON & O***	***ESE 1/8 - 1/4 (0.211 mi.)***	***F20***	***13***
Facility Id: 36009173				
Status: A				

CERS TANKS: A review of the CERS TANKS list, as provided by EDR, and dated 01/06/2023 has revealed that there is 1 CERS TANKS site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WESTERN FRUIT GROWER	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***14***

Other Ascertainable Records

RCRA NonGen / NLR: A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/06/2023 has revealed that there are 10 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BEYOND STEEL FABRICA EPA ID:: CAL000454499	881 N WABASH AVE	ENE 0 - 1/8 (0.003 mi.)	A2	9
C AND S POWDER COATI EPA ID:: CAL000416928 EPA ID:: CAC003141905	1717 E COLTON AVE	ESE 0 - 1/8 (0.085 mi.)	B6	10
SWAIN OIL TRANSPORT, EPA ID:: CAC003023970	1717B E. COLTON AVE	ESE 0 - 1/8 (0.086 mi.)	B8	11
SWAIN OIL TRANSPORT, EPA ID:: CAC002979917	1717B EAST COLTON AV	ESE 0 - 1/8 (0.086 mi.)	B9	11
PACIFIC BEND INC EPA ID:: CAL000456739	1700 E COLTON AVE	ESE 0 - 1/8 (0.120 mi.)	D12	11
PACIFIC BEND INC EPA ID:: CAL000456374	1700 E COLTON AVE	ESE 0 - 1/8 (0.120 mi.)	D13	12
PAUL HALL TRUCKING EPA ID:: CAR000199067	1756 NICE AVE	NE 1/8 - 1/4 (0.149 mi.)	E14	12
RICHMOND TECHNOLOGY EPA ID:: CAD980896161	***1897 E COLTON AVE***	***ESE 1/8 - 1/4 (0.192 mi.)***	***F19***	***13***
P&R PAPER SUPPLY CO EPA ID:: CAL000418194	1898 E COLTON AVE	ESE 1/8 - 1/4 (0.223 mi.)	G22	14
INTERNATIONAL PAVING EPA ID:: CAL000356275	1199 OPAL AVE	ENE 1/8 - 1/4 (0.230 mi.)	H26	15

US MINES: A review of the US MINES list, as provided by EDR, has revealed that there are 2 US MINES sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LARRY JACINTO CONSTR Database: US MINES, Date of Government Version: 11/07/2022 Mine ID:: 0405529		NNE 0 - 1/8 (0.099 mi.)	C10	11
TEXAS ROCK PLANT Database: MINES VIOLATIONS, Date of Government Version: 02/27/2023	***988 WABASH***	***NNE 0 - 1/8 (0.116 mi.)***	***C11***	***11***

EXECUTIVE SUMMARY

ABANDONED MINES: A review of the ABANDONED MINES list, as provided by EDR, and dated 12/20/2022 has revealed that there is 1 ABANDONED MINES site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
TEXAS ROCK PLANT	***988 WABASH***	***NNE 0 - 1/8 (0.116 mi.)***	***C11***	***11***

PFAS ECHO: A review of the PFAS ECHO list, as provided by EDR, and dated 03/30/2023 has revealed that there are 2 PFAS ECHO sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LORAN INC		SE 0 - 1/8 (0.037 mi.)	B4	10
RICHMOND TECHNOLOGY		E 1/8 - 1/4 (0.185 mi.)	F16	12

Cortese: A review of the Cortese list, as provided by EDR, and dated 12/14/2022 has revealed that there are 2 Cortese sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K #1971	***1702 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.351 mi.)***	***I28***	***15***
Cleanup Status: COMPLETED - CASE CLOSED				
MENTONE SERVICE STAT	***1759 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.418 mi.)***	***J30***	***16***
Cleanup Status: COMPLETED - CASE CLOSED				

HIST CORTESE: A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 HIST CORTESE site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MENTONE SERVICE STAT	***1759 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.418 mi.)***	***J30***	***16***
Reg Id: 083603461T				

San Bern. Co. Permit: A review of the San Bern. Co. Permit list, as provided by EDR, and dated 11/18/2022 has revealed that there are 9 San Bern. Co. Permit sites within approximately 0.25 miles of the target property.

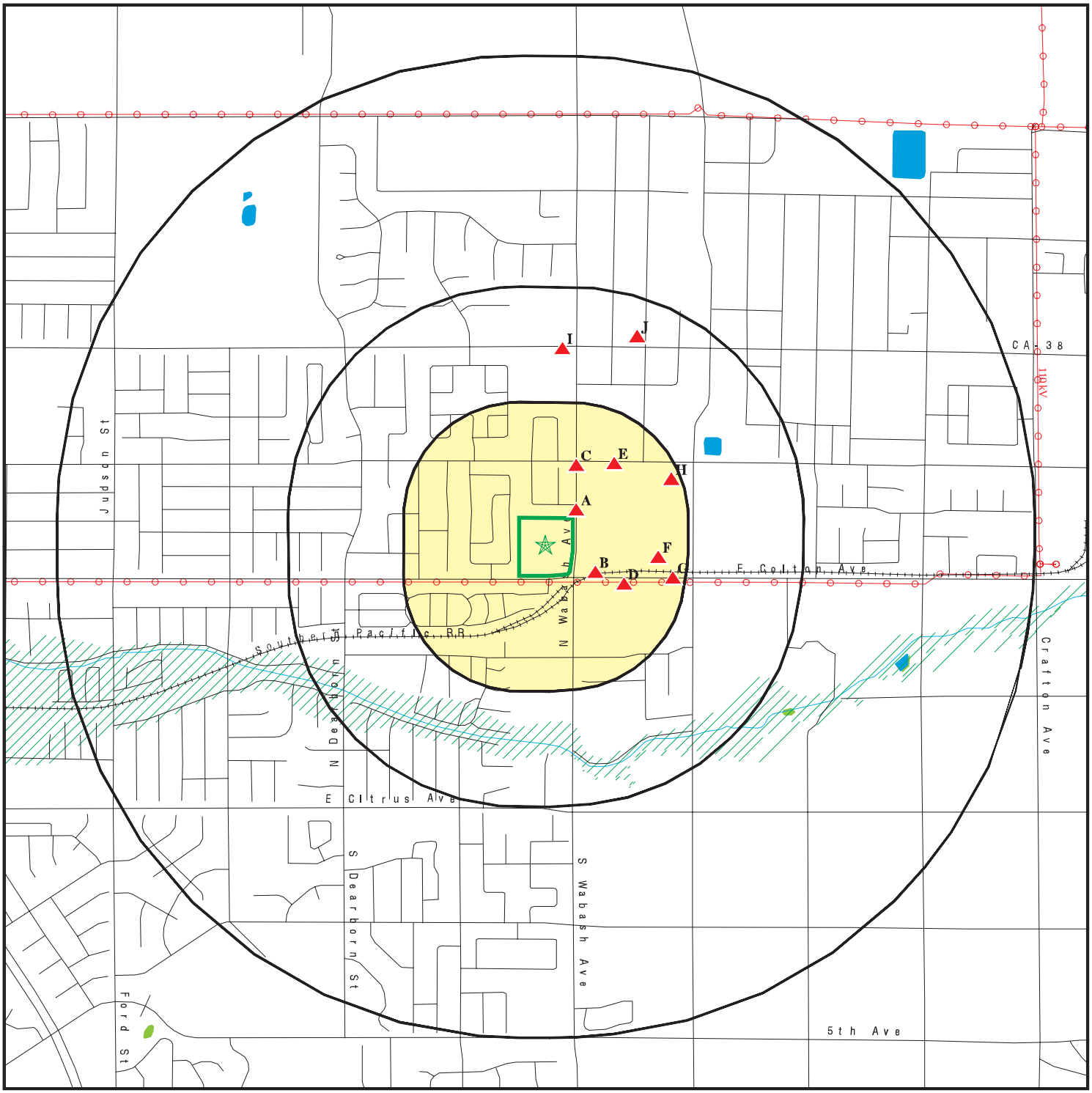
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MISSION STEEL FABRIC	***881 N WABASH AVE***	***ENE 0 - 1/8 (0.003 mi.)***	***A1***	***9***
Facility Status: ACTIVE				
Facility Id: FA0006352				
LARRY JACINTO CONSTR	***988 WABASH***	***NE 0 - 1/8 (0.020 mi.)***	***A3***	***9***
Facility Status: INACTIVE				
Facility Id: FA0004383				
LORAN INC	***1705 EAST COLTON ANE***	***ESE 0 - 1/8 (0.055 mi.)***	***B5***	***10***

Facility Status: INACTIVE Facility Id: FA0004481				
C AND S POWDER COATI Facility Status: ACTIVE Facility Id: FA0019353	***1717 E COLTON AVE***	***ESE 0 - 1/8 (0.085 mi.)***	***B7***	***10***
AT&T MOBILITY - HWY Facility Status: ACTIVE Facility Id: FA0009010	1758 NICE AVE	NE 1/8 - 1/4 (0.151 mi.)	E15	12
VINES RV & BOAT STOR Facility Status: ACTIVE Facility Id: FA0013496	***1897 E COLTON AVE***	***ESE 1/8 - 1/4 (0.192 mi.)***	***F17***	***12***
RICHMOND TECH INC Facility Status: INACTIVE Facility Id: FA0005708	***1897 COLTON AV***	***ESE 1/8 - 1/4 (0.192 mi.)***	***F18***	***13***
P&R PAPER SUPPLY COM Facility Status: ACTIVE Facility Status: INACTIVE Facility Id: FA0015301	***1898 E COLTON AVENUE***	***ESE 1/8 - 1/4 (0.223 mi.)***	***G23***	***14***
WESTERN FRUIT GROWER Facility Status: ACTIVE Facility Status: INACTIVE Facility Id: FA0003994	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***14***

Count: 1 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MENTONE	S126984130	MENTONE DISPOSAL SITE	SANTA ANA RIVER AND OPAL ROAD,	92359	SWF/LF

OVERVIEW MAP - 7326657.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

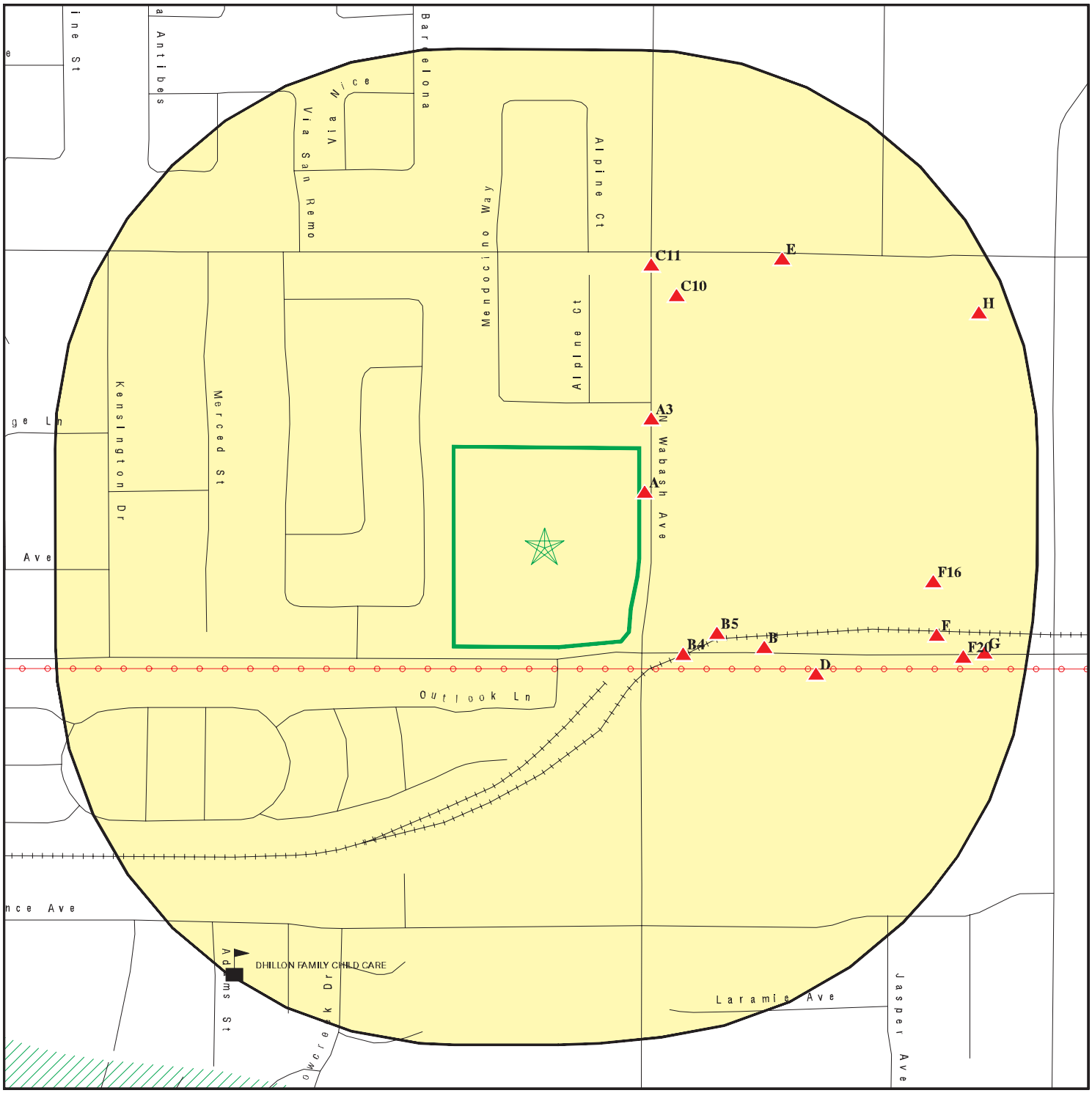
N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Not Reported	CLIENT:	Hazard Management Consulting
ADDRESS:	Not Reported REDLANDS CA 92374	CONTACT:	Gage Costales
		INQUIRY #:	7326657.2s
LAT/LONG:	34.063828 / 117.140061	DATE:	May 03, 2023 1:58 pm

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DETAIL MAP - 7326657.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Not Reported ADDRESS: Not Reported REDLANDS CA 92374 LAT/LONG: 34.063828 / 117.140061	CLIENT: Hazard Management Consulting CONTACT: Gage Costales INQUIRY #: 7326657.2s DATE: May 03, 2023 2:01 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		2	1	NR	NR	NR	3
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
Lists of state- and tribal (Superfund) equivalent sites								
RESPONSE	1.000		0	0	0	0	NR	0
Lists of state- and tribal hazardous waste facilities								
ENVIROSTOR	1.000		0	0	0	0	NR	0
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Lists of state and tribal leaking storage tanks								
LUST	0.500		0	0	4	NR	NR	4
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
Lists of state and tribal registered storage tanks								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	2	NR	NR	NR	2
INDIAN UST	0.250		0	0	NR	NR	NR	0
Lists of state and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	1	NR	NR	1
SWRCY	0.500		0	0	1	NR	NR	1
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		2	1	NR	NR	NR	3
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	1	NR	NR	NR	1
HIST UST	0.250		0	2	NR	NR	NR	2
CA FID UST	0.250		0	1	NR	NR	NR	1
CERS TANKS	0.250		0	1	NR	NR	NR	1
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		6	4	NR	NR	NR	10
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		2	0	NR	NR	NR	2
ABANDONED MINES	0.250		1	0	NR	NR	NR	1
FINDS	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
PFAS NPL	0.250		0	0	NR	NR	NR	0
PFAS FEDERAL SITES	0.250		0	0	NR	NR	NR	0
PFAS TSCA	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PFAS RCRA MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS ATSDR	0.250		0	0	NR	NR	NR	0
PFAS WQP	0.250		0	0	NR	NR	NR	0
PFAS NPDES	0.250		0	0	NR	NR	NR	0
PFAS ECHO	0.250		1	1	NR	NR	NR	2
PFAS ECHO FIRE TRAINING	0.250		0	0	NR	NR	NR	0
PFAS PART 139 AIRPORT	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM NRC	0.250		0	0	NR	NR	NR	0
PFAS	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	2	NR	NR	2
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	1	NR	NR	1
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
San Bern. Co. Permit	0.250		4	5	NR	NR	NR	9
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
HAZMAT	0.250		0	0	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
MINES MRDS	0.001		0	NR	NR	NR	NR	0
HWTS	TP		NR	NR	NR	NR	NR	0
PFAS TRIS	0.250		0	0	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	18	19	9	0	0	46

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1
ENE
< 1/8
0.003 mi.
18 ft.

Relative:
Higher

MISSION STEEL FABRICATION
881 N WABASH AVE
REDLANDS, CA 92374

Database(s): CERS HAZ WASTE, HAZNET, San Bern. Co. Permit, CERS, HWTS

EDR ID Number: S104905588
EPA ID Number: N/A

Click here for full text details

HAZNET
GEPAID CAL000454499

San Bern. Co. Permit
Facility Id FA0006352
Facility Status ACTIVE

A2
ENE
< 1/8
0.003 mi.
18 ft.

Relative:
Higher

BEYOND STEEL FABRICATION LLC
881 N WABASH AVE
REDLANDS, CA 92374

Database(s): RCRA NonGen / NLR

EDR ID Number: 1026170929
EPA ID Number: CAL000454499

Click here for full text details

RCRA NonGen / NLR
EPA Id CAL000454499

A3
NE
< 1/8
0.020 mi.
107 ft.

Relative:
Higher

LARRY JACINTO CONSTRUCTION INC
988 WABASH
MENTONE, CA 92359

Database(s): RCRA-SQG, FINDS, ECHO, HAZNET, San Bern. Co. Permit, HWTS

EDR ID Number: 1000596027
EPA ID Number: CAD983599861

Click here for full text details

RCRA-SQG
EPA Id CAD983599861

FINDS
Registry ID: 110002856669

ECHO
Registry ID 110002856669

HAZNET
GEPAID CAD983599861

San Bern. Co. Permit
Facility Id FA0004383
Facility Status INACTIVE

B4
SE
< 1/8
0.037 mi.
194 ft.

Relative:
Higher

LORAN INC

REDLANDS, CA

Click here for full text details

Database(s): PFAS ECHO
EDR ID Number: 1027383018
EPA ID Number: N/A

B5
ESE
< 1/8
0.055 mi.
292 ft.

Relative:
Higher

LORAN INC
1705 EAST COLTON ANENUE
REDLANDS, CA 92373

Click here for full text details

RCRA-SQG
EPA Id CAD982517419

San Bern. Co. Permit
Facility Id FA0004481
Facility Status INACTIVE

Database(s): RCRA-SQG, San Bern. Co. Permit, CERS
EDR ID Number: 1000150500
EPA ID Number: CAD982517419

B6
ESE
< 1/8
0.085 mi.
451 ft.

Relative:
Higher

C AND S POWDER COATING
1717 E COLTON AVE
REDLANDS, CA 92374

Click here for full text details

RCRA NonGen / NLR
EPA Id CAL000416928
EPA Id CAC003141905

Database(s): RCRA NonGen / NLR
EDR ID Number: 1027070452
EPA ID Number: CAC003141905

B7
ESE
< 1/8
0.085 mi.
451 ft.

Relative:
Higher

C AND S POWDER COATING
1717 E COLTON AVE
REDLANDS, CA 92374

Click here for full text details

HAZNET
GEPAID CAL000416928

San Bern. Co. Permit
Facility Id FA0019353
Facility Status ACTIVE

Database(s): CERS HAZ WASTE, HAZNET, San Bern. Co. Permit, CERS, HWTS
EDR ID Number: S126109519
EPA ID Number: N/A

B8
ESE
< 1/8
0.086 mi.
452 ft.

Relative:
Higher

SWAIN OIL TRANSPORT, DBA VISTA ENERGY TRANSPORT
1717B E. COLTON AVE
REDLANDS, CA 92374

RCRA NonGen / NLR | **1025844352**
CAC003023970

Click here for full text details

RCRA NonGen / NLR
EPA Id CAC003023970

B9
ESE
< 1/8
0.086 mi.
452 ft.

Relative:
Higher

SWAIN OIL TRANSPORT, DBA: VISTA ENERGY TRANSPORT
1717B EAST COLTON AVENUE
REDLANDS, CA 92374

RCRA NonGen / NLR | **1024760065**
CAC002979917

Click here for full text details

RCRA NonGen / NLR
EPA Id CAC002979917

C10
NNE
< 1/8
0.099 mi.
523 ft.

Relative:
Higher

LARRY JACINTO CONSTRUCTION INC

SAN BERNARDINO (County), CA

US MINES | **1011130952**
N/A

Click here for full text details

US MINES
Mine ID: 0405529

C11
NNE
< 1/8
0.116 mi.
610 ft.

Relative:
Higher

TEXAS ROCK PLANT
988 WABASH
MENTONE, CA 92359

US MINES
ABANDONED MINES | **1024906826**
N/A

Click here for full text details

D12
ESE
< 1/8
0.120 mi.
636 ft.

Relative:
Higher

PACIFIC BEND INC
1700 E COLTON AVE
REDLANDS, CA 92374

RCRA NonGen / NLR | **1026491968**
CAL000456739

Click here for full text details

RCRA NonGen / NLR
EPA Id CAL000456739

D13
ESE
< 1/8
0.120 mi.
636 ft.

Relative:
Higher

PACIFIC BEND INC
1700 E COLTON AVE
SAN BERNARDINO, CA 92374

RCRA NonGen / NLR | **1026491617**
CAL000456374

Click here for full text details

RCRA NonGen / NLR
EPA Id CAL000456374

E14
NE
1/8-1/4
0.149 mi.
788 ft.

Relative:
Higher

PAUL HALL TRUCKING
1756 NICE AVE
MENTONE, CA 92359

RCRA NonGen / NLR | **1012176066**
CAR000199067

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RCRA NonGen / NLR
EPA Id CAR000199067

E15
NE
1/8-1/4
0.151 mi.
796 ft.

Relative:
Higher

AT&T MOBILITY - HWY 38 WABASH - (USID26350)
1758 NICE AVE
MENTONE, CA 92359

San Bern. Co. Permit | **S106803283**
N/A

Click here for full text details

San Bern. Co. Permit
Facility Id FA0009010
Facility Status ACTIVE

F16
East
1/8-1/4
0.185 mi.
978 ft.

Relative:
Higher

RICHMOND TECHNOLOGY INC.

REDLANDS, CA

PFAS ECHO | **1027412945**
N/A

Click here for full text details

F17
ESE
1/8-1/4
0.192 mi.
1012 ft.

Relative:
Higher

VINES RV & BOAT STORAGE
1897 E COLTON AVE
REDLANDS, CA 92374

HAZNET
San Bern. Co. Permit
CERS
HWTS | **S112972755**
N/A

Click here for full text details

HAZNET
GEPAID CAC002634281

San Bern. Co. Permit
Facility Id FA0013496
Facility Status ACTIVE

F18
ESE
1/8-1/4
0.192 mi.
1012 ft.

Relative:
Higher

RICHMOND TECH INC
1897 COLTON AV
REDLANDS, CA 92374

EMI **S104769543**
San Bern. Co. Permit **N/A**
CERS

Click here for full text details

EMI
Facility Id 70603

San Bern. Co. Permit
Facility Id FA0005708
Facility Status INACTIVE

F19
ESE
1/8-1/4
0.192 mi.
1012 ft.

Relative:
Higher

RICHMOND TECHNOLOGY INC
1897 E COLTON AVE
REDLANDS, CA 92373

HIST UST **1000242847**
RCRA NonGen / NLR **CAD980896161**
HAZNET
NPDES
HWTS

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HIST UST
Facility Id 00000019669

RCRA NonGen / NLR
EPA Id CAD980896161

HAZNET
GEPAID CAD980896161

F20
ESE
1/8-1/4
0.211 mi.
1112 ft.

Relative:
Higher

WEE THREE
SE CORNER COLTON & OPAL
REDLANDS, CA 92373

SWEEPS UST **S101619384**
CA FID UST **N/A**

Click here for full text details

SWEEPS UST
Status A
Tank Status A
Comp Number 57682

CA FID UST
Facility Id 36009173
Status A

G21
ESE
1/8-1/4
0.223 mi.
1179 ft.

Relative:
Higher

DIGMOR EQUIP & ENGR CO INC
1898 E COLTON
MENTONE, CA 92359

RCRA-SQG
FINDS
ECHO

1000301926
CAD981376486

Click here for full text details

RCRA-SQG
EPA Id CAD981376486

FINDS
Registry ID: 110002685997

ECHO
Registry ID 110002685997

G22
ESE
1/8-1/4
0.223 mi.
1180 ft.

Relative:
Higher

P&R PAPER SUPPLY CO INC
1898 E COLTON AVE
REDLANDS, CA 92374

RCRA NonGen / NLR

1027091154
CAL000418194

Click here for full text details

RCRA NonGen / NLR
EPA Id CAL000418194

G23
ESE
1/8-1/4
0.223 mi.
1180 ft.

Relative:
Higher

P&R PAPER SUPPLY COMPANY
1898 E COLTON AVENUE
REDLANDS, CA 92373

HAZNET
NPDES
San Bern. Co. Permit
CIWQS
CERS
HWTS

S111828655
N/A

Click here for full text details

HAZNET
GEPAID CAL000418194

San Bern. Co. Permit
Facility Id FA0015301
Facility Status ACTIVE
Facility Status INACTIVE

H24
ENE
1/8-1/4
0.230 mi.
1214 ft.

Relative:
Higher

WESTERN FRUIT GROWERS
1199 OPAL AVE
MENTONE, CA 92359

AST
CERS HAZ WASTE
HIST UST
CERS TANKS
HAZNET
San Bern. Co. Permit
CERS
HWTS

U001575207
N/A

Click here for full text details

HIST UST
Facility Id 00000007391

WESTERN FRUIT GROWERS (Continued) **U001575207**

HAZNET
GEPAID CAL000356275

San Bern. Co. Permit
Facility Id FA0003994
Facility Status ACTIVE
Facility Status INACTIVE

H25
ENE
1/8-1/4
0.230 mi.
1214 ft.

Relative:
Higher

INT'L PAVEMENT SOLUTIONS, INC. **AST** **A100345853**
1199 OPAL AVE **N/A**
MENTONE, CA

Click here for full text details

H26
ENE
1/8-1/4
0.230 mi.
1214 ft.

Relative:
Higher

INTERNATIONAL PAVING SERVICES INC **RCRA NonGen / NLR** **1024827227**
1199 OPAL AVE **CAL000356275**
MENTONE, CA 92359

Click here for full text details

RCRA NonGen / NLR
EPA Id CAL000356275

I27
NNE
1/4-1/2
0.351 mi.
1853 ft.

Relative:
Higher

CIRCLE K #1971 **LUST** **S108210925**
1702 MENTONE BLVD **CERS** **N/A**
MENTONE, CA 92374

Click here for full text details

LUST
Global Id T0607100461
Status Completed - Case Closed

I28
NNE
1/4-1/2
0.351 mi.
1853 ft.

Relative:
Higher

CIRCLE K #1971 **LUST** **U003939123**
1702 MENTONE BLVD **Cortese** **N/A**
MENTONE, CA 92374

Click here for full text details

LUST
Facility Status Preliminary site assessment underway
Global ID T0607100461

Cortese

CIRCLE K #1971 (Continued) **U003939123**

Cleanup Status COMPLETED - CASE CLOSED

I29
North
1/4-1/2
0.368 mi.
1943 ft.

Relative:
Higher

CRV RECYCLING SOLUTIONS **SWRCY** **S118231787**
1786 E LUGONIA AVE **HAZNET** **N/A**
REDLANDS, CA 92374 **HWTS**

Click here for full text details

SWRCY
Cert Id RC308154.001

HAZNET
GEPAID CAL000340456

J30
NNE
1/4-1/2
0.418 mi.
2207 ft.

Relative:
Higher

MENTONE SERVICE STATION **LUST** **S104751127**
1759 MENTONE BLVD **SWEEPS UST** **N/A**
MENTONE, CA 92359 **Cortese**
HIST CORTESE
San Bern. Co. Permit
CERS
HWTS

Click here for full text details

LUST
Facility Status Preliminary site assessment workplan submitted
Global ID T0607100577

SWEEPS UST
Status A
Tank Status A
Comp Number 23589

Cortese
Cleanup Status COMPLETED - CASE CLOSED

HIST CORTESE
Reg Id 083603461T

San Bern. Co. Permit
Facility Id FA0015561
Facility Status INACTIVE

J31
NNE
1/4-1/2
0.418 mi.
2207 ft.

Relative:
Higher

MENTONE ARCO
1759 MENTONE BLVD
MENTONE, CA 92373

Click here for full text details

LUST
WMUDS/SWAT
CERS HAZ WASTE
HIST UST
CERS TANKS
San Bern. Co. Permit
CERS

U001575442
N/A

LUST
Global Id T0607100577
Status Completed - Case Closed

HIST UST
Facility Id 00000023589

San Bern. Co. Permit
Facility Id FA0004665
Facility Id FA0015163
Facility Id FA0003791
Facility Status ACTIVE
Facility Status INACTIVE

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
CA	AQUEOUS FOAM	Former Fire Training Facility Assessments Listing	State Water Resources Control Board	09/06/2022	09/06/2022	10/26/2022
CA	AST	Aboveground Petroleum Storage Tank Facilities	California Environmental Protection Agency	07/06/2016	07/12/2016	09/19/2016
CA	BROWNFIELDS	Considered Brownfieds Sites Listing	State Water Resources Control Board	12/14/2022	12/14/2022	03/07/2023
CA	CA BOND EXP. PLAN	Bond Expenditure Plan	Department of Health Services	01/01/1989	07/27/1994	08/02/1994
CA	CA FID UST	Facility Inventory Database	California Environmental Protection Agency	10/31/1994	09/05/1995	09/29/1995
CA	CDL	Clandestine Drug Labs	Department of Toxic Substances Control	12/31/2020	11/30/2022	02/09/2023
CA	CERS	CalEPA Regulated Site Portal Data	California Environmental Protection Agency	01/05/2023	01/06/2023	01/10/2023
CA	CERS HAZ WASTE	CERS HAZ WASTE	CalEPA	01/05/2023	01/06/2023	01/11/2023
CA	CERS TANKS	California Environmental Reporting System (CERS) Tanks	California Environmental Protection Agency	01/06/2023	01/06/2023	01/11/2023
CA	CHMIRS	California Hazardous Material Incident Report System	Office of Emergency Services	08/02/2022	10/17/2022	01/04/2023
CA	CIWQS	California Integrated Water Quality System	State Water Resources Control Board	11/28/2022	11/29/2022	02/13/2023
CA	CORTESE	"Cortese" Hazardous Waste & Substances Sites List	CAL EPA/Office of Emergency Information	12/14/2022	12/14/2022	03/07/2023
CA	CPS-SLIC	Statewide SLIC Cases (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	CUPA LIVERMORE-PLEASANTON	CUPA Facility Listing	Livermore-Pleasanton Fire Department	12/07/2021	05/09/2022	05/17/2022
CA	DEED	Deed Restriction Listing	DTSC and SWRCB	11/28/2022	11/29/2022	02/13/2023
CA	DRYCLEAN AVAQMD	Antelope Valley Air Quality Management District Drycleaner L	Antelope Valley Air Quality Management Distri	11/14/2022	11/14/2022	02/01/2023
CA	DRYCLEAN BAY AREA DIST	Bay Area Air Quality Management District Drycleaner Facility	Bay Area Air Quality Management District	02/20/2019	05/30/2019	05/01/2023
CA	DRYCLEAN BUTTE CO DIST	Butte County Air Quality Management DistrictDrycleaner Facil	Butte County Air Quality Management District	12/31/2018	04/23/2019	05/01/2023
CA	DRYCLEAN CALAVERAS CO DIST	Calaveras County Environmental Management Agency Drycleaner	Calaveras County Environmental Management Age	06/17/2019	06/19/2019	05/01/2023
CA	DRYCLEAN EAST KERN DIST	Eastern Kern Air Pollution Control District District Dryclea	Eastern Kern Air Pollution Control District	04/17/2019	04/17/2019	05/01/2023
CA	DRYCLEAN GLENN CO DIST	Glenn County Air Pollution Control District Drycleaner Facil	Glenn County Air Pollution Control District	04/17/2019	04/17/2019	05/01/2023
CA	DRYCLEAN GRANT	Grant Recipients List	California Air Resources Board	12/31/2020	02/04/2021	05/01/2023
CA	DRYCLEAN IMPERIAL CO DIST	Imperial County Air Pollution Control District Drycleaner Fa	Imperial County Air Pollution Control Distric	05/14/2019	05/17/2019	05/01/2023
CA	DRYCLEAN LAKE CO DIST	Lake County Air Quality Management District Drycleaner Facil	Lake County Air Quality Management District	04/29/2019	05/07/2019	05/01/2023
CA	DRYCLEAN MENDO CO DIST	Mendocino County Air Quality Management District Drycleaner	Mendocino County Air Quality Management Distr	02/08/2019	05/21/2019	05/01/2023
CA	DRYCLEAN MOJAVE DESERT DIST	Mojave Desert Air Quality Management District Drycleaner Fac	Mojave Desert Air Quality Management District	04/17/2019	04/17/2019	05/01/2023
CA	DRYCLEAN MONTEREY BAY DIST	Monterey Bay Air Quality Management District Drycleaner Faci	Monterey Bay Air Quality Management District	04/17/2019	04/17/2019	05/01/2023
CA	DRYCLEAN NO COAST UNIFIED DIST	North Coast Unified Air Quality Management District Dryclean	North Coast Unified Air Quality Management Di	11/30/2016	04/19/2019	05/01/2023
CA	DRYCLEAN NO SIERRA DIST	Northern Sierra Air Quality Management District Drycleaner F	Northern Sierra Air Quality Management Distri	05/07/2019	05/07/2019	05/01/2023
CA	DRYCLEAN NO SONOMA CO DIST	Norther Sonoma County County Air Pollution Control District	Santa Barbara County Air Pollution Control Di	04/17/2019	04/17/2019	05/01/2023
CA	DRYCLEAN PLACER CO DIST	Placer County Air Quality Management District Drycleaner Fac	Placer County Air Quality Management District	01/16/2018	04/19/2019	05/01/2023
CA	DRYCLEAN SACRAMENTO METRO DIST	Sacramento Metropolitan Air Quality Management DistrictDrycl	Sacramento Metropolitan Air Quality Managemen	04/24/2019	04/25/2019	05/01/2023
CA	DRYCLEAN SAN DIEGO CO DIST	San Diego County Air Pollution Control District Drycleaner F	San Diego County Air Pollution Control Distri	02/01/2019	05/01/2019	05/01/2023
CA	DRYCLEAN SAN JOAQ VAL DIST	San Joaquin Valley Air Pollution Control District District D	San Joaquin Valley Air Pollution Control Dist	05/01/2019	05/03/2019	05/01/2023
CA	DRYCLEAN SAN LUIS OB CO DIST	San Luis Obispo County Air Pollution Control District Drycle	San Luis Obispo County Air Pollution Control	04/23/2019	04/25/2019	05/01/2023
CA	DRYCLEAN SANTA BARB CO DIST	Santa Barbara County Air Pollution Control District Dryclean	Santa Barbara County Air Pollution Control Di	02/19/2019	04/17/2019	05/01/2023
CA	DRYCLEAN SHASTA CO DIST	Shasta County Air Quality Management District District Drycl	Shasta County Air Quality Management District	04/17/2019	04/19/2019	05/01/2023
CA	DRYCLEAN SOUTH COAST	South Coast Air Quality Management District Drycleaner Listi	South Coast Air Quality Management District	11/17/2022	11/30/2022	02/14/2023
CA	DRYCLEAN TEHAMA CO DIST	Tehama County Air Pollution Control District Drycleaner Faci	Tehama County Air Pollution Control District	04/24/2019	04/24/2019	05/01/2023
CA	DRYCLEAN VENTURA CO DIST	Drycleaner Facility Listing	Ventura County Air Pollution Control District	04/16/2019	04/17/2019	05/01/2023
CA	DRYCLEAN YOLO-SOLANO DIST	Yolo-Solano Air Quality Management District Drycleaner Facil	Yolo-Solano Air Quality Management District	05/31/2019	06/06/2019	05/01/2023
CA	DRYCLEANERS	Cleaner Facilities	Department of Toxic Substance Control	08/27/2021	09/01/2021	11/19/2021
CA	EMI	Emissions Inventory Data	California Air Resources Board	12/31/2020	06/13/2022	08/30/2022
CA	ENF	Enforcement Action Listing	State Water Resoruces Control Board	01/10/2023	01/18/2023	04/04/2023
CA	ENVIROSTOR	EnviroStor Database	Department of Toxic Substances Control	01/23/2023	01/24/2023	04/10/2023
CA	Financial Assurance 1	Financial Assurance Information Listing	Department of Toxic Substances Control	01/11/2023	01/17/2023	04/04/2023
CA	Financial Assurance 2	Financial Assurance Information Listing	California Integrated Waste Management Board	11/08/2022	11/23/2022	02/13/2023

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
CA	HAULERS	Registered Waste Tire Haulers Listing	Integrated Waste Management Board	11/16/2022	11/22/2022	02/13/2023
CA	HAZNET	Facility and Manifest Data	California Environmental Protection Agency	12/31/2021	07/05/2022	09/19/2022
CA	HIST CAL-SITES	Calsites Database	Department of Toxic Substance Control	08/08/2005	08/03/2006	08/24/2006
CA	HIST CORTESE	Hazardous Waste & Substance Site List	Department of Toxic Substances Control	04/01/2001	01/22/2009	04/08/2009
CA	HIST UST	Hazardous Substance Storage Container Database	State Water Resources Control Board	10/15/1990	01/25/1991	02/12/1991
CA	HWP	EnviroStor Permitted Facilities Listing	Department of Toxic Substances Control	11/10/2022	11/10/2022	02/01/2023
CA	HWT	Registered Hazardous Waste Transporter Database	Department of Toxic Substances Control	01/03/2023	01/04/2023	03/21/2023
CA	HWTS	Hazardous Waste Tracking System	Department of Toxic Substances Control	04/05/2022	04/05/2022	04/26/2022
CA	ICE	ICE	Department of Toxic Subsances Control	11/10/2022	11/10/2022	02/01/2023
CA	LDS	Land Disposal Sites Listing (GEOTRACKER)	State Water Qualilty Control Board	03/06/2023	03/07/2023	03/30/2023
CA	LIENS	Environmental Liens Listing	Department of Toxic Substances Control	02/23/2023	02/24/2023	03/23/2023
CA	LUST	Leaking Underground Fuel Tank Report (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/30/2023
CA	LUST REG 1	Active Toxic Site Investigation	California Regional Water Quality Control Boa	02/01/2001	02/28/2001	03/29/2001
CA	LUST REG 2	Fuel Leak List	California Regional Water Quality Control Boa	09/30/2004	10/20/2004	11/19/2004
CA	LUST REG 3	Leaking Underground Storage Tank Database	California Regional Water Quality Control Boa	05/19/2003	05/19/2003	06/02/2003
CA	LUST REG 4	Underground Storage Tank Leak List	California Regional Water Quality Control Boa	09/07/2004	09/07/2004	10/12/2004
CA	LUST REG 5	Leaking Underground Storage Tank Database	California Regional Water Quality Control Boa	07/01/2008	07/22/2008	07/31/2008
CA	LUST REG 6L	Leaking Underground Storage Tank Case Listing	California Regional Water Quality Control Boa	09/09/2003	09/10/2003	10/07/2003
CA	LUST REG 6V	Leaking Underground Storage Tank Case Listing	California Regional Water Quality Control Boa	06/07/2005	06/07/2005	06/29/2005
CA	LUST REG 7	Leaking Underground Storage Tank Case Listing	California Regional Water Quality Control Boa	02/26/2004	02/26/2004	03/24/2004
CA	LUST REG 8	Leaking Underground Storage Tanks	California Regional Water Quality Control Boa	02/14/2005	02/15/2005	03/28/2005
CA	LUST REG 9	Leaking Underground Storage Tank Report	California Regional Water Quality Control Boa	03/01/2001	04/23/2001	05/21/2001
CA	MCS	Military Cleanup Sites Listing (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	MILITARY PRIV SITES	Military Privatized Sites (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	MILITARY UST SITES	Military UST Sites (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	MINES	Mines Site Location Listing	Department of Conservation	12/02/2022	12/02/2022	02/22/2023
CA	MWMP	Medical Waste Management Program Listing	Department of Public Health	10/31/2022	11/29/2022	02/14/2023
CA	NON-CASE INFO	Non-Case Information Sites (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	NOTIFY 65	Proposition 65 Records	State Water Resources Control Board	12/07/2022	12/07/2022	03/01/2023
CA	NPDES	NPDES Permits Listing	State Water Resources Control Board	02/06/2023	02/07/2023	04/28/2023
CA	OTHER OIL GAS	Other Oil & Gas Projects Sites (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	PEST LIC	Pesticide Regulation Licenses Listing	Department of Pesticide Regulation	11/28/2022	11/29/2022	02/14/2023
CA	PFAS	PFAS Contamination Site Location Listing	State Water Resources Control Board	12/02/2022	12/02/2022	02/23/2023
CA	PROC	Certified Processors Database	Department of Conservation	03/06/2023	03/07/2023	03/31/2023
CA	PROD WATER PONDS	Produced Water Ponds Sites (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	PROJECT	Project Sites (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	RESPONSE	State Response Sites	Department of Toxic Substances Control	01/23/2023	01/24/2023	04/10/2023
CA	RGA LF	Recovered Government Archive Solid Waste Facilities List	Department of Resources Recycling and Recover		07/01/2013	01/13/2014
CA	RGA LUST	Recovered Government Archive Leaking Underground Storage Tan	State Water Resources Control Board		07/01/2013	12/30/2013
CA	SAMPLING POINT	Sampling Point ? Public Sites (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	SAN FRANCISCO AST	Aboveground Storage Tank Site Listing	San Francisco County Department of Public Hea	02/03/2023	02/07/2023	04/25/2023
CA	SAN JOSE HAZMAT	Hazardous Material Facilities	City of San Jose Fire Department	11/03/2020	11/05/2020	01/26/2021
CA	SCH	School Property Evaluation Program	Department of Toxic Substances Control	01/23/2023	01/24/2023	04/10/2023
CA	SLIC REG 1	Active Toxic Site Investigations	California Regional Water Quality Control Boa	04/03/2003	04/07/2003	04/25/2003
CA	SLIC REG 2	Spills, Leaks, Investigation & Cleanup Cost Recovery Listing	Regional Water Quality Control Board San Fran	09/30/2004	10/20/2004	11/19/2004
CA	SLIC REG 3	Spills, Leaks, Investigation & Cleanup Cost Recovery Listing	California Regional Water Quality Control Boa	05/18/2006	05/18/2006	06/15/2006
CA	SLIC REG 4	Spills, Leaks, Investigation & Cleanup Cost Recovery Listing	Region Water Quality Control Board Los Angele	11/17/2004	11/18/2004	01/04/2005

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
CA	SLIC REG 5	Spills, Leaks, Investigation & Cleanup Cost Recovery Listing	Regional Water Quality Control Board Central	04/01/2005	04/05/2005	04/21/2005
CA	SLIC REG 6L	SLIC Sites	California Regional Water Quality Control Boa	09/07/2004	09/07/2004	10/12/2004
CA	SLIC REG 6V	Spills, Leaks, Investigation & Cleanup Cost Recovery Listing	Regional Water Quality Control Board, Victorv	05/24/2005	05/25/2005	06/16/2005
CA	SLIC REG 7	SLIC List	California Regional Quality Control Board, Co	11/24/2004	11/29/2004	01/04/2005
CA	SLIC REG 8	Spills, Leaks, Investigation & Cleanup Cost Recovery Listing	California Region Water Quality Control Board	04/03/2008	04/03/2008	04/14/2008
CA	SLIC REG 9	Spills, Leaks, Investigation & Cleanup Cost Recovery Listing	California Regional Water Quality Control Boa	09/10/2007	09/11/2007	09/28/2007
CA	SPILLS 90	SPILLS90 data from FirstSearch	FirstSearch	06/06/2012	01/03/2013	02/22/2013
CA	SWEEPS UST	SWEEPS UST Listing	State Water Resources Control Board	06/01/1994	07/07/2005	08/11/2005
CA	SWF/LF (SWIS)	Solid Waste Information System	Department of Resources Recycling and Recover	02/06/2023	02/07/2023	04/26/2023
CA	SWRCY	Recycler Database	Department of Conservation	12/02/2022	12/02/2022	02/22/2023
CA	TOXIC PITS	Toxic Pits Cleanup Act Sites	State Water Resources Control Board	07/01/1995	08/30/1995	09/26/1995
CA	UIC	UIC Listing	Deaprtment of Conservation	03/06/2023	03/07/2023	03/31/2023
CA	UIC GEO	Underground Injection Control Sites (GEOTRACKER)	State Water Resource Control Board	03/06/2023	03/07/2023	03/31/2023
CA	UST	Active UST Facilities	SWRCB	12/02/2022	12/02/2022	02/22/2023
CA	UST CLOSURE	Proposed Closure of Underground Storage Tank (UST) Cases	State Water Resources Control Board	11/28/2022	12/02/2022	02/23/2023
CA	VCP	Voluntary Cleanup Program Properties	Department of Toxic Substances Control	01/23/2023	01/24/2023	04/10/2023
CA	WASTEWATER PITS	Oil Wastewater Pits Listing	RWQCB, Central Valley Region	02/11/2021	07/01/2021	09/29/2021
CA	WDR	Waste Discharge Requirements Listing	State Water Resources Control Board	12/02/2022	12/02/2022	02/23/2023
CA	WDS	Waste Discharge System	State Water Resources Control Board	06/19/2007	06/20/2007	06/29/2007
CA	WELL STIM PROJ	Well Stimulation Project (GEOTRACKER)	State Water Resources Control Board	03/06/2023	03/07/2023	03/31/2023
CA	WIP	Well Investigation Program Case List	Los Angeles Water Quality Control Board	07/03/2009	07/21/2009	08/03/2009
CA	WMUDS/SWAT	Waste Management Unit Database	State Water Resources Control Board	04/01/2000	04/10/2000	05/10/2000
US	2020 COR ACTION	2020 Corrective Action Program List	Environmental Protection Agency	09/30/2017	05/08/2018	07/20/2018
US	ABANDONED MINES	Abandoned Mines	Department of Interior	12/20/2022	12/20/2022	03/10/2023
US	AQUEOUS FOAM NRC	Aqueous Foam Related Incidents Listing	Environmental Protection Agency	04/27/2023	04/27/2023	05/02/2023
US	BRS	Biennial Reporting System	EPA/NTIS	12/31/2021	03/09/2023	03/20/2023
US	COAL ASH DOE	Steam-Electric Plant Operation Data	Department of Energy	12/31/2020	11/30/2021	02/22/2022
US	COAL ASH EPA	Coal Combustion Residues Surface Impoundments List	Environmental Protection Agency	01/12/2017	03/05/2019	11/11/2019
US	CONSENT	Superfund (CERCLA) Consent Decrees	Department of Justice, Consent Decree Library	12/31/2022	01/12/2023	04/07/2023
US	CORRACTS	Corrective Action Report	EPA	03/06/2023	03/09/2023	03/20/2023
US	DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations	EPA, Region 9	01/12/2009	05/07/2009	09/21/2009
US	DOCKET HWC	Hazardous Waste Compliance Docket Listing	Environmental Protection Agency	05/06/2021	05/21/2021	08/11/2021
US	DOD	Department of Defense Sites	USGS	06/07/2021	07/13/2021	03/09/2022
US	DOT OPS	Incident and Accident Data	Department of Transporation, Office of Pipeli	01/02/2020	01/28/2020	04/17/2020
US	Delisted NPL	National Priority List Deletions	EPA	01/25/2023	02/02/2023	02/28/2023
US	ECHO	Enforcement & Compliance History Information	Environmental Protection Agency	01/01/2023	01/04/2023	04/03/2023
US	EDR Hist Auto	EDR Exclusive Historical Auto Stations	EDR, Inc.			
US	EDR Hist Cleaner	EDR Exclusive Historical Cleaners	EDR, Inc.			
US	EDR MGP	EDR Proprietary Manufactured Gas Plants	EDR, Inc.			
US	EPA WATCH LIST	EPA WATCH LIST	Environmental Protection Agency	08/30/2013	03/21/2014	06/17/2014
US	ERNS	Emergency Response Notification System	National Response Center, United States Coast	12/12/2022	12/14/2022	12/19/2022
US	FEDERAL FACILITY	Federal Facility Site Information listing	Environmental Protection Agency	12/20/2022	12/21/2022	03/10/2023
US	FEDLAND	Federal and Indian Lands	U.S. Geological Survey	04/02/2018	04/11/2018	11/06/2019
US	FEMA UST	Underground Storage Tank Listing	FEMA	10/14/2021	11/05/2021	02/01/2022
US	FINDS	Facility Index System/Facility Registry System	EPA	02/02/2023	02/28/2023	03/24/2023
US	FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu	EPA/Office of Prevention, Pesticides and Toxi	04/09/2009	04/16/2009	05/11/2009
US	FTTS INSP	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu	EPA	04/09/2009	04/16/2009	05/11/2009

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
US	FUDS	Formerly Used Defense Sites	U.S. Army Corps of Engineers	02/01/2023	02/14/2023	05/02/2023
US	FUELS PROGRAM	EPA Fuels Program Registered Listing	EPA	02/13/2023	02/14/2023	04/19/2023
US	FUSRAP	Formerly Utilized Sites Remedial Action Program	Department of Energy	07/26/2021	07/27/2021	10/22/2021
US	HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing	Environmental Protection Agency	10/19/2006	03/01/2007	04/10/2007
US	HIST FTTS INSP	FIFRA/TSCA Tracking System Inspection & Enforcement Case Lis	Environmental Protection Agency	10/19/2006	03/01/2007	04/10/2007
US	HMIRS	Hazardous Materials Information Reporting System	U.S. Department of Transportation	12/13/2022	12/14/2022	03/10/2023
US	ICIS	Integrated Compliance Information System	Environmental Protection Agency	11/18/2016	11/23/2016	02/10/2017
US	IHS OPEN DUMPS	Open Dumps on Indian Land	Department of Health & Human Serivces, Indian	04/01/2014	08/06/2014	01/29/2015
US	INDIAN LUST R1	Leaking Underground Storage Tanks on Indian Land	EPA Region 1	10/19/2022	12/06/2022	03/03/2023
US	INDIAN LUST R10	Leaking Underground Storage Tanks on Indian Land	EPA Region 10	11/23/2022	12/06/2022	04/19/2023
US	INDIAN LUST R4	Leaking Underground Storage Tanks on Indian Land	EPA Region 4	11/26/2022	12/06/2022	03/03/2023
US	INDIAN LUST R5	Leaking Underground Storage Tanks on Indian Land	EPA, Region 5	10/14/2022	12/06/2022	03/03/2023
US	INDIAN LUST R6	Leaking Underground Storage Tanks on Indian Land	EPA Region 6	11/23/2022	12/06/2022	03/03/2023
US	INDIAN LUST R7	Leaking Underground Storage Tanks on Indian Land	EPA Region 7	10/14/2022	12/06/2022	03/03/2023
US	INDIAN LUST R8	Leaking Underground Storage Tanks on Indian Land	EPA Region 8	11/23/2022	12/06/2022	03/03/2023
US	INDIAN LUST R9	Leaking Underground Storage Tanks on Indian Land	Environmental Protection Agency	11/23/2022	12/06/2022	03/03/2023
US	INDIAN ODI	Report on the Status of Open Dumps on Indian Lands	Environmental Protection Agency	12/31/1998	12/03/2007	01/24/2008
US	INDIAN RESERV	Indian Reservations	USGS	12/31/2014	07/14/2015	01/10/2017
US	INDIAN UST R1	Underground Storage Tanks on Indian Land	EPA, Region 1	10/19/2022	12/06/2022	03/03/2023
US	INDIAN UST R10	Underground Storage Tanks on Indian Land	EPA Region 10	11/23/2022	12/06/2022	04/19/2023
US	INDIAN UST R4	Underground Storage Tanks on Indian Land	EPA Region 4	11/23/2022	12/06/2022	03/03/2023
US	INDIAN UST R5	Underground Storage Tanks on Indian Land	EPA Region 5	10/14/2022	12/06/2022	03/03/2023
US	INDIAN UST R6	Underground Storage Tanks on Indian Land	EPA Region 6	11/23/2022	12/06/2022	03/03/2023
US	INDIAN UST R7	Underground Storage Tanks on Indian Land	EPA Region 7	10/14/2022	12/06/2022	03/03/2023
US	INDIAN UST R8	Underground Storage Tanks on Indian Land	EPA Region 8	11/23/2022	12/06/2022	03/03/2023
US	INDIAN UST R9	Underground Storage Tanks on Indian Land	EPA Region 9	11/23/2022	12/06/2022	03/03/2023
US	INDIAN VCP R1	Voluntary Cleanup Priority Listing	EPA, Region 1	07/27/2015	09/29/2015	02/18/2016
US	INDIAN VCP R7	Voluntary Cleanup Priority Lisitng	EPA, Region 7	03/20/2008	04/22/2008	05/19/2008
US	LEAD SMELTER 1	Lead Smelter Sites	Environmental Protection Agency	01/25/2023	02/02/2023	02/28/2023
US	LEAD SMELTER 2	Lead Smelter Sites	American Journal of Public Health	04/05/2001	10/27/2010	12/02/2010
US	LIENS 2	CERCLA Lien Information	Environmental Protection Agency	01/25/2023	02/02/2023	02/28/2023
US	LUCIS	Land Use Control Information System	Department of the Navy	02/08/2023	02/09/2023	05/02/2023
US	MINES MRDS	Mineral Resources Data System	USGS	08/23/2022	11/22/2022	02/28/2023
US	MINES VIOLATIONS	MSHA Violation Assessment Data	DOL, Mine Safety & Health Admi	02/27/2023	03/01/2023	03/24/2023
US	MLTS	Material Licensing Tracking System	Nuclear Regulatory Commission	10/26/2022	11/22/2022	12/05/2022
US	NPL	National Priority List	EPA	01/25/2023	02/03/2023	02/28/2023
US	NPL LIENS	Federal Superfund Liens	EPA	10/15/1991	02/02/1994	03/30/1994
US	ODI	Open Dump Inventory	Environmental Protection Agency	06/30/1985	08/09/2004	09/17/2004
US	PADS	PCB Activity Database System	EPA	11/03/2022	01/04/2023	04/03/2023
US	PCB TRANSFORMER	PCB Transformer Registration Database	Environmental Protection Agency	09/13/2019	11/06/2019	02/10/2020
US	PCS	Permit Compliance System	EPA, Office of Water	07/14/2011	08/05/2011	09/29/2011
US	PCS ENF	Enforcement data	EPA	12/31/2014	02/05/2015	03/06/2015
US	PFAS ATSDR	PFAS Contamination Site Location Listing	Department of Health & Human Services	06/24/2020	03/17/2021	11/08/2022
US	PFAS ECHO	Facilities in Industries that May Be Handling PFAS Listing	Environmental Protection Agency	03/30/2023	03/30/2023	04/03/2023
US	PFAS ECHO FIRE TRAINING	Facilities in Industries that May Be Handling PFAS Listing	Environmental Protection Agency	03/30/2023	03/30/2023	04/03/2023
US	PFAS FEDERAL SITES	Federal Sites PFAS Information	Environmental Protection Agency	03/30/2023	03/30/2023	04/07/2023
US	PFAS NPDES	Clean Water Act Discharge Monitoring Information	Environmental Protection Agency	03/30/2023	03/30/2023	04/07/2023

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
US	PFAS NPL	Superfund Sites with PFAS Detections Information	Environmental Protection Agency	02/23/2022	07/08/2022	11/08/2022
US	PFAS PART 139 AIRPORT	All Certified Part 139 Airports PFAS Information Listing	Environmental Protection Agency	03/30/2023	03/30/2023	04/03/2023
US	PFAS RCRA MANIFEST	PFAS Transfers Identified In the RCRA Database Listing	Environmental Protection Agency	03/30/2023	03/30/2023	05/02/2023
US	PFAS TRIS	List of PFAS Added to the TRI	Environmental Protection Agency	03/07/2023	03/07/2023	03/24/2023
US	PFAS TSCA	PFAS Manufacture and Imports Information	Environmental Protection Agency	01/03/2022	03/31/2022	11/08/2022
US	PFAS WQP	Ambient Environmental Sampling for PFAS	Environmental Protection Agency	03/30/2023	03/30/2023	05/02/2023
US	PRP	Potentially Responsible Parties	EPA	10/27/2022	11/01/2022	11/15/2022
US	Proposed NPL	Proposed National Priority List Sites	EPA	01/25/2023	02/02/2023	02/28/2023
US	RAATS	RCRA Administrative Action Tracking System	EPA	04/17/1995	07/03/1995	08/07/1995
US	RADINFO	Radiation Information Database	Environmental Protection Agency	07/01/2019	07/01/2019	09/23/2019
US	RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated	Environmental Protection Agency	03/06/2023	03/09/2023	03/20/2023
US	RCRA-LQG	RCRA - Large Quantity Generators	Environmental Protection Agency	03/06/2023	03/09/2023	03/20/2023
US	RCRA-SQG	RCRA - Small Quantity Generators	Environmental Protection Agency	03/06/2023	03/09/2023	03/20/2023
US	RCRA-TSDF	RCRA - Treatment, Storage and Disposal	Environmental Protection Agency	03/06/2023	03/09/2023	03/20/2023
US	RCRA-VSQG	RCRA - Very Small Quantity Generators (Formerly Conditionall	Environmental Protection Agency	03/06/2023	03/09/2023	03/20/2023
US	RMP	Risk Management Plans	Environmental Protection Agency	04/27/2022	05/04/2022	05/10/2022
US	ROD	Records Of Decision	EPA	01/25/2023	02/02/2023	02/28/2023
US	SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing	Environmental Protection Agency	07/30/2021	02/03/2023	02/10/2023
US	SEMS	Superfund Enterprise Management System	EPA	01/25/2023	02/02/2023	02/28/2023
US	SEMS-ARCHIVE	Superfund Enterprise Management System Archive	EPA	01/25/2023	02/02/2023	02/28/2023
US	SSTS	Section 7 Tracking Systems	EPA	01/17/2023	01/18/2023	04/19/2023
US	TRIS	Toxic Chemical Release Inventory System	EPA	12/31/2021	02/16/2023	05/02/2023
US	TSCA	Toxic Substances Control Act	EPA	12/31/2020	06/14/2022	03/24/2023
US	UMTRA	Uranium Mill Tailings Sites	Department of Energy	08/30/2019	11/15/2019	01/28/2020
US	US AIRS (AFS)	Aerometric Information Retrieval System Facility Subsystem (	EPA	10/12/2016	10/26/2016	02/03/2017
US	US AIRS MINOR	Air Facility System Data	EPA	10/12/2016	10/26/2016	02/03/2017
US	US BROWNFIELDS	A Listing of Brownfields Sites	Environmental Protection Agency	04/06/2023	04/13/2023	04/19/2023
US	US CDL	Clandestine Drug Labs	Drug Enforcement Administration	01/06/2023	02/02/2023	02/10/2023
US	US ENG CONTROLS	Engineering Controls Sites List	Environmental Protection Agency	02/20/2023	02/21/2023	05/02/2023
US	US FIN ASSUR	Financial Assurance Information	Environmental Protection Agency	12/13/2022	12/14/2022	03/10/2023
US	US HIST CDL	National Clandestine Laboratory Register	Drug Enforcement Administration	01/06/2023	02/02/2023	02/10/2023
US	US INST CONTROLS	Institutional Controls Sites List	Environmental Protection Agency	02/20/2023	02/21/2023	05/02/2023
US	US MINES	Mines Master Index File	Department of Labor, Mine Safety and Health A	11/07/2022	11/17/2022	02/10/2023
US	US MINES 2	Ferrous and Nonferrous Metal Mines Database Listing	USGS	05/06/2020	05/27/2020	08/13/2020
US	US MINES 3	Active Mines & Mineral Plants Database Listing	USGS	04/14/2011	06/08/2011	09/13/2011
US	UXO	Unexploded Ordnance Sites	Department of Defense	11/09/2021	10/20/2022	01/10/2023

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

St	Acronym	Full Name	Government Agency	Gov Date	Arvl. Date	Active Date
CT	CT MANIFEST	Hazardous Waste Manifest Data	Department of Energy & Environmental Protecti	11/16/2022	11/16/2022	02/06/2023
NJ	NJ MANIFEST	Manifest Information	Department of Environmental Protection	12/31/2018	04/10/2019	05/16/2019
NY	NY MANIFEST	Facility and Manifest Data	Department of Environmental Conservation	01/01/2019	10/29/2021	01/19/2022
PA	PA MANIFEST	Manifest Information	Department of Environmental Protection	06/30/2018	07/19/2019	09/10/2019
RI	RI MANIFEST	Manifest information	Department of Environmental Management	12/31/2020	11/30/2021	02/18/2022
WI	WI MANIFEST	Manifest Information	Department of Natural Resources	05/31/2018	06/19/2019	09/03/2019
US	AHA Hospitals	Sensitive Receptor: AHA Hospitals	American Hospital Association, Inc.			
US	Medical Centers	Sensitive Receptor: Medical Centers	Centers for Medicare & Medicaid Services			
US	Nursing Homes	Sensitive Receptor: Nursing Homes	National Institutes of Health			
US	Public Schools	Sensitive Receptor: Public Schools	National Center for Education Statistics			
US	Private Schools	Sensitive Receptor: Private Schools	National Center for Education Statistics			
CA	Daycare Centers	Sensitive Receptor: Licensed Facilities	Department of Social Services			
US	Flood Zones	100-year and 500-year flood zones	Emergency Management Agency (FEMA)			
US	NWI	National Wetlands Inventory	U.S. Fish and Wildlife Service			
CA	State Wetlands	Wetland Inventory	Department of Fish and Wildlife			
US	Topographic Map		U.S. Geological Survey			
US	Oil/Gas Pipelines		Endeavor Business Media			
US	Electric Power Transmission Line Data		Endeavor Business Media			

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

NOT REPORTED
NOT REPORTED
REDLANDS, CA 92374

TARGET PROPERTY COORDINATES

Latitude (North):	34.063828 - 34° 3' 49.78''
Longitude (West):	117.140061 - 117° 8' 24.22''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	487075.1
UTM Y (Meters):	3769047.2
Elevation:	1608 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	12014994 REDLANDS, CA
Version Date:	2018
East Map:	12015002 YUCAIPA, CA
Version Date:	2018

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

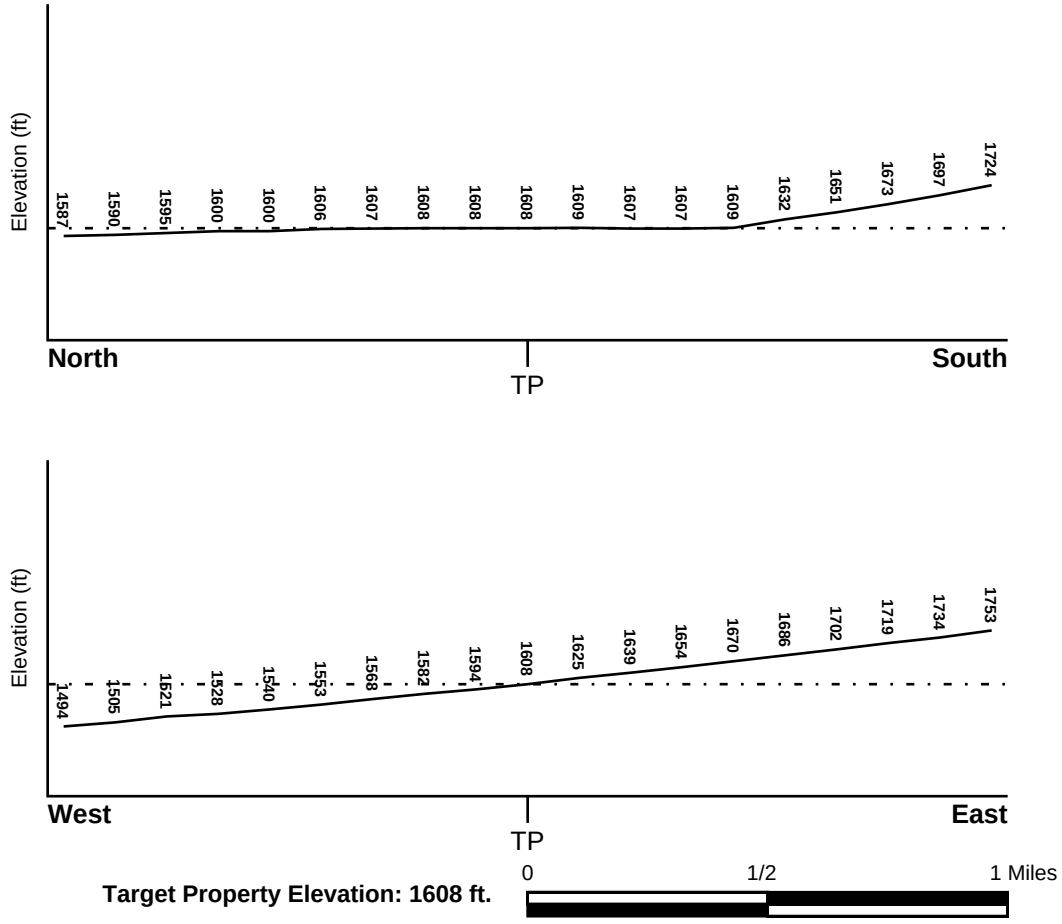
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General West

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1608 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06071C8709H	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06071C8730H	FEMA FIRM Flood data
06071C8708H	FEMA FIRM Flood data
06071C8716H	FEMA FIRM Flood data
06071C8717H	FEMA FIRM Flood data
06071C8740H	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Location Relative to TP:	1/2 - 1 Mile South
Site Name:	Lockheed Propulsion Co
Site EPA ID Number:	CAD980893093
Groundwater Flow Direction:	W FOLLOWING THE SANTA ANA RIVER IN THE SITE VICINITY. FLOW IN THE REDLANDS SUBBASINS IS SW WITH LEAKAGE THROUGH THE BRYN MAWR BARRIER INTO THE BUNKER HILL BASIN. FLOW IN THE BUNKER HILL BASIN IS W FOLLOWING THE DIRECTION OF THE SANTA ANA RIVER.
Inferred Depth to Water:	50 feet to 200 feet.
Hydraulic Connection:	Northeast trending faults cut through the basin and divide the basin into subbasins. The faults influence groundwater flow direction but to not appear to prevent flow from one basin to another.
Sole Source Aquifer:	No information about a sole source aquifer is available
Data Quality:	Information is inferred in the CERCLIS investigation report(s)

* ©1996 Site--specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

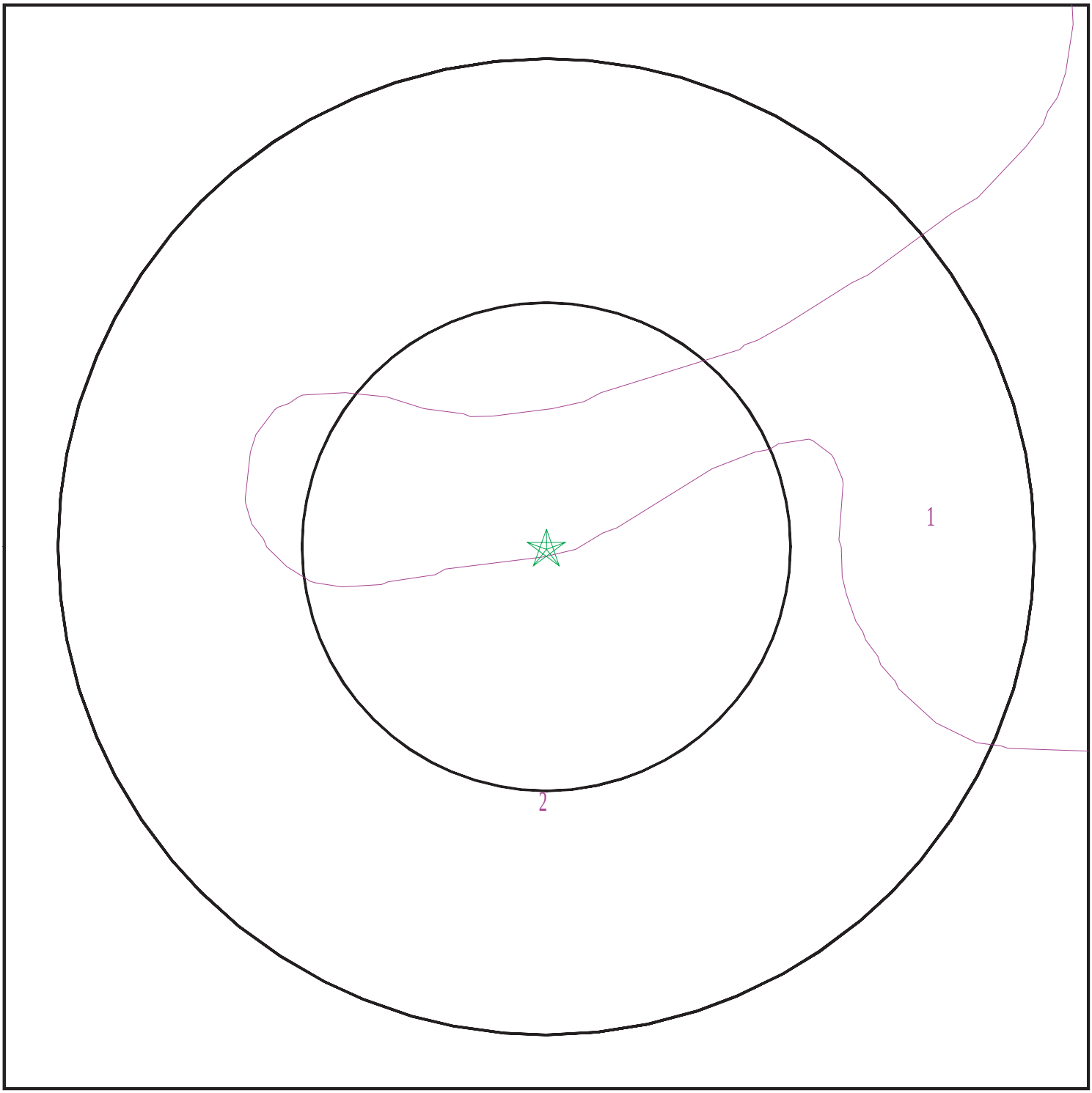
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 7326657.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Not Reported	CLIENT:	Hazard Management Consulting
ADDRESS:	Not Reported REDLANDS CA 92374	CONTACT:	Gage Costales
		INQUIRY #:	7326657.2s
LAT/LONG:	34.063828 / 117.140061	DATE:	May 03, 2023 2:02 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: TUJUNGA

Soil Surface Texture: gravelly loamy sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	35 inches	gravelly loamy sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.3 Min: 6.1
2	35 inches	59 inches	gravelly sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.3 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 2

Soil Component Name: Hanford

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 5.6
2	11 inches	59 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 5.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
2	USGS40000140387	0 - 1/8 Mile SE
3	USGS40000140443	1/8 - 1/4 Mile NW
A5	USGS40000140386	1/4 - 1/2 Mile ESE
9	USGS40000140287	1/4 - 1/2 Mile SSE
11	USGS40000140438	1/4 - 1/2 Mile ENE
16	USGS40000140598	1/2 - 1 Mile North
D18	USGS40000140609	1/2 - 1 Mile North
19	USGS40000140536	1/2 - 1 Mile NE
E20	USGS40000140332	1/2 - 1 Mile ESE
21	USGS40000140235	1/2 - 1 Mile SW
24	USGS40000140542	1/2 - 1 Mile NE
26	USGS40000140411	1/2 - 1 Mile East
F29	USGS40000140315	1/2 - 1 Mile ESE
F30	USGS40000140316	1/2 - 1 Mile ESE
F33	USGS40000140301	1/2 - 1 Mile ESE
F35	USGS40000140284	1/2 - 1 Mile ESE
G36	USGS40000140502	1/2 - 1 Mile ENE
41	USGS40000140599	1/2 - 1 Mile NW
43	USGS40000140523	1/2 - 1 Mile WNW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
13	CA3600385	1/2 - 1 Mile NE

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

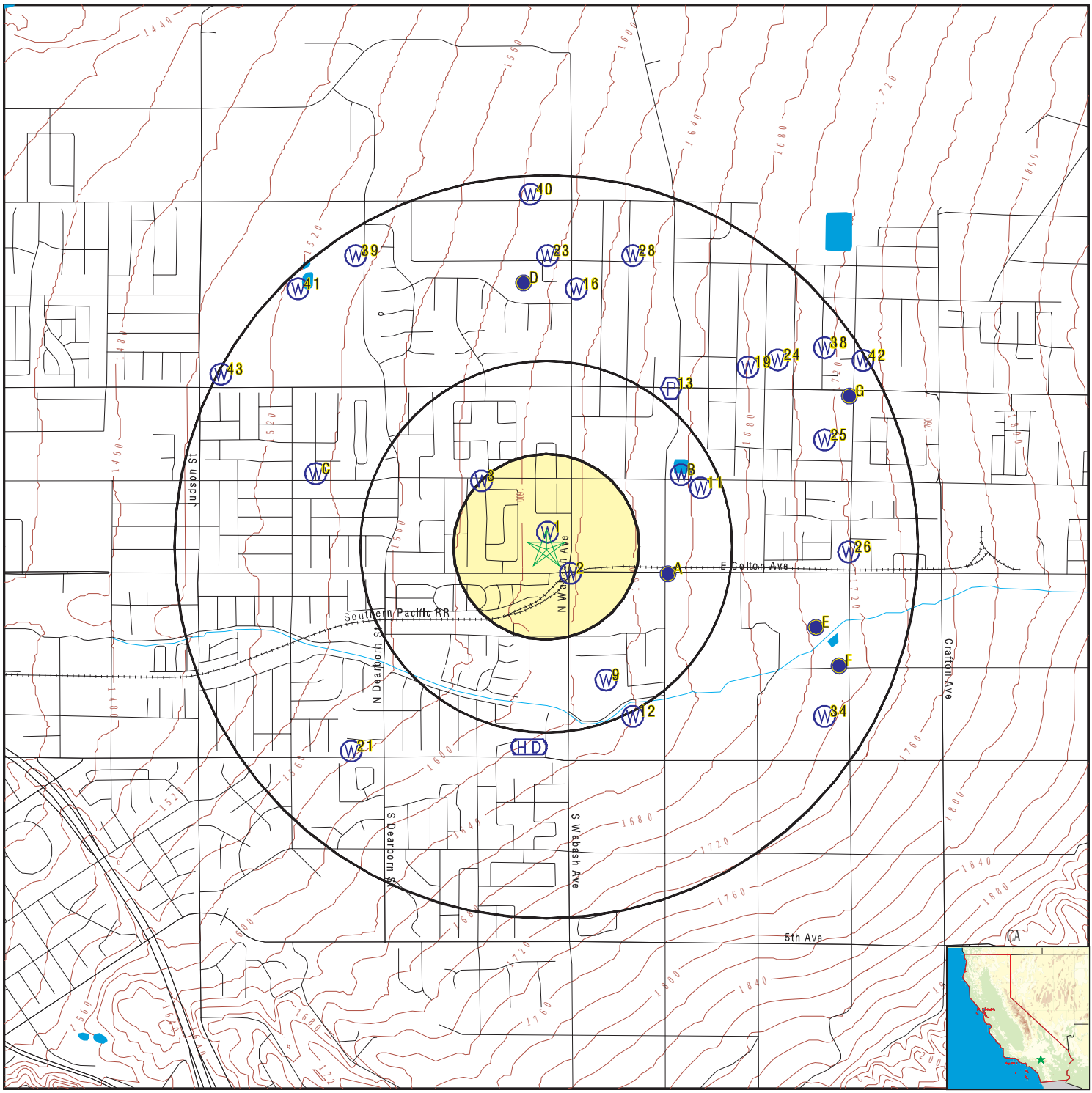
MAP ID	WELL ID	LOCATION FROM TP
1	CADWR0000006262	0 - 1/8 Mile North
A4	CADWR9000006574	1/4 - 1/2 Mile ESE
A6	CAUSGSN00018903	1/4 - 1/2 Mile ESE
A7	CADWR0000005721	1/4 - 1/2 Mile ESE
B8	768	1/4 - 1/2 Mile ENE
B10	CADDW0000009731	1/4 - 1/2 Mile ENE
12	CADWR0000029011	1/2 - 1 Mile SSE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
C14	18787	1/2 - 1 Mile WNW
C15	822	1/2 - 1 Mile WNW
D17	CAUSGSN00018278	1/2 - 1 Mile North
E22	CADWR0000022991	1/2 - 1 Mile ESE
23	CADWR0000019496	1/2 - 1 Mile North
25	CADWR0000033759	1/2 - 1 Mile ENE
F27	CADWR9000006565	1/2 - 1 Mile ESE
28	CADWR0000018214	1/2 - 1 Mile NNE
F31	CAUSGSN00016042	1/2 - 1 Mile ESE
F32	CADWR0000011131	1/2 - 1 Mile ESE
34	CADWR0000007061	1/2 - 1 Mile ESE
G37	CAUSGSN00009101	1/2 - 1 Mile ENE
38	CADWR0000012260	1/2 - 1 Mile NE
39	CADWR0000035017	1/2 - 1 Mile NNW
40	CADDW0000010232	1/2 - 1 Mile North
42	CADPR0000001332	1/2 - 1 Mile ENE

PHYSICAL SETTING SOURCE MAP - 7326657.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Not Reported	CLIENT:	Hazard Management Consulting
ADDRESS:	Not Reported	CONTACT:	Gage Costales
	REDLANDS CA 92374	INQUIRY #:	7326657.2s
LAT/LONG:	34.063828 / 117.140061	DATE:	May 03, 2023 2:02 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
1 **North** **0 - 1/8 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000006262**
2 **SE** **0 - 1/8 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140387**
3 **NW** **1/8 - 1/4 Mile** **Lower**	Click here for full text details	**FED USGS**	**USGS40000140443**
A4 **ESE** **1/4 - 1/2 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR9000006574**
A5 **ESE** **1/4 - 1/2 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140386**
A6 **ESE** **1/4 - 1/2 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CAUSGSN00018903**
A7 **ESE** **1/4 - 1/2 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000005721**
B8 **ENE** **1/4 - 1/2 Mile** **Higher**	Click here for full text details	**CA WELLS**	**768**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
9 **SSE** **1/4 - 1/2 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140287**
B10 **ENE** **1/4 - 1/2 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADDW0000009731**
11 **ENE** **1/4 - 1/2 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140438**
12 **SSE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000029011**
13 **NE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FRDS PWS**	**CA3600385**
C14 **WNW** **1/2 - 1 Mile** **Lower**	Click here for full text details	**CA WELLS**	**18787**
C15 **WNW** **1/2 - 1 Mile** **Lower**	Click here for full text details	**CA WELLS**	**822**
16 **North** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140598**
D17 **North** **1/2 - 1 Mile** **Lower**	Click here for full text details	**CA WELLS**	**CAUSGSN00018278**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
D18 **North** **1/2 - 1 Mile** **Lower**	Click here for full text details	**FED USGS**	**USGS40000140609**
19 **NE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140536**
E20 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140332**
21 **SW** **1/2 - 1 Mile** **Lower**	Click here for full text details	**FED USGS**	**USGS40000140235**
E22 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000022991**
23 **North** **1/2 - 1 Mile** **Lower**	Click here for full text details	**CA WELLS**	**CADWR0000019496**
24 **NE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140542**
25 **ENE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000033759**
26 **East** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140411**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
F27 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR9000006565**
28 **NNE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000018214**
F29 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140315**
F30 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140316**
F31 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CAUSGSN00016042**
F32 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000011131**
F33 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140301**
34 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000007061**
F35 **ESE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140284**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
G36 **ENE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**FED USGS**	**USGS40000140502**
G37 **ENE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CAUSGSN00009101**
38 **NE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADWR0000012260**
39 **NNW** **1/2 - 1 Mile** **Lower**	Click here for full text details	**CA WELLS**	**CADWR0000035017**
40 **North** **1/2 - 1 Mile** **Lower**	Click here for full text details	**CA WELLS**	**CADDW0000010232**
41 **NW** **1/2 - 1 Mile** **Lower**	Click here for full text details	**FED USGS**	**USGS40000140599**
42 **ENE** **1/2 - 1 Mile** **Higher**	Click here for full text details	**CA WELLS**	**CADPR0000001332**
43 **WNW** **1/2 - 1 Mile** **Lower**	Click here for full text details	**FED USGS**	**USGS40000140523**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92374	85	0

Federal EPA Radon Zone for SAN BERNARDINO County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 92374

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.500 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

PHYSICAL SETTING SOURCE RECORDS SEARCHED

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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Not Reported
Not Reported
REDLANDS, CA 92374

Inquiry Number: 7326657.2s
May 03, 2023

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

NOT REPORTED
REDLANDS, CA 92374

COORDINATES

Latitude (North):	34.0638280 - 34° 3' 49.78''
Longitude (West):	117.1400610 - 117° 8' 24.21''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	487075.1
UTM Y (Meters):	3769047.2
Elevation:	1608 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	12014994 REDLANDS, CA
Version Date:	2018
East Map:	12015002 YUCAIPA, CA
Version Date:	2018

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140603, 20140530
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
NOT REPORTED
REDLANDS, CA 92374

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	MISSION STEEL FABRIC	881 N WABASH AVE	CERS HAZ WASTE, HAZNET, San Bern. Co. Permit,...	Higher	18, 0.003, ENE
A2	BEYOND STEEL FABRICA	881 N WABASH AVE	RCRA NonGen / NLR	Higher	18, 0.003, ENE
A3	LARRY JACINTO CONSTR	988 WABASH	RCRA-SQG, FINDS, ECHO, HAZNET, San Bern. Co....	Higher	107, 0.020, NE
B4	LORAN INC		PFAS ECHO	Higher	194, 0.037, SE
B5	LORAN INC	1705 EAST COLTON ANE	RCRA-SQG, San Bern. Co. Permit, CERS	Higher	292, 0.055, ESE
B6	C AND S POWDER COATI	1717 E COLTON AVE	RCRA NonGen / NLR	Higher	451, 0.085, ESE
B7	C AND S POWDER COATI	1717 E COLTON AVE	CERS HAZ WASTE, HAZNET, San Bern. Co. Permit,...	Higher	451, 0.085, ESE
B8	SWAIN OIL TRANSPORT,	1717B E. COLTON AVE	RCRA NonGen / NLR	Higher	452, 0.086, ESE
B9	SWAIN OIL TRANSPORT,	1717B EAST COLTON AV	RCRA NonGen / NLR	Higher	452, 0.086, ESE
C10	LARRY JACINTO CONSTR		US MINES	Higher	523, 0.099, NNE
C11	TEXAS ROCK PLANT	988 WABASH	US MINES, ABANDONED MINES	Higher	610, 0.116, NNE
D12	PACIFIC BEND INC	1700 E COLTON AVE	RCRA NonGen / NLR	Higher	636, 0.120, ESE
D13	PACIFIC BEND INC	1700 E COLTON AVE	RCRA NonGen / NLR	Higher	636, 0.120, ESE
E14	PAUL HALL TRUCKING	1756 NICE AVE	RCRA NonGen / NLR	Higher	788, 0.149, NE
E15	AT&T MOBILITY - HWY	1758 NICE AVE	San Bern. Co. Permit	Higher	796, 0.151, NE
F16	RICHMOND TECHNOLOGY		PFAS ECHO	Higher	978, 0.185, East
F17	VINES RV & BOAT STOR	1897 E COLTON AVE	HAZNET, San Bern. Co. Permit, CERS, HWTS	Higher	1012, 0.192, ESE
F18	RICHMOND TECH INC	1897 COLTON AV	EMI, San Bern. Co. Permit, CERS	Higher	1012, 0.192, ESE
F19	RICHMOND TECHNOLOGY	1897 E COLTON AVE	HIST UST, RCRA NonGen / NLR, HAZNET, NPDES, HWTS	Higher	1012, 0.192, ESE
F20	WEE THREE	SE CORNER COLTON & O	SWEEPS UST, CA FID UST	Higher	1112, 0.211, ESE
G21	DIGMOR EQUIP & ENGR	1898 E COLTON	RCRA-SQG, FINDS, ECHO	Higher	1179, 0.223, ESE
G22	P&R PAPER SUPPLY CO	1898 E COLTON AVE	RCRA NonGen / NLR	Higher	1180, 0.223, ESE
G23	P&R PAPER SUPPLY COM	1898 E COLTON AVENUE	HAZNET, NPDES, San Bern. Co. Permit, CIWQS, CERS,...	Higher	1180, 0.223, ESE
H24	WESTERN FRUIT GROWER	1199 OPAL AVE	AST, CERS HAZ WASTE, HIST UST, CERS TANKS, HAZNET,...	Higher	1214, 0.230, ENE
H25	INT'L PAVEMENT SOLUT	1199 OPAL AVE	AST	Higher	1214, 0.230, ENE
H26	INTERNATIONAL PAVING	1199 OPAL AVE	RCRA NonGen / NLR	Higher	1214, 0.230, ENE
I27	CIRCLE K #1971	1702 MENTONE BLVD	LUST, CERS	Higher	1853, 0.351, NNE
I28	CIRCLE K #1971	1702 MENTONE BLVD	LUST, Cortese	Higher	1853, 0.351, NNE
I29	CRV RECYCLING SOLUTI	1786 E LUGONIA AVE	SWRCY, HAZNET, HWTS	Higher	1943, 0.368, North
J30	MENTONE SERVICE STAT	1759 MENTONE BLVD	LUST, SWEEPS UST, Cortese, HIST CORTESE, San Bern....	Higher	2207, 0.418, NNE
J31	MENTONE ARCO	1759 MENTONE BLVD	LUST, WMUDS/SWAT, CERS HAZ WASTE, HIST UST, CERS...	Higher	2207, 0.418, NNE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Lists of Federal Delisted NPL sites

Delisted NPL ---------- National Priority List Deletions

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS ---------- Corrective Action Report

Lists of Federal RCRA TSD facilities

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Lists of Federal RCRA generators

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List

US INST CONTROLS ..... Institutional Controls Sites List

Federal ERNS list

ERNS ..... Emergency Response Notification System

Lists of state- and tribal (Superfund) equivalent sites

RESPONSE ..... State Response Sites

Lists of state- and tribal hazardous waste facilities

ENVIROSTOR ..... EnviroStor Database

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF ..... Solid Waste Information System

Lists of state and tribal leaking storage tanks

INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land
CPS-SLIC ..... Statewide SLIC Cases

Lists of state and tribal registered storage tanks

FEMA UST ..... Underground Storage Tank Listing
UST ..... Active UST Facilities
INDIAN UST ..... Underground Storage Tanks on Indian Land

Lists of state and tribal voluntary cleanup sites

INDIAN VCP ..... Voluntary Cleanup Priority Listing
VCP ..... Voluntary Cleanup Program Properties

Lists of state and tribal brownfield sites

BROWNFIELDS ..... Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

HAULERS ..... Registered Waste Tire Haulers Listing
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
ODI ..... Open Dump Inventory
IHS OPEN DUMPS ..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ..... Delisted National Clandestine Laboratory Register

HIST Cal-Sites	Historical Calsites Database
SCH	School Property Evaluation Program
CDL	Clandestine Drug Labs
Toxic Pits	Toxic Pits Cleanup Act Sites
US CDL	National Clandestine Laboratory Register

Local Land Records

LIENS	Environmental Liens Listing
LIENS 2	CERCLA Lien Information
DEED	Deed Restriction Listing

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
FINDS	Facility Index System/Facility Registry System
DOCKET HWC	Hazardous Waste Compliance Docket Listing
UXO	Unexploded Ordnance Sites

ECHO - Enforcement & Compliance History Information
FUELS PROGRAM - EPA Fuels Program Registered Listing
PFAS NPL - Superfund Sites with PFAS Detections Information
PFAS FEDERAL SITES - Federal Sites PFAS Information
PFAS TSCA - PFAS Manufacture and Imports Information
PFAS RCRA MANIFEST - PFAS Transfers Identified In the RCRA Database Listing
PFAS ATSDR - PFAS Contamination Site Location Listing
PFAS WQP - Ambient Environmental Sampling for PFAS
PFAS NPDES - Clean Water Act Discharge Monitoring Information
PFAS ECHO FIRE TRAINING - Facilities in Industries that May Be Handling PFAS Listing
PFAS PART 139 AIRPORT - All Certified Part 139 Airports PFAS Information Listing
AQUEOUS FOAM NRC - Aqueous Foam Related Incidents Listing
PFAS - PFAS Contamination Site Location Listing
AQUEOUS FOAM - Former Fire Training Facility Assessments Listing
CA BOND EXP. PLAN - Bond Expenditure Plan
CUPA Listings - CUPA Resources List
DRYCLEANERS - Cleaner Facilities
EMI - Emissions Inventory Data
ENF - Enforcement Action Listing
Financial Assurance - Financial Assurance Information Listing
ICE - ICE
HWP - EnviroStor Permitted Facilities Listing
HWT - Registered Hazardous Waste Transporter Database
HAZNET - Facility and Manifest Data
MINES - Mines Site Location Listing
MWMP - Medical Waste Management Program Listing
NPDES - NPDES Permits Listing
PEST LIC - Pesticide Regulation Licenses Listing
PROC - Certified Processors Database
Notify 65 - Proposition 65 Records
HAZMAT - Hazardous Material Facilities
UIC - UIC Listing
UIC GEO - UIC GEO (GEOTRACKER)
WASTEWATER PITS - Oil Wastewater Pits Listing
WDS - Waste Discharge System
WIP - Well Investigation Program Case List
MILITARY PRIV SITES - MILITARY PRIV SITES (GEOTRACKER)
PROJECT - PROJECT (GEOTRACKER)
WDR - Waste Discharge Requirements Listing
CIWQS - California Integrated Water Quality System
CERS - CERS
NON-CASE INFO - NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS - OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS - PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT - SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ - Well Stimulation Project (GEOTRACKER)
MINES MRDS - Mineral Resources Data System
HWTS - Hazardous Waste Tracking System
PFAS TRIS - List of PFAS Added to the TRI

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP - EDR Proprietary Manufactured Gas Plants

EXECUTIVE SUMMARY

EDR Hist Auto ---------- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ---------- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF ---------- Recovered Government Archive Solid Waste Facilities List
RGA LUST ---------- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal RCRA generators

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 03/06/2023 has revealed that there are 3 RCRA-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LARRY JACINTO CONSTR EPA ID:: CAD983599861	***988 WABASH***	***NE 0 - 1/8 (0.020 mi.)***	***A3***	***20***
LORAN INC EPA ID:: CAD982517419	***1705 EAST COLTON ANE***	***ESE 0 - 1/8 (0.055 mi.)***	***B5***	***38***
DIGMOR EQUIP & ENGR EPA ID:: CAD981376486	***1898 E COLTON***	***ESE 1/8 - 1/4 (0.223 mi.)***	***G21***	***102***

EXECUTIVE SUMMARY

Lists of state and tribal leaking storage tanks

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K #1971	***1702 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.351 mi.)***	***I27***	***128***
Database: LUST, Date of Government Version: 03/06/2023 Status: Completed - Case Closed Global Id: T0607100461				
CIRCLE K #1971	***1702 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.351 mi.)***	***I28***	***129***
Database: LUST REG 8, Date of Government Version: 02/14/2005 Facility Status: Preliminary site assessment underway Global ID: T0607100461				
MENTONE SERVICE STAT	***1759 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.418 mi.)***	***J30***	***134***
Database: LUST REG 8, Date of Government Version: 02/14/2005 Facility Status: Preliminary site assessment workplan submitted Global ID: T0607100577				
MENTONE ARCO	***1759 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.418 mi.)***	***J31***	***139***
Database: LUST, Date of Government Version: 03/06/2023 Status: Completed - Case Closed Global Id: T0607100577				

Lists of state and tribal registered storage tanks

AST: A listing of aboveground storage tank petroleum storage tank locations.

A review of the AST list, as provided by EDR, has revealed that there are 2 AST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WESTERN FRUIT GROWER	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***114***
Database: AST, Date of Government Version: 07/06/2016				
INT'L PAVEMENT SOLUT	1199 OPAL AVE	ENE 1/8 - 1/4 (0.230 mi.)	H25	125
Database: AST, Date of Government Version: 07/06/2016				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: The Waste Management Unit Database System is used for program tracking and inventory of waste management units. The source is the State Water Resources Control Board.

A review of the WMUDS/SWAT list, as provided by EDR, and dated 04/01/2000 has revealed that there is

1 WMUDS/SWAT site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MENTONE ARCO	*1759 MENTONE BLVD*	*NNE 1/4 - 1/2 (0.418 mi.)*	*J31*	*139*

SWRCY: A listing of recycling facilities in California.

A review of the SWRCY list, as provided by EDR, and dated 12/02/2022 has revealed that there is 1 SWRCY site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CRV RECYCLING SOLUTI Cert Id: RC308154.001	*1786 E LUGONIA AVE*	*N 1/4 - 1/2 (0.368 mi.)*	*I29*	*131*

Local Lists of Hazardous waste / Contaminated Sites

CERS HAZ WASTE: List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

A review of the CERS HAZ WASTE list, as provided by EDR, and dated 01/05/2023 has revealed that there are 3 CERS HAZ WASTE sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MISSION STEEL FABRIC	*881 N WABASH AVE*	*ENE 0 - 1/8 (0.003 mi.)*	*A1*	*9*
C AND S POWDER COATI	*1717 E COLTON AVE*	*ESE 0 - 1/8 (0.085 mi.)*	*B7*	*44*
WESTERN FRUIT GROWER	*1199 OPAL AVE*	*ENE 1/8 - 1/4 (0.230 mi.)*	*H24*	*114*

Local Lists of Registered Storage Tanks

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there is 1 SWEEPS UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WEE THREE Status: A Tank Status: A Comp Number: 57682	*SE CORNER COLTON & O*	*ESE 1/8 - 1/4 (0.211 mi.)*	*F20*	*101*

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 2 HIST UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RICHMOND TECHNOLOGY Facility Id: 00000019669	***1897 E COLTON AVE***	***ESE 1/8 - 1/4 (0.192 mi.)***	***F19***	***80***
WESTERN FRUIT GROWER Facility Id: 00000007391	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***114***

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there is 1 CA FID UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WEE THREE Facility Id: 36009173 Status: A	***SE CORNER COLTON & O***	***ESE 1/8 - 1/4 (0.211 mi.)***	***F20***	***101***

CERS TANKS: List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

A review of the CERS TANKS list, as provided by EDR, and dated 01/06/2023 has revealed that there is 1 CERS TANKS site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WESTERN FRUIT GROWER	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***114***

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/06/2023 has revealed that there are 10 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BEYOND STEEL FABRICA EPA ID:: CAL000454499	881 N WABASH AVE	ENE 0 - 1/8 (0.003 mi.)	A2	18
C AND S POWDER COATI EPA ID:: CAL000416928 EPA ID:: CAC003141905	1717 E COLTON AVE	ESE 0 - 1/8 (0.085 mi.)	B6	41
SWAIN OIL TRANSPORT,	1717B E. COLTON AVE	ESE 0 - 1/8 (0.086 mi.)	B8	47

EPA ID:: CAC003023970				
SWAIN OIL TRANSPORT, EPA ID:: CAC002979917	1717B EAST COLTON AV	ESE 0 - 1/8 (0.086 mi.)	B9	49
PACIFIC BEND INC EPA ID:: CAL000456739	1700 E COLTON AVE	ESE 0 - 1/8 (0.120 mi.)	D12	59
PACIFIC BEND INC EPA ID:: CAL000456374	1700 E COLTON AVE	ESE 0 - 1/8 (0.120 mi.)	D13	61
PAUL HALL TRUCKING EPA ID:: CAR000199067	1756 NICE AVE	NE 1/8 - 1/4 (0.149 mi.)	E14	63
RICHMOND TECHNOLOGY EPA ID:: CAD980896161	***1897 E COLTON AVE***	***ESE 1/8 - 1/4 (0.192 mi.)***	***F19***	***80***
P&R PAPER SUPPLY CO EPA ID:: CAL000418194	1898 E COLTON AVE	ESE 1/8 - 1/4 (0.223 mi.)	G22	105
INTERNATIONAL PAVING EPA ID:: CAL000356275	1199 OPAL AVE	ENE 1/8 - 1/4 (0.230 mi.)	H26	125

US MINES: Mines Master Index File. The source of this database is the Dept. of Labor, Mine Safety and Health Administration.

A review of the US MINES list, as provided by EDR, has revealed that there are 2 US MINES sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LARRY JACINTO CONSTR Database: US MINES, Date of Government Version: 11/07/2022 Mine ID:: 0405529		NNE 0 - 1/8 (0.099 mi.)	C10	51
TEXAS ROCK PLANT Database: MINES VIOLATIONS, Date of Government Version: 02/27/2023	***988 WABASH***	***NNE 0 - 1/8 (0.116 mi.)***	***C11***	***52***

ABANDONED MINES: An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

A review of the ABANDONED MINES list, as provided by EDR, and dated 12/20/2022 has revealed that there is 1 ABANDONED MINES site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
TEXAS ROCK PLANT	***988 WABASH***	***NNE 0 - 1/8 (0.116 mi.)***	***C11***	***52***

EXECUTIVE SUMMARY

PFAS ECHO: Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

A review of the PFAS ECHO list, as provided by EDR, and dated 03/30/2023 has revealed that there are 2 PFAS ECHO sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LORAN INC		SE 0 - 1/8 (0.037 mi.)	B4	36
RICHMOND TECHNOLOGY		E 1/8 - 1/4 (0.185 mi.)	F16	66

Cortese: The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

A review of the Cortese list, as provided by EDR, and dated 12/14/2022 has revealed that there are 2 Cortese sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K #1971	***1702 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.351 mi.)***	***I28***	***129***
Cleanup Status: COMPLETED - CASE CLOSED				
MENTONE SERVICE STAT	***1759 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.418 mi.)***	***J30***	***134***
Cleanup Status: COMPLETED - CASE CLOSED				

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 HIST CORTESE site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MENTONE SERVICE STAT	***1759 MENTONE BLVD***	***NNE 1/4 - 1/2 (0.418 mi.)***	***J30***	***134***
Reg Id: 083603461T				

San Bern. Co. Permit: San Bernardino County Fire Department Hazardous Materials Division.

A review of the San Bern. Co. Permit list, as provided by EDR, and dated 11/18/2022 has revealed that there are 9 San Bern. Co. Permit sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MISSION STEEL FABRIC	***881 N WABASH AVE***	***ENE 0 - 1/8 (0.003 mi.)***	***A1***	***9***
Facility Status: ACTIVE				
Facility Id: FA0006352				
LARRY JACINTO CONSTR	***988 WABASH***	***NE 0 - 1/8 (0.020 mi.)***	***A3***	***20***
Facility Status: INACTIVE				
Facility Id: FA0004383				
LORAN INC	***1705 EAST COLTON ANE***	***ESE 0 - 1/8 (0.055 mi.)***	***B5***	***38***

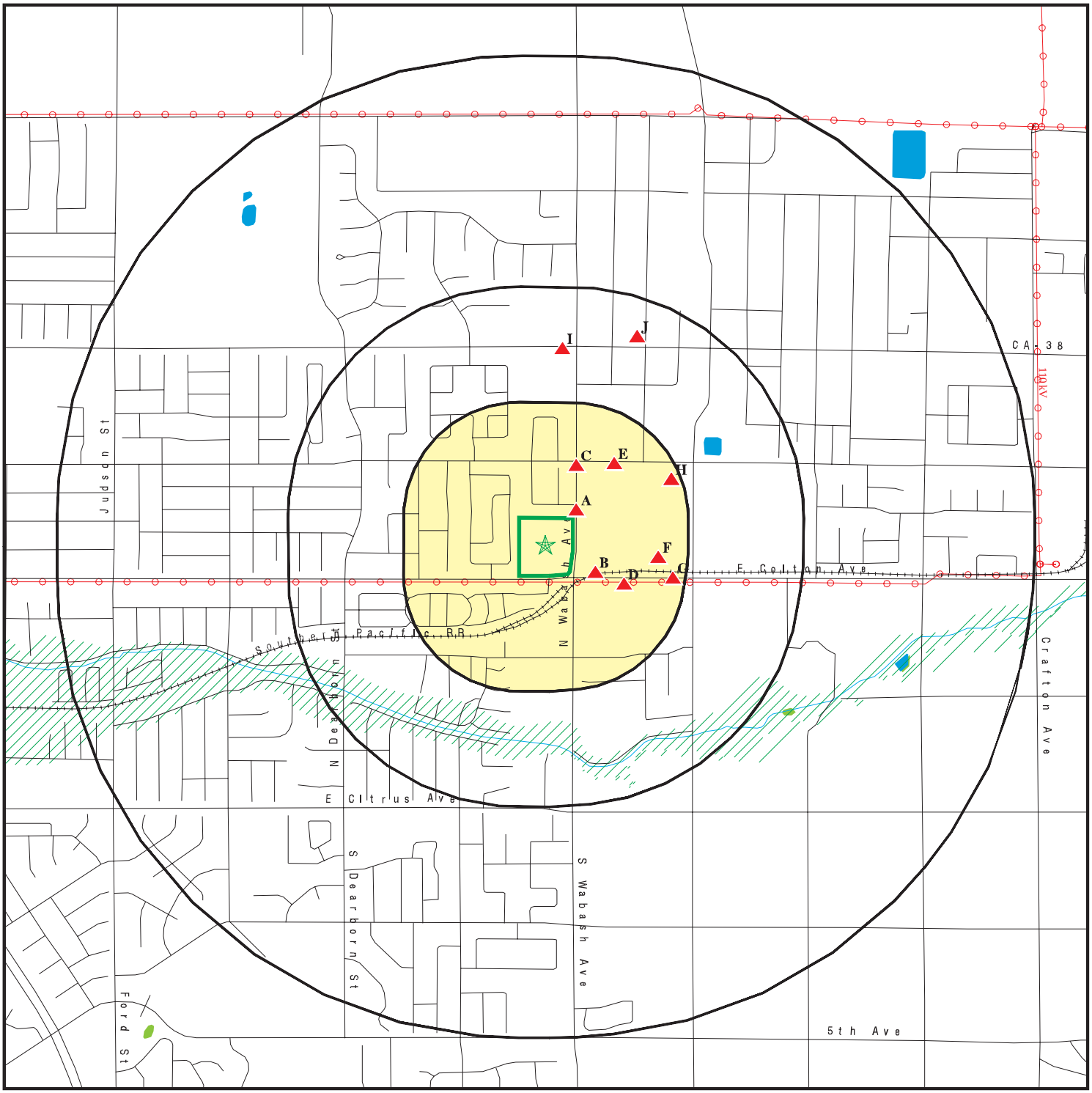
Facility Status: INACTIVE Facility Id: FA0004481				
C AND S POWDER COATI Facility Status: ACTIVE Facility Id: FA0019353	***1717 E COLTON AVE***	***ESE 0 - 1/8 (0.085 mi.)***	***B7***	***44***
AT&T MOBILITY - HWY Facility Status: ACTIVE Facility Id: FA0009010	1758 NICE AVE	NE 1/8 - 1/4 (0.151 mi.)	E15	66
VINES RV & BOAT STOR Facility Status: ACTIVE Facility Id: FA0013496	***1897 E COLTON AVE***	***ESE 1/8 - 1/4 (0.192 mi.)***	***F17***	***67***
RICHMOND TECH INC Facility Status: INACTIVE Facility Id: FA0005708	***1897 COLTON AV***	***ESE 1/8 - 1/4 (0.192 mi.)***	***F18***	***76***
P&R PAPER SUPPLY COM Facility Status: ACTIVE Facility Status: INACTIVE Facility Id: FA0015301	***1898 E COLTON AVENUE***	***ESE 1/8 - 1/4 (0.223 mi.)***	***G23***	***107***
WESTERN FRUIT GROWER Facility Status: ACTIVE Facility Status: INACTIVE Facility Id: FA0003994	***1199 OPAL AVE***	***ENE 1/8 - 1/4 (0.230 mi.)***	***H24***	***114***

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 1 records.

Site Name	Database(s)
MENTONE DISPOSAL SITE	SWF/LF

OVERVIEW MAP - 7326657.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

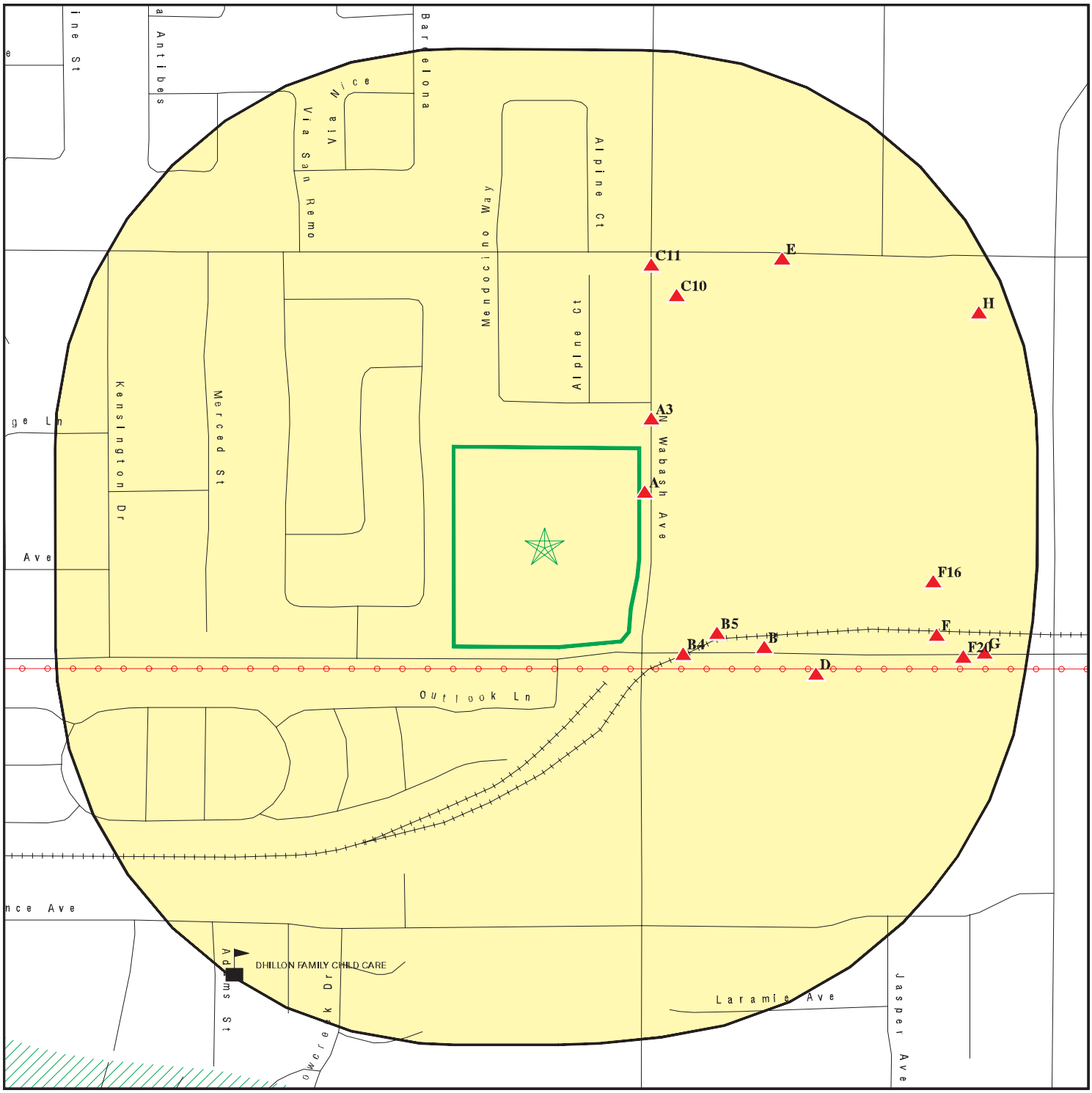
N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Not Reported	CLIENT:	Hazard Management Consulting
ADDRESS:	Not Reported REDLANDS CA 92374	CONTACT:	Gage Costales
		INQUIRY #:	7326657.2s
LAT/LONG:	34.063828 / 117.140061	DATE:	May 03, 2023 1:58 pm

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DETAIL MAP - 7326657.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Not Reported ADDRESS: Not Reported REDLANDS CA 92374 LAT/LONG: 34.063828 / 117.140061	CLIENT: Hazard Management Consulting CONTACT: Gage Costales INQUIRY #: 7326657.2s DATE: May 03, 2023 2:01 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		2	1	NR	NR	NR	3
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
Lists of state- and tribal (Superfund) equivalent sites								
RESPONSE	1.000		0	0	0	0	NR	0
Lists of state- and tribal hazardous waste facilities								
ENVIROSTOR	1.000		0	0	0	0	NR	0
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Lists of state and tribal leaking storage tanks								
LUST	0.500		0	0	4	NR	NR	4
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
Lists of state and tribal registered storage tanks								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	2	NR	NR	NR	2
INDIAN UST	0.250		0	0	NR	NR	NR	0
Lists of state and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	1	NR	NR	1
SWRCY	0.500		0	0	1	NR	NR	1
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		2	1	NR	NR	NR	3
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	1	NR	NR	NR	1
HIST UST	0.250		0	2	NR	NR	NR	2
CA FID UST	0.250		0	1	NR	NR	NR	1
CERS TANKS	0.250		0	1	NR	NR	NR	1
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		6	4	NR	NR	NR	10
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		2	0	NR	NR	NR	2
ABANDONED MINES	0.250		1	0	NR	NR	NR	1
FINDS	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
PFAS NPL	0.250		0	0	NR	NR	NR	0
PFAS FEDERAL SITES	0.250		0	0	NR	NR	NR	0
PFAS TSCA	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PFAS RCRA MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS ATSDR	0.250		0	0	NR	NR	NR	0
PFAS WQP	0.250		0	0	NR	NR	NR	0
PFAS NPDES	0.250		0	0	NR	NR	NR	0
PFAS ECHO	0.250		1	1	NR	NR	NR	2
PFAS ECHO FIRE TRAINING	0.250		0	0	NR	NR	NR	0
PFAS PART 139 AIRPORT	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM NRC	0.250		0	0	NR	NR	NR	0
PFAS	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	2	NR	NR	2
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	1	NR	NR	1
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
HAZNET	0.001		0	NR	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
San Bern. Co. Permit	0.250		4	5	NR	NR	NR	9
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
HAZMAT	0.250		0	0	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WDR	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
CERS	0.001		0	NR	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
MINES MRDS	0.001		0	NR	NR	NR	NR	0
HWTS	TP		NR	NR	NR	NR	NR	0
PFAS TRIS	0.250		0	0	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	18	19	9	0	0	46

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **MISSION STEEL FABRICATION** **CERS HAZ WASTE** **S104905588**
ENE **881 N WABASH AVE** **HAZNET** **N/A**
< 1/8 **REDLANDS, CA 92374** **San Bern. Co. Permit**
0.003 mi. **CERS**
18 ft. **Site 1 of 3 in cluster A** **HWTS**

Relative:
Higher

Actual:
1617 ft.

CERS HAZ WASTE:

Name:	MISSION STEEL FABRICATION
Address:	881 N WABASH AVE
City,State,Zip:	REDLANDS, CA 92374
Site ID:	566300
CERS ID:	10842565
CERS Description:	Hazardous Waste Generator

HAZNET:

Name:	BEYOND STEEL FABRICATION LLC
Address:	881 N WABASH AVE
Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 92374
Contact:	MICHAEL MANZO
Telephone:	9093890088
Mailing Name:	Not reported
Mailing Address:	PO BOX 549
Year:	2020
Gepaid:	CAL000454499
TSD EPA ID:	AZR000520304
CA Waste Code:	223 - Unspecified oil-containing waste
Disposal Method:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.37531

Additional Info:

Year:	2020
Gen EPA ID:	CAL000454499
Shipment Date:	7/7/2020
Creation Date:	8/11/2020
Receipt Date:	7/22/2020
Manifest ID:	020719499JJK
Trans EPA ID:	CAR000148296
Trans Name:	STARLITE RECLAMATION ENVIRONMENTAL SVCS INC
Trans 2 EPA ID:	CAD980585293
Trans 2 Name:	INDUSTRIAL WASTE UTILIZATION
TSDF EPA ID:	AZR000520304
Trans Name:	AA SYDCOL LLC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	223 - Unspecified oil-containing waste
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.37531
Waste Quantity:	90
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported

MISSION STEEL FABRICATION (Continued) **S104905588**

Additional Code 3: Not reported
Additional Code 4: Not reported
Additional Code 5: Not reported

Detail Two:
Year: 2020
EM Manifest ID: 506a02ef-3a04-4b0c-8e61-ac5cf04f36cd
Shipment Date: 7/7/2020
Receipt Date: 7/22/2020
Manifest Number: 020719499JJK
Generator EPA ID: CAL000454499
Name: BEYOND STEEL FABRICATION LLC
Address: 881 N WABASH AVE
Address 2: Not reported
City: REDLANDS
Zip: 92374
Telephone: 555-555-5555
Contact: MICHAEL MANZO
Contact Telephone: 909-389-0088
Transporter 1 EPA ID: CAR000148296
Transporter 1 Emergency Number: Not reported
Transporter 2 EPA ID: CAD980585293
Transporter 2 Emergency Number: Not reported
TSDF EPA ID: AZR000520304
TSDF Name: AA SYDCOL LLC
TSDF Address 1: 2264 E 13TH ST
TSDF Address 2: Not reported
TSDF City: YUMA
TSDF Zip: 85365-1858
TSDF Telephone: Not reported

State:
Year: 2020
EM Manifest ID: 506a02ef-3a04-4b0c-8e61-ac5cf04f36cd
Generator EPA ID: CAL000454499
Shipment Date: 2020-07-07
Manifest Number: 020719499JJK
Line Number: 1
Method Code: H141
Quantity Tons: 0.37530
Quantity Waste: 90.000000
Quantity Unit: G
Number of Containers: 2
Type of Container: Metal drums, barrels, kegs
Quantity Type: Gallons
State Code: 223

San Bern. Co. Permit:
Name: MISSION STEEL
Address: 881 N WABASH AVE
City,State,Zip: REDLANDS, CA 92374
Region: SAN BERNARDINO
Facility ID: FA0006352
Owner: JOSE MANZO
Permit Number: PT0040101
Permit Category: SMALL QUANTITY GENERATOR

MISSION STEEL FABRICATION (Continued) **S104905588**

Facility Status: ACTIVE
Expiration Date: 04/30/2023

Name: MISSION STEEL
Address: 881 N WABASH AVE
City,State,Zip: REDLANDS, CA 92374
Region: SAN BERNARDINO
Facility ID: FA0006352
Owner: JOSE MANZO
Permit Number: PT0006583
Permit Category: HAZARDOUS MATERIALS 4-10 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 04/30/2023

CERS:
Name: MISSION STEEL FABRICATION
Address: 881 N WABASH AVE
City,State,Zip: REDLANDS, CA 92374
Site ID: 566300
CERS ID: 10842565
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 566300
Site Name: Mission Steel Fabrication
Violation Date: 05-05-2020
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 07/17/2020. OBSERVATION: Facility has not submitted an accurate and complete business plan via CERS CORRECTIVE ACTION: Submit an accurate and complete business plan via CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 566300
Site Name: Mission Steel Fabrication
Violation Date: 05-05-2020
Citation: Un-Specified
Violation Description: Business Plan Program - Administration/Documentation - General Local Ordinance
Violation Notes: Returned to compliance on 07/17/2020. OBSERVATION: Facility stores hazardous materials above the reportable quantities (55 gallons for liquids, 500 pounds for solids, and/or 200 cubic feet for compressed gases) and has not obtained a current hazardous material handler permit with this Division. CORRECTIVE ACTION: Obtain a hazardous materials handler permit by submitting a business plan via CERS at https://cers.calepa.ca.gov/. Pay permit fees upon receipt of invoice.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 566300
Site Name: Mission Steel Fabrication

MISSION STEEL FABRICATION (Continued) **S104905588**

Violation Date:	05-05-2020
Citation:	22 CCR 12 66262.12 - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.12
Violation Description:	Failure to obtain an Identification Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.
Violation Notes:	Returned to compliance on 07/17/2020. OBSERVATION: The generator has not obtained an active EPA ID number to manage hazardous waste. A hazardous waste generator shall not treat, store, dispose of, transport or offer for transportation, hazardous waste without an active EPA ID number. CORRECTIVE ACTION: Obtain a permanent EPA ID number by submitting form 1358 to DTSC. Submit a signed statement indicating that a valid EPA ID number has been obtained.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	566300
Site Name:	Mission Steel Fabrication
Violation Date:	05-05-2020
Citation:	HSC 6.5 25160.2 - California Health and Safety Code, Chapter 6.5, Section(s) 25160.2
Violation Description:	Failure of a generator of hazardous waste that meets the conditions to be transported on a consolidated manifest to comply with one or more of the required consolidated manifesting procedures and retain copies of receipts for three years.
Violation Notes:	Returned to compliance on 07/17/2020. OBSERVATION: Owner/Operator failed to comply with one or more consolidated manifesting requirements. CORRECTIVE ACTION: Ensure that all wastes transported on a consolidated manifest meet all consolidated manifest requirements, and maintain copies of manifests for three years.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	566300
Site Name:	Mission Steel Fabrication
Violation Date:	05-05-2020
Citation:	Un-Specified
Violation Description:	Hazardous Waste Generator Program - Administration/Documentation - General Local Ordinance
Violation Notes:	Returned to compliance on 07/17/2020. OBSERVATION: Facility did not provide facility information to the CUPA. CORRECTIVE ACTION: Provide facility information to the CUPA including but not limited to 1. Names, addresses and phone numbers of the business and owner. 2. Name and twenty-four (24) hour phone number of the emergency contact person. 3. Site address where hazardous waste is generated or produced, if different from the facility address. 4. List of each type of hazardous waste generated. 5. The permittee shall prepare a Contingency Plan as defined in Section 66260.10 and Section 66265.50 et seq. of Title 22 of the California Code of Regulations.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	566300
Site Name:	Mission Steel Fabrication

MISSION STEEL FABRICATION (Continued) **S104905588**

Violation Date:	05-05-2020
Citation:	HSC 6.95 25507 - California Health and Safety Code, Chapter 6.95, Section(s) 25507
Violation Description:	Failure to adequately establish and implement a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes:	Returned to compliance on 07/17/2020. OBSERVATION: Facility has not established and implemented a business plan. CORRECTIVE ACTION: Establish and implement the business plan via CERS.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HMRRP
Violation Source:	CERS,
Site ID:	566300
Site Name:	Mission Steel Fabrication
Violation Date:	05-05-2020
Citation:	40 CFR 1 262.34(d)(5)(iii) - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 262.34(d)(5)(iii)
Violation Description:	Failure to ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relevant to their responsibilities during normal facility operations and emergencies.
Violation Notes:	Returned to compliance on 07/17/2020. OBSERVATION: Facility did not ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relevant to their responsibilities during normal facility operations and emergencies. 40 CFR 1 262.34(d)(5)(iii) CORRECTIVE ACTION: Submit a signed statement affirming that all employees are thoroughly familiar with proper waste handling and emergency procedures, relevant to their responsibilities during normal facility operations and emergencies. 40 CFR 1 262.34(d)(5)(iii)
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	566300
Site Name:	Mission Steel Fabrication
Violation Date:	05-05-2020
Citation:	HSC 6.5 25123.3(h)(1) - California Health and Safety Code, Chapter 6.5, Section(s) 25123.3(h)(1)
Violation Description:	Failure to send hazardous waste offsite for treatment, storage, or disposal within 180 days (or 270 days if waste is transported over 200 miles) for a generator who generates less than 1000 kilogram per month if all of the following conditions are met: (1) The quantity of hazardous waste accumulated onsite never exceeds 6,000 kilograms. (2) The generator complies with the requirements of 40 Code of Federal Regulations section 262.34(d), (e) and (f). (3) The generator does not hold acutely hazardous waste or extremely hazardous waste in an amount greater than one kilogram for more than 90 days.
Violation Notes:	Returned to compliance on 07/17/2020. OBSERVATION: Owner/Operator is a small quantity generator and failed to send hazardous waste offsite for treatment, storage, or disposal within 180 days (or 270 days if waste is transported over 200 miles), or has failed to comply with the conditions of CCR 66262.34(d) and has stored hazardous waste over 90 days. CORRECTIVE ACTION: Dispose of hazardous waste that has been stored over the applicable time limit and provide documentation that the violation has been corrected.
Violation Division:	San Bernardino County Fire Department

MISSION STEEL FABRICATION (Continued) **S104905588**

Violation Program:	HW
Violation Source:	CERS,
Site ID:	566300
Site Name:	Mission Steel Fabrication
Violation Date:	05-05-2020
Citation:	22 CCR 11 66261.7 - California Code of Regulations, Title 22, Chapter 11, Section(s) 66261.7
Violation Description:	Failure to manage empty containers greater than 5 gallons in capacity that previously held a hazardous material/waste in accordance with 22 CCR 11 66261.7 including but not limited to the following: (e)(2)By reclaiming its scrap value onsite or shipping the container or inner liner to a person who reclaims its scrap value; or (3) By reconditioning or re manufacturing the container or inner liner onsite for subsequent reuse, or shipping the container or inner liner to a person who reconditions or re-manufactures the container or inner liner; or (4) By shipping the container or inner liner to a supplier or to another intermediate collection location for accumulation prior to managing the container or inner liner pursuant to subsections (e)(2) or (e)(3) of 22 CCR 11 66261.7; or (i) By shipping the container or inner liner back to the supplier for the purpose of being refilled. (f) A container or an inner liner removed from a container larger than five gallons in capacity which is managed pursuant to subsection (e) of 22 CCR 11 66261.7 shall be marked with the date it has been emptied and shall be managed within one year of being emptied.
Violation Notes:	Returned to compliance on 07/17/2020. OBSERVATION: (1) 55-gallon empty drum which previously held cutting oil] was observed in the hazardous waste storage area without a label. CORRECTIVE ACTION: Submit photos/documentation to this department demonstrating that the empty containers listed above have been marked with the date they were emptied and are being properly managed pursuant to 22 CCR 11 66261.7.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	566300
Site Name:	Mission Steel Fabrication
Violation Date:	05-05-2020
Citation:	HSC 6.95 25505(a)(4) - California Health and Safety Code, Chapter 6.95, Section(s) 25505(a)(4)
Violation Description:	Failure to provide initial and annual training to all employees in safety procedures in the event of a release or threatened release of a hazardous material or failure to document and maintain training records for a minimum of three years.
Violation Notes:	Returned to compliance on 07/17/2020. OBSERVATION: Facility has not maintained training records of employees. CORRECTIVE ACTION: Conduct initial and annual employee training and maintain training records for a minimum of three years. Submit a signed statement indicating that training has been conducted and that training records will be kept on site for review.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HMRRP
Violation Source:	CERS,
Site ID:	566300
Site Name:	Mission Steel Fabrication

MISSION STEEL FABRICATION (Continued) **S104905588**

Violation Date: 05-05-2020
Citation: Un-Specified
Violation Description: Hazardous Waste Generator Program - Administration/Documentation - General Local Ordinance
Violation Notes: Returned to compliance on 07/17/2020. OBSERVATION: Facility generates hazardous waste from business maintenance activities. Facility has not obtained a current hazardous waste generator permit. CORRECTIVE ACTION: Obtain a hazardous waste generator permit by submitting a business plan via the California Environmental Reporting System (CERS) at https://cers.calepa.ca.gov/. Pay permit fees upon receipt of invoice.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 566300
Site Name: Mission Steel Fabrication
Violation Date: 05-05-2020
Citation: 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f)
Violation Description: Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date.
Violation Notes: Returned to compliance on 07/17/2020. OBSERVATION: (1) 55-gallon drum of used oil located in the hazardous waste storage area was observed without a hazardous waste label. CORRECTIVE ACTION: Properly label all hazardous waste containers and submit a photo to the CUPA demonstrating that the container listed above has been properly labeled.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-05-2020
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HAZMAT INSPECTION
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-05-2020
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HAZ WASTE INSPECTION
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Coordinates:
Site ID: 566300

MISSION STEEL FABRICATION (Continued) **S104905588**

Facility Name:	Mission Steel Fabrication
Env Int Type Code:	HMBP
Program ID:	10842565
Coord Name:	Not reported
Ref Point Type Desc:	Center of a facility or station.,
Latitude:	34.063810
Longitude:	-117.138930

Affiliation:

Affiliation Type Desc:	Environmental Contact
Entity Name:	MICHAEL MANZO
Entity Title:	Not reported
Affiliation Address:	PO BOX 549
Affiliation City:	MENTONE
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92359
Affiliation Phone:	,

Affiliation Type Desc:	Document Preparer
Entity Name:	Michael Manzo
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	,

Affiliation Type Desc:	CUPA District
Entity Name:	San Bernardino County Fire
Entity Title:	Not reported
Affiliation Address:	620 South E Street
Affiliation City:	San Bernardino
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92415-0153
Affiliation Phone:	(909) 386-8401,

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	PO BOX 549
Affiliation City:	MENTONE
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92359
Affiliation Phone:	,

Affiliation Type Desc:	Identification Signer
Entity Name:	Michael Manzo
Entity Title:	CFO
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported

MISSION STEEL FABRICATION (Continued) **S104905588**

Affiliation Phone: ,

Affiliation Type Desc: Legal Owner
Entity Name: JOSE MANZO
Entity Title: Not reported
Affiliation Address: 6262 GRETCHEN CT
Affiliation City: FONTANA
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 92336
Affiliation Phone: (909) 389-0088,

Affiliation Type Desc: Operator
Entity Name: JOSE MANZO
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (909) 368-3635,

Affiliation Type Desc: Parent Corporation
Entity Name: Beyond Steel Fabrication, LLC DBA Mission Steel Fabrication
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

HWTS:
Name: BEYOND STEEL FABRICATION LLC
Address: 881 N WABASH AVE
Address 2: Not reported
City,State,Zip: REDLANDS, CA 92374
EPA ID: CAL000454499
Inactive Date: Not reported
Create Date: 05/07/2020
Last Act Date: Not reported
Mailing Name: Not reported
Mailing Address: PO BOX 549
Mailing Address 2: Not reported
Mailing City,State,Zip: MENTONE, CA 92359
Owner Name: BEYOND STEEL FABRICATION LLC
Owner Address: 881 WABASH AVE
Owner Address 2: Not reported
Owner City,State,Zip: REDLANDS, CA 923740000
Contact Name: MICHAEL MANZO
Contact Address: PO BOX 549
Contact Address 2: Not reported
City,State,Zip: MENTONE, CA 92359
Facility Status: Active
Facility Type: PERMANENT
Category: STATE

MISSION STEEL FABRICATION (Continued) **S104905588**

Latitude: 34.06377491
Longitude: -117.1389397

NAICS:
EPA ID: CAL000454499
Create Date: 2020-05-07 13:51:11.910
NAICS Code: 332312
NAICS Description: Fabricated Structural Metal Manufacturing
Issued EPA ID Date: 2020-05-07 13:51:11.89300
Inactive Date: Not reported
Facility Name: BEYOND STEEL FABRICATION LLC
Facility Address: 881 N WABASH AVE
Facility Address 2: Not reported
Facility City: REDLANDS
Facility County: Not reported
Facility State: CA
Facility Zip: 92374

A2 **BEYOND STEEL FABRICATION LLC** **RCRA NonGen / NLR** **1026170929**
ENE **881 N WABASH AVE** **CAL000454499**
< 1/8 **REDLANDS, CA 92374**
0.003 mi.
18 ft. **Site 2 of 3 in cluster A**

Relative:
Higher

Actual:
1617 ft.

RCRA Listings:
Date Form Received by Agency: 20200507
Handler Name: Beyond Steel Fabrication Llc
Handler Address: 881 N WABASH AVE
Handler City,State,Zip: REDLANDS, CA 92374
EPA ID: CAL000454499
Contact Name: MICHAEL MANZO
Contact Address: PO BOX 549
Contact City,State,Zip: MENTONE, CA 92359
Contact Telephone: 909-389-0088
Contact Fax: Not reported
Contact Email: MICHAEL@MISSIONSTEEL.COM
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: Not reported
State District: Not reported
Mailing Address: PO BOX 549
Mailing City,State,Zip: MENTONE, CA 92359
Owner Name: Beyond Steel Fabrication Llc
Owner Type: Other
Operator Name: Michael Manzo
Operator Type: Other
Short-Term Generator Activity: No
Importer Activity: No
Mixed Waste Generator: No
Transporter Activity: No
Transfer Facility Activity: No

BEYOND STEEL FABRICATION LLC (Continued) **1026170929**

Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20200515
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: BEYOND STEEL FABRICATION LLC	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	6262 GRETCHEN CT
Owner/Operator City,State,Zip:	FONTANA, CA 92336
Owner/Operator Telephone:	909-368-3635
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name: MICHAEL MANZO	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	PO BOX 549
Owner/Operator City,State,Zip:	MENTONE, CA 92359

BEYOND STEEL FABRICATION LLC (Continued) **1026170929**

Owner/Operator Telephone: 909-389-0088
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20200507
Handler Name: BEYOND STEEL FABRICATION LLC
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 332312
NAICS Description: FABRICATED STRUCTURAL METAL MANUFACTURING

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

A3 **LARRY JACINTO CONSTRUCTION INC** **RCRA-SQG** **1000596027**
NE **988 WABASH** **FINDS** **CAD983599861**
< 1/8 **MENTONE, CA 92359** **ECHO**
0.020 mi. **HAZNET**
107 ft. **Site 3 of 3 in cluster A** **San Bern. Co. Permit**
HWTS

Relative:
Higher

Actual:
1617 ft.

RCRA Listings:
Date Form Received by Agency: 19910808
Handler Name: Larry Jacinto Construction Inc
Handler Address: 988 WABASH
Handler City,State,Zip: MENTONE, CA 92359
EPA ID: CAD983599861
Contact Name: LARRY JACINTO
Contact Address: P O BOX 615
Contact City,State,Zip: MENTONE, CA 92359
Contact Telephone: 714-794-2151
Contact Fax: Not reported
Contact Email: Not reported
Contact Title: Not reported
EPA Region: 09
Land Type: Private
Federal Waste Generator Description: Small Quantity Generator
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Active Site Indicator:	Handler Activities
State District Owner:	CA
State District:	4R
Mailing Address:	988 WABASH
Mailing City,State,Zip:	MENTONE, CA 92359
Owner Name:	Larry Jacinto
Owner Type:	Private
Operator Name:	Not reported
Operator Type:	Not reported
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	NN
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20020627
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	Not reported
Manifest Broker:	Not reported
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: LARRY JACINTO	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Owner/Operator Address: P O BOX 615
Owner/Operator City,State,Zip: MENTONE, CA 92359
Owner/Operator Telephone: 714-794-2151
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 19910808
Handler Name: LARRY JACINTO CONSTRUCTION INC
Federal Waste Generator Description: Small Quantity Generator
State District Owner: CA
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 23411
NAICS Description: HIGHWAY AND STREET CONSTRUCTION

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

FINDS:
Registry ID: 110002856669

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1000596027
Registry ID: 110002856669
DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110002856669

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Name: LARRY JACINTO CONSTRUCTION INC
Address: 988 WABASH
City,State,Zip: MENTONE, CA 92359

HAZNET:
Name: LARRY JACINTO CONSTRUCTION INC
Address: 988 WABASH
Address 2: Not reported
City,State,Zip: MENTONE, CA 923590000
Contact: STEVE@LJACINTO.COM
Telephone: 9097942151
Mailing Name: Not reported
Mailing Address: PO BOX 615

Year: 2006
Gepaid: CAD983599861
TSD EPA ID: CAD028409019
CA Waste Code: 331 - Off-specification, aged or surplus organics
Disposal Method: H01 - Transfer Station
Tons: 0.075

Year: 2006
Gepaid: CAD983599861
TSD EPA ID: CAT080013352
CA Waste Code: 241 - Tank bottom waste
Disposal Method: R01 - Recycler
Tons: 6.8805

Year: 2005
Gepaid: CAD983599861
TSD EPA ID: CAD008252405
CA Waste Code: 214 - Unspecified solvent mixture
Disposal Method: R01 - Recycler
Tons: 0.0504

Year: 2005
Gepaid: CAD983599861
TSD EPA ID: CAT080033681
CA Waste Code: 352 - Other organic solids
Disposal Method: R01 - Recycler
Tons: 0.45

Year: 2005
Gepaid: CAD983599861
TSD EPA ID: CAT080033681
CA Waste Code: -
Disposal Method: R01 - Recycler
Tons: Not reported

Year: 2005
Gepaid: CAD983599861
TSD EPA ID: CAT080033681
CA Waste Code: 135 - Unspecified aqueous solution
Disposal Method: D80 - Disposal, Land Fill
Tons: 3.36

Year: 2005

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Gepaid: CAD983599861
TSD EPA ID: CAT080033681
CA Waste Code: 221 - Waste oil and mixed oil
Disposal Method: R01 - Recycler
Tons: 0.171

Year: 2005
Gepaid: CAD983599861
TSD EPA ID: CAT080033681
CA Waste Code: 352 - Other organic solids
Disposal Method: D80 - Disposal, Land Fill
Tons: 0.6

Year: 2004
Gepaid: CAD983599861
TSD EPA ID: CAT080033681
CA Waste Code: 352 - Other organic solids
Disposal Method: R01 - Recycler
Tons: 1

Year: 2004
Gepaid: CAD983599861
TSD EPA ID: CAT080033681
CA Waste Code: 221 - Waste oil and mixed oil
Disposal Method: R01 - Recycler
Tons: 0.38

Click this hyperlink while viewing on your computer to access
11 additional CA HAZNET: record(s) in the EDR Site Report.

Additional Info:
Year: 2006
Gen EPA ID: CAD983599861

Shipment Date: 20060627
Creation Date: 9/8/2006 18:31:20
Receipt Date: 20060630
Manifest ID: 24771765
Trans EPA ID: CAT080012800
Trans Name: HAZ MAT TRANS INC
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
TSDF EPA ID: CAD028409019
Trans Name: CROSBY OVERTON
TSDF Alt EPA ID: CAD028409019
TSDF Alt Name: Not reported
Waste Code Description: 331 - Off-specification, aged, or surplus organics
RCRA Code: D001
Meth Code: H01 - Transfer Station
Quantity Tons: 0.075
Waste Quantity: 150
Quantity Unit: P
Additional Code 1: Not reported
Additional Code 2: Not reported
Additional Code 3: Not reported
Additional Code 4: Not reported

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Additional Code 5:	Not reported
Shipment Date:	20060626
Creation Date:	9/8/2006 18:33:59
Receipt Date:	20060629
Manifest ID:	24771766
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080013352
Trans Name:	DEMENNO KERDOON
TSDF Alt EPA ID:	CAT080013352
TSDF Alt Name:	Not reported
Waste Code Description:	241 - Tank bottom waste 251 Still bottoms with halogenated organics
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	6.8805
Waste Quantity:	1650
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	2005
Gen EPA ID:	CAD983599861
Shipment Date:	20050509
Creation Date:	10/11/2005 18:30:25
Receipt Date:	20050513
Manifest ID:	23758682
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	D/K ENVIRONMENTAL
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	221 - Waste oil and mixed oil
RCRA Code:	NONE
Meth Code:	R01 - Recycler
Quantity Tons:	0.171
Waste Quantity:	45
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20050509
Creation Date:	Not reported
Receipt Date:	Not reported

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Manifest ID:	23758682
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	D/K ENVIRONMENTAL
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	122 - Alkaline solution without metals (pH > 12.5
RCRA Code:	D002
Meth Code:	R01 - Recycler
Quantity Tons:	0.6255
Waste Quantity:	150
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20050509
Creation Date:	10/11/2005 18:30:25
Receipt Date:	20050513
Manifest ID:	23758682
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	D/K ENVIRONMENTAL
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	NONE
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	0.6
Waste Quantity:	1200
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20050118
Creation Date:	3/2/2007 18:30:13
Receipt Date:	20050121
Manifest ID:	23758542
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	D/K ENVIRONMENTAL
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Waste Code Description:	135 - Unspecified aqueous solution
RCRA Code:	NONE
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	3.36
Waste Quantity:	800
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20050117
Creation Date:	3/2/2007 18:30:13
Receipt Date:	20050121
Manifest ID:	23758528
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	D/K ENVIRONMENTAL
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	NONE
Meth Code:	R01 - Recycler
Quantity Tons:	0.45
Waste Quantity:	900
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20050117
Creation Date:	3/2/2007 18:30:13
Receipt Date:	20050121
Manifest ID:	23758528
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	D/K ENVIRONMENTAL
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	- Not reported
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	Not reported
Waste Quantity:	Not reported
Quantity Unit:	Not reported
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20050113
Creation Date:	6/3/2005 18:31:06
Receipt Date:	20050113
Manifest ID:	24101610
Trans EPA ID:	CAD008252405
Trans Name:	PACIFIC COAST LACQUER
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD008252405
Trans Name:	PACIFIC RESOURCE RECOVERY
TSDF Alt EPA ID:	CAD008252405
TSDF Alt Name:	Not reported
Waste Code Description:	214 - Unspecified solvent mixture
RCRA Code:	D001
Meth Code:	R01 - Recycler
Quantity Tons:	0.0504
Waste Quantity:	14
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	2004
Gen EPA ID:	CAD983599861
Shipment Date:	20041221
Creation Date:	3/17/2005 18:34:39
Receipt Date:	20041230
Manifest ID:	23758509
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	D/K ENVIRONMENTAL
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	221 - Waste oil and mixed oil
RCRA Code:	NONE
Meth Code:	R01 - Recycler
Quantity Tons:	0.38
Waste Quantity:	100
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20041221
Creation Date:	3/17/2005 18:34:39

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Receipt Date:	20041230
Manifest ID:	23758509
Trans EPA ID:	CAT080012800
Trans Name:	HAZ MAT TRANS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	D/K ENVIRONMENTAL
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	NONE
Meth Code:	R01 - Recycler
Quantity Tons:	1
Waste Quantity:	2000
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	2002
Gen EPA ID:	CAD983599861
Shipment Date:	20020117
Creation Date:	3/7/2002 0:00:00
Receipt Date:	20020117
Manifest ID:	21416034
Trans EPA ID:	CAD008252405
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD008252405
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD008252405
TSDF Alt Name:	Not reported
Waste Code Description:	214 - Unspecified solvent mixture
RCRA Code:	D001
Meth Code:	R01 - Recycler
Quantity Tons:	0.0576
Waste Quantity:	16
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	2001
Gen EPA ID:	CAD983599861
Shipment Date:	20010801
Creation Date:	10/1/2001 0:00:00

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Receipt Date:	20010803
Manifest ID:	21107784
Trans EPA ID:	SCR000075150
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT000613893
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	134 - Aqueous solution with <10% total organic residues
RCRA Code:	D039
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.0546
Waste Quantity:	13
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20010320
Creation Date:	5/16/2001 0:00:00
Receipt Date:	20010327
Manifest ID:	20620133
Trans EPA ID:	SCR000075150
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT000613893
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	134 - Aqueous solution with <10% total organic residues
RCRA Code:	D039
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.0672
Waste Quantity:	16
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20010103
Creation Date:	3/22/2001 0:00:00
Receipt Date:	20010103
Manifest ID:	20609939
Trans EPA ID:	CAD008252405
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD008252405
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD008252405

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

TSDF Alt Name:	Not reported
Waste Code Description:	214 - Unspecified solvent mixture
RCRA Code:	D001
Meth Code:	R01 - Recycler
Quantity Tons:	0.054
Waste Quantity:	15
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	2000
Gen EPA ID:	CAD983599861
Shipment Date:	20001228
Creation Date:	3/22/2001 0:00:00
Receipt Date:	20001228
Manifest ID:	20608713
Trans EPA ID:	CAD008252405
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD008252405
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD008252405
TSDF Alt Name:	Not reported
Waste Code Description:	214 - Unspecified solvent mixture
RCRA Code:	D001
Meth Code:	R01 - Recycler
Quantity Tons:	0.054
Waste Quantity:	15
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20000803
Creation Date:	9/25/2000 0:00:00
Receipt Date:	20000808
Manifest ID:	99705289
Trans EPA ID:	CAT080012800
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	241 - Tank bottom waste 251 Still bottoms with halogenated organics
RCRA Code:	Not reported
Meth Code:	T01 - Treatment, Tank
Quantity Tons:	1.251

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Waste Quantity:	300
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	1998
Gen EPA ID:	CAD983599861
Shipment Date:	19981029
Creation Date:	1/13/1999 0:00:00
Receipt Date:	19981029
Manifest ID:	98118004
Trans EPA ID:	CAT080012800
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080013352
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	241 - Tank bottom waste 251 Still bottoms with halogenated organics
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	1.251
Waste Quantity:	300
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	19980807
Creation Date:	10/1/1998 0:00:00
Receipt Date:	19980814
Manifest ID:	98185869
Trans EPA ID:	ILD984908202
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT000613893
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT000613893
TSDF Alt Name:	Not reported
Waste Code Description:	134 - Aqueous solution with <10% total organic residues
RCRA Code:	D006
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.042
Waste Quantity:	10
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	19980416
Creation Date:	6/26/1998 0:00:00
Receipt Date:	19980416
Manifest ID:	98252461
Trans EPA ID:	CAD008252405
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD008252405
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD008252405
TSDF Alt Name:	Not reported
Waste Code Description:	214 - Unspecified solvent mixture
RCRA Code:	D001
Meth Code:	R01 - Recycler
Quantity Tons:	0.36
Waste Quantity:	100
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	1997
Gen EPA ID:	CAD983599861
Shipment Date:	19970414
Creation Date:	6/26/1997 0:00:00
Receipt Date:	19970415
Manifest ID:	96201795
Trans EPA ID:	CAT080012800
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080013352
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	241 - Tank bottom waste 251 Still bottoms with halogenated organics
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	1.3552
Waste Quantity:	325
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Year:	1995
Gen EPA ID:	CAD983599861
Shipment Date:	19950908
Creation Date:	4/1/1996 0:00:00
Receipt Date:	19950913
Manifest ID:	95409230
Trans EPA ID:	CAT080012800
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD980883177
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	241 - Tank bottom waste 251 Still bottoms with halogenated organics
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	1.1467
Waste Quantity:	275
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	1994
Gen EPA ID:	CAD983599861
Shipment Date:	19940616
Creation Date:	10/10/1995 0:00:00
Receipt Date:	19940617
Manifest ID:	92662327
Trans EPA ID:	CAT080012800
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD980883177
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	241 - Tank bottom waste 251 Still bottoms with halogenated organics
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	1.0425
Waste Quantity:	250
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	19940423
Creation Date:	10/5/1995 0:00:00

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

Receipt Date:	19940325
Manifest ID:	92662204
Trans EPA ID:	CAT080012800
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD980883177
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	241 - Tank bottom waste 251 Still bottoms with halogenated organics
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	2.085
Waste Quantity:	500
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

San Bern. Co. Permit:

Name:	LARRY JACINTO CONST
Address:	988 WABASH
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0004383
Owner:	LARRY JACINTO
Permit Number:	PT0004682
Permit Category:	HAZMAT HANDLER 11-25 EMPLOYEES
Facility Status:	INACTIVE
Expiration Date:	09/30/2006

Name:	LARRY JACINTO CONST
Address:	988 WABASH
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0004383
Owner:	LARRY JACINTO
Permit Number:	PT0016112
Permit Category:	ABOVEGROUND PETROLEUM STORAGE (AST) (SPCC)
Facility Status:	INACTIVE
Expiration Date:	09/30/2006

Name:	LARRY JACINTO CONST
Address:	988 WABASH
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0004383
Owner:	LARRY JACINTO
Permit Number:	PT0004683
Permit Category:	SPECIAL GENERATOR
Facility Status:	INACTIVE
Expiration Date:	09/30/2006

LARRY JACINTO CONSTRUCTION INC (Continued) **1000596027**

HWTS:

Name:	LARRY JACINTO CONSTRUCTION INC
Address:	988 WABASH
Address 2:	Not reported
City,State,Zip:	MENTONE, CA 92359
EPA ID:	CAD983599861
Inactive Date:	06/30/2006
Create Date:	08/08/1991
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	PO BOX 615
Mailing Address 2:	Not reported
Mailing City,State,Zip:	MENTONE, CA 923590615
Owner Name:	LARRY JACINTO
Owner Address:	PO BOX 615
Owner Address 2:	Not reported
Owner City,State,Zip:	MENTONE, CA 923590000
Contact Name:	STEVE@LJACINTO.COM
Contact Address:	PO BOX 615
Contact Address 2:	Not reported
City,State,Zip:	MENTONE, CA 923590000
Facility Status:	Inactive
Facility Type:	PERMANENT
Category:	FEDERAL
Latitude:	34.075008
Longitude:	-117.138851

NAICS:

EPA ID:	CAD983599861
Create Date:	2002-03-14 16:36:27.000
NAICS Code:	23593
NAICS Description:	Excavation Contractors
Issued EPA ID Date:	1991-08-08 00:00:00
Inactive Date:	2006-06-30 00:00:00
Facility Name:	LARRY JACINTO CONSTRUCTION INC
Facility Address:	988 WABASH
Facility Address 2:	Not reported
Facility City:	MENTONE
Facility County:	Not reported
Facility State:	CA
Facility Zip:	923590000

B4 **LORAN INC** **PFAS ECHO** **1027383018**
SE **N/A**
< 1/8 **REDLANDS, CA**
0.037 mi.
194 ft. **Site 1 of 6 in cluster B**

Relative:
Higher

Actual:
1621 ft.

PFAS ECHO:

Name:	LORAN INC
Address:	Not reported
City,State,Zip:	REDLANDS, CA
Latitude:	34.06284
Longitude:	-117.13854
Count:	1
County:	SAN BERNARDINO
Status:	Active

LORAN INC (Continued) **1027383018**

Region:	09
Industry:	Electronics Industry
ECHO Facility Report:	https://echo.epa.gov/detailed-facility-report?fid=110008061881
Facility Percent Minority:	46.775
Facility Derived Tribes:	San Manuel Band of Mission Indians, California - 6.8 mile(s), San Manuel Band of Mission Indians, California - 7.2 mile(s), Morongo Band of Mission Indians, California - 14.8 mile(s), Soboba Band of Luiseno Indians, California - 20.9 mile(s), Soboba Band
Facility Population:	2080.57
EPA Programs:	RCRA
Federal Facility:	No
Federal Agency:	-
Facility FIPS Code:	06071
Facility Indian Country Flag:	N
Facility Collection Method:	ADDRESS MATCHING-HOUSE NUMBER
Facility Derived HUC:	18070203
Facility Derived WBD:	180702030506
Facility Derived CD113:	08
Facility Derived CB2010:	060710086012004
Facility Major Flag:	-
Facility Active Flag:	Y
Facility Inspection Count:	0
Facility Date Last Inspection:	-
Facility Days Last Inspection:	-
Facility Informal Count:	0
Facility Date Last Informal Action:	-
Facility Formal Action Count:	0
Facility Date Last Formal Action:	-
Facility Total Penalties:	0
Facility Penalty Count:	-
Facility Date Last Penalty:	-
Facility Last Penalty AMT:	-
Facility QTRS With NC:	0
Facility Programs With SNC:	0
Facility Compliance Status:	No Violation Identified
Facility SNC Flag:	N
AIR Flag:	N
NPDES Flag:	N
SDWIS Flag:	N
RCRA Flag:	Y
TRI Flag:	N
GHG Flag:	N
AIR IDS:	-
CAA Permit Types:	-
CAA NAICS:	-
CAA SICS:	-
NPDES IDS:	-
CWA Permit Types:	-
CWA NAICS:	-
CWA SICS:	-
RCRA IDS:	CAD982517419
RCRA Permit Types:	SQG
RCRA NAICS:	335121
SDWA IDS:	-
SDWA System Types:	-
SDWA Compliance Status:	-
SDWA SNC Flag:	N

LORAN INC (Continued) **1027383018**

TRI IDS:	92374LRNNC1705E
TRI Releases Transfers:	-
TRI On Site Releases:	-
TRI Off Site Transfers:	-
TRI Reporter:	-
Facility IMP Water Flag:	-
EJSCREEN Flag US:	Y
EJSCREEN Report:	https://ejscreen.epa.gov/mapper/mobile/EJSCREEN_mobile.aspx?geometry=%7B%22x%22:-117.13854,%22y%22:34.06284,%22spatialReference%22:%7B%22wkid%22:4326%7D%7D&unit=9035&areatype=&areaid=&basemap=streets&distance=1

B5 **LORAN INC** **RCRA-SQG** **1000150500**
ESE **1705 EAST COLTON ANENUE** **San Bern. Co. Permit** **CAD982517419**
< 1/8 **REDLANDS, CA 92373** **CERS**
0.055 mi.
292 ft. **Site 2 of 6 in cluster B**

Relative: **Higher**
Actual: **1623 ft.**

RCRA Listings:

Date Form Received by Agency:	19960901
Handler Name:	Loran Inc
Handler Address:	1705 EAST COLTON ANENUE
Handler City,State,Zip:	REDLANDS, CA 92373
EPA ID:	CAD982517419
Contact Name:	Not reported
Contact Address:	Not reported
Contact City,State,Zip:	Not reported
Contact Telephone:	Not reported
Contact Fax:	Not reported
Contact Email:	Not reported
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Small Quantity Generator
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	CA
State District:	4
Mailing Address:	1705 EAST COLTON AVENUE
Mailing City,State,Zip:	REDLANDS, CA 92373
Owner Name:	Not reported
Owner Type:	Not reported
Operator Name:	Not Required
Operator Type:	Private
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No

LORAN INC (Continued) **1000150500**

Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	NN
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20020627
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	Not reported
Manifest Broker:	Not reported
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: LOCKLIN WILLIAM	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	NOT REQUIRED
Owner/Operator City,State,Zip:	NOT REQUIRED, ME 99999
Owner/Operator Telephone:	415-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name: NOT REQUIRED	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	NOT REQUIRED
Owner/Operator City,State,Zip:	NOT REQUIRED, ME 99999
Owner/Operator Telephone:	415-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	19960901

LORAN INC (Continued) **1000150500**

Handler Name: LORAN INC
Federal Waste Generator Description: Small Quantity Generator
State District Owner: CA
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

Receive Date: 19890308
Handler Name: LORAN INC
Federal Waste Generator Description: Large Quantity Generator
State District Owner: CA
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: No
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 335121
NAICS Description: RESIDENTIAL ELECTRIC LIGHTING FIXTURE MANUFACTURING

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

San Bern. Co. Permit:
Name: LORAN, INC
Address: 1705 E COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Region: SAN BERNARDINO
Facility ID: FA0004481
Owner: LOCKLIN, WILLIAM J.
Permit Number: PT0014029
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: INACTIVE
Expiration Date: 11/30/2014

Name: LORAN, INC
Address: 1705 E COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Region: SAN BERNARDINO
Facility ID: FA0004481
Owner: LOCKLIN, WILLIAM J.
Permit Number: PT0004034

LORAN INC (Continued) **1000150500**

Permit Category: HAZARDOUS MATERIALS 4-10 CHEMICALS
Facility Status: INACTIVE
Expiration Date: 11/30/2014

CERS:
Name: LORAN, INC
Address: 1705 E COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Site ID: 131329
CERS ID: 92374LRNNC1705E
CERS Description: Toxic Release Inventory

Affiliation:
Affiliation Type Desc: Company Official
Entity Name: April Goodrich
Entity Title: Project Maneger
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: 92374
Affiliation Phone: ,

Affiliation Type Desc: Public Contact
Entity Name: April Goodrich
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: 92374
Affiliation Phone: 9516580114,

Affiliation Type Desc: Technical Contact
Entity Name: GEM
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: 92374
Affiliation Phone: 9516580114,

B6 **C AND S POWDER COATING** **RCRA NonGen / NLR** **1027070452**
ESE **1717 E COLTON AVE** **CAC003141905**
< 1/8 **REDLANDS, CA 92374**
0.085 mi.
451 ft. **Site 3 of 6 in cluster B**

Relative:
Higher

Actual:
1628 ft.

RCRA Listings:
Date Form Received by Agency: 20160510
Handler Name: C And S Powder Coating
Handler Address: 1717 E COLTON AVE
Handler City,State,Zip: REDLANDS, CA 92374-4917
EPA ID: CAL000416928
Contact Name: SCOTT REEVES
Contact Address: 1717 E COLTON AVE

C AND S POWDER COATING (Continued) **1027070452**

Contact City,State,Zip:	REDLANDS, CA 92359
Contact Telephone:	909-557-3291
Contact Fax:	909-794-1969
Contact Email:	CANDSPOWDERCOATING@GMAIL.COM
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	1717 E COLTON AVE
Mailing City,State,Zip:	REDLANDS, CA 92374-4917
Owner Name:	Scott Reeves
Owner Type:	Other
Operator Name:	Scott Reeves
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20220425
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No

C AND S POWDER COATING (Continued) **1027070452**

Recycler Activity Without Storage: No
Manifest Broker: No
Sub-Part P Indicator: No

Handler - Owner Operator:
Owner/Operator Indicator: Operator
Owner/Operator Name: SCOTT REEVES
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 1717 E COLTON AVE
Owner/Operator City,State,Zip: REDLANDS, CA 92359
Owner/Operator Telephone: 909-557-3291
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: SCOTT REEVES
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 9320 GARNET ST
Owner/Operator City,State,Zip: MENTONE, CA 92359-9733
Owner/Operator Telephone: 909-735-2488
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20160510
Handler Name: C AND S POWDER COATING
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: Not reported
Recognized Trader Exporter: Not reported
Spent Lead Acid Battery Importer: Not reported
Spent Lead Acid Battery Exporter: Not reported
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

B7 **C AND S POWDER COATING** **CERS HAZ WASTE** **S126109519**
ESE **1717 E COLTON AVE** **HAZNET** **N/A**
< 1/8 **REDLANDS, CA 92374** **San Bern. Co. Permit**
0.085 mi. **CERS**
451 ft. **Site 4 of 6 in cluster B** **HWTS**

Relative: Higher

Actual: 1628 ft.

CERS HAZ WASTE:
Name: C AND S POWDER COATING
Address: 1717 E COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Site ID: 612137
CERS ID: 10897195
CERS Description: Hazardous Waste Generator

HAZNET:
Name: C AND S POWDER COATING
Address: 1717 E COLTON AVE
Address 2: Not reported
City,State,Zip: REDLANDS, CA 923744917
Contact: SCOTT REEVES
Telephone: 9095573291
Mailing Name: Not reported
Mailing Address: 1717 E COLTON AVE

Year: 2016
Gepaid: CAL000416928
TSD EPA ID: CAD044429835
CA Waste Code: 181 - Other inorganic solid waste
Disposal Method: H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.6

San Bern. Co. Permit:
Name: C AND S POWDER COATING
Address: 1717 E COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Region: SAN BERNARDINO
Facility ID: FA0019353
Owner: SCOTT REEVES
Permit Number: PT0041467
Permit Category: CONDITIONALLY EXEMPT SM QTY GENERATOR
Facility Status: ACTIVE
Expiration Date: 08/31/2023

Name: C AND S POWDER COATING
Address: 1717 E COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Region: SAN BERNARDINO
Facility ID: FA0019353
Owner: SCOTT REEVES
Permit Number: PT0041466
Permit Category: HAZARDOUS MATERIALS 1-3 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 08/31/2023

CERS:
Name: C AND S POWDER COATING

C AND S POWDER COATING (Continued) **S126109519**

Address: 1717 E COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Site ID: 612137
CERS ID: 10897195
CERS Description: Chemical Storage Facilities

Affiliation:
Affiliation Type Desc: Environmental Contact
Entity Name: scott reeves
Entity Title: Not reported
Affiliation Address: 1717 E Colton Ave
Affiliation City: Redlands
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92374-497
Affiliation Phone: ,

Affiliation Type Desc: Identification Signer
Entity Name: scott reeves
Entity Title: owner
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Parent Corporation
Entity Name: C and S Powder Coating
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Document Preparer
Entity Name: scott reeves
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Operator
Entity Name: C and S Powder Coating
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (909) 735-2488,

Affiliation Type Desc: Property Owner

C AND S POWDER COATING (Continued) **S126109519**

Entity Name:	John Whittam
Entity Title:	Not reported
Affiliation Address:	1717 E Colton Ave
Affiliation City:	Redlands
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92374
Affiliation Phone:	(909) 478-4812,
Affiliation Type Desc:	CUPA District
Entity Name:	San Bernardino County Fire
Entity Title:	Not reported
Affiliation Address:	620 South E Street
Affiliation City:	San Bernardino
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92415-0153
Affiliation Phone:	(909) 386-8401,
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	1717 E Colton Ave
Affiliation City:	Redlands
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92374-4971
Affiliation Phone:	,
Affiliation Type Desc:	Legal Owner
Entity Name:	Scott Reeves
Entity Title:	Not reported
Affiliation Address:	1717 E Colton Ave
Affiliation City:	Redlands
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	923740000
Affiliation Phone:	(909) 735-2488,

HWTS:

Name:	C AND S POWDER COATING
Address:	1717 E COLTON AVE
Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 92374
EPA ID:	CAC003141905
Inactive Date:	01/03/2022
Create Date:	10/04/2021
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	1717 E COLTON AVE
Mailing Address 2:	Not reported
Mailing City,State,Zip:	REDLANDS, CA 92374
Owner Name:	SCOTT REEVES
Owner Address:	1717 E COLTON AVE
Owner Address 2:	Not reported
Owner City,State,Zip:	REDLANDS, CA 92374

C AND S POWDER COATING (Continued) **S126109519**

Contact Name:	SCOTT REEVES
Contact Address:	1717 E COLTON AVE
Contact Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 92374
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	34.06317801
Longitude:	-117.13716402

B8 **SWAIN OIL TRANSPORT, DBA VISTA ENERGY TRANSPORT** **RCRA NonGen / NLR** **1025844352**
ESE **1717B E. COLTON AVE** **CAC003023970**
< 1/8 **REDLANDS, CA 92374**
0.086 mi.
452 ft. **Site 5 of 6 in cluster B**

Relative: **Higher**

Actual: **1628 ft.**

RCRA Listings:

Date Form Received by Agency:	20190715
Handler Name:	Swain Oil Transport, Dba Vista Energy Transport
Handler Address:	1717B E. COLTON AVE
Handler City,State,Zip:	REDLANDS, CA 92374
EPA ID:	CAC003023970
Contact Name:	WAYNE YAZELL
Contact Address:	1717B E. COLTON AVE
Contact City,State,Zip:	REDLANDS, CA 92374
Contact Telephone:	909-200-6150
Contact Fax:	Not reported
Contact Email:	WAYNE@VISTAENERGYTRANS.COM
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	10951 SAN DIEGO MISSON RD
Mailing City,State,Zip:	BLOOMINGTON, CA 92336
Owner Name:	Ipc Usa
Owner Type:	Other
Operator Name:	Wayne Yazell
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	Yes
Universal Waste Destination Facility:	Yes
Federal Universal Waste:	No
Active Site State-Reg Handler:	---

SWAIN OIL TRANSPORT, DBA VISTA ENERGY TRANSPORT (Continued) **1025844352**

Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20190729
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: IPC USA	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	10951 SAN DIEGO MISSON RD
Owner/Operator City,State,Zip:	BLOOMINGTON, CA 92336
Owner/Operator Telephone:	760-607-0245
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name: WAYNE YAZELL	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1717B E. COLTON AVE
Owner/Operator City,State,Zip:	REDLANDS, CA 92374
Owner/Operator Telephone:	909-200-6150
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20190715
Handler Name:	SWAIN OIL TRANSPORT, DBA VISTA ENERGY TRANSPORT

SWAIN OIL TRANSPORT, DBA VISTA ENERGY TRANSPORT (Continued) **1025844352**

Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:

NAICS Code:	484210
NAICS Description:	USED HOUSEHOLD AND OFFICE GOODS MOVING

Facility Has Received Notices of Violations:

Violations:	No Violations Found

Evaluation Action Summary:

Evaluations:	No Evaluations Found

B9 **SWAIN OIL TRANSPORT, DBA: VISTA ENERGY TRANSPORT** **RCRA NonGen / NLR** **1024760065**
ESE **1717B EAST COLTON AVENUE** **CAC002979917**
< 1/8 **REDLANDS, CA 92374**
0.086 mi.
452 ft. **Site 6 of 6 in cluster B**

Relative: **Higher**

Actual: **1628 ft.**

RCRA Listings:

Date Form Received by Agency:	20180912
Handler Name:	Swain Oil Transport, Dba: Vista Energy Transport
Handler Address:	1717B EAST COLTON AVENUE
Handler City,State,Zip:	REDLANDS, CA 92374
EPA ID:	CAC002979917
Contact Name:	TODD HIXON
Contact Address:	10981 SAN DIEGO MISSION RD
Contact City,State,Zip:	SAN DIEGO, CA 92108
Contact Telephone:	619-250-1490
Contact Fax:	760-607-0247
Contact Email:	TODD@VISTAENERGYTRANS.COM
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	10981 SAN DIEGO MISSION RD
Mailing City,State,Zip:	SAN DIEGO, CA 92108
Owner Name:	Wayne Yazell
Owner Type:	Other
Operator Name:	Todd Hixon
Operator Type:	Other

SWAIN OIL TRANSPORT, DBA: VISTA ENERGY TRANSPORT (Continued) **1024760065**

Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	Yes
Universal Waste Destination Facility:	Yes
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20181001
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: WAYNE YAZELL	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	10981 SAN DIEGO MISSION RD
Owner/Operator City,State,Zip:	SAN DIEGO, CA 92108
Owner/Operator Telephone:	909-200-6150
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Operator
Owner/Operator Name: TODD HIXON	

SWAIN OIL TRANSPORT, DBA: VISTA ENERGY TRANSPORT (Continued) **1024760065**

Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	10981 SAN DIEGO MISSION RD
Owner/Operator City,State,Zip:	SAN DIEGO, CA 92108
Owner/Operator Telephone:	619-250-1490
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20180912
Handler Name:	SWAIN OIL TRANSPORT, DBA: VISTA ENERGY TRANSPORT
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:

NAICS Code:	486110
NAICS Description:	PIPELINE TRANSPORTATION OF CRUDE OIL

Facility Has Received Notices of Violations:

Violations:	No Violations Found

Evaluation Action Summary:

Evaluations:	No Evaluations Found

C10 **LARRY JACINTO CONSTRUCTION INC** **US MINES** **1011130952**
NNE **N/A**
< 1/8 **SAN BERNARDINO (County), CA**
0.099 mi.
523 ft. **Site 1 of 2 in cluster C**

Relative:
Higher

Actual:
1619 ft.

US MINES:

Sic Code(s):	142900
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	0405529
Entity Name:	TEXAS ROCK PLANT
Company:	LARRY JACINTO CONSTRUCTION INC
Status:	Permanently Abandoned
Status Date:	20100519
Operation Class:	2
Number of Shops:	0
Number of Plants:	0

LARRY JACINTO CONSTRUCTION INC (Continued) **1011130952**

Latitude Degree:	34
Longitude Degree:	117
Latitude Minute:	03
Latitude Seconds:	58
Longitude Minutes:	08
Longitude Seconds:	19
Number of Pits:	000

C11 **TEXAS ROCK PLANT** **US MINES** **1024906826**
NNE **988 WABASH** **ABANDONED MINES** **N/A**
< 1/8 **MENTONE, CA 92359**
0.116 mi.
610 ft. **Site 2 of 2 in cluster C**

Relative:
Higher

Actual:
1616 ft.

MINES VIOLATIONS:

Name:	TEXAS ROCK PLANT
Address:	988 WABASH
City,State,Zip:	MENTONE, CA 92359
Facility ID:	Not reported

MINES VIOLATIONS:

Violation Number:	7997479
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	02/06/2003
Action Type:	104(a)
Type of Issue:	Citation
S and S:	Y
Term Date:	02/07/2003
Title 30 Code of Federal Regulations:	56.3131
Proposed Penalty:	66
Assessment Amount:	66
Paid Penalty Amount:	66
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2003
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO

Violation Number:	6380896
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	02/13/2006
Action Type:	104(a)

TEXAS ROCK PLANT (Continued) **1024906826**

Type of Issue:	Citation
S and S:	N
Term Date:	02/14/2006
Title 30 Code of Federal Regulations:	56.14107(a)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2006
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO

Violation Number:	8555203
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	10/29/2009
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	10/29/2009
Title 30 Code of Federal Regulations:	56.1000
Proposed Penalty:	100.00
Assessment Amount:	100.00
Paid Penalty Amount:	100.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2009
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA

TEXAS ROCK PLANT (Continued) **1024906826**

County:	SAN BERNARDINO
Violation Number:	6364205
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	04/01/2004
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	04/01/2004
Title 30 Code of Federal Regulations:	56.1000
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2004
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO
Violation Number:	6376664
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	05/31/2005
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	06/02/2005
Title 30 Code of Federal Regulations:	56.14132(b)(1)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2005
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto

TEXAS ROCK PLANT (Continued) **1024906826**

Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO
Violation Number:	6376658
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	05/31/2005
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	05/31/2005
Title 30 Code of Federal Regulations:	56.4201(a)(2)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2005
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO
Violation Number:	6376659
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	05/31/2005
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	06/02/2005
Title 30 Code of Federal Regulations:	56.14130(c)(1)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2005
Address Type:	MineLocation

TEXAS ROCK PLANT (Continued) **1024906826**

PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO
Violation Number:	6376660
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	05/31/2005
Action Type:	104(a)
Type of Issue:	Citation
S and S:	Y
Term Date:	06/01/2005
Title 30 Code of Federal Regulations:	56.14107(a)
Proposed Penalty:	114.00
Assessment Amount:	114.00
Paid Penalty Amount:	114.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2005
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO
Violation Number:	6376661
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	05/31/2005
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	06/01/2005
Title 30 Code of Federal Regulations:	50.30(a)

TEXAS ROCK PLANT (Continued) **1024906826**

Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2005
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO

Violation Number:	6376662
Mine ID:	0405529
Contractor ID:	Not reported
Date Issued:	05/31/2005
Action Type:	104(a)
Type of Issue:	Citation
S and S:	Y
Term Date:	05/31/2005
Title 30 Code of Federal Regulations:	56.18002(b)
Proposed Penalty:	165.00
Assessment Amount:	165.00
Paid Penalty Amount:	165.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2005
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO

Violation Number:	6376663
Mine ID:	0405529

TEXAS ROCK PLANT (Continued) **1024906826**

Contractor ID:	Not reported
Date Issued:	05/31/2005
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	06/02/2005
Title 30 Code of Federal Regulations:	56.14132(a)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2005
Address Type:	MineLocation
PO Box:	Not reported
Address:	988 WABASH
City:	MENTONE
State:	CA
Operator:	Larry Jacinto Construction Inc
Zip:	92359
Mine Controller Name:	Larry Jacinto
Name:	TEXAS ROCK PLANT
Ownership Date:	07/22/2002
Mine Status:	Abandoned
Status Date:	05/19/2010
Primary Site Description:	Crushed, Broken Stone NEC
Mine Type:	Surface
State 2:	CA
County:	SAN BERNARDINO

Click this hyperlink while viewing on your computer to access
1 additional US_MINES_VIOLATIONS: record(s) in the EDR Site Report.

ABANDONED MINES:

Mine ID:	0405529
Mine Name:	TEXAS ROCK PLANT
Mine Address:	988 WABASH
City,State,Zip:	MENTONE, CA 92359
Primary SIC Code:	Crushed, Broken Stone NEC
Mine Type:	Surface
Mine Status Description:	Abandoned
Mine Status Date:	5/19/2010
Coal (C) or Metal (M) Mine:	M
Controller ID:	0040895
Controller Name:	Larry Jacinto
Operator ID:	0050531
Operator name:	Larry Jacinto Construction Inc
Address of Record Street:	2226 Mentone Blvd
Address of Record PO Box:	Not reported
Address of Record City:	Mentone
Address of Record State:	CA
Address of Record Zip Code:	92359
Assessment Address Street:	2226 Mentone Blvd
Assessment Address PO Box:	Not reported
Assessment Address City:	MENTONE
Assessment Address State:	CA

TEXAS ROCK PLANT (Continued) **1024906826**

Assessment Address Zip Code:	92359
Mine Health and Safety Address Street:	Not reported
Mine Health and Safety Address PO Box:	615
Mine Health and Safety Address City:	Mentone
Mine Health and Safety Address State:	CA
Mine Health and Safety Address Zip Code:	Not reported
Latitude:	34.066388
Longitude:	-117.138888

D12 **PACIFIC BEND INC** **RCRA NonGen / NLR** **1026491968**
ESE **1700 E COLTON AVE** **CAL000456739**
< 1/8 **REDLANDS, CA 92374**
0.120 mi.
636 ft. **Site 1 of 2 in cluster D**

Relative: **Higher**

Actual: **1632 ft.**

RCRA Listings:

Date Form Received by Agency:	20200914
Handler Name:	Pacific Bend Inc
Handler Address:	1700 E COLTON AVE
Handler City,State,Zip:	REDLANDS, CA 92374
EPA ID:	CAL000456739
Contact Name:	JOHN WINTERSWYK
Contact Address:	1700 E COLTON AVE
Contact City,State,Zip:	REDLANDS, CA 92374
Contact Telephone:	909-276-9250
Contact Fax:	Not reported
Contact Email:	TEDDY@PACIFICBENDINC.COM
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	1700 E COLTON AVE
Mailing City,State,Zip:	REDLANDS, CA 92374
Owner Name:	Pacific Bend Inc
Owner Type:	Other
Operator Name:	John Winterswyk
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported

PACIFIC BEND INC (Continued) **1026491968**

Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20200920
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: PACIFIC BEND INC	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1700 E COLTON AVE
Owner/Operator City,State,Zip:	REDLANDS, CA 92374
Owner/Operator Telephone:	909-793-5914
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name: JOHN WINTERSWYK	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1700 E COLTON AVE
Owner/Operator City,State,Zip:	REDLANDS, CA 92374
Owner/Operator Telephone:	909-276-9250
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20200914
Handler Name: PACIFIC BEND INC	
Federal Waste Generator Description:	Not a generator, verified

PACIFIC BEND INC (Continued) **1026491968**

State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 337215
NAICS Description: SHOWCASE, PARTITION, SHELVING, AND LOCKER MANUFACTURING

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

D13 **PACIFIC BEND INC** **RCRA NonGen / NLR** **1026491617**
ESE **1700 E COLTON AVE** **CAL000456374**
< 1/8 **SAN BERNARDINO, CA 92374**
0.120 mi.
636 ft. **Site 2 of 2 in cluster D**

Relative:
Higher

Actual:
1632 ft.

RCRA Listings:
Date Form Received by Agency: 20200820
Handler Name: Pacific Bend Inc
Handler Address: 1700 E COLTON AVE
Handler City,State,Zip: SAN BERNARDINO, CA 92374
EPA ID: CAL000456374
Contact Name: JOHN WINTERSWYK
Contact Address: 1700 E COLTON AVE
Contact City,State,Zip: SAN BERNARDINO, CA 92374
Contact Telephone: 909-276-9250
Contact Fax: Not reported
Contact Email: TEDDY@PACIFICBENDINC.COM
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: Not reported
State District: Not reported
Mailing Address: 1700 E COLTON AVE
Mailing City,State,Zip: SAN BERNARDINO, CA 92374
Owner Name: Pacific Bend Inc
Owner Type: Other
Operator Name: John Winterswyk
Operator Type: Other
Short-Term Generator Activity: No

PACIFIC BEND INC (Continued) **1026491617**

Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20200904
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: PACIFIC BEND INC	
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1700 E COLTON AVE
Owner/Operator City,State,Zip:	SAN BERNARDINO, CA 92374
Owner/Operator Telephone:	909-793-5914
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Operator
Owner/Operator Name: JOHN WINTERSWYK	
Legal Status:	Other

PACIFIC BEND INC (Continued) **1026491617**

Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1700 E COLTON AVE
Owner/Operator City,State,Zip:	SAN BERNARDINO, CA 92374
Owner/Operator Telephone:	909-276-9250
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20200820
Handler Name: PACIFIC BEND INC	
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:

NAICS Code:	337215
NAICS Description:	SHOWCASE, PARTITION, SHELVING, AND LOCKER MANUFACTURING

Facility Has Received Notices of Violations:

Violations:	No Violations Found

Evaluation Action Summary:

Evaluations:	No Evaluations Found

E14 **PAUL HALL TRUCKING** **RCRA NonGen / NLR** **1012176066**
NE **1756 NICE AVE** **CAR000199067**
1/8-1/4 **MENTONE, CA 92359**
0.149 mi.
788 ft. **Site 1 of 2 in cluster E**

Relative:
Higher

Actual:
1627 ft.

RCRA Listings:

Date Form Received by Agency:	20090302
Handler Name:	Paul Hall Trucking
Handler Address:	1756 NICE AVE
Handler City,State,Zip:	MENTONE, CA 92359
EPA ID:	CAR000199067
Contact Name:	BRENT M HALL
Contact Address:	PO BOX 218
Contact City,State,Zip:	MENTONE, CA 92359
Contact Telephone:	714-624-8188
Contact Fax:	Not reported
Contact Email:	HALL_BRENT@SBCGLOBAL.NET
Contact Title:	Not reported
EPA Region:	09
Land Type:	Private
Federal Waste Generator Description:	Not a generator, verified

PAUL HALL TRUCKING (Continued) **1012176066**

Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	PO BOX 218
Mailing City,State,Zip:	MENTONE, CA 92359
Owner Name:	Paul Hall
Owner Type:	Private
Operator Name:	Paul Hall Trucking
Operator Type:	Private
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	Yes
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	NN
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20090302
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	Not reported
Manifest Broker:	Not reported
Sub-Part P Indicator:	No

Handler - Owner Operator:
Owner/Operator Indicator: Owner
Owner/Operator Name: PAUL HALL

PAUL HALL TRUCKING (Continued) **1012176066**

Legal Status:	Private
Date Became Current:	19611201
Date Ended Current:	Not reported
Owner/Operator Address:	PO BOX 218
Owner/Operator City,State,Zip:	MENTONE, CA 92359
Owner/Operator Telephone:	Not reported
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported
Owner/Operator Indicator:	Operator
Owner/Operator Name: PAUL HALL TRUCKING	
Legal Status:	Private
Date Became Current:	19611201
Date Ended Current:	Not reported
Owner/Operator Address:	Not reported
Owner/Operator City,State,Zip:	Not reported
Owner/Operator Telephone:	Not reported
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20090302
Handler Name: PAUL HALL TRUCKING	
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:

NAICS Code:	562111
NAICS Description:	SOLID WASTE COLLECTION

Facility Has Received Notices of Violations:

Violations:	No Violations Found

Evaluation Action Summary:

Evaluations:	No Evaluations Found

E15 **AT&T MOBILITY - HWY 38 WABASH - (USID26350)** **San Bern. Co. Permit** **S106803283**
NE **1758 NICE AVE** **N/A**
1/8-1/4 **MENTONE, CA 92359**
0.151 mi.
796 ft. **Site 2 of 2 in cluster E**

Relative:
Higher

Actual:
1628 ft.

San Bern. Co. Permit:

Name:	AT&T MOBILITY - HWY 38 WABASH - (USID26350)
Address:	1758 NICE AVE
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0009010
Owner:	New Cingular Wireless PCS, LLC dba AT&T Mobility
Permit Number:	PT0015877
Permit Category:	HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL
Facility Status:	ACTIVE
Expiration Date:	09/30/2023

F16 **RICHMOND TECHNOLOGY INC.** **PFAS ECHO** **1027412945**
East **N/A**
1/8-1/4 **REDLANDS, CA**
0.185 mi.
978 ft. **Site 1 of 5 in cluster F**

Relative:
Higher

Actual:
1641 ft.

PFAS ECHO:

Name:	RICHMOND TECHNOLOGY INC.
Address:	Not reported
City,State,Zip:	REDLANDS, CA
Latitude:	34.0635
Longitude:	-117.1358
Count:	1
County:	SAN BERNARDINO
Status:	Inactive
Region:	09
Industry:	Paper Mills and Products
ECHO Facility Report:	https://echo.epa.gov/detailed-facility-report?fid=110002414085
Facility Percent Minority:	46.357
Facility Derived Tribes:	-
Facility Population:	1991.5
EPA Programs:	RCRA
Federal Facility:	No
Federal Agency:	-
Facility FIPS Code:	06071
Facility Indian Country Flag:	N
Facility Collection Method:	INTERPOLATION-MAP
Facility Derived HUC:	18070203
Facility Derived WBD:	180702030506
Facility Derived CD113:	31
Facility Derived CB2010:	060710086013016
Facility Major Flag:	-
Facility Active Flag:	-
Facility Inspection Count:	0
Facility Date Last Inspection:	-
Facility Days Last Inspection:	-
Facility Informal Count:	0
Facility Date Last Informal Action:	-
Facility Formal Action Count:	0
Facility Date Last Formal Action:	-
Facility Total Penalties:	0
Facility Penalty Count:	-

RICHMOND TECHNOLOGY INC. (Continued) **1027412945**

Facility Date Last Penalty:	-
Facility Last Penalty AMT:	-
Facility QTRS With NC:	0
Facility Programs With SNC:	0
Facility Compliance Status:	No Violation Identified
Facility SNC Flag:	N
AIR Flag:	N
NPDES Flag:	N
SDWIS Flag:	N
RCRA Flag:	Y
TRI Flag:	N
GHG Flag:	N
AIR IDS:	-
CAA Permit Types:	-
CAA NAICS:	-
CAA SICS:	-
NPDES IDS:	-
CWA Permit Types:	-
CWA NAICS:	-
CWA SICS:	-
RCRA IDS:	CAD980896161
RCRA Permit Types:	Other
RCRA NAICS:	322223
SDWA IDS:	-
SDWA System Types:	-
SDWA Compliance Status:	-
SDWA SNC Flag:	N
TRI IDS:	92373RCHMN1897C
TRI Releases Transfers:	-
TRI On Site Releases:	-
TRI Off Site Transfers:	-
TRI Reporter:	-
Facility IMP Water Flag:	-
EJSCREEN Flag US:	Y
EJSCREEN Report:	https://ejscreen.epa.gov/mapper/mobile/EJSCREEN_mobile.aspx?geometry=%7B%22x%22:-117.1358,%22y%22:34.0635,%22spatialReference%22:%7B%22wkid%22:4326%7D%7D&unit=9035&areatype=&areaid=&basemap=streets&distance=1

F17 **VINES RV & BOAT STORAGE** **HAZNET** **S112972755**
ESE **1897 E COLTON AVE** **San Bern. Co. Permit** **N/A**
1/8-1/4 **REDLANDS, CA 92374** **CERS**
0.192 mi. **HWTS**
1012 ft. **Site 2 of 5 in cluster F**

Relative: **Higher**
Actual: **1643 ft.**

HAZNET:

Name:	VINES RV & BOAT STORAGE
Address:	1897 E COLTON AVE
Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 92374
Contact:	GENEIL VINES
Telephone:	9512170962
Mailing Name:	Not reported
Mailing Address:	303 BROOKSIDE AVE
Year:	2008
Gepaid:	CAC002634281
TSD EPA ID:	CAD982444481
CA Waste Code:	181 - Other inorganic solid waste

VINES RV & BOAT STORAGE (Continued) **S112972755**

Disposal Method: H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.06

Year: 2008
Gepaid: CAC002634281
TSD EPA ID: CAD982444481
CA Waste Code: 141 - Off-specification, aged or surplus inorganics
Disposal Method: H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.4587

Year: 2008
Gepaid: CAC002634281
TSD EPA ID: CAD028409019
CA Waste Code: 141 - Off-specification, aged or surplus inorganics
Disposal Method: H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 2.85645

Year: 2008
Gepaid: CAC002634281
TSD EPA ID: CAD982444481
CA Waste Code: 221 - Waste oil and mixed oil
Disposal Method: H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.209

Year: 2008
Gepaid: CAC002634281
TSD EPA ID: CAD028409019
CA Waste Code: 212 - Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method: H061 - Fuel Blending Prior To Energy Recovery At Another Site
Tons: 0.0198

Year: 2008
Gepaid: CAC002634281
TSD EPA ID: CAD982444481
CA Waste Code: 331 - Off-specification, aged or surplus organics
Disposal Method: H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.099

Additional Info:
Year: 2008
Gen EPA ID: CAC002634281

Shipment Date: 20080905
Creation Date: 10/30/2008 18:30:18
Receipt Date: 20080908
Manifest ID: 004854157JJK
Trans EPA ID: CAR000172460
Trans Name: ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
TSDF EPA ID: CAD982444481

VINES RV & BOAT STORAGE (Continued) **S112972755**

Trans Name:	FILTER RECYCLING SERVICES INC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	221 - Waste oil and mixed oil
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.209
Waste Quantity:	55
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	10/30/2008 18:30:24
Receipt Date:	20080910
Manifest ID:	004055339JJK
Trans EPA ID:	CAR000172460
Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	CROSBY & OVERTON
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	141 - Off-specification, aged, or surplus inorganics
RCRA Code:	D002
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.22935
Waste Quantity:	55
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	10/30/2008 18:30:18
Receipt Date:	20080908
Manifest ID:	004854157JJK
Trans EPA ID:	CAR000172460
Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	FILTER RECYCLING SERVICES INC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	181 - Other inorganic solid waste Organics
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)

VINES RV & BOAT STORAGE (Continued) **S112972755**

Quantity Tons:	0.015
Waste Quantity:	30
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	10/30/2008 18:30:18
Receipt Date:	20080908
Manifest ID:	004854157JJK
Trans EPA ID:	CAR000172460
Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	FILTER RECYCLING SERVICES INC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	181 - Other inorganic solid waste Organics
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.03
Waste Quantity:	60
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	10/30/2008 18:30:18
Receipt Date:	20080908
Manifest ID:	004854158JJK
Trans EPA ID:	CAR000172460
Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	FILTER RECYCLING SERVICES INC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	181 - Other inorganic solid waste Organics
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.015
Waste Quantity:	30
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported

VINES RV & BOAT STORAGE (Continued) **S112972755**

Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	10/30/2008 18:30:18
Receipt Date:	20080908
Manifest ID:	004854158JJK
Trans EPA ID:	CAR000172460
Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	FILTER RECYCLING SERVICES INC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	141 - Off-specification, aged, or surplus inorganics
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.22935
Waste Quantity:	55
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	10/30/2008 18:30:18
Receipt Date:	20080908
Manifest ID:	004854158JJK
Trans EPA ID:	CAR000172460
Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	FILTER RECYCLING SERVICES INC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	141 - Off-specification, aged, or surplus inorganics
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.22935
Waste Quantity:	55
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	11/3/2008 18:30:08
Receipt Date:	20080910
Manifest ID:	004854159JJK
Trans EPA ID:	CAR000172460

VINES RV & BOAT STORAGE (Continued) **S112972755**

Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	CROSBY & OVERTON
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	141 - Off-specification, aged, or surplus inorganics
RCRA Code:	D002
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.7089
Waste Quantity:	170
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	11/3/2008 18:30:08
Receipt Date:	20080910
Manifest ID:	004854159JJK
Trans EPA ID:	CAR000172460
Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	CROSBY & OVERTON
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	141 - Off-specification, aged, or surplus inorganics
RCRA Code:	D002
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.4587
Waste Quantity:	110
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20080905
Creation Date:	11/3/2008 18:30:08
Receipt Date:	20080910
Manifest ID:	004854159JJK
Trans EPA ID:	CAR000172460
Trans Name:	ENVIRONMENTAL LOGISTICS INC
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	CROSBY & OVERTON
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported

VINES RV & BOAT STORAGE (Continued) **S112972755**

Waste Code Description:	141 - Off-specification, aged, or surplus inorganics
RCRA Code:	D002
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.22935
Waste Quantity:	55
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

San Bern. Co. Permit:

Name:	VERIZON WIRELESS: HELLEN
Address:	1897 E COLTON AVE
City,State,Zip:	REDLANDS, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0013496
Owner:	Verizon Wireless
Permit Number:	PT0023810
Permit Category:	HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL
Facility Status:	ACTIVE
Expiration Date:	10/31/2021

CERS:

Name:	VERIZON WIRELESS: HELLEN
Address:	1897 E COLTON AVE
City,State,Zip:	REDLANDS, CA 92359
Site ID:	168124
CERS ID:	10162683
CERS Description:	Chemical Storage Facilities

Violations:

Site ID:	168124
Site Name:	Verizon Wireless: Hellen
Violation Date:	01-28-2015
Citation:	HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2
Violation Description:	Failure to annually review and electronically certify that the business plan is complete, accurate, and up-to-date.
Violation Notes:	Returned to compliance on 02/02/2015. Failure to update the business plan annually. Last business plan on file is dated 3/1/2012.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HMRRP
Violation Source:	CERS,

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	02-24-2021
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Bernardino County Fire Department
Eval Program:	HMRRP
Eval Source:	CERS,

VINES RV & BOAT STORAGE (Continued) **S112972755**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-25-2018
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-28-2015
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE INSPECTION
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Enforcement Action:
Site ID: 168124
Site Name: Verizon Wireless: Hellen
Site Address: 1897 E COLTON AVE
Site City: REDLANDS
Site Zip: 92359
Enf Action Date: 01-28-2015
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Bernardino County Fire Department
Enf Action Program: HMRRP
Enf Action Source: CERS,

Affiliation:
Affiliation Type Desc: Identification Signer
Entity Name: Wilson Rodriguez
Entity Title: Engr III Spec-RE/Regulatory
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Parent Corporation
Entity Name: Verizon Wireless [Southern California]
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: CUPA District
Entity Name: San Bernardino County Fire
Entity Title: Not reported

VINES RV & BOAT STORAGE (Continued) **S112972755**

Affiliation Address:	620 South E Street
Affiliation City:	San Bernardino
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92415-0153
Affiliation Phone:	(909) 386-8401,
Affiliation Type Desc:	Legal Owner
Entity Name:	Verizon Wireless
Entity Title:	Not reported
Affiliation Address:	15505 Sand Canyon Avenue, MS D-104
Affiliation City:	Irvine
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92618
Affiliation Phone:	(949) 286-7000,
Affiliation Type Desc:	Environmental Contact
Entity Name:	Environmental Compliance
Entity Title:	Not reported
Affiliation Address:	15505 Sand Canyon Avenue, MS D-104
Affiliation City:	Irvine
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92618
Affiliation Phone:	,
Affiliation Type Desc:	Operator
Entity Name:	Verizon Wireless
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(949) 286-7000,
Affiliation Type Desc:	Document Preparer
Entity Name:	Steve Skanderson, Stantec
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	,
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	15505 Sand Canyon Avenue, MS D-104
Affiliation City:	Irvine
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92618
Affiliation Phone:	,

VINES RV & BOAT STORAGE (Continued) **S112972755**

HWTS:

Name:	VINES RV & BOAT STORAGE
Address:	1897 E COLTON AVE
Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 92374
EPA ID:	CAC002634281
Inactive Date:	03/02/2009
Create Date:	09/02/2008
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	303 BROOKSIDE AVE
Mailing Address 2:	Not reported
Mailing City,State,Zip:	REDLANDS, CA 923734617
Owner Name:	VINES RV & BOAT STORAGE
Owner Address:	303 BROOKSIDE AVE
Owner Address 2:	Not reported
Owner City,State,Zip:	REDLANDS, CA 923734617
Contact Name:	GENEIL VINES
Contact Address:	303 BROOKSIDE AVE
Contact Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 923734617
Facility Status:	Inactive
Facility Type:	TEMPORARY
Category:	STATE
Latitude:	34.062921
Longitude:	-117.128368

F18 **RICHMOND TECH INC** **EMI** **S104769543**
ESE **1897 COLTON AV** **San Bern. Co. Permit** **N/A**
1/8-1/4 **REDLANDS, CA 92374** **CERS**
0.192 mi.
1012 ft. **Site 3 of 5 in cluster F**

Relative:
Higher

Actual:
1643 ft.

EMI:

Name:	RICHMOND TECH INC
Address:	1897 COLTON AVE
City,State,Zip:	REDLANDS, CA 92374
Year:	1990
County Code:	36
Air Basin:	SC
Facility ID:	70603
Air District Name:	SC
SIC Code:	5113
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	15
Reactive Organic Gases Tons/Yr:	13
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Name:	RICHMOND TECH INC
Address:	1897 COLTON AV
City,State,Zip:	REDLANDS, CA 92374

RICHMOND TECH INC (Continued) **S104769543**

Year:	1995
County Code:	36
Air Basin:	SC
Facility ID:	70603
Air District Name:	SC
SIC Code:	5113
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	8
Reactive Organic Gases Tons/Yr:	2
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Name:	RICHMOND TECH INC
Address:	1897 COLTON AVE
City,State,Zip:	REDLANDS, CA 92374
Year:	1996
County Code:	36
Air Basin:	SC
Facility ID:	70603
Air District Name:	SC
SIC Code:	5113
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Name:	RICHMOND TECH INC
Address:	1897 COLTON AV
City,State,Zip:	REDLANDS, CA 92374
Year:	1997
County Code:	36
Air Basin:	SC
Facility ID:	70603
Air District Name:	SC
SIC Code:	2673
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	3
Reactive Organic Gases Tons/Yr:	2
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

RICHMOND TECH INC (Continued) **S104769543**

Name:	RICHMOND TECH INC
Address:	1897 COLTON AV
City,State,Zip:	REDLANDS, CA 92374
Year:	1998
County Code:	36
Air Basin:	SC
Facility ID:	70603
Air District Name:	SC
SIC Code:	2673
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	3
Reactive Organic Gases Tons/Yr:	2
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Name:	RICHMOND TECH INC
Address:	1897 COLTON AV
City,State,Zip:	REDLANDS, CA 92374
Year:	1999
County Code:	36
Air Basin:	SC
Facility ID:	70603
Air District Name:	SC
SIC Code:	2673
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	3
Reactive Organic Gases Tons/Yr:	2
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Name:	RICHMOND TECH INC
Address:	1897 COLTON AV
City,State,Zip:	REDLANDS, CA 92374
Year:	2000
County Code:	36
Air Basin:	SC
Facility ID:	70603
Air District Name:	SC
SIC Code:	2673
Air District Name:	SOUTH COAST AQMD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	3
Reactive Organic Gases Tons/Yr:	2
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0

RICHMOND TECH INC (Continued) **S104769543**

Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

Name: RICHMOND TECH INC
Address: 1897 COLTON AV
City,State,Zip: REDLANDS, CA 92374
Year: 2001
County Code: 36
Air Basin: SC
Facility ID: 70603
Air District Name: SC
SIC Code: 2673
Air District Name: SOUTH COAST AQMD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 3
Reactive Organic Gases Tons/Yr: 2
Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 0
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

San Bern. Co. Permit:
Name: RICHMOND TECHNOLOGY INC
Address: 1897 COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Region: SAN BERNARDINO
Facility ID: FA0005708
Owner: RICHMOND TECHNOLOGY INC
Permit Number: PT0001793
Permit Category: HAZARDOUS WASTE GENERATOR - 26-50 EMPLOYEES
Facility Status: INACTIVE
Expiration Date: 07/31/2003

Name: RICHMOND TECHNOLOGY INC
Address: 1897 COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Region: SAN BERNARDINO
Facility ID: FA0005708
Owner: RICHMOND TECHNOLOGY INC
Permit Number: PT0001792
Permit Category: HAZMAT HANDLER 26-50 EMPLOYEES (W/GEN PRMT)
Facility Status: INACTIVE
Expiration Date: 07/31/2003

CERS:
Name: RICHMOND TECHNOLOGY INC.
Address: 1897 COLTON AVE
City,State,Zip: REDLANDS, CA 92374-9797
Site ID: 490155
CERS ID: 110002414085
CERS Description: US EPA Air Emission Inventory System (EIS)

Affiliation:
Affiliation Type Desc: Environmental Contact
Entity Name: RON LUCE

RICHMOND TECH INC (Continued) **S104769543**

Entity Title:	Not reported
Affiliation Address:	1897 E COLTON AVE
Affiliation City:	REDLANDS
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	,
Affiliation Type Desc:	Public Contact
Entity Name:	JOACHIM NETELER
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	,

F19 **RICHMOND TECHNOLOGY INC** **HIST UST** **1000242847**
ESE **1897 E COLTON AVE** **RCRA NonGen / NLR** **CAD980896161**
1/8-1/4 **REDLANDS, CA 92373** **HAZNET**
0.192 mi. **NPDES**
1012 ft. **Site 4 of 5 in cluster F** **HWTS**

Relative:
Higher

Actual:
1643 ft.

HIST UST:

Name:	RICHMOND DIVISION
Address:	COLTON
City,State,Zip:	REDLANDS, CA 92373
File Number:	0002a4d1
URL:	https://documents.geotracker.waterboards.ca.gov/ustpdfs/pdf/0002a4d1.pdf
Region:	STATE
Facility ID:	00000019669
Facility Type:	Other
Other Type:	PLASTICS MFG.
Contact Name:	Not reported
Telephone:	7147942111
Owner Name:	RICHMOND TECHNOLOGY INC
Owner Address:	COLTON AND OPAL STREET
Owner City,St,Zip:	REDLANDS, CA 92373
Total Tanks:	0004
Tank Num:	001
Container Num:	2
Year Installed:	1968
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	001
Container Num:	2
Year Installed:	1968
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	3
Year Installed:	1968
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	002
Container Num:	3
Year Installed:	1968
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	003
Container Num:	4
Year Installed:	1968
Tank Capacity:	00000500
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	003
Container Num:	4
Year Installed:	1968
Tank Capacity:	00000500
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	004
Container Num:	1
Year Installed:	1968
Tank Capacity:	00005000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor
Tank Num:	004
Container Num:	1
Year Installed:	1968
Tank Capacity:	00005000
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	Not reported
Leak Detection:	Stock Inventor

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Click here for Geo Tracker PDF:

RCRA Listings:

Date Form Received by Agency:	20040617
Handler Name:	Richmond Technology Inc
Handler Address:	1897 E COLTON AVE
Handler City,State,Zip:	REDLANDS, CA 92373
EPA ID:	CAD980896161
Contact Name:	RON LUCE
Contact Address:	1897 E COLTON AV
Contact City,State,Zip:	REDLANDS, CA 92373
Contact Telephone:	713-996-4263
Contact Fax:	Not reported
Contact Email:	Not reported
Contact Title:	Not reported
EPA Region:	09
Land Type:	Private
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	CA
State District:	4
Mailing Address:	9505 BAMBOO RD
Mailing City,State,Zip:	HOUSTON, TX 77041
Owner Name:	Illinois Tool Works Inc
Owner Type:	Private
Operator Name:	Not reported
Operator Type:	Not reported
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	NN
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20040706
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	Not reported
Manifest Broker:	Not reported
Sub-Part P Indicator:	No

Biennial: List of Years
Year: 2001

Click Here for Biennial Reporting System Data:

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: ILLINOIS TOOL WORKS INC	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	3600 W LAKE AVE
Owner/Operator City,State,Zip:	GLENVIEW, IL 60025
Owner/Operator Telephone:	847-724-7500
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name: NOT REQUIRED	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	NOT REQUIRED
Owner/Operator City,State,Zip:	NOT REQUIRED, ME 99999
Owner/Operator Telephone:	415-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Owner
Owner/Operator Name: ILLINOIS TOOL WORKS INC	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	3600 W LAKE AVE
Owner/Operator City,State,Zip:	GLENVIEW, IL 60025
Owner/Operator Telephone:	847-724-7500
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Historic Generators:

Receive Date:	19960901
Handler Name:	RICHMOND TECHNOLOGY INC
Federal Waste Generator Description:	Small Quantity Generator
State District Owner:	CA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	19970113
Handler Name:	RICHMOND TECHNOLOGY INC
Federal Waste Generator Description:	Small Quantity Generator
State District Owner:	CA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	20040617
Handler Name:	RICHMOND TECHNOLOGY INC
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	CA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	19900427
Handler Name:	RICHMOND TECHNOLOGY INC
Federal Waste Generator Description:	Large Quantity Generator
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	20001012
Handler Name:	RICHMOND TECHNOLOGY
Federal Waste Generator Description:	Large Quantity Generator
State District Owner:	Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: No
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

Receive Date: 20020228
Handler Name: RICHMOND TECHNOLOGY INC
Federal Waste Generator Description: Large Quantity Generator
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: No
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 322223
NAICS Description: COATED PAPER BAG AND POUCH MANUFACTURING

NAICS Code: 3261
NAICS Description: PLASTICS PRODUCT MANUFACTURING

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

HAZNET:
Name: RICHMOND TECHNOLOGY INC
Address: 1897 E COLTON AVE
Address 2: Not reported
City,State,Zip: REDLANDS, CA 923749797
Contact: DAVID FLOWERS
Telephone: 9097942111
Mailing Name: Not reported
Mailing Address: 1897 E COLTON AVE

Year: 2002
Gepaid: CAD980896161
TSD EPA ID: CAT080013352
CA Waste Code: 223 - Unspecified oil-containing waste
Disposal Method: H01 - Transfer Station
Tons: 0.075

Year: 2002
Gepaid: CAD980896161

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

TSD EPA ID: CAD008302903
CA Waste Code: 181 - Other inorganic solid waste
Disposal Method: H01 - Transfer Station
Tons: 0.2

Year: 2001
Gepaid: CAD980896161
TSD EPA ID: CAD028409019
CA Waste Code: 331 - Off-specification, aged or surplus organics
Disposal Method: H01 - Transfer Station
Tons: 0.225

Year: 2001
Gepaid: CAD980896161
TSD EPA ID: CAD028409019
CA Waste Code: 181 - Other inorganic solid waste
Disposal Method: -
Tons: 0.2

Year: 2001
Gepaid: CAD980896161
TSD EPA ID: CAD028409019
CA Waste Code: 221 - Waste oil and mixed oil
Disposal Method: T01 - Treatment, Tank
Tons: 0.19

Year: 2001
Gepaid: CAD980896161
TSD EPA ID: CAD028409019
CA Waste Code: 551 - Laboratory waste chemicals
Disposal Method: H01 - Transfer Station
Tons: 0.0125

Year: 2001
Gepaid: CAD980896161
TSD EPA ID: CAD028409019
CA Waste Code: 214 - Unspecified solvent mixture
Disposal Method: H01 - Transfer Station
Tons: 0.198

Year: 2001
Gepaid: CAD980896161
TSD EPA ID: CAD028409019
CA Waste Code: 352 - Other organic solids
Disposal Method: H01 - Transfer Station
Tons: 0.4

Year: 2001
Gepaid: CAD980896161
TSD EPA ID: CAT080013352
CA Waste Code: 331 - Off-specification, aged or surplus organics
Disposal Method: R01 - Recycler
Tons: 4.125

Year: 2001
Gepaid: CAD980896161
TSD EPA ID: CAT080033681

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

CA Waste Code: 122 - Alkaline solution without metals pH >= 12.5
Disposal Method: R01 - Recycler
Tons: 0.9174

Click this hyperlink while viewing on your computer to access
48 additional CA HAZNET: record(s) in the EDR Site Report.

Additional Info:
Year: 2002
Gen EPA ID: CAD980896161

Shipment Date: 20020322
Creation Date: 7/16/2002 18:30:48
Receipt Date: 20020417
Manifest ID: 21776176
Trans EPA ID: CAD983668583
Trans Name: Not reported
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
TSDF EPA ID: CAT080013352
Trans Name: Not reported
TSDF Alt EPA ID: Not reported
TSDF Alt Name: Not reported
Waste Code Description: 223 - Unspecified oil-containing waste
RCRA Code: Not reported
Meth Code: H01 - Transfer Station
Quantity Tons: 0.075
Waste Quantity: 150
Quantity Unit: P
Additional Code 1: Not reported
Additional Code 2: Not reported
Additional Code 3: Not reported
Additional Code 4: Not reported
Additional Code 5: Not reported

Shipment Date: 20020103
Creation Date: 2/20/2002 0:00:00
Receipt Date: 20020108
Manifest ID: 99679507
Trans EPA ID: CAD983668583
Trans Name: Not reported
Trans 2 EPA ID: Not reported
Trans 2 Name: Not reported
TSDF EPA ID: CAD008302903
Trans Name: Not reported
TSDF Alt EPA ID: Not reported
TSDF Alt Name: Not reported
Waste Code Description: 181 - Other inorganic solid waste Organics
RCRA Code: D001
Meth Code: H01 - Transfer Station
Quantity Tons: 0.2
Waste Quantity: 400
Quantity Unit: P
Additional Code 1: Not reported
Additional Code 2: Not reported
Additional Code 3: Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	2001
Gen EPA ID:	CAD980896161
Shipment Date:	20011219
Creation Date:	Not reported
Receipt Date:	Not reported
Manifest ID:	99679495
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	331 - Off-specification, aged, or surplus organics
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.025
Waste Quantity:	50
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20011219
Creation Date:	Not reported
Receipt Date:	Not reported
Manifest ID:	99679496
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	0.25
Waste Quantity:	500
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20011219
Creation Date:	2/26/2002 0:00:00

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Receipt Date:	20011219
Manifest ID:	99679497
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080013352
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT080013352
TSDF Alt Name:	Not reported
Waste Code Description:	331 - Off-specification, aged, or surplus organics
RCRA Code:	D001
Meth Code:	R01 - Recycler
Quantity Tons:	4.125
Waste Quantity:	1250
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20011219
Creation Date:	2/26/2002 0:00:00
Receipt Date:	20011221
Manifest ID:	99679496
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	551 - Laboratory waste chemicals 561 Detergent and soap
RCRA Code:	D002
Meth Code:	R01 - Recycler
Quantity Tons:	0.0075
Waste Quantity:	15
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20011219
Creation Date:	2/26/2002 0:00:00
Receipt Date:	20011221
Manifest ID:	99679496
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT080033681

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

TSDF Alt Name:	Not reported
Waste Code Description:	331 - Off-specification, aged, or surplus organics
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	0.495
Waste Quantity:	150
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20011219
Creation Date:	2/26/2002 0:00:00
Receipt Date:	20011221
Manifest ID:	99679496
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	551 - Laboratory waste chemicals 561 Detergent and soap
RCRA Code:	D002
Meth Code:	R01 - Recycler
Quantity Tons:	0.15
Waste Quantity:	300
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20011219
Creation Date:	2/26/2002 0:00:00
Receipt Date:	20011221
Manifest ID:	99679496
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080033681
Trans Name:	Not reported
TSDF Alt EPA ID:	CAT080033681
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	1
Waste Quantity:	2000
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20011219
Creation Date:	2/26/2002 0:00:00
Receipt Date:	20011227
Manifest ID:	99679495
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	551 - Laboratory waste chemicals 561 Detergent and soap
RCRA Code:	D002
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.005
Waste Quantity:	10
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20011219
Creation Date:	2/26/2002 0:00:00
Receipt Date:	20011227
Manifest ID:	99679495
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	181 - Other inorganic solid waste Organics
RCRA Code:	D001
Meth Code:	- Not reported
Quantity Tons:	0.2
Waste Quantity:	400
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20011219
Creation Date:	2/26/2002 0:00:00
Receipt Date:	20011227
Manifest ID:	99679495
Trans EPA ID:	CAD983668583

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD028409019
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD028409019
TSDF Alt Name:	Not reported
Waste Code Description:	551 - Laboratory waste chemicals 561 Detergent and soap
RCRA Code:	D001
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.0025
Waste Quantity:	5
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	2000
Gen EPA ID:	CAD980896161
Shipment Date:	20001012
Creation Date:	1/9/2001 0:00:00
Receipt Date:	20001018
Manifest ID:	20108882
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	Not reported
TSDF Alt EPA ID:	CAD982444481
TSDF Alt Name:	Not reported
Waste Code Description:	223 - Unspecified oil-containing waste
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	0.2085
Waste Quantity:	50
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20001012
Creation Date:	1/9/2001 0:00:00
Receipt Date:	20001018
Manifest ID:	20108882
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

TSDF Alt EPA ID:	CAD982444481
TSDF Alt Name:	Not reported
Waste Code Description:	223 - Unspecified oil-containing waste
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	0.1
Waste Quantity:	200
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20001012
Creation Date:	1/9/2001 0:00:00
Receipt Date:	20001019
Manifest ID:	20108883
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080022148
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	214 - Unspecified solvent mixture
RCRA Code:	D001
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.1908
Waste Quantity:	53
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20001012
Creation Date:	1/9/2001 0:00:00
Receipt Date:	20001019
Manifest ID:	20108883
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080022148
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	135 - Unspecified aqueous solution
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	1.26
Waste Quantity:	300
Quantity Unit:	G
Additional Code 1:	Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20001012
Creation Date:	1/9/2001 0:00:00
Receipt Date:	20001019
Manifest ID:	20108883
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080022148
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	512 - Other empty containers 30 gallons or more
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.0175
Waste Quantity:	35
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20001012
Creation Date:	Not reported
Receipt Date:	Not reported
Manifest ID:	20108883
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080022148
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	352 - Other organic solids
RCRA Code:	D007
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.04
Waste Quantity:	80
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20001012
Creation Date:	12/13/2000 0:00:00
Receipt Date:	20001018
Manifest ID:	20108884

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080022148
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	135 - Unspecified aqueous solution
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.42
Waste Quantity:	100
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20001012
Creation Date:	12/13/2000 0:00:00
Receipt Date:	20001018
Manifest ID:	20108884
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080022148
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	512 - Other empty containers 30 gallons or more
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.02
Waste Quantity:	40
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	20001012
Creation Date:	Not reported
Receipt Date:	Not reported
Manifest ID:	20108883
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080022148
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	181 - Other inorganic solid waste Organics

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.1
Waste Quantity:	200
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20001012
Creation Date:	Not reported
Receipt Date:	Not reported
Manifest ID:	20108883
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080022148
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	135 - Unspecified aqueous solution
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.075
Waste Quantity:	150
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	1999
Gen EPA ID:	CAD980896161
Shipment Date:	19990903
Creation Date:	11/16/1999 0:00:00
Receipt Date:	19990907
Manifest ID:	99257509
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAT080013352
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	331 - Off-specification, aged, or surplus organics
RCRA Code:	Not reported
Meth Code:	R01 - Recycler
Quantity Tons:	1.98
Waste Quantity:	600
Quantity Unit:	G

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	1998
Gen EPA ID:	CAD980896161
Shipment Date:	19980206
Creation Date:	4/16/1998 0:00:00
Receipt Date:	19980210
Manifest ID:	97301778
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	135 - Unspecified aqueous solution
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.231
Waste Quantity:	55
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	19980206
Creation Date:	4/16/1998 0:00:00
Receipt Date:	19980210
Manifest ID:	97301778
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	135 - Unspecified aqueous solution
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	1.113
Waste Quantity:	265
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Shipment Date:	19980206
Creation Date:	4/16/1998 0:00:00
Receipt Date:	19980210
Manifest ID:	97301778
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	223 - Unspecified oil-containing waste
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.24
Waste Quantity:	480
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	1997
Gen EPA ID:	CAD980896161

Shipment Date:	19970909
Creation Date:	7/23/1998 0:00:00
Receipt Date:	19970916
Manifest ID:	96735343
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	135 - Unspecified aqueous solution
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	1.155
Waste Quantity:	275
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	19970909
Creation Date:	7/23/1998 0:00:00
Receipt Date:	19970916
Manifest ID:	96735343
Trans EPA ID:	CAD983668583

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	223 - Unspecified oil-containing waste
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.2
Waste Quantity:	400
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Shipment Date:	19970909
Creation Date:	7/23/1998 0:00:00
Receipt Date:	19970916
Manifest ID:	96735343
Trans EPA ID:	CAD983668583
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD982444481
Trans Name:	Not reported
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	221 - Waste oil and mixed oil
RCRA Code:	Not reported
Meth Code:	H01 - Transfer Station
Quantity Tons:	0.19
Waste Quantity:	50
Quantity Unit:	G
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Additional Info:

Year:	1995
Gen EPA ID:	CAD980896161

Shipment Date:	19951216
Creation Date:	7/26/1996 0:00:00
Receipt Date:	19951220
Manifest ID:	95476042
Trans EPA ID:	CAL000020974
Trans Name:	Not reported
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD009007626
Trans Name:	Not reported

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	D80 - Disposal, Land Fill
Quantity Tons:	0.2107
Waste Quantity:	0.25
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

NPDES:

Name:	VINES ENTERPRISES INC
Address:	1897 E COLTON AVE
City,State,Zip:	REDLANDS, CA 92374
Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	Not reported
Regulatory Measure Type:	Industrial
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Returned
Status Date:	09/27/2006
Operator Name:	Theron L Vines Jr
Operator Address:	803 La Solano
Operator City:	Redlands
Operator State:	California
Operator Zip:	92374

HWTS:

Name:	RICHMOND TECHNOLOGY INC
Address:	1897 E COLTON AVE
Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 92374
EPA ID:	CAD980896161
Inactive Date:	06/30/2001
Create Date:	11/12/1986
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	1897 E COLTON AVE

RICHMOND TECHNOLOGY INC (Continued) **1000242847**

Mailing Address 2:	Not reported
Mailing City,State,Zip:	REDLANDS, CA 923749797
Owner Name:	ILLINOIS TOOL WORKS INC
Owner Address:	3600 WEST LAKE AVENUE
Owner Address 2:	Not reported
Owner City,State,Zip:	GLENVIEW, IL 600259797
Contact Name:	DAVID FLOWERS
Contact Address:	1897 E COLTON AVE
Contact Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 923749797
Facility Status:	Inactive
Facility Type:	PERMANENT
Category:	FEDERAL
Latitude:	34.062769
Longitude:	-117.124203

F20 **WEE THREE** **SWEEPS UST** **S101619384**
ESE **SE CORNER COLTON & OPAL** **CA FID UST** **N/A**
1/8-1/4 **REDLANDS, CA 92373**
0.211 mi.
1112 ft. **Site 5 of 5 in cluster F**

Relative:
Higher

Actual:
1645 ft.

SWEEPS UST:

Name:	WEE THREE
Address:	SE CORNER COLTON & OPAL
City:	REDLANDS
Status:	Active
Comp Number:	57682
Number:	9
Board Of Equalization:	Not reported
Referral Date:	09-10-91
Action Date:	09-10-91
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	36-000-057682-000001
Tank Status:	A
Capacity:	Not reported
Active Date:	07-01-85
Tank Use:	M.V. FUEL
STG:	P
Content:	LEADED
Number Of Tanks:	1

CA FID UST:

Facility ID:	36009173
Regulated By:	UTNKA
Regulated ID:	00057682
Cortese Code:	Not reported
SIC Code:	Not reported
Facility Phone:	7147932511
Mail To:	Not reported
Mailing Address:	P O BOX
Mailing Address 2:	Not reported
Mailing City,St,Zip:	REDLANDS 92373
Contact:	Not reported
Contact Phone:	Not reported
DUNs Number:	Not reported

WEE THREE (Continued) **S101619384**

NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

G21 **DIGMOR EQUIP & ENGR CO INC** **RCRA-SQG** **1000301926**
ESE **1898 E COLTON** **FINDS** **CAD981376486**
1/8-1/4 **MENTONE, CA 92359** **ECHO**
0.223 mi.
1179 ft. **Site 1 of 3 in cluster G**

Relative: **Higher**
Actual: **1646 ft.**

RCRA Listings:

Date Form Received by Agency:	19960901
Handler Name:	Digmor Equip & Engr Co Inc
Handler Address:	1898 E COLTON
Handler City,State,Zip:	MENTONE, CA 92359
EPA ID:	CAD981376486
Contact Name:	Not reported
Contact Address:	Not reported
Contact City,State,Zip:	Not reported
Contact Telephone:	Not reported
Contact Fax:	Not reported
Contact Email:	Not reported
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Small Quantity Generator
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	CA
State District:	4
Mailing Address:	BOX FIRST THOUSAND FIRST HUNDR
Mailing City,State,Zip:	REDLANDS, CA 92373
Owner Name:	Not reported
Owner Type:	Not reported
Operator Name:	Not Required
Operator Type:	Private
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	NN
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline

DIGMOR EQUIP & ENGR CO INC (Continued) **1000301926**

202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20020627
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	Not reported
Manifest Broker:	Not reported
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name: L MILLER JD CROOK	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	NOT REQUIRED
Owner/Operator City,State,Zip:	NOT REQUIRED, ME 99999
Owner/Operator Telephone:	415-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name: NOT REQUIRED	
Legal Status:	Private
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	NOT REQUIRED
Owner/Operator City,State,Zip:	NOT REQUIRED, ME 99999
Owner/Operator Telephone:	415-555-1212
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	19960901
Handler Name: DIGMOR EQUIP & ENGR CO INC	
Federal Waste Generator Description:	Small Quantity Generator
State District Owner:	CA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No

DIGMOR EQUIP & ENGR CO INC (Continued) **1000301926**

Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

Receive Date:	19860121
Handler Name:	DIGMOR EQUIP & ENGR CO INC
Federal Waste Generator Description:	Large Quantity Generator
State District Owner:	CA
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	No
Recognized Trader Exporter:	No
Spent Lead Acid Battery Importer:	No
Spent Lead Acid Battery Exporter:	No
Current Record:	No
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

List of NAICS Codes and Descriptions:
NAICS Codes: No NAICS Codes Found

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

FINDS:
Registry ID: 110002685997

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1000301926
Registry ID:	110002685997
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110002685997
Name:	DIGMOR EQUIP & ENGR CO INC
Address:	1898 E COLTON
City,State,Zip:	MENTONE, CA 92359

G22 **P&R PAPER SUPPLY CO INC** **RCRA NonGen / NLR** **1027091154**
ESE **1898 E COLTON AVE** **CAL000418194**
1/8-1/4 **REDLANDS, CA 92374**
0.223 mi.
1180 ft. **Site 2 of 3 in cluster G**

Relative:
Higher

Actual:
1646 ft.

RCRA Listings:

Date Form Received by Agency:	20160616
Handler Name:	P&R Paper Supply Co Inc
Handler Address:	1898 E COLTON AVE
Handler City,State,Zip:	REDLANDS, CA 92374
EPA ID:	CAL000418194
Contact Name:	DAN MURRAY
Contact Address:	1898 E COLTON AVE
Contact City,State,Zip:	REDLANDS, CA 92374
Contact Telephone:	909-567-5843
Contact Fax:	Not reported
Contact Email:	DAN.MURRAY@IMPERIALDADE.COM
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Not reported
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	1898 E COLTON AVE
Mailing City,State,Zip:	REDLANDS, CA 92374
Owner Name:	P&R Paper Imperial Dade Inc
Owner Type:	Other
Operator Name:	Dan Murray
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	No
Universal Waste Destination Facility:	No
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No

P&R PAPER SUPPLY CO INC (Continued) **1027091154**

Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20211011
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No
Recycler Activity Without Storage:	No
Manifest Broker:	No
Sub-Part P Indicator:	No

Handler - Owner Operator:

Owner/Operator Indicator:	Owner
Owner/Operator Name:	P&R PAPER IMPERIAL DADE INC
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1898 E COLTON AVE
Owner/Operator City,State,Zip:	REDLANDS, CA 92374
Owner/Operator Telephone:	909-794-1108
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Owner/Operator Indicator:	Operator
Owner/Operator Name:	DAN MURRAY
Legal Status:	Other
Date Became Current:	Not reported
Date Ended Current:	Not reported
Owner/Operator Address:	1898 E COLTON AVE
Owner/Operator City,State,Zip:	REDLANDS, CA 92374
Owner/Operator Telephone:	909-567-5843
Owner/Operator Telephone Ext:	Not reported
Owner/Operator Fax:	Not reported
Owner/Operator Email:	Not reported

Historic Generators:

Receive Date:	20160616
Handler Name:	P&R PAPER SUPPLY CO INC
Federal Waste Generator Description:	Not a generator, verified
State District Owner:	Not reported
Large Quantity Handler of Universal Waste:	No
Recognized Trader Importer:	Not reported
Recognized Trader Exporter:	Not reported
Spent Lead Acid Battery Importer:	Not reported
Spent Lead Acid Battery Exporter:	Not reported
Current Record:	Yes
Non Storage Recycler Activity:	Not reported
Electronic Manifest Broker:	Not reported

P&R PAPER SUPPLY CO INC (Continued) **1027091154**

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: ALL OTHER WASTE MANAGEMENT SERVICES

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

G23 **P&R PAPER SUPPLY COMPANY** **HAZNET** **S111828655**
ESE **1898 E COLTON AVENUE** **NPDES** **N/A**
1/8-1/4 **REDLANDS, CA 92373** **San Bern. Co. Permit**
0.223 mi. **CIWQS**
1180 ft. **Site 3 of 3 in cluster G** **CERS**
HWTS

Relative:
Higher

Actual:
1646 ft.

HAZNET:
Name: P&R PAPER SUPPLY CO INC
Address: 1898 E COLTON AVE
Address 2: Not reported
City,State,Zip: REDLANDS, CA 92374
Contact: DAN MURRAY
Telephone: 9095675843
Mailing Name: Not reported
Mailing Address: 1898 E COLTON AVE

Year: 2021
Gepaid: CAL000418194
TSD EPA ID: CAD044429835
CA Waste Code: 213 - Hydrocarbon solvents (benzene, hexane, Stoddard, Etc.)
Disposal Method: H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.025

Year: 2021
Gepaid: CAL000418194
TSD EPA ID: UTD981552177
CA Waste Code: 135 - Unspecified aqueous solution
Disposal Method: H040 - Incineration--Thermal Destruction Other Than Use As A Fuel
Tons: 0.025

Year: 2021
Gepaid: CAL000418194
TSD EPA ID: UTD981552177
CA Waste Code: 612 - Household waste
Disposal Method: H040 - Incineration--Thermal Destruction Other Than Use As A Fuel
Tons: 0.2

Year: 2017
Gepaid: CAL000418194
TSD EPA ID: AZR000515924
CA Waste Code: 331 - Off-specification, aged or surplus organics
Disposal Method: H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)

P&R PAPER SUPPLY COMPANY (Continued) **S111828655**

Tons:	0.055

Additional Info:

Year:	2017
Gen EPA ID:	CAL000418194
Shipment Date:	20171024
Creation Date:	7/17/2018 18:30:28
Receipt Date:	20171031
Manifest ID:	016951558JJK
Trans EPA ID:	CAR000262956
Trans Name:	ENVIROPROS
Trans 2 EPA ID:	CAR000175422
Trans 2 Name:	WORLDWIDE RECOVERY SYSTEMS INC
TSDF EPA ID:	AZR000515924
Trans Name:	YUMA YES LLC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	331 - Off-specification, aged, or surplus organics
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.055
Waste Quantity:	110
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

NPDES:

Name:	P&R PAPER SUPPLY COMPANY
Address:	1898 E COLTON AVENUE
City,State,Zip:	REDLANDS, CA 92373
Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	8 36W000704
Regulatory Measure Type:	Construction
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Expired

P&R PAPER SUPPLY COMPANY (Continued) **S111828655**

Status Date:	09/30/2012
Operator Name:	P&R Paper Supply Company Inc
Operator Address:	PO Box 590
Operator City:	Redlands
Operator State:	California
Operator Zip:	92373

San Bern. Co. Permit:

Name:	P & R PAPER SUPPLY COMPANY INC
Address:	1898 E COLTON AVE
City,State,Zip:	REDLANDS, CA 92374
Region:	SAN BERNARDINO
Facility ID:	FA0015301
Owner:	IMPERIAL DADE INC.
Permit Number:	PT0027460
Permit Category:	HAZARDOUS MATERIALS 11-30 CHEMICALS
Facility Status:	ACTIVE
Expiration Date:	03/31/2023

Name:	P & R PAPER SUPPLY COMPANY INC
Address:	1898 E COLTON AVE
City,State,Zip:	REDLANDS, CA 92374
Region:	SAN BERNARDINO
Facility ID:	FA0015301
Owner:	IMPERIAL DADE INC.
Permit Number:	PT0038110
Permit Category:	CONDITIONALLY EXEMPT SM QTY GENERATOR
Facility Status:	INACTIVE
Expiration Date:	03/31/2019

CIWQS:

Name:	P&R PAPER SUPPLY COMPANY
Address:	1898 E COLTON AVENUE
City,State,Zip:	REDLANDS, CA 92373
Agency:	P&R Paper Supply Company Inc
Agency Address:	PO Box 590, Redlands, CA 92373
Place/Project Type:	Construction - Commercial
SIC/NAICS:	Not reported
Region:	8
Program:	CONSTW
Regulatory Measure Status:	Terminated
Regulatory Measure Type:	Storm water construction
Order Number:	2009-0009-DWQ
WDID:	8 36C364615
NPDES Number:	CAS000002
Adoption Date:	Not reported
Effective Date:	09/18/2012
Termination Date:	05/21/2013
Expiration/Review Date:	Not reported
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	Not reported
TTWQ:	Not reported
Enforcement Actions within 5 years:	0
Violations within 5 years:	0
Latitude:	34.0621

P&R PAPER SUPPLY COMPANY (Continued) **S111828655**

Longitude: -117.13557

CERS:
Name: P & R PAPER SUPPLY COMPANY INC
Address: 1898 E COLTON AVE
City,State,Zip: REDLANDS, CA 92374
Site ID: 416231
CERS ID: 10652233
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 416231
Site Name: P & R PAPER SUPPLY COMPANY INC
Violation Date: 01-06-2017
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 01/27/2017. A business plan has not been completed and electronically submitted to the
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 416231
Site Name: P & R PAPER SUPPLY COMPANY INC
Violation Date: 12-09-2019
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.
Violation Notes: Returned to compliance on 01/16/2020. Emergency response plan template was submitted blank. CORRECTIVE ACTION: Comply by submitting a complete emergency response plan via CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 416231
Site Name: P & R PAPER SUPPLY COMPANY INC
Violation Date: 12-09-2019
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a site map with all required content.
Violation Notes: Returned to compliance on 01/16/2020. Submitted site map was missing the locations of the hazardous materials storage area. CORRECTIVE ACTION: Comply by submitting an accurate and complete site map via CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 416231
Site Name: P & R PAPER SUPPLY COMPANY INC

P&R PAPER SUPPLY COMPANY (Continued) **S111828655**

Violation Date: 01-06-2017
Citation: HSC 6.95 25507 - California Health and Safety Code, Chapter 6.95, Section(s) 25507
Violation Description: Failure to adequately establish and implement a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 01/27/2017. A business plan has not been established and implemented.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-06-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION FOR P&R PAPER SUPPLY COMPANY INC.
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-06-2017
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-09-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-07-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-06-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: New facility -P&R paper, Redlands
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

P&R PAPER SUPPLY COMPANY (Continued) **S111828655**

Enforcement Action:

Site ID:	416231
Site Name:	P & R PAPER SUPPLY COMPANY INC
Site Address:	1898 E COLTON AVE
Site City:	REDLANDS
Site Zip:	92374
Enf Action Date:	01-06-2017
Enf Action Type:	Notice of Violation (Unified Program)
Enf Action Description:	Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes:	Not reported
Enf Action Division:	San Bernardino County Fire Department
Enf Action Program:	HMRRP
Enf Action Source:	CERS,

Affiliation:

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	PO BOX 590
Affiliation City:	REDLANDS
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92373
Affiliation Phone:	,
Affiliation Type Desc:	Identification Signer
Entity Name:	DAN MURRAY
Entity Title:	SAFETY / FACILITY COORDINATOR
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	,
Affiliation Type Desc:	Legal Owner
Entity Name:	IMPERIAL DADE INC
Entity Title:	Not reported
Affiliation Address:	255 ROUTE 1 & 9
Affiliation City:	JERSEY CITY
Affiliation State:	NJ
Affiliation Country:	United States
Affiliation Zip:	07306
Affiliation Phone:	(855) 772-1645,
Affiliation Type Desc:	CUPA District
Entity Name:	San Bernardino County Fire
Entity Title:	Not reported
Affiliation Address:	620 South E Street
Affiliation City:	San Bernardino
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92415-0153
Affiliation Phone:	(909) 386-8401,
Affiliation Type Desc:	Document Preparer

P&R PAPER SUPPLY COMPANY (Continued) **S111828655**

Entity Name: DAN MURRAY
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Parent Corporation
Entity Name: P & R PAPER SUPPLY COMPANY INC
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Environmental Contact
Entity Name: DAN MURRAY
Entity Title: Not reported
Affiliation Address: 1898 E COLTON AVE
Affiliation City: REDLANDS
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92374
Affiliation Phone: ,

Affiliation Type Desc: Operator
Entity Name: P&R PAPER SUPPLY
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (909) 794-1108,

HWTS:
Name: P&R PAPER SUPPLY CO INC
Address: 1898 E COLTON AVE
Address 2: Not reported
City,State,Zip: REDLANDS, CA 92374
EPA ID: CAL000418194
Inactive Date: Not reported
Create Date: 06/16/2016
Last Act Date: Not reported
Mailing Name: Not reported
Mailing Address: 1898 E COLTON AVE
Mailing Address 2: Not reported
Mailing City,State,Zip: REDLANDS, CA 92374
Owner Name: P&R PAPER IMPERIAL DADE INC
Owner Address: 1898 E COLTON AVE
Owner Address 2: Not reported
Owner City,State,Zip: REDLANDS, CA 92374

P&R PAPER SUPPLY COMPANY (Continued) **S111828655**

Contact Name:	DAN MURRAY
Contact Address:	1898 E COLTON AVE
Contact Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 92374
Facility Status:	Active
Facility Type:	PERMANENT
Category:	STATE
Latitude:	-90
Longitude:	180

NAICS:

EPA ID:	CAL000418194
Create Date:	2016-06-16 14:56:27.563
NAICS Code:	42213
NAICS Description:	Industrial and Personal Service Paper Wholesalers
Issued EPA ID Date:	2016-06-16 14:56:27.56000
Inactive Date:	2017-06-30 00:00:00
Facility Name:	P&R PAPER SUPPLY CO
Facility Address:	1898 E COLTON AVE
Facility Address 2:	Not reported
Facility City:	REDLANDS
Facility County:	Not reported
Facility State:	CA
Facility Zip:	92374

H24 **WESTERN FRUIT GROWERS** **AST** **U001575207**
ENE **1199 OPAL AVE** **CERS HAZ WASTE** **N/A**
1/8-1/4 **MENTONE, CA 92359** **HIST UST**
0.230 mi. **CERS TANKS**
1214 ft. **Site 1 of 3 in cluster H** **HAZNET**
San Bern. Co. Permit
Relative: **CERS**
Higher **HWTS**

Actual:
1646 ft.

AST:

Name:	INTERNATIONAL PAVING SERVICES
Address:	1199 OPAL AVE
City/Zip:	MENTONE,92359
Certified Unified Program Agencies:	Not reported
Owner:	INTERNATIONAL PAVING SERVICES
Total Gallons:	Not reported
CERSID:	10040692
Facility ID:	FA0003994
Business Name:	INTERNATIONAL PAVING SERVICES
Phone:	(909) 794-2101
Fax:	(909) 794-7098
Mailing Address:	1199 OPAL AVE
Mailing Address City:	MENTONE
Mailing Address State:	CA
Mailing Address Zip Code:	Not reported
Operator Name:	International Paving Services, Inc.
Operator Phone:	909-794-2101
Owner Phone:	(909) 794-2101 132
Owner Mail Address:	P O BOX 10458
Owner State:	CA
Owner Zip Code:	Not reported
Owner Country:	United States

WESTERN FRUIT GROWERS (Continued) **U001575207**

Property Owner Name: BRENT C. RIEGER
Property Owner Phone: 909-794-2101
Property Owner Mailing Address: P O BOX 10458
Property Owner City: SAN BERNARDINO
Property Owner Stat : CA
Property Owner Zip Code: 92423
Property Owner Country: United States
EPAID: CAL000356275

CERS HAZ WASTE:
Name: INTERNATIONAL PAVING SERVICES, INC.
Address: 1199 OPAL AVE
City,State,Zip: MENTONE, CA 92359
Site ID: 395185
CERS ID: 10040692
CERS Description: Hazardous Waste Generator

HIST UST:
Name: WESTERN FRUIT GROWERS
Address: 1199 OPAL AVE
City,State,Zip: MENTONE, CA 92359
File Number: 00029eab
URL: https://documents.geotracker.waterboards.ca.gov/ustpdfs/pdf/00029eab.pdf
Region: STATE
Facility ID: 00000007391
Facility Type: Other
Other Type: CITRUS PACKING HOUSE
Contact Name: LAIRD RODDICK
Telephone: 7147941101
Owner Name: FMC CORPORATION
Owner Address: 1540 LINDEN ST.
Owner City,St,Zip: RIVERSIDE, CA 92507
Total Tanks: 0001

Tank Num: 001
Container Num: 1
Year Installed: Not reported
Tank Capacity: 00001000
Tank Used for: WASTE
Type of Fuel: Not reported
Container Construction Thickness: 10
Leak Detection: None

Click here for Geo Tracker PDF:

CERS TANKS:
Name: INTERNATIONAL PAVING SERVICES, INC.
Address: 1199 OPAL AVE
City,State,Zip: MENTONE, CA 92359
Site ID: 395185
CERS ID: 10040692
CERS Description: Aboveground Petroleum Storage

HAZNET:
Name: INTERNATIONAL PAVING SERVICES INC

WESTERN FRUIT GROWERS (Continued) **U001575207**

Address:	1199 OPAL AVE
Address 2:	Not reported
City,State,Zip:	MENTONE, CA 923591284
Contact:	APRIL HERGENREDER
Telephone:	9097942101
Mailing Name:	Not reported
Mailing Address:	PO BOX 10458
Year:	2020
Gepaid:	CAL000356275
TSD EPA ID:	AZR000520304
CA Waste Code:	351 - Organic solids with halogens
Disposal Method:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.1
Year:	2016
Gepaid:	CAL000356275
TSD EPA ID:	AZR000501510
CA Waste Code:	351 - Organic solids with halogens
Disposal Method:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.1

Additional Info:

Year:	2020
Gen EPA ID:	CAL000356275
Shipment Date:	3/20/2020
Creation Date:	4/8/2020
Receipt Date:	3/27/2020
Manifest ID:	019954027JJK
Trans EPA ID:	CAL000263169
Trans Name:	ALL VALLEY ENVIRONMENTAL
Trans 2 EPA ID:	CAD980585293
Trans 2 Name:	INDUSTRIAL WASTE UTILIZATION
TSDF EPA ID:	AZR000520304
Trans Name:	AA SYDCOL LLC
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	351 - Organic solids with halogens
RCRA Code:	Not reported
Meth Code:	H141 - Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Quantity Tons:	0.1
Waste Quantity:	200
Quantity Unit:	P
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported

Detail Two:

Year:	2020

WESTERN FRUIT GROWERS (Continued) **U001575207**

EM Manifest ID:	f0a86d53-03a8-4919-854d-8fa14ad530d8
Shipment Date:	3/20/2020
Receipt Date:	3/27/2020
Manifest Number:	019954027JJK
Generator EPA ID:	CAL000356275
Name:	INTERNATIONAL PAVING SERVICES INC
Address:	1199 OPAL AVE
Address 2:	Not reported
City:	MENTONE
Zip:	92359-1284
Telephone:	909-584-9284
Contact:	APRIL HERGENREDER
Contact Telephone:	909-794-2101
Transporter 1 EPA ID:	CAL000263169
Transporter 1 Emergency Number:	Not reported
Transporter 2 EPA ID:	CAD980585293
Transporter 2 Emergency Number:	Not reported
TSDF EPA ID:	AZR000520304
TSDF Name:	AA SYDCOL LLC
TSDF Address 1:	2264 E 13TH ST
TSDF Address 2:	Not reported
TSDF City:	YUMA
TSDF Zip:	85365-1858
TSDF Telephone:	Not reported

State:

Year:	2020
EM Manifest ID:	f0a86d53-03a8-4919-854d-8fa14ad530d8
Generator EPA ID:	CAL000356275
Shipment Date:	2020-03-20
Manifest Number:	019954027JJK
Line Number:	1
Method Code:	H141
Quantity Tons:	0.10000
Quantity Waste:	200.000000
Quantity Unit:	P
Number of Containers:	1
Type of Container:	Metal drums, barrels, kegs
Quantity Type:	Pounds
State Code:	351

San Bern. Co. Permit:

Name:	INTERNATIONAL PAVING SERVICES, INC.
Address:	1199 OPAL AVE
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0003994
Owner:	INTERNATIONAL PAVING SERVICES
Permit Number:	PT0018566
Permit Category:	APSA 1,320-10,000 GAL FAC CAPACITY
Facility Status:	ACTIVE
Expiration Date:	04/30/2023

Name:	INTERNATIONAL PAVING SERVICES, INC.
Address:	1199 OPAL AVE
City,State,Zip:	MENTONE, CA 92359

WESTERN FRUIT GROWERS (Continued) **U001575207**

Region: SAN BERNARDINO
Facility ID: FA0003994
Owner: INTERNATIONAL PAVING SERVICES
Permit Number: PT0003244
Permit Category: HAZARDOUS MATERIALS 11-30 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 04/30/2023

Name: INTERNATIONAL PAVING SERVICES, INC.
Address: 1199 OPAL AVE
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0003994
Owner: INTERNATIONAL PAVING SERVICES
Permit Number: PT0003245
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: ACTIVE
Expiration Date: 04/30/2023

Name: INTERNATIONAL PAVING SERVICES, INC.
Address: 1199 OPAL AVE
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0003994
Owner: INTERNATIONAL PAVING SERVICES
Permit Number: PT0024243
Permit Category: EPCRA FACILITY
Facility Status: INACTIVE
Expiration Date: 04/30/2014

Name: INTERNATIONAL PAVING SERVICES, INC.
Address: 1199 OPAL AVE
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0003994
Owner: INTERNATIONAL PAVING SERVICES
Permit Number: PT0018565
Permit Category: AST OPERATING PERMIT
Facility Status: INACTIVE
Expiration Date: 04/30/2010

CERS:
Name: INTERNATIONAL PAVING SERVICES, INC.
Address: 1199 OPAL AVE
City,State,Zip: MENTONE, CA 92359
Site ID: 395185
CERS ID: 10040692
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 395185
Site Name: International Paving Services, Inc.
Violation Date: 01-26-2017
Citation: HSC 6.5 25250.22 - California Health and Safety Code, Chapter 6.5, Section(s) 25250.22
Violation Description: Failure to properly manage used oil and/or fuel filters in accordance with the requirements.

WESTERN FRUIT GROWERS (Continued) **U001575207**

Violation Notes:	Returned to compliance on 02/23/2017. Operator stated the container of used to drain oil filters also contained the waste coolant. Operator stated that a different container will be provided to store waste coolant.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	395185
Site Name:	International Paving Services, Inc.
Violation Date:	01-29-2020
Citation:	HSC 6.5 25123.3(h)(1) - California Health and Safety Code, Chapter 6.5, Section(s) 25123.3(h)(1)
Violation Description:	Failure to send hazardous waste offsite for treatment, storage, or disposal within 180 days (or 270 days if waste is transported over 200 miles) for a generator who generates less than 1000 kilogram per month if all of the following conditions are met: (1) The quantity of hazardous waste accumulated onsite never exceeds 6,000 kilograms. (2) The generator complies with the requirements of 40 Code of Federal Regulations section 262.34(d), (e) and (f). (3) The generator does not hold acutely hazardous waste or extremely hazardous waste in an amount greater than one kilogram for more than 90 days.
Violation Notes:	Returned to compliance on 02/17/2020. Observed (1) 55 gallon drum containing used oil contaminated solids and (1) 55 gallon drum containing waste antifreeze, to exceeded the accumulation time frame for this facility. CORRECTIVE ACTION: Sign the Certificate of Compliance indicating that all hazardous waste that has exceeded the accumulation time frame for this facility has been transported off site by a licensed hazardous waste transporter; provide this Division with a copy of the hazardous waste disposal record.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	395185
Site Name:	International Paving Services, Inc.
Violation Date:	01-26-2017
Citation:	HSC 6.5 Multiple - California Health and Safety Code, Chapter 6.5, Section(s) Multiple
Violation Description:	Hazardous Waste Generator Program - Operations/Maintenance - General
Violation Notes:	Returned to compliance on 02/23/2017. Failure to complete hazardous waste labels (CCR 66262.34(f)(3)) Observed incomplete hazardous waste labels.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	395185
Site Name:	International Paving Services, Inc.
Violation Date:	01-26-2017
Citation:	HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f)
Violation Description:	Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or

WESTERN FRUIT GROWERS (Continued) **U001575207**

business name. A substantial change in the handler's operations that requires modification to any portion of the business plan.
Violation Notes: Returned to compliance on 02/23/2017. Observed (1) 55 gallon drum of waste spent absorbent previously undisclosed.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 395185
Site Name: International Paving Services, Inc.
Violation Date: 01-29-2020
Citation: 40 CFR 1 262.34(d)(5)(iii) - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 262.34(d)(5)(iii)
Violation Description: Failure to ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relevant to their responsibilities during normal facility operations and emergencies.
Violation Notes: Returned to compliance on 02/17/2020. Facility operator was unable to adequately demonstrate that hazardous waste training is conducted for employees. CORRECTIVE ACTION: Sign the Certificate of Compliance indicating that initial hazardous waste training has been conducted, and annual refresher training will be conducted.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-06-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Routine inspection with Brenda MacGregor
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-29-2020
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-06-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Inspection
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-26-2017
Violations Found: Yes
Eval Type: Routine done by local agency

WESTERN FRUIT GROWERS (Continued) **U001575207**

Eval Notes: ROUTINE HANDLER INSPECTION FOR INTERNATIONAL PAVING SERVICES INC.
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-29-2020
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-26-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE GENERATOR INSPECTION FOR INTERNATIONAL PAVING SERVICES INC.
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-29-2020
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-06-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: inspection
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-06-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: inspection
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-26-2017
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: ROUTINE APSA INSPECTION FOR INTERNATIONAL PAVING SERVICES INC.
Eval Division: San Bernardino County Fire Department
Eval Program: APSA

WESTERN FRUIT GROWERS (Continued) **U001575207**

Eval Source: CERS,

Enforcement Action:
Site ID: 395185
Site Name: International Paving Services, Inc.
Site Address: 1199 OPAL AVE
Site City: MENTONE
Site Zip: 92359
Enf Action Date: 01-26-2017
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Bernardino County Fire Department
Enf Action Program: HMRRP
Enf Action Source: CERS,

Site ID: 395185
Site Name: International Paving Services, Inc.
Site Address: 1199 OPAL AVE
Site City: MENTONE
Site Zip: 92359
Enf Action Date: 01-26-2017
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Bernardino County Fire Department
Enf Action Program: HW
Enf Action Source: CERS,

Coordinates:
Site ID: 395185
Facility Name: International Paving Services, Inc.
Env Int Type Code: APSA
Program ID: 10040692
Coord Name: Not reported
Ref Point Type Desc: Unknown,
Latitude: 34.065952
Longitude: -117.135300

Affiliation:
Affiliation Type Desc: Environmental Contact
Entity Name: BRENT C. RIEGER
Entity Title: Not reported
Affiliation Address: PO BOX 10458
Affiliation City: SAN BERNARDINO
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92423-0458
Affiliation Phone: ,

Affiliation Type Desc: Document Preparer
Entity Name: April Kimmen Hergenreder
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported

WESTERN FRUIT GROWERS (Continued) **U001575207**

Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Property Owner
Entity Name: BRENT C RIEGER
Entity Title: Not reported
Affiliation Address: P O BOX 10458
Affiliation City: SAN BERNARDINO
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 92423
Affiliation Phone: (909) 794-2101,

Affiliation Type Desc: CUPA District
Entity Name: San Bernardino County Fire
Entity Title: Not reported
Affiliation Address: 620 South E Street
Affiliation City: San Bernardino
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92415-0153
Affiliation Phone: (909) 386-8401,

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 1199 OPAL AVE
Affiliation City: MENTONE
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92359-1313
Affiliation Phone: ,

Affiliation Type Desc: Identification Signer
Entity Name: BRENT C. RIEGER
Entity Title: PRESIDENT
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Legal Owner
Entity Name: INTERNATIONAL PAVING SERVICES
Entity Title: Not reported
Affiliation Address: P O BOX 10458
Affiliation City: SAN BERNARDINO
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 92423-9242
Affiliation Phone: (909) 794-2101,

Affiliation Type Desc: Operator
Entity Name: International Paving Services, Inc.
Entity Title: Not reported

WESTERN FRUIT GROWERS (Continued) **U001575207**

Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (909) 794-2101,

Affiliation Type Desc: Parent Corporation
Entity Name: INTERNATIONAL PAVING SERVICES
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

HWTS:
Name: INTERNATIONAL PAVING SERVICES INC
Address: 1199 OPAL AVE
Address 2: Not reported
City,State,Zip: MENTONE, CA 92359
EPA ID: CAL000356275
Inactive Date: Not reported
Create Date: 08/30/2010
Last Act Date: Not reported
Mailing Name: Not reported
Mailing Address: PO BOX 10458
Mailing Address 2: Not reported
Mailing City,State,Zip: SAN BERNARDINO, CA 924230458
Owner Name: INTERNATIONAL PAVING SERVICES INC
Owner Address: PO BOX 10458
Owner Address 2: Not reported
Owner City,State,Zip: SAN BERNARDINO, CA 924230458
Contact Name: APRIL HERGENREDER
Contact Address: PO BOX 10458
Contact Address 2: Not reported
City,State,Zip: SAN BERNARDINO, CA 92423
Facility Status: Active
Facility Type: PERMANENT
Category: STATE
Latitude: 34.068932
Longitude: -117.133841

NAICS:
EPA ID: CAL000356275
Create Date: 2010-08-30 13:26:36.980
NAICS Code: 324121
NAICS Description: Asphalt Paving Mixture and Block Manufacturing
Issued EPA ID Date: 2010-08-30 13:26:36.98000
Inactive Date: Not reported
Facility Name: INTERNATIONAL PAVING SERVICES INC
Facility Address: 1199 OPAL AVE
Facility Address 2: Not reported
Facility City: MENTONE
Facility County: Not reported

WESTERN FRUIT GROWERS (Continued) **U001575207**

Facility State: CA
Facility Zip: 923591284

H25 **INT'L PAVEMENT SOLUTIONS, INC.** **AST** **A100345853**
ENE **1199 OPAL AVE** **N/A**
1/8-1/4 **MENTONE, CA**
0.230 mi.
1214 ft. **Site 2 of 3 in cluster H**

Relative: **Higher**
Actual: **1646 ft.**

AST:

Name:	INT'L PAVEMENT SOLUTIONS, INC.
Address:	1199 OPAL AVE
City/Zip:	MENTONE,
Certified Unified Program Agencies:	San Bernardino
Owner:	RIEGER, DENNIS C.
Total Gallons:	8,745
CERSID:	Not reported
Facility ID:	Not reported
Business Name:	Not reported
Phone:	Not reported
Fax:	Not reported
Mailing Address:	Not reported
Mailing Address City:	Not reported
Mailing Address State:	Not reported
Mailing Address Zip Code:	Not reported
Operator Name:	Not reported
Operator Phone:	Not reported
Owner Phone:	Not reported
Owner Mail Address:	Not reported
Owner State:	Not reported
Owner Zip Code:	Not reported
Owner Country:	Not reported
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	Not reported

H26 **INTERNATIONAL PAVING SERVICES INC** **RCRA NonGen / NLR** **1024827227**
ENE **1199 OPAL AVE** **CAL000356275**
1/8-1/4 **MENTONE, CA 92359**
0.230 mi.
1214 ft. **Site 3 of 3 in cluster H**

Relative: **Higher**
Actual: **1646 ft.**

RCRA Listings:

Date Form Received by Agency:	20100830
Handler Name:	International Paving Services Inc
Handler Address:	1199 OPAL AVE
Handler City,State,Zip:	MENTONE, CA 92359-1284
EPA ID:	CAL000356275
Contact Name:	APRIL HERGENREDER
Contact Address:	PO BOX 10458

INTERNATIONAL PAVING SERVICES INC (Continued) **1024827227**

Contact City,State,Zip:	SAN BERNARDINO, CA 92423
Contact Telephone:	909-794-2101
Contact Fax:	909-794-7098
Contact Email:	APRIL@IPSPAVING.COM
Contact Title:	Not reported
EPA Region:	09
Land Type:	Not reported
Federal Waste Generator Description:	Not a generator, verified
Non-Notifier:	Not reported
Biennial Report Cycle:	Not reported
Accessibility:	Not reported
Active Site Indicator:	Handler Activities
State District Owner:	Not reported
State District:	Not reported
Mailing Address:	PO BOX 10458
Mailing City,State,Zip:	SAN BERNARDINO, CA 92423-0458
Owner Name:	International Paving Services Inc
Owner Type:	Other
Operator Name:	April Hergenreder
Operator Type:	Other
Short-Term Generator Activity:	No
Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
Transfer Facility Activity:	No
Recycler Activity with Storage:	No
Small Quantity On-Site Burner Exemption:	No
Smelting Melting and Refining Furnace Exemption:	No
Underground Injection Control:	No
Off-Site Waste Receipt:	No
Universal Waste Indicator:	Yes
Universal Waste Destination Facility:	Yes
Federal Universal Waste:	No
Active Site State-Reg Handler:	---
Federal Facility Indicator:	Not reported
Hazardous Secondary Material Indicator:	N
Sub-Part K Indicator:	Not reported
2018 GPRA Permit Baseline:	Not on the Baseline
2018 GPRA Renewals Baseline:	Not on the Baseline
202 GPRA Corrective Action Baseline:	No
Subject to Corrective Action Universe:	No
Non-TSDFs Where RCRA CA has Been Imposed Universe:	No
Corrective Action Priority Ranking:	No NCAPS ranking
Environmental Control Indicator:	No
Institutional Control Indicator:	No
Human Exposure Controls Indicator:	N/A
Groundwater Controls Indicator:	N/A
Significant Non-Complier Universe:	No
Unaddressed Significant Non-Complier Universe:	No
Addressed Significant Non-Complier Universe:	No
Significant Non-Complier With a Compliance Schedule Universe:	No
Financial Assurance Required:	Not reported
Handler Date of Last Change:	20180905
Recognized Trader-Importer:	No
Recognized Trader-Exporter:	No
Importer of Spent Lead Acid Batteries:	No
Exporter of Spent Lead Acid Batteries:	No

INTERNATIONAL PAVING SERVICES INC (Continued) **1024827227**

Recycler Activity Without Storage: No
Manifest Broker: No
Sub-Part P Indicator: No

Handler - Owner Operator:
Owner/Operator Indicator: Owner
Owner/Operator Name: INTERNATIONAL PAVING SERVICES INC
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 10458
Owner/Operator City,State,Zip: SAN BERNARDINO, CA 92423-0458
Owner/Operator Telephone: 909-794-2101
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Operator
Owner/Operator Name: APRIL HERGENREDER
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 10458
Owner/Operator City,State,Zip: SAN BERNARDINO, CA 92423
Owner/Operator Telephone: 909-794-2101
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20100830
Handler Name: INTERNATIONAL PAVING SERVICES INC
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 324121
NAICS Description: ASPHALT PAVING MIXTURE AND BLOCK MANUFACTURING

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

I27 **CIRCLE K #1971** **LUST** **S108210925**
NNE **1702 MENTONE BLVD** **CERS** **N/A**
1/4-1/2 **MENTONE, CA 92374**
0.351 mi.
1853 ft. **Site 1 of 3 in cluster I**

Relative:
Higher

Actual:
1618 ft.

LUST:

Name:	CIRCLE K #1971
Address:	1702 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92374
Lead Agency:	SAN BERNARDINO COUNTY
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607100461
Global Id:	T0607100461
Latitude:	34.0697959
Longitude:	-117.138339
Status:	Completed - Case Closed
Status Date:	06/26/1998
Case Worker:	Not reported
RB Case Number:	083603098T
Local Agency:	Not reported
File Location:	Local Agency
Local Case Number:	97065
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline
EPA Region:	9
Coordinate Source:	Google Map Move
Cuf Case:	NO
Quantity Released Gallons:	Not reported
Begin Date:	10/07/1997
Leak Reported Date:	11/21/1997
How Discovered:	Not reported
How Discovered Description:	Not reported
Discharge Source:	Not reported
Discharge Cause:	Not reported
Stop Method:	Not reported
Stop Description:	Not reported
No Further Action Date:	06/26/1998
CA Water Watershed Name:	Santa Ana River - Upper Santa Ana River - Mentone (801.54)
Dwr Groundwater Subbasin Name:	Upper Santa Ana Valley - San Bernardino (8-002.06)
Disadvantaged Community:	Not reported
CA Enviroscreen 3 Score:	51-55%
CA Enviroscreen 4 Score:	50-55%
Military DOD Site:	No
Facility Project Subtype:	Not reported
RWQCB Region:	SANTA ANA RWQCB (REGION 8)
Site History:	Not reported

LUST:

Global Id:	T0607100461
Contact Type:	Regional Board Caseworker
Contact Name:	MAILE SEEGER GEE
Organization Name:	SANTA ANA RWQCB (REGION 8)
Address:	3737 MAIN STREET, SUITE 500
City:	RIVERSIDE
Email:	maile.gee@waterboards.ca.gov
Phone Number:	9517824379

LUST:

CIRCLE K #1971 (Continued) **S108210925**

Global Id: T0607100461
Action Type: ENFORCEMENT
Date: 06/26/1998
Action: Clean-up and Abatement Order

Global Id: T0607100461
Action Type: Other
Date: 11/21/1997
Action: Leak Reported

Global Id: T0607100461
Action Type: Other
Date: 10/07/1997
Action: Leak Discovery

LUST:
Global Id: T0607100461
Status: Open - Case Begin Date
Status Date: 10/07/1997

Global Id: T0607100461
Status: Completed - Case Closed
Status Date: 06/26/1998

CERS:
Name: CIRCLE K #1971
Address: 1702 MENTONE BLVD
City,State,Zip: MENTONE, CA 92374
Site ID: 192423
CERS ID: T0607100461
CERS Description: Leaking Underground Storage Tank Cleanup Site

Affiliation:
Affiliation Type Desc: Regional Board Caseworker
Entity Name: MAILE SEEGER GEE - SANTA ANA RWQCB (REGION 8)
Entity Title: Not reported
Affiliation Address: 3737 MAIN STREET, SUITE 500
Affiliation City: RIVERSIDE
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: 9517824379,

I28 **CIRCLE K #1971** **LUST** **U003939123**
NNE **1702 MENTONE BLVD** **Cortese** **N/A**
1/4-1/2 **MENTONE, CA 92374**
0.351 mi.
1853 ft. **Site 2 of 3 in cluster I**

Relative:
Higher

Actual:
1618 ft.

LUST REG 8:
Name: CIRCLE K #1971
Address: 1702 MENTONE BLVD
City: MENTONE
Region: 8
County: San Bernardino

CIRCLE K #1971 (Continued) **U003939123**

Regional Board:	Santa Ana Region
Facility Status:	Preliminary site assessment underway
Case Number:	083603098T
Local Case Num:	97065
Case Type:	Soil only
Substance:	Gasoline
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	Not reported
Enf Type:	Cleanup and Abatement Orders
Funding:	Not reported
How Discovered:	Not reported
How Stopped:	Not reported
Leak Cause:	Not reported
Leak Source:	Not reported
Global ID:	T0607100461
How Stopped Date:	Not reported
Enter Date:	12/18/1997
Date Confirmation of Leak Began:	Not reported
Date Preliminary Assessment Began:	1/1/1965
Discover Date:	10/7/1997
Enforcement Date:	Not reported
Close Date:	6/26/1998
Date Prelim Assessment Workplan Submitted:	Not reported
Date Pollution Characterization Began:	Not reported
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	12/18/1997
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	34.069961
Longitude:	-117.1387977
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	1
MTBE Tested:	Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
MTBE Class:	*
Staff:	CAB
Staff Initials:	BM7
Lead Agency:	Local Agency
Local Agency:	36000L
Hydr Basin #:	UPPER SANTA ANA VALL
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

CORTESE:
Name: CIRCLE K #1971

CIRCLE K #1971 (Continued) **U003939123**

Address:	1702 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92374
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0607100461
Site/Facility Type:	LUST CLEANUP SITE
Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

I29 **CRV RECYCLING SOLUTIONS** **SWRCY** **S118231787**
North **1786 E LUGONIA AVE** **HAZNET** **N/A**
1/4-1/2 **REDLANDS, CA 92374** **HWTS**
0.368 mi.
1943 ft. **Site 3 of 3 in cluster I**

Relative:
Higher

Actual:
1610 ft.

SWRCY:

Name:	CRV RECYCLING SOLUTIONS
Address:	1786 E LUGONIA AVE
City,State,Zip:	REDLANDS, CA 92374
Reg Id:	Not reported
Cert Id:	RC308154.001
Mailing Address:	26104 Adamor Rd
Mailing City:	Calabasas
Mailing State:	CA
Mailing Zip Code:	91302
Website:	Not reported
Email:	Not reported
Phone Number:	(818) 203-3035
Rural:	N
Operation Begin Date:	01/02/2022
Aluminium:	Not reported
Glass:	Not reported
Plastic:	Not reported
Bimetal:	Not reported
Hours of Operation:	Mon Closed; Tue - Sat 9:00 am - 5:00 pm, Closed 1:00 pm - 1:30 pm; Sun Closed
Organization ID:	Not reported
Organization Name:	Recycling Solution Sites Inc

HAZNET:

Name:	STATER BROS MARKETS #89 REDLANDS/LUGONIA
Address:	1786 E LUGONIA AVE

CRV RECYCLING SOLUTIONS (Continued) **S118231787**

Address 2:	Not reported
City,State,Zip:	REDLANDS, CA 923742703
Contact:	CHERYL SKALICKY
Telephone:	9097335288
Mailing Name:	Not reported
Mailing Address:	PO BOX 150
Year:	2014
Gepaid:	CAL000340456
TSD EPA ID:	CAD009007626
CA Waste Code:	151 - Asbestos containing waste
Disposal Method:	H132 - Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Tons:	32

Additional Info:

Year:	2014
Gen EPA ID:	CAL000340456
Shipment Date:	20140128
Creation Date:	3/8/2014 22:15:07
Receipt Date:	20140129
Manifest ID:	000039086WAS
Trans EPA ID:	CAR000049064
Trans Name:	ECTI
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD009007626
Trans Name:	AZUSA LAND RECLAMATION
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported
Waste Code Description:	151 - Asbestos-containing waste
RCRA Code:	Not reported
Meth Code:	H132 - Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Quantity Tons:	16
Waste Quantity:	40
Quantity Unit:	Y
Additional Code 1:	Not reported
Additional Code 2:	Not reported
Additional Code 3:	Not reported
Additional Code 4:	Not reported
Additional Code 5:	Not reported
Shipment Date:	20140122
Creation Date:	3/6/2014 22:15:20
Receipt Date:	20140124
Manifest ID:	000039081WAS
Trans EPA ID:	CAR000049064
Trans Name:	ECTI
Trans 2 EPA ID:	Not reported
Trans 2 Name:	Not reported
TSDF EPA ID:	CAD009007626
Trans Name:	AZUSA LAND RECLAMATION
TSDF Alt EPA ID:	Not reported
TSDF Alt Name:	Not reported

CRV RECYCLING SOLUTIONS (Continued) **S118231787**

Waste Code Description: 151 - Asbestos-containing waste
RCRA Code: Not reported
Meth Code: H132 - Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization)
Quantity Tons: 16
Waste Quantity: 40
Quantity Unit: Y
Additional Code 1: Not reported
Additional Code 2: Not reported
Additional Code 3: Not reported
Additional Code 4: Not reported
Additional Code 5: Not reported

HWTS:
Name: STATER BROS MARKETS #89 REDLANDS/LUGONIA
Address: 1786 E LUGONIA AVE
Address 2: Not reported
City,State,Zip: REDLANDS, CA 92374
EPA ID: CAL000340456
Inactive Date: 09/23/2014
Create Date: 02/10/2009
Last Act Date: Not reported
Mailing Name: Not reported
Mailing Address: PO BOX 150
Mailing Address 2: Not reported
Mailing City,State,Zip: SAN BERNARDINO, CA 924020000
Owner Name: STATER BROS MARKETS
Owner Address: 301 S TIPPECANOE AVE
Owner Address 2: Not reported
Owner City,State,Zip: SAN BERNARDINO, CA 924080121
Contact Name: CHERYL SKALICKY
Contact Address: 301 S. TIPPECANOE AVE.
Contact Address 2: Not reported
City,State,Zip: SAN BERNARDINO, CA 92408
Facility Status: Inactive
Facility Type: PERMANENT
Category: STATE
Latitude: 34.070116
Longitude: -117.139348

NAICS:
EPA ID: CAL000340456
Create Date: 2009-02-10 11:18:30.173
NAICS Code: 45291
NAICS Description: Warehouse Clubs and Superstores
Issued EPA ID Date: 2009-02-10 11:18:30.16000
Inactive Date: 2014-09-23 00:00:00
Facility Name: STATER BROS MARKETS #89 REDLANDS/LUGONIA
Facility Address: 1786 E LUGONIA AVE
Facility Address 2: Not reported
Facility City: REDLANDS
Facility County: Not reported
Facility State: CA
Facility Zip: 923742703

J30 **MENTONE SERVICE STATION** **LUST** **S104751127**
NNE **1759 MENTONE BLVD** **SWEEPS UST** **N/A**
1/4-1/2 **MENTONE, CA 92359** **Cortese**
0.418 mi. **HIST CORTESE**
2207 ft. **Site 1 of 2 in cluster J** **San Bern. Co. Permit**
CERS
Relative: **HWTS**
Higher

Actual: **1633 ft.**

LUST REG 8:

Name:	MENTONE SERVICE STATION
Address:	1759 MENTONE BLVD
City:	MENTONE
Region:	8
County:	San Bernardino
Regional Board:	Santa Ana Region
Facility Status:	Preliminary site assessment workplan submitted
Case Number:	083603461T
Local Case Num:	99072
Case Type:	Soil only
Substance:	8006619, MTB
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	JASPAR
Enf Type:	Not reported
Funding:	Not reported
How Discovered:	Tank Closure
How Stopped:	Not reported
Leak Cause:	UNK
Leak Source:	Piping
Global ID:	T0607100577
How Stopped Date:	2/12/1999
Enter Date:	5/14/1999
Date Confirmation of Leak Began:	2/1/1999
Date Preliminary Assessment Began:	Not reported
Discover Date:	2/1/1999
Enforcement Date:	Not reported
Close Date:	Not reported
Date Prelim Assessment Workplan Submitted:	3/25/1999
Date Pollution Characterization Began:	Not reported
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	5/14/1999
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	34.070159
Longitude:	-117.1365046
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	0
MTBE Tested:	Not Required to be Tested.
MTBE Class:	*
Staff:	NOM

MENTONE SERVICE STATION (Continued) **S104751127**

Staff Initials:	LH6
Lead Agency:	Local Agency
Local Agency:	36000L
Hydr Basin #:	UPPER SANTA ANA VALL
Beneficial:	MUN
Priority:	A2
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported
Summary:	Not reported

SWEEPS UST:

Name:	MAGIC MENTONE INC
Address:	1759 MENTONE BLVD
City:	MENTONE
Status:	Active
Comp Number:	23589
Number:	1
Board Of Equalization:	44-020795
Referral Date:	07-28-92
Action Date:	07-28-92
Created Date:	02-29-88
Owner Tank Id:	1
SWRCB Tank Id:	36-000-023589-000001
Tank Status:	A
Capacity:	8000
Active Date:	06-21-90
Tank Use:	M.V. FUEL
STG:	P
Content:	REG UNLEADED
Number Of Tanks:	5

Name:	MAGIC MENTONE INC
Address:	1759 MENTONE BLVD
City:	MENTONE
Status:	Active
Comp Number:	23589
Number:	1
Board Of Equalization:	44-020795
Referral Date:	07-28-92
Action Date:	07-28-92
Created Date:	02-29-88
Owner Tank Id:	2
SWRCB Tank Id:	36-000-023589-000002
Tank Status:	A
Capacity:	8000
Active Date:	06-21-90
Tank Use:	M.V. FUEL
STG:	P
Content:	LEADED
Number Of Tanks:	Not reported

Name:	MAGIC MENTONE INC
Address:	1759 MENTONE BLVD
City:	MENTONE
Status:	Active
Comp Number:	23589
Number:	1

MENTONE SERVICE STATION (Continued) **S104751127**

Board Of Equalization: 44-020795
Referral Date: 07-28-92
Action Date: 07-28-92
Created Date: 02-29-88
Owner Tank Id: 3
SWRCB Tank Id: 36-000-023589-000003
Tank Status: A
Capacity: 4000
Active Date: 06-21-90
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: Not reported

Name: MAGIC MENTONE INC
Address: 1759 MENTONE BLVD
City: MENTONE
Status: Active
Comp Number: 23589
Number: 1
Board Of Equalization: 44-020795
Referral Date: 07-28-92
Action Date: 07-28-92
Created Date: 02-29-88
Owner Tank Id: 4
SWRCB Tank Id: 36-000-023589-000004
Tank Status: A
Capacity: 6000
Active Date: 06-21-90
Tank Use: M.V. FUEL
STG: P
Content: REG UNLEADED
Number Of Tanks: Not reported

Name: MAGIC MENTONE INC
Address: 1759 MENTONE BLVD
City: MENTONE
Status: Active
Comp Number: 23589
Number: 1
Board Of Equalization: 44-020795
Referral Date: 07-28-92
Action Date: 07-28-92
Created Date: 02-29-88
Owner Tank Id: 4
SWRCB Tank Id: 36-000-023589-000005
Tank Status: A
Capacity: 500
Active Date: 06-21-90
Tank Use: OIL
STG: W
Content: WASTE OIL
Number Of Tanks: Not reported

CORTESE:
Name: MENTONE SERVICE STATION
Address: 1759 MENTONE BLVD

MENTONE SERVICE STATION (Continued) **S104751127**

City,State,Zip:	MENTONE, CA 92359
Region:	CORTESE
Envirostor Id:	Not reported
Global ID:	T0607100577
Site/Facility Type:	LUST CLEANUP SITE
Cleanup Status:	COMPLETED - CASE CLOSED
Status Date:	Not reported
Site Code:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Owner:	Not reported
Enf Type:	Not reported
Swat R:	Not reported
Flag:	active
Order No:	Not reported
Waste Discharge System No:	Not reported
Effective Date:	Not reported
Region 2:	Not reported
WID Id:	Not reported
Solid Waste Id No:	Not reported
Waste Management Uit Name:	Not reported
File Name:	Active Open

HIST CORTESE:

edr_fname:	MENTONE SERVICE STATION
edr_fadd1:	1759
City,State,Zip:	MENTONE, CA 92359
Region:	CORTESE
Facility County Code:	36
Reg By:	LTNKA
Reg Id:	083603461T

San Bern. Co. Permit:

Name:	MIKES SERVICE CENTER
Address:	1759 1/2 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0015561
Owner:	Michael Shihab
Permit Number:	PT0034104
Permit Category:	HAZARDOUS MATERIALS 1-3 CHEMICALS
Facility Status:	INACTIVE
Expiration Date:	09/30/2019

Name:	MIKES SERVICE CENTER
Address:	1759 1/2 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0015561
Owner:	Michael Shihab
Permit Number:	PT0034103
Permit Category:	CONDITIONALLY EXEMPT SM QTY GENERATOR
Facility Status:	INACTIVE
Expiration Date:	09/30/2019

MENTONE SERVICE STATION (Continued) **S104751127**

CERS:

Name:	MENTONE SERVICE STATION
Address:	1759 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92359
Site ID:	237205
CERS ID:	T0607100577
CERS Description:	Leaking Underground Storage Tank Cleanup Site

HWTS:

Name:	MIKES SERVICE CENTER
Address:	1759 1/2 MENTONE BLVD
Address 2:	Not reported
City,State,Zip:	MENTONE, CA 92359
EPA ID:	CAL000399540
Inactive Date:	06/30/2020
Create Date:	08/06/2014
Last Act Date:	Not reported
Mailing Name:	Not reported
Mailing Address:	1759 1/2 MENTONE BLVD
Mailing Address 2:	Not reported
Mailing City,State,Zip:	MENTONE, CA 92359
Owner Name:	MICHAEL SHIHAB
Owner Address:	1759 1/2 MENTONE BLVD
Owner Address 2:	Not reported
Owner City,State,Zip:	MENTONE, CA 92359
Contact Name:	MICHAEL SHIHAB
Contact Address:	1759 1/2 MENTONE BLVD
Contact Address 2:	Not reported
City,State,Zip:	MENTONE, CA 92359
Facility Status:	Inactive
Facility Type:	PERMANENT
Category:	STATE
Latitude:	34.07017217
Longitude:	-117.13655983

NAICS:

EPA ID:	CAL000399540
Create Date:	2014-08-06 09:47:28.463
NAICS Code:	811111
NAICS Description:	General Automotive Repair
Issued EPA ID Date:	2014-08-06 09:47:28.41300
Inactive Date:	2020-06-30 00:00:00
Facility Name:	MIKES SERVICE CENTER
Facility Address:	1759 1/2 MENTONE BLVD
Facility Address 2:	Not reported
Facility City:	MENTONE
Facility County:	Not reported
Facility State:	CA
Facility Zip:	92359

J31 **MENTONE ARCO** **LUST** **U001575442**
NNE **1759 MENTONE BLVD** **WMUDS/SWAT** **N/A**
1/4-1/2 **MENTONE, CA 92373** **CERS HAZ WASTE**
0.418 mi. **HIST UST**
2207 ft. **Site 2 of 2 in cluster J** **CERS TANKS**
San Bern. Co. Permit
Relative: **CERS**
Higher

Actual: **1633 ft.**

LUST:

Name:	MENTONE SERVICE STATION
Address:	1759 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92359
Lead Agency:	SAN BERNARDINO COUNTY
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607100577
Global Id:	T0607100577
Latitude:	34.070159
Longitude:	-117.1365046
Status:	Completed - Case Closed
Status Date:	10/04/2007
Case Worker:	Not reported
RB Case Number:	083603461T
Local Agency:	Not reported
File Location:	Local Agency
Local Case Number:	99072
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Gasoline, MTBE / TBA / Other Fuel Oxygenates
EPA Region:	9
Coordinate Source:	* Historical Geocode - Exact Address Match
Cuf Case:	YES
Quantity Released Gallons:	Not reported
Begin Date:	02/01/1999
Leak Reported Date:	04/23/1999
How Discovered:	Tank Closure
How Discovered Description:	Not reported
Discharge Source:	Piping
Discharge Cause:	Unknown
Stop Method:	Not reported
Stop Description:	Not reported
No Further Action Date:	10/04/2007
CA Water Watershed Name:	Santa Ana River - Upper Santa Ana River - Mentone (801.54)
Dwr Groundwater Subbasin Name:	Upper Santa Ana Valley - San Bernardino (8-002.06)
Disadvantaged Community:	Not reported
CA Enviroscreen 3 Score:	51-55%
CA Enviroscreen 4 Score:	50-55%
Military DOD Site:	No
Facility Project Subtype:	Not reported
RWQCB Region:	SANTA ANA RWQCB (REGION 8)
Site History:	Not reported

LUST:

Global Id:	T0607100577
Action Type:	Other
Date:	04/23/1999
Action:	Leak Reported
Global Id:	T0607100577
Action Type:	REMEDIATION
Date:	05/25/1999
Action:	Excavation

MENTONE ARCO (Continued) **U001575442**

Global Id: T0607100577
Action Type: REMEDIATION
Date: 11/25/2005
Action: Soil Vapor Extraction (SVE)

Global Id: T0607100577
Action Type: ENFORCEMENT
Date: 10/04/2007
Action: Closure/No Further Action Letter

Global Id: T0607100577
Action Type: Other
Date: 02/01/1999
Action: Leak Discovery

Global Id: T0607100577
Action Type: Other
Date: 02/12/1999
Action: Leak Stopped

LUST:
Global Id: T0607100577
Status: Open - Case Begin Date
Status Date: 02/01/1999

Global Id: T0607100577
Status: Open - Site Assessment
Status Date: 02/01/1999

Global Id: T0607100577
Status: Open - Site Assessment
Status Date: 03/25/1999

Global Id: T0607100577
Status: Open - Remediation
Status Date: 11/25/2005

Global Id: T0607100577
Status: Open - Site Assessment
Status Date: 11/20/2006

Global Id: T0607100577
Status: Completed - Case Closed
Status Date: 10/04/2007

WMUDS/SWAT:
Edit Date: Not reported
Complexity: Not reported
Primary Waste: Not reported
Primary Waste Type: Not reported
Secondary Waste: Not reported
Secondary Waste Type: Not reported
Base Meridian: Not reported
NPID: Not reported
Tonnage: 0

MENTONE ARCO (Continued) **U001575442**

Regional Board ID:	Not reported
Municipal Solid Waste:	False
Superorder:	False
Open To Public:	False
Waste List:	False
Agency Type:	Not reported
Agency Name:	SAN BERDARDINO COUNTY
Agency Department:	Not reported
Agency Address:	Not reported
Agency City,St,Zip:	Not reported
Agency Contact:	Not reported
Agency Telephone:	Not reported
Land Owner Name:	Not reported
Land Owner Address:	Not reported
Land Owner City,St,Zip:	CA
Land Owner Contact:	Not reported
Land Owner Phone:	Not reported
Region:	8
Facility Type:	Not reported
Facility Description:	Not reported
Facility Telephone:	Not reported
SWAT Facility Name:	Not reported
Primary SIC:	Not reported
Secondary SIC:	Not reported
Comments:	Not reported
Last Facility Editors:	Not reported
Waste Discharge System:	False
Solid Waste Assessment Test Program:	True
Toxic Pits Cleanup Act Program:	False
Resource Conservation Recovery Act:	False
Department of Defence:	False
Solid Waste Assessment Test Program:	SAN BERDARDINO COUNTY
Threat to Water Quality:	Not reported
Sub Chapter 15:	False
Regional Board Project Officer:	MA
Number of WMUDS at Facility:	1
Section Range:	Not reported
RCRA Facility:	Not reported
Waste Discharge Requirements:	Not reported
Self-Monitoring Rept. Frequency:	Not reported
Waste Discharge System ID:	8 360016NUR
Solid Waste Information ID:	Not reported

CERS HAZ WASTE:

Name:	MENTONE GAS & MINIMART
Address:	1759 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92359
Site ID:	397425
CERS ID:	10041889
CERS Description:	Hazardous Waste Generator

HIST UST:

Name:	MENTONE ARCO
Address:	1759 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92373
File Number:	0002aa29

MENTONE ARCO (Continued) **U001575442**

URL:	https://documents.geotracker.waterboards.ca.gov/ustpdfs/pdf/0002aa29.pdf
Region:	STATE
Facility ID:	00000023589
Facility Type:	Gas Station
Other Type:	Not reported
Contact Name:	WALTER J. DE BLAUW
Telephone:	7147945824
Owner Name:	WALTER J. DE BLAUW
Owner Address:	1759 MENTONE BLVD.
Owner City,St,Zip:	MENTONE, CA 92373
Total Tanks:	0004
Tank Num:	001
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00008000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	001
Container Num:	1
Year Installed:	Not reported
Tank Capacity:	00008000
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	002
Container Num:	2
Year Installed:	Not reported
Tank Capacity:	00008000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	002
Container Num:	2
Year Installed:	Not reported
Tank Capacity:	00008000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	None
Tank Num:	003
Container Num:	3
Year Installed:	Not reported
Tank Capacity:	00004000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	None

MENTONE ARCO (Continued) **U001575442**

Tank Num:	003
Container Num:	3
Year Installed:	Not reported
Tank Capacity:	00004000
Tank Used for:	PRODUCT
Type of Fuel:	PREMIUM
Container Construction Thickness:	Not reported
Leak Detection:	None

Tank Num:	004
Container Num:	4
Year Installed:	Not reported
Tank Capacity:	00004000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Not reported

Tank Num:	004
Container Num:	4
Year Installed:	Not reported
Tank Capacity:	00004000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Not reported

Click here for Geo Tracker PDF:

CERS TANKS:

Name:	MENTONE GAS & MINIMART
Address:	1759 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92359
Site ID:	397425
CERS ID:	10041889
CERS Description:	Underground Storage Tank

San Bern. Co. Permit:

Name:	MENTONE GAS & MINIMART
Address:	1759 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0004665
Owner:	ESY CORPORATION
Permit Number:	PT0010239
Permit Category:	REGULAR UST ANNUAL INSPECTION (PER TANK)
Facility Status:	ACTIVE
Expiration Date:	10/31/2022

Name:	MENTONE GAS & MINIMART
Address:	1759 MENTONE BLVD
City,State,Zip:	MENTONE, CA 92359
Region:	SAN BERNARDINO
Facility ID:	FA0004665
Owner:	ESY CORPORATION
Permit Number:	PT0010240

MENTONE ARCO (Continued) **U001575442**

Permit Category: REGULAR UST ANNUAL INSPECTION (PER TANK)
Facility Status: ACTIVE
Expiration Date: 10/31/2022

Name: MENTONE GAS & MINIMART
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0004665
Owner: ESY CORPORATION
Permit Number: PT0010241
Permit Category: REGULAR UST ANNUAL INSPECTION (PER TANK)
Facility Status: ACTIVE
Expiration Date: 10/31/2022

Name: MENTONE GAS & MINIMART
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0004665
Owner: ESY CORPORATION
Permit Number: PT0010242
Permit Category: REGULAR UST ANNUAL INSPECTION (PER TANK)
Facility Status: ACTIVE
Expiration Date: 10/31/2022

Name: MENTONE GAS & MINIMART
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0004665
Owner: ESY CORPORATION
Permit Number: PT0005756
Permit Category: HAZMAT HANDLER, UST ONLY - PER YEAR
Facility Status: ACTIVE
Expiration Date: 10/31/2022

Name: MENTONE GAS & MINIMART
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0004665
Owner: ESY CORPORATION
Permit Number: PT0026315
Permit Category: WASTE INCIDENTAL UST OPERATION ONLY -PER YEAR
Facility Status: ACTIVE
Expiration Date: 10/31/2022

Name: BUDGET AUTO REPAIR
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0015163
Owner: KHALAF, LUAY
Permit Number: PT0026447
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: INACTIVE

MENTONE ARCO (Continued) **U001575442**

Expiration Date: 11/30/2014

Name: BUDGET AUTO REPAIR
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0015163
Owner: KHALAF, LUAY
Permit Number: PT0026446
Permit Category: HAZARDOUS MATERIALS 1-3 CHEMICALS
Facility Status: INACTIVE
Expiration Date: 11/30/2014

Name: HIGH TECH SMOG & AUTO REPAIR
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0003791
Owner: SIMON EL HAGE
Permit Number: PT0000471
Permit Category: SPECIAL GENERATOR
Facility Status: INACTIVE
Expiration Date: 07/31/2003

Name: HIGH TECH SMOG & AUTO REPAIR
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Region: SAN BERNARDINO
Facility ID: FA0003791
Owner: SIMON EL HAGE
Permit Number: PT0000472
Permit Category: SPECIAL HANDLER
Facility Status: INACTIVE
Expiration Date: 07/31/2003

CERS:
Name: MENTONE GAS & MINIMART
Address: 1759 MENTONE BLVD
City,State,Zip: MENTONE, CA 92359
Site ID: 397425
CERS ID: 10041889
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-24-2013
Citation: HSC 6.7 25299 - California Health and Safety Code, Chapter 6.7, Section(s) 25299
Violation Description: Failure to comply with one or more of the operating permit conditions.
Violation Notes: Returned to compliance on 08/05/2013. THE VR 323 SENSOR IN THE 87 TURBINE SUMP DID NOT ENABLE POSITIVE SHUTDOWN. PLEASE REPLACE OR REPAIR THIS SENSOR AND RETEST WITHIN 15 DAYS. A RE- INSPECTION IS REQUIRED.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

MENTONE ARCO (Continued) **U001575442**

Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	08-05-2020
Citation:	HSC 6.5 25123.3(h)(1) - California Health and Safety Code, Chapter 6.5, Section(s) 25123.3(h)(1)
Violation Description:	Failure to send hazardous waste offsite for treatment, storage, or disposal within 180 days (or 270 days if waste is transported over 200 miles) for a generator who generates less than 1000 kilogram per month if all of the following conditions are met: (1) The quantity of hazardous waste accumulated onsite never exceeds 6,000 kilograms. (2) The generator complies with the requirements of 40 Code of Federal Regulations section 262.34(d), (e) and (f). (3) The generator does not hold acutely hazardous waste or extremely hazardous waste in an amount greater than one kilogram for more than 90 days.
Violation Notes:	Returned to compliance on 10/16/2020. REVIEW OF DISPOSAL RECORDS INDICATE HAZARDOUS WASTE GENERATED ON SITE HAS NOT BEEN DISPOSED OF SINCE 2017. BOTH CONTAINERS 55 GALLON CONTAINERS USED TO STORE HAZARDOUS WASTE WERE NEARLY FULL. IMMEDIATELY DISPOSE HAZARDOUS WASTE USING APPROVED HAZARDOUS WASTE HAULER AND PROVIDE DOCUMENTATION OF DISPOSAL TO THIS DEPARTMENT WITHIN 30 DAYS.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,

Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	07-25-2022
Citation:	23 CCR 16 2712(b)(2) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2712(b)(2)
Violation Description:	Failure to maintain monitoring records for release detection and/or maintain records of appropriate follow-up actions.
Violation Notes:	Returned to compliance on 12/07/2022. OBSERVATION: Overfill Prevention Equipment Test records were not available on site for test conducted on 11/05/2021. CORRECTIVE ACTION: Keep a copy on site of the Overfill Prevention Equipment Test that was conducted on 11/05/2021 and submit a signed certificate of compliance to this agency that you have done so.
Violation Division:	San Bernardino County Fire Department
Violation Program:	UST
Violation Source:	CERS,

Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	08-05-2020
Citation:	22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f)
Violation Description:	Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date.
Violation Notes:	Returned to compliance on 10/16/2020. HAZARDOUS WASTE LABELS ARE MISSING ON WASTE ACCUMULATION CONTAINERS IN STORAGE AREA BESIDE CAR WASH. IMMEDIATELY PROVIDE COMPLETED HAZARDOUS WASTE LABELS AND SUBMIT DOCUMENTATION OF COMPLIANCE TO THIS DEPARTMENT WITHIN 30 DAYS.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW

MENTONE ARCO (Continued) **U001575442**

Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	07-24-2017
Citation:	23 CCR 6.7 25284, 25286 - California Code of Regulations, Title 23, Chapter 6.7, Section(s) 25284, 25286
Violation Description:	Failure to submit a complete and accurate application for a permit to operate a UST, or for renewal of the permit.
Violation Notes:	Returned to compliance on 08/10/2017. OBSERVATION: THE UST SUBMITTED DOCUMENTATION IN CERS NOTED THAT VAPOR PIPING & SECONDARY PIPING WAS PRESENT FOR T3(DSL) AND T4(DSL). DURING THE INSPECTION, VAPOR PIPING WAS NOT OBSERVED FOR BOTH DIESEL TANKS. COMPLIANCE REQUIREMENT: UPDATE CERS WITH CURRENT UST INFORMATION.
Violation Division:	San Bernardino County Fire Department
Violation Program:	UST
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	08-05-2020
Citation:	23 CCR 16 2637(f) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2637(f)
Violation Description:	Failure to submit a copy of the secondary containment test results on the Secondary Containment Testing report Form to the UPA within 30 days after the test.
Violation Notes:	Returned to compliance on 09/17/2020. SECONDARY CONTAINMENT TEST REPORT DATED 12/20/2019 IS NOT ACCEPTED DUE TO FAILURE TO INCLUDE THE INCON RESULT PRINT OUTS. IMMEDIATELY PROVIDE MISSING INCON RESULT PRINT OUTS WITH REPORT WITH DOCUMENTATION OF COMPLIANCE TO THIS DEPARTMENT WITHIN 7 DAYS OR SCHEDULE A COMPLETE SECONDARY CONTAINMENT TEST WITH THIS DEPARTMENT WITHIN 7 DAYS. THIS IS A RECALCITRANT VIOLATION NOTED ON THE PREVIOUS INSPECTION REPORT DATED 12/16/2019. THE FAILURE TO CORRECT THIS VIOLATION WITHIN 7 DAYS WILL RESULT IN FURTHER ENFORCEMENT ACTIONS INCLUDING BUT NOT LIMITED TO RED TAG ENFORCEMENT.
Violation Division:	San Bernardino County Fire Department
Violation Program:	UST
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	07-24-2017
Citation:	23 CCR 16 2712(i) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2712(i)
Violation Description:	Failure to have a UST Response Plan available on site.
Violation Notes:	Returned to compliance on 08/19/2017. OBSERVATION: THE UST MONITORING SITE PLAN WAS NOT SUBMITTED TO CERS. THE UST RESPONSE PLAN WAS SUBMITTED IN THE SITE PLANS PLACE. COMPLIANCE REQUIREMENT: UPDATED CERS WITH CURRENT INFORMATION.
Violation Division:	San Bernardino County Fire Department
Violation Program:	UST
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	07-24-2017

MENTONE ARCO (Continued) **U001575442**

Citation:	HSC 6.7 25292(e) - California Health and Safety Code, Chapter 6.7, Section(s) 25292(e)
Violation Description:	Failure to install a line leak detector (LLD).
Violation Notes:	Returned to compliance on 08/24/2017. OBSERVATION: TANK 3 (DIESEL-NORTH END) MECHANICAL LINE LEAK DETECTOR(MLLD) FAILED WHEN TEST. COMPLIANCE REQUIREMENT: SUBMIT A COPY OF THE WORK ORDER DOCUMENTING THE REPLACEMENT AND FUNCTIONALITY OF TANK 3 MLLD.
Violation Division:	San Bernardino County Fire Department
Violation Program:	UST
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	07-24-2013
Citation:	23 CCR 16 2638 - California Code of Regulations, Title 23, Chapter 16, Section(s) 2638
Violation Description:	Failure to test leak detection equipment as required every 12 months (VPH, sensor, LLD, ATG, etc.) and/or submit monitoring system certification to the CUPA within 30 days of completion of the test
Violation Notes:	Returned to compliance on 08/05/2013. THE DIESEL MLLD COULD NOT BE TESTED BECAUSE THE FITTING IN THE UDC WAS NOT ACCESSIBLE. PLEASE TEST THE DIESEL MLLD WITHIN 15 DAYS. A RE- INSPECTION IS REQUIRED.
Violation Division:	San Bernardino County Fire Department
Violation Program:	UST
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	07-25-2022
Citation:	23 CCR 16 2665(b) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2665(b)
Violation Description:	"Failure to submit a copy of the overfill prevention equipment inspection results on the Overfill Prevention Equipment Inspection Report Form to the UPA within 30 days after the inspection. "
Violation Notes:	Returned to compliance on 11/06/2022. OBSERVATION: Facility failed to send a copy of the Overfill Prevention Equipment Inspection Report Form to this CUPA for the testing conducted on 11/05/2021. CORRECTIVE ACTION: Submit a copy of the Overfill Prevention Equipment Inspection Report Form to this CUPA for the testing conducted on 11/05/2021.
Violation Division:	San Bernardino County Fire Department
Violation Program:	UST
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	08-05-2020
Citation:	HSC 6.7 25291(a)(1) - California Health and Safety Code, Chapter 6.7, Section(s) 25291(a)(1)
Violation Description:	Failure to construct, operate, and maintain primary containment as product-tight.
Violation Notes:	Returned to compliance on 08/12/2020. PRODUCT LINES INSIDE THE FOLLOWING UDC'S WERE OBSERVED LEAKING DURING INSPECTION: -UDC #1/2 -UDC #3/4 -UDC #5/6 -UDC #7/8 IMMEDIATELY REPAIR CAUSE OF PRODUCT LEAKS OBSERVED ON PRIMARY PIPING IN ALL ABOVE CONTAINMENTS AND SUBMIT MAINTENANCE WORK ORDER AND COMPLIANCE DOCUMENTATION TO THIS DEPARTMENT WITHIN 7 DAYS. NOTE: CONTACT THIS DEPARTMENT FOR APPROVAL PRIOR TO ANY REPAIRS REQUIRING PERMITS. THIS IS A RECALCITRANT VIOLATION NOTED ON

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THE PREVIOUS INSPECTION REPORT DATED 12/16/2019 AND IS NOW A CLASS 2 VIOLATION. THE FAILURE TO CORRECT THIS VIOLATION WITHIN 7 DAYS WILL RESULT IN FURTHER ENFORCEMENT ACTIONS INCLUDING BUT NOT LIMITED TO RED TAG ENFORCEMENT.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-22-2016
Citation: 23 CCR 16 2712 - California Code of Regulations, Title 23, Chapter 16, Section(s) 2712
Violation Description: Failure to comply with any of the applicable requirements of the permit issued for the operation of the UST system.
Violation Notes: Returned to compliance on 07/22/2016. L6 VR323 LIQUID SENSOR INSIDE THE 91 STP SUMP INITIALLY FAILED WHEN TESTED. THE INOPERABLE FAILED SENSOR WAS REPLACED "LIKE FOR LIKE" DURING INSPECTION AND WAS WITNESSED OPERABLE UPON RETEST.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-24-2013
Citation: HSC 6.7 25292.1(a) - California Health and Safety Code, Chapter 6.7, Section(s) 25292.1(a)
Violation Description: Failure to operate the UST system to prevent spills and/or overfills.
Violation Notes: Returned to compliance on 08/05/2013. THE VR 323 SENSOR IN THE 87 TURBINE SUMP DID NOT ENABLE POSITIVE SHUTDOWN WHEN TESTED. PLEASE REPLACE OR REPAIR THIS SENSOR AND RETEST WITHIN 15 DAYS. A RE-INSPECTION IS REQUIRED.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-20-2021
Citation: HSC 6.7 25290.2(c) - California Health and Safety Code, Chapter 6.7, Section(s) 25290.2(c)
Violation Description: Failure to maintain secondary containment (e.g., failure of secondary containment testing).
Violation Notes: Returned to compliance on 03/02/2022. PER UST TECHNICIAN, ALL UDC'S FAILED DURING THE SECONDARY CONTAINMENT PRECISION HYDROSTATIC TESTING COMPLETED YESTERDAY (7/19/2021). IMMEDIATELY SUBMIT PLANS FOR REPAIR TO THIS DEPARTMENT WITHIN 30 DAYS.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 12-16-2019
Citation: 23 CCR 16 2712(b)(1)(G) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2712(b)(1)(G)

MENTONE ARCO (Continued) **U001575442**

Violation Description: Failure to comply with one or more of the following overfill prevention equipment requirements: Alert the transfer operator when the tank is 90 percent full by restricting the flow into the tank or triggering an audible and visual alarm; or Restrict delivery of flow to the tank at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95 percent of capacity; and activate an audible alarm at least five minutes before the tank overfills; or Provide positive shut-off of flow to the tank when the tank is filled to no more than 95 percent of capacity; or Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling. Install/retrofit overfill prevention equipment that does not use flow restrictors on vent piping to meet overfill prevention equipment requirements when the overfill prevention equipment is installed, repaired, or replaced on and after October 1, 2018. For USTs installed before October 1, 2018, perform an inspection by October 13, 2018 and every 36 months thereafter. For USTs installed on and after October 1, 2018, perform an inspection at installation and every 36 months thereafter. Inspected within 30 days after a repair to the overfill prevention equipment. Inspected using an applicable manufacturer guidelines, industry codes, engineering standards, or a method approved by a professional engineer. Inspected by a certified UST service technician. Maintain records of overfill prevention equipment inspection for 36 months.
Violation Notes: Returned to compliance on 11/03/2020. OVERFILL INSPECTION REPORT FOR INSPECTION COMPLETED ON 12/20/2018 IS NOT ACCEPTED DUE TO TANK CHARTS OR TANK CHART EQUIVALENT NOT INCLUDED WITH RESULTS. IMMEDIATELY PROVIDE TANK CHARTS OR TANK CHART EQUIVALENT TO THIS DEPARTMENT WITHIN 30 DAYS. THE FAILURE TO PROVIDE REQUESTED DOCUMENTATION WILL RESULT IN OVERFILL TEST REPORT NOT BEING ACCEPTED BY THIS DEPARTMENT.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-20-2021
Citation: 22 CCR 12 66262.40(a) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.40(a)
Violation Description: Failure to keep a copy of each properly signed manifest for at least three years from the date the waste was accepted by the initial transporter. The manifest signed at the time the waste was accepted for transport shall be kept until receiving a signed copy from the designated facility which received the waste.
Violation Notes: Returned to compliance on 08/10/2022. HAZARDOUS WASTE DISPOSAL RECORDS WERE NOT AVAILABLE ON SITE DURING INSPECTION. IMMEDIATELY OBTAIN HAZARDOUS WASTE DISPOSAL RECORDS, PROVIDE COPIES TO THIS DEPARTMENT FOR REVIEW AND SUBMIT DOCUMENTATION OF COMPLIANCE TO THIS DEPARTMENT WITHIN 30 DAYS.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-26-2018
Citation: HSC 6.7 25284, 25286 - California Health and Safety Code, Chapter 6.7,

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Section(s) 25284, 25286
Violation Description: Failure to submit a complete and accurate application for a permit to operate a UST, or for renewal of the permit.
Violation Notes: Returned to compliance on 07/27/2018. Tank install dates in CERS are incorrect. Update Install dates in Tank information to reflect correct date of 2/16/1999.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 08-05-2020
Citation: 23 CCR 16 2712(b)(1)(G) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2712(b)(1)(G)
Violation Description: Failure to comply with one or more of the following overfill prevention equipment requirements: Alert the transfer operator when the tank is 90 percent full by restricting the flow into the tank or triggering an audible and visual alarm; or Restrict delivery of flow to the tank at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95 percent of capacity; and activate an audible alarm at least five minutes before the tank overfills; or Provide positive shut-off of flow to the tank when the tank is filled to no more than 95 percent of capacity; or Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling. Install/retrofit overfill prevention equipment that does not use flow restrictors on vent piping to meet overfill prevention equipment requirements when the overfill prevention equipment is installed, repaired, or replaced on and after October 1, 2018. For USTs installed before October 1, 2018, perform an inspection by October 13, 2018 and every 36 months thereafter. For USTs installed on and after October 1, 2018, perform an inspection at installation and every 36 months thereafter. Inspected within 30 days after a repair to the overfill prevention equipment. Inspected using an applicable manufacturer guidelines, industry codes, engineering standards, or a method approved by a professional engineer. Inspected by a certified UST service technician. Maintain records of overfill prevention equipment inspection for 36 months.
Violation Notes: Returned to compliance on 11/03/2020. OVERFILL INSPECTION REPORT FOR INSPECTION COMPLETED ON 12/20/2018 IS NOT ACCEPTED DUE TO TANK CHARTS OR TANK CHART EQUIVALENT NOT INCLUDED WITH RESULTS. IMMEDIATELY PROVIDE TANK CHARTS OR TANK CHART EQUIVALENT TO THIS DEPARTMENT WITHIN 7 DAYS. THE FAILURE TO PROVIDE REQUESTED DOCUMENTATION WILL RESULT IN OVERFILL TEST REPORT NOT BEING ACCEPTED BY THIS DEPARTMENT. THIS IS A RECALCITRANT VIOLATION NOTED ON THE PREVIOUS INSPECTION REPORT DATED 12/16/2019 AND IS NOW A CLASS 2 VIOLATION. THE FAILURE TO CORRECT THIS VIOLATION WITHIN 7 DAYS WILL RESULT IN FURTHER ENFORCEMENT ACTIONS INCLUDING BUT NOT LIMITED TO RED TAG ENFORCEMENT.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-25-2022
Citation: 22 CCR 12 66262.40(a) - California Code of Regulations, Title 22,

MENTONE ARCO (Continued) **U001575442**

	Chapter 12, Section(s) 66262.40(a)
Violation Description:	Failure to keep a copy of each properly signed manifest for at least three years from the date the waste was accepted by the initial transporter. The manifest signed at the time the waste was accepted for transport shall be kept until receiving a signed copy from the designated facility which received the waste.
Violation Notes:	Returned to compliance on 08/10/2022. OBSERVATION: Uniform Hazardous Waste Manifests were not available at the time of inspection. CORRECTIVE ACTION: Locate a copy of all manifests and submit a copy of the most recent manifest record to this agency within 30 days.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HW
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	07-20-2021
Citation:	23 CCR 16 2712 - California Code of Regulations, Title 23, Chapter 16, Section(s) 2712
Violation Description:	Failure to comply with any of the applicable requirements of the permit issued for the operation of the UST system.
Violation Notes:	Returned to compliance on 07/31/2021. BOARD OF EQUALIZATION NUMBER FOR THIS UST FACILITY HAS BEEN CLOSED. IMMEDIATELY OBTAIN VALID/ACTIVE BOARD OF EQUALIZATION NUMBER FOR THIS UST SYSTEM, PROVIDE CURRENT NUMBER IN CERS, AND SUBMIT DOCUMENTATION OF COMPLIANCE TO THIS DEPARTMENT WITHIN 30 DAYS.
Violation Division:	San Bernardino County Fire Department
Violation Program:	UST
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	07-26-2018
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes:	Returned to compliance on 07/27/2018. Inventory Element in CERS does not correctly reflect inventory. Tank #4 is not being used and contains no inventory. Provide corrected quantity of diesel fuel on site.
Violation Division:	San Bernardino County Fire Department
Violation Program:	HMRRP
Violation Source:	CERS,
Site ID:	397425
Site Name:	MENTONE GAS & MINIMART
Violation Date:	12-16-2019
Citation:	HSC 6.7 25291(a)(1) - California Health and Safety Code, Chapter 6.7, Section(s) 25291(a)(1)
Violation Description:	Failure to construct, operate, and maintain primary containment as product-tight.
Violation Notes:	Returned to compliance on 08/12/2020. PRODUCT LINES INSIDE THE FOLLOWING UDC'S WERE OBSERVED LEAKING DURING INSPECTION: -UDC #1/2 -UDC #3/4 -UDC #5/6 -UDC #7/8 IMMEDIATELY REPAIR CAUSE OF PRODUCT LEAKS OBSERVED ON PRIMARY PIPING IN ALL ABOVE CONTAINMENTS AND SUBMIT

MENTONE ARCO (Continued) **U001575442**

MAINTENANCE WORK ORDER AND COMPLIANCE DOCUMENTATION TO THIS DEPARTMENT WITHIN 30 DAYS. NOTE: CONTACT THIS DEPARTMENT FOR APPROVAL PRIOR TO ANY REPAIRS REQUIRING PERMITS.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 12-16-2019
Citation: 23 CCR 16 2644.1(a)(2) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2644.1(a)(2)
Violation Description: Failure to demonstrate to the UPA that the equipment and methods used to monitor the UST system are certified by an independent third-party as complying with the standards set forth in 23 CCR 2643(f).
Violation Notes: Returned to compliance on 12/16/2019. PREVIOUS ANNUAL UST MONITORING SYSTEM CERTIFICATION WAS COMPLETED ON 7/26/2019 AND IS APPROXIMATELY 5 MONTHS PAST DUE. THE CERTIFICATION TESTING COMPLETED TODAY WILL SATISFY THE COMPLIANCE REQUIREMENTS OF THIS VIOLATION. NOTE: NEXT CERTIFICATION WILL BE DUE ON OR BEFORE JULY 2020. FAILURE TO COMPLY WITH THIS ORDER WILL RESULT IN FURTHER ENFORCEMENT ACTIONS.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-24-2013
Citation: HSC 6.7 29291(b) - California Health and Safety Code, Chapter 6.7, Section(s) 29291(b)
Violation Description: Failure of the UST system to be designed and constructed with a monitoring system capable of detecting the entry of the hazardous substance stored in the primary containment into the secondary containment.
Violation Notes: Returned to compliance on 08/05/2013. THE VR 323 SENSOR IN THE 87 TURBINE SUMP DID NOT ENABLE POSITIVE SHUTDOWN WHEN TESTED. PLEASE REPLACE OR REPAIR THIS SENSOR AND RETEST WITHIN 15 DAYS. A RE-INSPECTION IS REQUIRED.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 12-16-2019
Citation: 23 CCR 16 2641(h) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2641(h)
Violation Description: Failure to have an approved UST Monitoring Plan.
Violation Notes: Returned to compliance on 12/16/2019. UST MONITORING PLAN IN THE CALIFORNIA ENVIRONMENTAL REPORTING SYSTEM (CERS) FOR TANK #1 AND TANK #2 IS DEFICIENT INDICTING VENT PIPING FOR THE TANKS TO BE DOUBLE WALLED WHEN IT WAS OBSERVED TO BE SINGLE WALLED DURING INSPECTION. UPDATE UST MONITORING PLAN ADDRESSING THE PREVIOUSLY NOTED DEFICIENCIES ON CERS AND SUBMIT DOCUMENTATION OF COMPLIANCE TO THIS DEPARTMENT WITHIN 30 DAYS.
Violation Division: San Bernardino County Fire Department
Violation Program: UST

MENTONE ARCO (Continued) **U001575442**

Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-24-2017
Citation: 23 CCR 16 2715(i) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2715(i)
Violation Description: Failure to have a properly qualified service technician test leak detection equipment as required every 12 months (vapor, pressure, hydrostatic (VPH) system, sensors, line-leak detectors (LLD), automatic tank gauge (ATG), etc.).
Violation Notes: Returned to compliance on 07/24/2017. OBSERVATION: UST MONITORING SYSTEMS MUST BE RE-CERTIFIED YEARLY. THE LAST PERFORMED CERTIFICATION WAS PERFORMED ON 07/22/2016 (2 DAYS LATE). COMPLIANCE MET ON SITE: FACILITY PERFORMED THE MONITORING CERTIFICATION 07/24/2017.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 10-19-2020
Citation: 23 CCR 16 2712(b)(1)(G) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2712(b)(1)(G)
Violation Description: Failure to comply with one or more of the following overfill prevention equipment requirements: Alert the transfer operator when the tank is 90 percent full by restricting the flow into the tank or triggering an audible and visual alarm; or Restrict delivery of flow to the tank at least 30 minutes before the tank overfills, provided the restriction occurs when the tank is filled to no more than 95 percent of capacity; and activate an audible alarm at least five minutes before the tank overfills; or Provide positive shut-off of flow to the tank when the tank is filled to no more than 95 percent of capacity; or Provide positive shut-off of flow to the tank so that none of the fittings located on the top of the tank are exposed to product due to overfilling. Install/retrofit overfill prevention equipment that does not use flow restrictors on vent piping to meet overfill prevention equipment requirements when the overfill prevention equipment is installed, repaired, or replaced on and after October 1, 2018. For USTs installed before October 1, 2018, perform an inspection by October 13, 2018 and every 36 months thereafter. For USTs installed on and after October 1, 2018, perform an inspection at installation and every 36 months thereafter. Inspected within 30 days after a repair to the overfill prevention equipment. Inspected using an applicable manufacturer guidelines, industry codes, engineering standards, or a method approved by a professional engineer. Inspected by a certified UST service technician. Maintain records of overfill prevention equipment inspection for 36 months.
Violation Notes: Returned to compliance on 11/03/2020. OBSERVATION: OVERFILL EQUIPMENT TESTING WAS NOT COMPLETED CORRECTLY ON 12/20/18 AND IS PAST DUE FOR TESTING. CORRECTIVE ACTION: OWNER SET UP OVERFILL EQUIPMENT TESTING WITH LICENSED CONTRACTOR SCHEDULED FOR 10/29/20. FAILURE TO SUBMIT COMPLETED TEST RESULTS WITH REQUIRED DOCUMENTATION INCLUDING TANK CHART WILL RESULT IN FURTHER ACTION INCLUDING RED TAG.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

MENTONE ARCO (Continued) **U001575442**

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 12-16-2019
Citation: 23 CCR 16 2637(f) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2637(f)
Violation Description: Failure to submit a copy of the secondary containment test results on the Secondary Containment Testing report Form to the UPA within 30 days after the test.
Violation Notes: Returned to compliance on 06/02/2020. SECONDARY CONTAINMENT TEST REPORT DATED 12/20/2019 IS NOT ACCEPTED DUE TO FAILURE TO INCLUDE THE INCON RESULT PRINT OUTS. IMMEDIATELY PROVIDE MISSING INCON RESULT PRINT OUTS WITH REPORT WITH DOCUMENTATION OF COMPLIANCE TO THIS DEPARTMENT WITHIN 30 DAYS OR SCHEDULE A COMPLETE SECONDARY CONTAINMENT TEST WITH THIS DEPARTMENT WITHIN 30 DAYS.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-25-2022
Citation: 23 CCR 16 2644.1(a)(2) - California Code of Regulations, Title 23, Chapter 16, Section(s) 2644.1(a)(2)
Violation Description: Failure to demonstrate to the UPA that the equipment and methods used to monitor the UST system are certified by an independent third-party as complying with the standards set forth in 23 CCR 2643(f).
Violation Notes: OBSERVATION: Facility was unable to test the line leak detection equipment for the south diesel tank (Tank 3B) due to low fuel. Per facility, tank has not been in operation. CORRECTIVE ACTION: One of the following options are required for compliance: A) Test Line Leak Detection Equipment for the south diesel tank and send test results to this agency within 30 days. OR B) Detach product line from turbine and cap turbine and product line; send work order to this agency within 30 days.
Violation Division: San Bernardino County Fire Department
Violation Program: UST
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-20-2021
Citation: 22 CCR 12 66262.12 - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.12
Violation Description: Failure to obtain an Identification Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.
Violation Notes: Returned to compliance on 07/31/2021. HAZARDOUS WASTE IDENTIFICATION NUMBER FOR THSI SITE IS IN-ACTIVE. OBTAIN ACTIVE EPA HAZARDOUS WASTE IDENTIFICATION NUMBER AND SUBMIT DOCUMENTATION OF COMPLIANCE TO THIS DEPARTMENT WITHIN 30 DAYS.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Violation Date: 07-24-2013

MENTONE ARCO (Continued) **U001575442**

Citation: HSC 6.67 Multiple - California Health and Safety Code, Chapter 6.67, Section(s) Multiple
Violation Description: Haz Waste Generator Program - Administration/Documentation - General
Violation Notes: Returned to compliance on 08/17/2017. Failure to obtain an EPA ID Number (CCR 66262.12(a))
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-22-2016
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: HAZARDOUS MATERIALS HANDLER INSPECTION - UST ONLY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-24-2013
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: MENTONE GAS & MINIMART 1759 MENTONE BLVD MENTONE
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-24-2013
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: " "
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-25-2022
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-26-2018
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: UST Annual Inspection and Monitoring Cert
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 08-05-2013

MENTONE ARCO (Continued) **U001575442**

Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: MENTONE GAS & MINIMART 1759 MENTONE BLVD MENTONE/REINSPECTION
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-05-2020
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: HAZARDOUS WASTE INSPECTION - UST ONLY
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 11-03-2020
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: OVERFILL PREVENTION INSPECTION. REPLACEMENT OF FAILED FILL TUBES.
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-16-2019
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: HAZARDOUS MATERIALS INSPECTION - UST ONLY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-24-2017
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: MENTONE & GAS MARKET- UST INSPECTION
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-26-2018
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: UST Waste Handler Inspection
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 07-29-2015
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: UST SECONDARY CONTAINMENT TESTING. SEE C16 REPORT FOR INSPECTION

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INFORMATION.
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-05-2020
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: HAZARDOUS MATERIALS HANDLER INSPECTION - UST ONLY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-16-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ANNUAL UST INSPECTION WITH MONITORING SYSTEM CERTIFICATION.
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-20-2021
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: HAZARDOUS WASTE INSPECTION
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-22-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: UST ANNUAL INSPECTION WITH MONITORING SYSTEM CERTIFICATION.
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-24-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: MENTONE GAS & MARKET- UST MONITORING CERTIFICATION
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-25-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP

MENTONE ARCO (Continued) **U001575442**

Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-25-2022
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-29-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: HAZARDOUS MATERIALS HANDLER INSPECTION UST ONLY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-31-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: MENTONE GAS & MINIMART- UST MONTIORING CERTIFICATION
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-20-2021
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: HAZARDOUS WASTE GENERATOR INSPECTION.
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-20-2021
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: UST ANNUAL INSPECTION WITH MONITORING SYSTEM CERTIFICATION.
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-24-2013
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: " "
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection

MENTONE ARCO (Continued) **U001575442**

Eval Date: 07-26-2018
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: UST Handler Inspection
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-29-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: UST ANNUAL INSPECTION WITH MONITORING SYSTEM CERTIFICATION.
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-31-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: MENTONE GAS & MINIMARKET- UST MONITORING CERTIFICATION
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-05-2020
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: UST ANNUAL INSPECTION WITH MONITORING SYSTEM CERTIFICATION.
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 10-19-2020
Violations Found: Yes
Eval Type: Other, not routine, done by local agency
Eval Notes: Reinspection and Notice of Significant UST Violation issued
Eval Division: San Bernardino County Fire Department
Eval Program: UST
Eval Source: CERS,

Enforcement Action:
Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Site Address: 1759 MENTONE BLVD
Site City: MENTONE
Site Zip: 92359
Enf Action Date: 07-22-2016
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Bernardino County Fire Department
Enf Action Program: UST
Enf Action Source: CERS,

MENTONE ARCO (Continued) **U001575442**

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Site Address: 1759 MENTONE BLVD
Site City: MENTONE
Site Zip: 92359
Enf Action Date: 07-24-2013
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Bernardino County Fire Department
Enf Action Program: HW
Enf Action Source: CERS,

Site ID: 397425
Site Name: MENTONE GAS & MINIMART
Site Address: 1759 MENTONE BLVD
Site City: MENTONE
Site Zip: 92359
Enf Action Date: 07-24-2013
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Bernardino County Fire Department
Enf Action Program: UST
Enf Action Source: CERS,

Coordinates:
Site ID: 397425
Facility Name: MENTONE GAS & MINIMART
Env Int Type Code: HMBP
Program ID: 10041889
Coord Name: Not reported
Ref Point Type Desc: Unknown,
Latitude: 34.070435
Longitude: -117.136597

Affiliation:
Affiliation Type Desc: Document Preparer
Entity Name: Patrick Kanchy
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Identification Signer
Entity Name: Abbos Moradi
Entity Title: President
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

MENTONE ARCO (Continued) **U001575442**

Affiliation Type Desc:	UST Property Owner Name
Entity Name:	Solomon Saddi
Entity Title:	Not reported
Affiliation Address:	P.O. Box 1416
Affiliation City:	Redlands
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92373
Affiliation Phone:	(951) 751-1949,

Affiliation Type Desc:	CUPA District
Entity Name:	San Bernardino County Fire
Entity Title:	Not reported
Affiliation Address:	620 South E Street
Affiliation City:	San Bernardino
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92415-0153
Affiliation Phone:	(909) 386-8401,

Affiliation Type Desc:	UST Permit Applicant
Entity Name:	Abboss Moradi
Entity Title:	President
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(909) 794-0529,

Affiliation Type Desc:	UST Tank Operator
Entity Name:	ESY Corporation/Abboss Moradi
Entity Title:	Not reported
Affiliation Address:	1759 Mentone Blvd.
Affiliation City:	Mentone
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92359
Affiliation Phone:	(909) 794-0529,

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	1759 MENTONE BLVD
Affiliation City:	MENTONE
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92359
Affiliation Phone:	,

Affiliation Type Desc:	Operator
Entity Name:	ESY Corporation/Abbos Moradi
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported

MENTONE ARCO (Continued) **U001575442**

Affiliation Zip:	Not reported
Affiliation Phone:	(909) 794-0529,
Affiliation Type Desc:	Property Owner
Entity Name:	Solomon Saddi
Entity Title:	Not reported
Affiliation Address:	P.O. Box 1416
Affiliation City:	Redlands
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92373
Affiliation Phone:	(951) 751-1949,
Affiliation Type Desc:	UST Tank Owner
Entity Name:	Solomon Saddi
Entity Title:	Not reported
Affiliation Address:	P.O. Box 1416
Affiliation City:	Redlands
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92373
Affiliation Phone:	(951) 751-1949,
Affiliation Type Desc:	Environmental Contact
Entity Name:	ABBASS MORADI
Entity Title:	Not reported
Affiliation Address:	1759 MENTONE BLVD
Affiliation City:	MENTONE
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	92359
Affiliation Phone:	,
Affiliation Type Desc:	Legal Owner
Entity Name:	ESY CORPORATION
Entity Title:	Not reported
Affiliation Address:	1759 MENTONE BLVD
Affiliation City:	MENTONE
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	92359
Affiliation Phone:	(909) 635-4423,
Affiliation Type Desc:	Parent Corporation
Entity Name:	MENTONE GAS & MINIMART
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	,

Count: 1 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MENTONE	S126984130	MENTONE DISPOSAL SITE	SANTA ANA RIVER AND OPAL ROAD,	92359	SWF/LF

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 25

Source: EPA
Telephone: N/A
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Lists of Federal Delisted NPL sites

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 12/20/2022
Date Data Arrived at EDR: 12/21/2022
Date Made Active in Reports: 03/10/2023
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 03/28/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Quarterly

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA TSD facilities

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

Lists of Federal RCRA generators

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/08/2023
Date Data Arrived at EDR: 02/09/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 82

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/03/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 02/20/2023
Date Data Arrived at EDR: 02/21/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 70

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/21/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 02/20/2023
Date Data Arrived at EDR: 02/21/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 70

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/21/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/12/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 12/19/2022
Number of Days to Update: 5

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

Lists of state- and tribal (Superfund) equivalent sites

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

Lists of state- and tribal hazardous waste facilities

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/06/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/26/2023
Number of Days to Update: 78

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/07/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Quarterly

Lists of state and tribal leaking storage tanks

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/30/2023
Number of Days to Update: 23

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 10/14/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/26/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/19/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/14/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 134

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)

Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

Lists of state and tribal registered storage tanks

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 10/14/2021
Date Data Arrived at EDR: 11/05/2021
Date Made Active in Reports: 02/01/2022
Number of Days to Update: 88

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/22/2023
Number of Days to Update: 82
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Semi-Annually

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/23/2023
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69
Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/14/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/19/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 11/23/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 134

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 10/14/2022
Date Data Arrived at EDR: 12/06/2022
Date Made Active in Reports: 03/03/2023
Number of Days to Update: 87

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

Lists of state and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/17/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

Lists of state and tribal brownfield sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 12/14/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 04/06/2023
Date Data Arrived at EDR: 04/13/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 6
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/22/2023
Number of Days to Update: 82

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 11/16/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 83

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176
Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 01/06/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 8
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/02/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs
A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2022
Date Made Active in Reports: 02/09/2023
Number of Days to Update: 71
Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 01/05/2023
Date Data Arrived at EDR: 01/06/2023
Date Made Active in Reports: 01/11/2023
Number of Days to Update: 5

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 01/06/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 8

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/02/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 02/03/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/25/2023
Number of Days to Update: 77

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 01/06/2023
Date Data Arrived at EDR: 01/06/2023
Date Made Active in Reports: 01/11/2023
Number of Days to Update: 5

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 02/23/2023
Date Data Arrived at EDR: 02/24/2023
Date Made Active in Reports: 03/23/2023
Number of Days to Update: 27

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 76

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/13/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/10/2023
Number of Days to Update: 86

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 08/02/2022
Date Data Arrived at EDR: 10/17/2022
Date Made Active in Reports: 01/04/2023
Number of Days to Update: 79

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/30/2023
Number of Days to Update: 23

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 02/01/2023
Date Data Arrived at EDR: 02/14/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 77

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/14/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021
Date Data Arrived at EDR: 07/13/2021
Date Made Active in Reports: 03/09/2022
Number of Days to Update: 239

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/11/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/03/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/02/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/13/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/10/2023
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/01/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/03/2023
Next Scheduled EDR Contact: 05/15/2023
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/14/2022
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 283

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/13/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 02/16/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 75

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/16/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 01/17/2023
Date Data Arrived at EDR: 01/18/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 91

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/27/2022
Date Data Arrived at EDR: 05/04/2022
Date Made Active in Reports: 05/10/2022
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/13/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/27/2022
Date Data Arrived at EDR: 11/01/2022
Date Made Active in Reports: 11/15/2022
Number of Days to Update: 14

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/03/2022
Date Data Arrived at EDR: 01/04/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 89

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 10/26/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 12/05/2022
Number of Days to Update: 13

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/13/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/22/2022
Number of Days to Update: 84

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/03/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 02/27/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 02/03/2023
Next Scheduled EDR Contact: 05/15/2023
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 03/23/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80
Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 01/12/2023
Date Made Active in Reports: 04/07/2023
Number of Days to Update: 85

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/03/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 07/26/2021
Date Data Arrived at EDR: 07/27/2021
Date Made Active in Reports: 10/22/2021
Number of Days to Update: 87

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/13/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/25/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 26

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 05/02/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 02/27/2023
Date Data Arrived at EDR: 03/01/2023
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 23

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 11/17/2022
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 85

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/22/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/24/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/24/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/20/2022
Date Data Arrived at EDR: 12/20/2022
Date Made Active in Reports: 03/10/2023
Number of Days to Update: 80

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 02/02/2023
Date Data Arrived at EDR: 02/28/2023
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 24

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/21/2021
Date Made Active in Reports: 08/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 02/24/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 11/09/2021
Date Data Arrived at EDR: 10/20/2022
Date Made Active in Reports: 01/10/2023
Number of Days to Update: 82

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/01/2023
Date Data Arrived at EDR: 01/04/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 03/31/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/13/2023
Date Data Arrived at EDR: 02/14/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 64

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/14/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 02/23/2022
Date Data Arrived at EDR: 07/08/2022
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 123

Source: Environmental Protection Agency
Telephone: 703-603-8895
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/07/2023
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 01/03/2022
Date Data Arrived at EDR: 03/31/2022
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 222

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020
Date Data Arrived at EDR: 03/17/2021
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 601

Source: Department of Health & Human Services
Telephone: 202-741-5770
Last EDR Contact: 04/20/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 33

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/07/2023
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS ECHO FIRE TRAINING: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facilitys name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS PART 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration?s document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 03/30/2023
Date Data Arrived at EDR: 03/30/2023
Date Made Active in Reports: 04/03/2023
Number of Days to Update: 4

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 04/27/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 05/02/2023
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/23/2023
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

AQUEOUS FOAM: Former Fire Training Facility Assessments Listing

Airports shown on this list are those believed to use Aqueous Film Forming Foam (AFFF), and certified by the Federal Aviation Administration (FAA) under Title 14, Code of Federal Regulations (CFR), Part 139 (14 CFR Part 139). This list was created by SWRCB using information available from the FAA. Location points shown are from the latitude and longitude listed on the FAA airport master record.

Date of Government Version: 09/06/2022
Date Data Arrived at EDR: 09/06/2022
Date Made Active in Reports: 10/26/2022
Number of Days to Update: 50

Source: State Water Resources Control Board
Telephone: 916-341-5455
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 12/14/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 03/21/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing
list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 12/07/2021
Date Data Arrived at EDR: 05/09/2022
Date Made Active in Reports: 05/17/2022
Number of Days to Update: 8
Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 02/10/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 11/17/2022
Date Data Arrived at EDR: 11/30/2022
Date Made Active in Reports: 02/14/2023
Number of Days to Update: 76
Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 11/14/2022
Date Data Arrived at EDR: 11/14/2022
Date Made Active in Reports: 02/01/2023
Number of Days to Update: 79
Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN SACRAMENTO METO DIST: Sacramento Metropolitan Air Quality Management DistrictDrycleaner Facility Listing
A listing of drycleaner facility locations, for the Sacramento Metropolitan Air Quality Management District.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1467
Source: Sacramento Metropolitan Air Quality Management District
Telephone: 916-874-3958
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN SANTA BARB CO DIST: Santa Barbara County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Santa Barbara County Air Pollution Control District.

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475
Source: Santa Barbara County Air Pollution Control District
Telephone: 805-961-8867
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN SAN JOAQ VAL DIST: San Joaquin Valley Air Pollution Control District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Joaquin Valley Air Pollution Control District.

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/03/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1459
Source: San Joaquin Valley Air Pollution Control District
Telephone: 559-230-6001
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN SAN LUIS OB CO DIST: San Luis Obispo County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Luis Obispo County Air Pollution Control District.

Date of Government Version: 04/23/2019
Date Data Arrived at EDR: 04/25/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1467
Source: San Luis Obispo County Air Pollution Control District
Telephone: 805-781-5756
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN SAN DIEGO CO DIST: San Diego County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Diego County Air Pollution Control District.

Date of Government Version: 02/01/2019
Date Data Arrived at EDR: 05/01/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1461
Source: San Diego County Air Pollution Control District
Telephone: 858-586-2616
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN SHASTA CO DIST: Shasta County Air Quality Management District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Shasta County Air Quality Management District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473
Source: Shasta County Air Quality Management District
Telephone: 530-225-5674
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN TEHAMA CO DIST: Tehama County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Tehama County Air Pollution Control District.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1468
Source: Tehama County Air Pollution Control District
Telephone: 530-527-3717
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN YOLO-SOLANO DIST: Yolo-Solano Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Yolo-Solano Air Quality Management District.

Date of Government Version: 05/31/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1425
Source: Yolo-Solano Air Quality Management District
Telephone: 530-757-3650
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/27/2021
Date Data Arrived at EDR: 09/01/2021
Date Made Active in Reports: 11/19/2021
Number of Days to Update: 79
Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 01/24/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Annually

DRYCLEAN VENTURA CO DIST: Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Ventura County Air Pollution Control District.

Date of Government Version: 04/16/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Ventura County Air Pollution Control District
Telephone: 805-645-1421
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN NO SONOMA CO DIST: Norther Sonoma County County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sonoma County Air Pollution Control District.,

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Santa Barbara County Air Pollution Control District
Telephone: 707-433-5911
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN PLACER CO DIST: Placer County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Placer County Air Quality Management District.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473

Source: Placer County Air Quality Management District
Telephone: 530-745-2335
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN BAY AREA DIST: Bay Area Air Quality Management District Drycleaner Facility Listing
Bay Area Air Quality Management District Drycleaner Facility Listing.

Date of Government Version: 02/20/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1432

Source: Bay Area Air Quality Management District
Telephone: 415-516-1916
Last EDR Contact: 04/24/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN BUTTE CO DIST: Butte County Air Quality Management DistrictDrycleaner Facility Listing
Butte County Air Quality Management DistrictDrycleaner Facility Listing.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1469

Source: Butte County Air Quality Management District
Telephone: 530-332-9400
Last EDR Contact: 04/24/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN CALAVERAS CO DIST: Calaveras County Environmental Management Agency Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Calaveras County Environmental Management Agency.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1412

Source: Calaveras County Environmental Management Agency
Telephone: 209-754-6399
Last EDR Contact: 04/24/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN EAST KERN DIST: Eastern Kern Air Pollution Control District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Eastern Kern Air Pollution Control District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Eastern Kern Air Pollution Control District
Telephone: 661-862-9684
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN GLENN CO DIST: Glenn County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Glenn County Air Pollution Control District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475
Source: Glenn County Air Pollution Control District
Telephone: 530-934-6500
Last EDR Contact: 04/16/2019
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN GRANT: Grant Recipients List
Assembly Bill 998 (AB 998) established the Non-Toxic Dry Cleaning Incentive Program to provide financial assistance to the dry cleaning industry to switch from systems using perchloroethylene (Perc), an identified toxic air contaminant and potential human carcinogen, to non-toxic and non-smog forming alternatives.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 02/04/2021
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 816
Source: California Air Resources Board
Telephone: 916-323-0006
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

DRYCLEAN IMPERIAL CO DIST: Imperial County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Imperial County Air Pollution Control District

Date of Government Version: 05/14/2019
Date Data Arrived at EDR: 05/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1445
Source: Imperial County Air Pollution Control District
Telephone: 442-265-1800
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN LAKE CO DIST: Lake County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Lake County Air Quality Management District,

Date of Government Version: 04/29/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1455
Source: Lake County Air Quality Management District
Telephone: 707-263-7000
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN MENDO CO DIST: Mendocino County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mendocino County Air Quality Management District.

Date of Government Version: 02/08/2019
Date Data Arrived at EDR: 05/21/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1441
Source: Mendocino County Air Quality Management District
Telephone: 707-463-4354
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN MOJAVE DESERT DIST: Mojave Desert Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mojave Desert Air Quality Management District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475
Source: Mojave Desert Air Quality Management District
Telephone: 760-245-1661
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN MONTEREY BAY DIST: Monterey Bay Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Monterey Bay Air Quality Management District.

Date of Government Version: 04/17/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475
Source: Monterey Bay Air Quality Management District
Telephone: 831-647-9411
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

DRYCLEAN NO COAST UNIFIED DIST: North Coast Unified Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the North Coast Unified Air Quality Management District.

Date of Government Version: 11/30/2016
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473
Source: North Coast Unified Air Quality Management District
Telephone: 707-443-3093
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN NO SIERRA DIST: Northern Sierra Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sierra Air Quality Management District,

Date of Government Version: 05/07/2019
Date Data Arrived at EDR: 05/07/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1455
Source: Northern Sierra Air Quality Management District
Telephone: 530-274-9350
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/13/2022
Date Made Active in Reports: 08/30/2022
Number of Days to Update: 78
Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 01/10/2023
Date Data Arrived at EDR: 01/18/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 76
Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 01/11/2023
Date Data Arrived at EDR: 01/17/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 77
Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/08/2022
Date Data Arrived at EDR: 11/23/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 82
Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 02/03/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Varies

ICE: ICE
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 11/10/2022
Date Data Arrived at EDR: 11/10/2022
Date Made Active in Reports: 02/01/2023
Number of Days to Update: 83

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 02/14/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/10/2022
Date Data Arrived at EDR: 11/10/2022
Date Made Active in Reports: 02/01/2023
Number of Days to Update: 83

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/14/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 01/03/2023
Date Data Arrived at EDR: 01/04/2023
Date Made Active in Reports: 03/21/2023
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Quarterly

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 07/05/2022
Date Made Active in Reports: 09/19/2022
Number of Days to Update: 76

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Annually

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/22/2023
Number of Days to Update: 82

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 10/31/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/14/2023
Number of Days to Update: 77

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 02/06/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/28/2023
Number of Days to Update: 80

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/07/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/14/2023
Number of Days to Update: 77

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 12/07/2022
Date Data Arrived at EDR: 12/07/2022
Date Made Active in Reports: 03/01/2023
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 01/26/2021
Number of Days to Update: 82

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 07/01/2021
Date Made Active in Reports: 09/29/2021
Number of Days to Update: 90

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/13/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 12/02/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/23/2023
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/13/2023
Number of Days to Update: 76

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 01/05/2023
Date Data Arrived at EDR: 01/06/2023
Date Made Active in Reports: 01/10/2023
Number of Days to Update: 4

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/31/2023
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 08/23/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 98

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 02/24/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: No Update Planned

PFAS TRIS: List of PFAS Added to the TRI
Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

Date of Government Version: 03/07/2023
Date Data Arrived at EDR: 03/07/2023
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 202-566-0250
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

HWTS: Hazardous Waste Tracking System

DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 04/05/2022
Date Data Arrived at EDR: 04/05/2022
Date Made Active in Reports: 04/26/2022
Number of Days to Update: 21

Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 04/13/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

PCS ENF: Enforcement data

No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 12/28/2022
Date Data Arrived at EDR: 12/28/2022
Date Made Active in Reports: 03/17/2023
Number of Days to Update: 79

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 01/31/2023
Date Data Arrived at EDR: 02/02/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 76

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 12/13/2022
Date Data Arrived at EDR: 12/15/2022
Date Made Active in Reports: 12/21/2022
Number of Days to Update: 6

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 12/28/2022
Date Data Arrived at EDR: 01/24/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 76

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 05/04/2022
Date Data Arrived at EDR: 05/06/2022
Date Made Active in Reports: 07/28/2022
Number of Days to Update: 83

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/08/2022
Date Data Arrived at EDR: 08/09/2022
Date Made Active in Reports: 09/01/2022
Number of Days to Update: 23

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 06/28/2021
Date Data Arrived at EDR: 12/21/2021
Date Made Active in Reports: 03/03/2022
Number of Days to Update: 72

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/12/2021
Date Data Arrived at EDR: 08/12/2021
Date Made Active in Reports: 11/08/2021
Number of Days to Update: 88

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 01/13/2023
Date Data Arrived at EDR: 01/17/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 77

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 01/30/2023
Date Data Arrived at EDR: 02/01/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 77

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 01/30/2023
Date Data Arrived at EDR: 02/01/2023
Date Made Active in Reports: 04/21/2023
Number of Days to Update: 79

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 12/03/2020
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/14/2021
Number of Days to Update: 78

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 11/04/2022
Date Data Arrived at EDR: 11/07/2022
Date Made Active in Reports: 01/25/2023
Number of Days to Update: 79

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 01/09/2023
Date Data Arrived at EDR: 01/12/2023
Date Made Active in Reports: 03/29/2023
Number of Days to Update: 76

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 03/29/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 01/09/2023
Date Data Arrived at EDR: 01/10/2023
Date Made Active in Reports: 03/23/2023
Number of Days to Update: 72

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 04/11/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 01/12/2023
Date Made Active in Reports: 03/29/2023
Number of Days to Update: 76

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills
This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 01/10/2022
Date Data Arrived at EDR: 01/12/2022
Date Made Active in Reports: 04/04/2022
Number of Days to Update: 82
Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory
A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 11/01/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/24/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory
A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 11/01/2022
Date Data Arrived at EDR: 12/14/2022
Date Made Active in Reports: 03/07/2023
Number of Days to Update: 83
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 03/24/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 05/26/2021
Date Data Arrived at EDR: 07/09/2021
Date Made Active in Reports: 09/29/2021
Number of Days to Update: 82
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 04/18/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 04/05/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 10/18/2022
Date Data Arrived at EDR: 10/19/2022
Date Made Active in Reports: 01/10/2023
Number of Days to Update: 83

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 03/22/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Semi-Annually

MENDOCINO COUNTY:

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/22/2021
Date Data Arrived at EDR: 11/18/2021
Date Made Active in Reports: 11/22/2021
Number of Days to Update: 4

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 02/15/2022
Date Data Arrived at EDR: 02/17/2022
Date Made Active in Reports: 05/11/2022
Number of Days to Update: 83

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 10/04/2021
Date Data Arrived at EDR: 10/06/2021
Date Made Active in Reports: 12/29/2021
Number of Days to Update: 84

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 03/22/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 01/23/2023
Date Data Arrived at EDR: 01/25/2023
Date Made Active in Reports: 04/10/2023
Number of Days to Update: 75

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 05/24/2022
Date Data Arrived at EDR: 08/09/2022
Date Made Active in Reports: 10/28/2022
Number of Days to Update: 80

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/31/2023
Next Scheduled EDR Contact: 05/15/2023
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 04/08/2022
Date Data Arrived at EDR: 05/18/2022
Date Made Active in Reports: 08/03/2022
Number of Days to Update: 77

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/31/2023
Next Scheduled EDR Contact: 05/15/2023
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 05/24/2022
Date Data Arrived at EDR: 08/01/2022
Date Made Active in Reports: 10/20/2022
Number of Days to Update: 80

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/31/2023
Next Scheduled EDR Contact: 05/15/2023
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 08/26/2022
Date Data Arrived at EDR: 08/29/2022
Date Made Active in Reports: 11/15/2022
Number of Days to Update: 78

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 02/13/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 01/18/2023
Date Data Arrived at EDR: 01/19/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 75

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 01/18/2023
Date Data Arrived at EDR: 01/19/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 75

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/21/2022
Date Made Active in Reports: 03/16/2023
Number of Days to Update: 85

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/09/2022
Date Made Active in Reports: 03/01/2023
Number of Days to Update: 82

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 10/27/2022
Date Data Arrived at EDR: 10/28/2022
Date Made Active in Reports: 01/18/2023
Number of Days to Update: 82

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 11/18/2022
Date Data Arrived at EDR: 11/21/2022
Date Made Active in Reports: 02/09/2023
Number of Days to Update: 80

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 11/29/2022
Date Made Active in Reports: 02/14/2023
Number of Days to Update: 77

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 02/28/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/27/2021
Date Data Arrived at EDR: 03/04/2022
Date Made Active in Reports: 05/31/2022
Number of Days to Update: 88

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 04/04/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing

A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/22/2021
Date Data Arrived at EDR: 10/19/2021
Date Made Active in Reports: 01/13/2022
Number of Days to Update: 86

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 02/03/2023
Date Data Arrived at EDR: 02/07/2023
Date Made Active in Reports: 04/26/2023
Number of Days to Update: 78

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/03/2022
Date Data Arrived at EDR: 11/07/2022
Date Made Active in Reports: 01/24/2023
Number of Days to Update: 78

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 04/26/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Quarterly

SAN FRANCISO COUNTY:

SAN FRANCISCO MAHER: Maher Ordinance Property Listing
a listing of properties that fall within a Maher Ordinance, for all of San Francisco

Date of Government Version: 10/11/2022
Date Data Arrived at EDR: 10/14/2022
Date Made Active in Reports: 01/04/2023
Number of Days to Update: 82

Source: San Francisco Planning
Telephone: 628-652-7483
Last EDR Contact: 04/13/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 03/09/2023
Next Scheduled EDR Contact: 06/26/2023
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/08/2022
Date Data Arrived at EDR: 11/09/2022
Date Made Active in Reports: 02/01/2023
Number of Days to Update: 84

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/10/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 03/02/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28
Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 10/28/2022
Date Data Arrived at EDR: 11/01/2022
Date Made Active in Reports: 01/20/2023
Number of Days to Update: 80
Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22
Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/15/2023
Next Scheduled EDR Contact: 06/05/2023
Data Release Frequency: No Update Planned

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/09/2023
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/15/2021
Date Data Arrived at EDR: 09/16/2021
Date Made Active in Reports: 12/09/2021
Number of Days to Update: 84

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 07/02/2021
Date Data Arrived at EDR: 07/06/2021
Date Made Active in Reports: 07/14/2021
Number of Days to Update: 8

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 06/28/2021
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 06/30/2021
Date Data Arrived at EDR: 06/30/2021
Date Made Active in Reports: 09/24/2021
Number of Days to Update: 86

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 03/16/2023
Next Scheduled EDR Contact: 07/03/2023
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 02/08/2022
Date Data Arrived at EDR: 02/10/2022
Date Made Active in Reports: 05/04/2022
Number of Days to Update: 83

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 01/09/2023
Next Scheduled EDR Contact: 04/24/2023
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 08/03/2022
Date Data Arrived at EDR: 08/25/2022
Date Made Active in Reports: 11/14/2022
Number of Days to Update: 81

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 02/23/2023
Next Scheduled EDR Contact: 06/12/2023
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 11/17/2022
Date Data Arrived at EDR: 11/21/2022
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 81

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 05/01/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 01/13/2023
Date Data Arrived at EDR: 01/17/2023
Date Made Active in Reports: 04/04/2023
Number of Days to Update: 77

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 10/07/2022
Date Data Arrived at EDR: 10/07/2022
Date Made Active in Reports: 12/21/2022
Number of Days to Update: 75

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 04/25/2023
Next Scheduled EDR Contact: 08/14/2023
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 04/12/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 12/27/2022
Date Data Arrived at EDR: 01/26/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 83

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/17/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/22/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/02/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 12/27/2022
Date Data Arrived at EDR: 01/26/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 83

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 04/17/2023
Next Scheduled EDR Contact: 07/31/2023
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 11/28/2022
Date Data Arrived at EDR: 12/02/2022
Date Made Active in Reports: 02/23/2023
Number of Days to Update: 83

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/07/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 12/19/2022
Date Data Arrived at EDR: 12/27/2022
Date Made Active in Reports: 03/17/2023
Number of Days to Update: 80

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 03/22/2023
Next Scheduled EDR Contact: 07/10/2023
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 01/26/2023
Date Data Arrived at EDR: 01/27/2023
Date Made Active in Reports: 04/19/2023
Number of Days to Update: 82

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 04/19/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/16/2022
Date Data Arrived at EDR: 11/16/2022
Date Made Active in Reports: 02/06/2023
Number of Days to Update: 82

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/10/2023
Next Scheduled EDR Contact: 05/22/2023
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 03/30/2023
Next Scheduled EDR Contact: 07/17/2023
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 10/29/2021
Date Made Active in Reports: 01/19/2022
Number of Days to Update: 82

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 04/27/2023
Next Scheduled EDR Contact: 08/07/2023
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/06/2023
Next Scheduled EDR Contact: 07/24/2023
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/18/2022
Number of Days to Update: 80

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/13/2022
Next Scheduled EDR Contact: 05/29/2023
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/06/2023
Next Scheduled EDR Contact: 06/19/2023
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.
Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

NOT REPORTED
NOT REPORTED
REDLANDS, CA 92374

TARGET PROPERTY COORDINATES

Latitude (North):	34.063828 - 34° 3' 49.78''
Longitude (West):	117.140061 - 117° 8' 24.22''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	487075.1
UTM Y (Meters):	3769047.2
Elevation:	1608 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	12014994 REDLANDS, CA
Version Date:	2018
East Map:	12015002 YUCAIPA, CA
Version Date:	2018

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

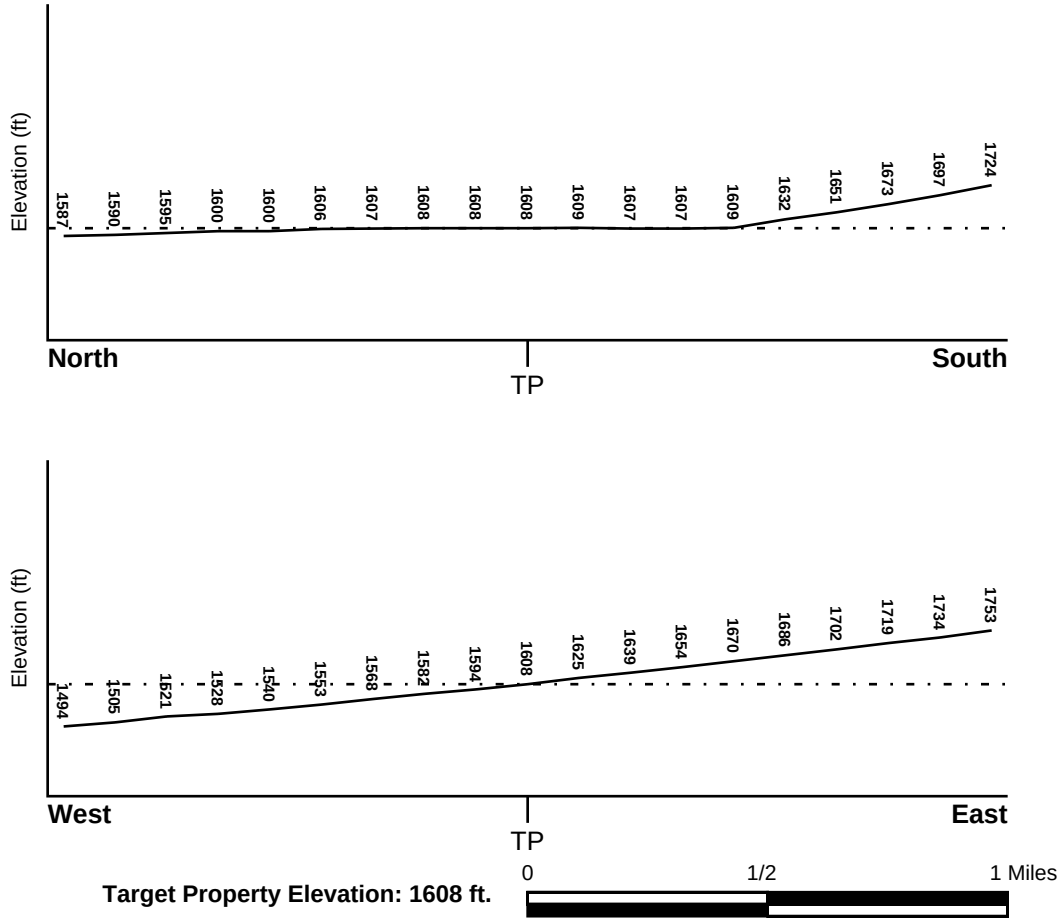
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General West

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1608 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06071C8709H	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06071C8730H	FEMA FIRM Flood data
06071C8708H	FEMA FIRM Flood data
06071C8716H	FEMA FIRM Flood data
06071C8717H	FEMA FIRM Flood data
06071C8740H	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Location Relative to TP:	1/2 - 1 Mile South
Site Name:	Lockheed Propulsion Co
Site EPA ID Number:	CAD980893093
Groundwater Flow Direction:	W FOLLOWING THE SANTA ANA RIVER IN THE SITE VICINITY. FLOW IN THE REDLANDS SUBBASINS IS SW WITH LEAKAGE THROUGH THE BRYN MAWR BARRIER INTO THE BUNKER HILL BASIN. FLOW IN THE BUNKER HILL BASIN IS W FOLLOWING THE DIRECTION OF THE SANTA ANA RIVER.
Inferred Depth to Water:	50 feet to 200 feet.
Hydraulic Connection:	Northeast trending faults cut through the basin and divide the basin into subbasins. The faults influence groundwater flow direction but to not appear to prevent flow from one basin to another.
Sole Source Aquifer:	No information about a sole source aquifer is available
Data Quality:	Information is inferred in the CERCLIS investigation report(s)

* ©1996 Site--specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

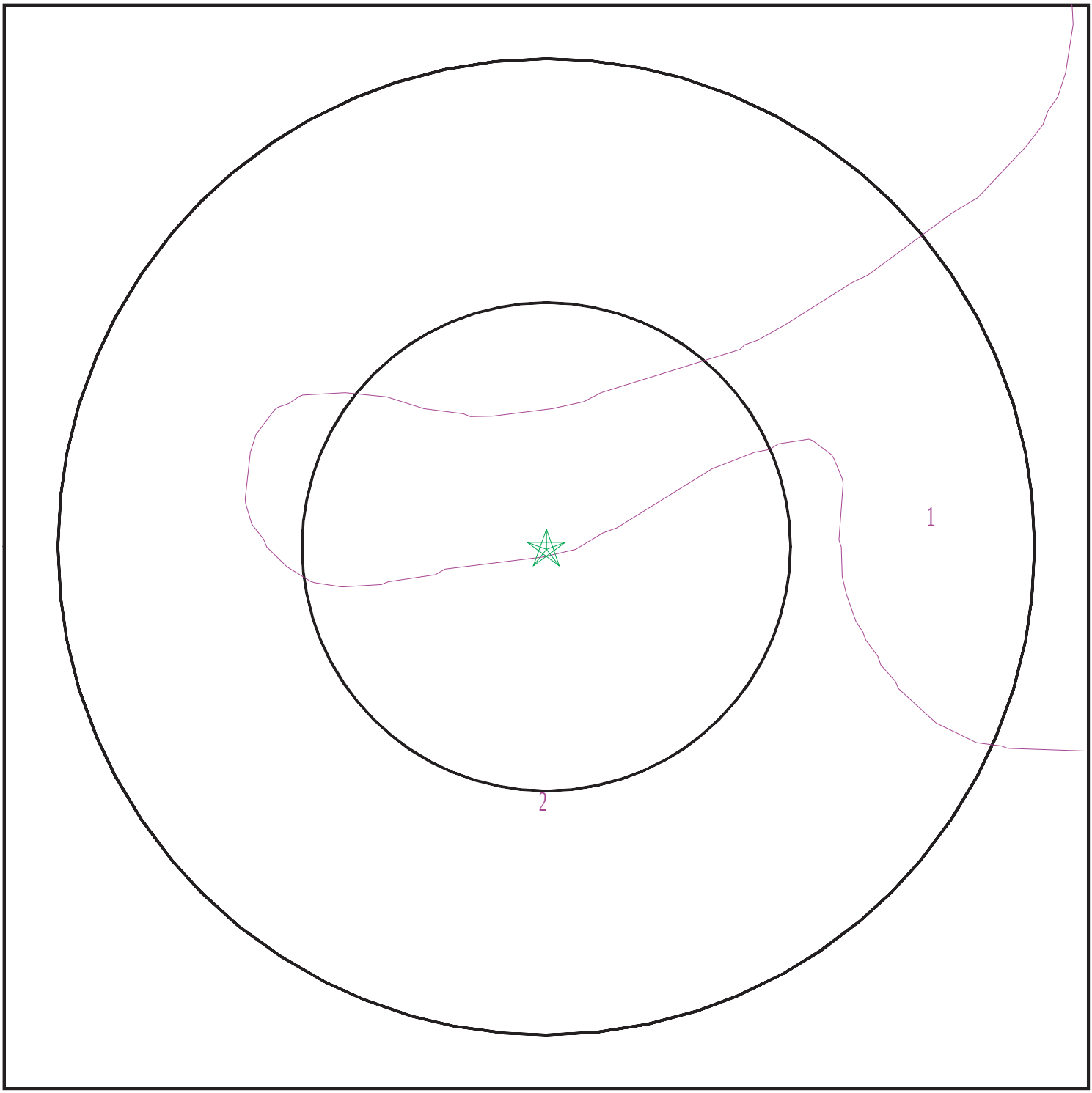
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 7326657.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Not Reported	CLIENT:	Hazard Management Consulting
ADDRESS:	Not Reported REDLANDS CA 92374	CONTACT:	Gage Costales
		INQUIRY #:	7326657.2s
LAT/LONG:	34.063828 / 117.140061	DATE:	May 03, 2023 2:02 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: TUJUNGA

Soil Surface Texture: gravelly loamy sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	35 inches	gravelly loamy sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.3 Min: 6.1
2	35 inches	59 inches	gravelly sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 7.3 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 2

Soil Component Name: Hanford

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	11 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 5.6
2	11 inches	59 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 7.8 Min: 5.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
2	USGS40000140387	0 - 1/8 Mile SE
3	USGS40000140443	1/8 - 1/4 Mile NW
A5	USGS40000140386	1/4 - 1/2 Mile ESE
9	USGS40000140287	1/4 - 1/2 Mile SSE
11	USGS40000140438	1/4 - 1/2 Mile ENE
16	USGS40000140598	1/2 - 1 Mile North
D18	USGS40000140609	1/2 - 1 Mile North
19	USGS40000140536	1/2 - 1 Mile NE
E20	USGS40000140332	1/2 - 1 Mile ESE
21	USGS40000140235	1/2 - 1 Mile SW
24	USGS40000140542	1/2 - 1 Mile NE
26	USGS40000140411	1/2 - 1 Mile East
F29	USGS40000140315	1/2 - 1 Mile ESE
F30	USGS40000140316	1/2 - 1 Mile ESE
F33	USGS40000140301	1/2 - 1 Mile ESE
F35	USGS40000140284	1/2 - 1 Mile ESE
G36	USGS40000140502	1/2 - 1 Mile ENE
41	USGS40000140599	1/2 - 1 Mile NW
43	USGS40000140523	1/2 - 1 Mile WNW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
13	CA3600385	1/2 - 1 Mile NE

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

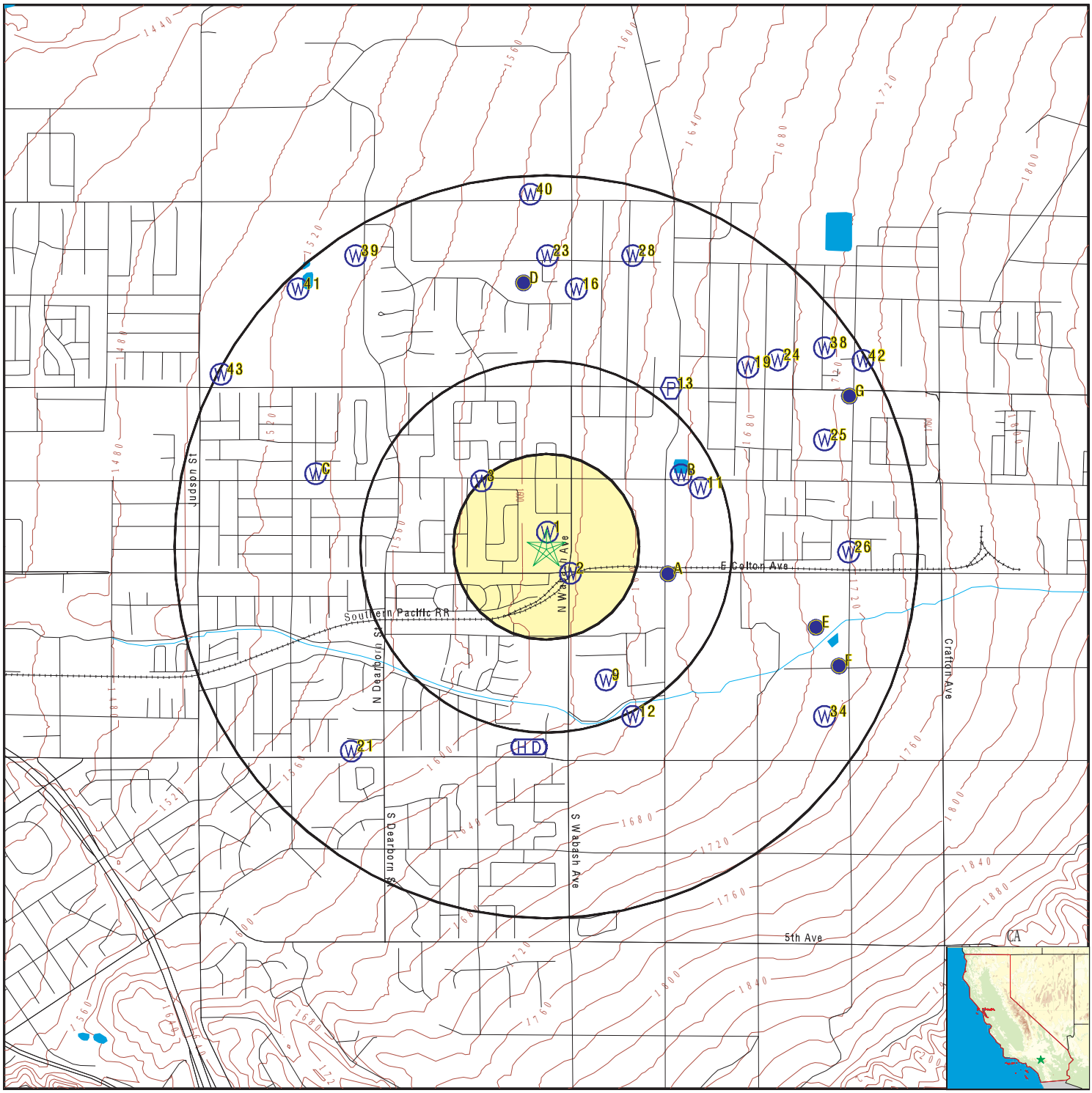
MAP ID	WELL ID	LOCATION FROM TP
1	CADWR0000006262	0 - 1/8 Mile North
A4	CADWR9000006574	1/4 - 1/2 Mile ESE
A6	CAUSGSN00018903	1/4 - 1/2 Mile ESE
A7	CADWR0000005721	1/4 - 1/2 Mile ESE
B8	768	1/4 - 1/2 Mile ENE
B10	CADDW0000009731	1/4 - 1/2 Mile ENE
12	CADWR0000029011	1/2 - 1 Mile SSE

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
C14	18787	1/2 - 1 Mile WNW
C15	822	1/2 - 1 Mile WNW
D17	CAUSGSN00018278	1/2 - 1 Mile North
E22	CADWR0000022991	1/2 - 1 Mile ESE
23	CADWR0000019496	1/2 - 1 Mile North
25	CADWR0000033759	1/2 - 1 Mile ENE
F27	CADWR9000006565	1/2 - 1 Mile ESE
28	CADWR0000018214	1/2 - 1 Mile NNE
F31	CAUSGSN00016042	1/2 - 1 Mile ESE
F32	CADWR0000011131	1/2 - 1 Mile ESE
34	CADWR0000007061	1/2 - 1 Mile ESE
G37	CAUSGSN00009101	1/2 - 1 Mile ENE
38	CADWR0000012260	1/2 - 1 Mile NE
39	CADWR0000035017	1/2 - 1 Mile NNW
40	CADDW0000010232	1/2 - 1 Mile North
42	CADPR0000001332	1/2 - 1 Mile ENE

PHYSICAL SETTING SOURCE MAP - 7326657.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Not Reported	CLIENT:	Hazard Management Consulting
ADDRESS:	Not Reported	CONTACT:	Gage Costales
	REDLANDS CA 92374	INQUIRY #:	7326657.2s
LAT/LONG:	34.063828 / 117.140061	DATE:	May 03, 2023 2:02 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
North
0 - 1/8 Mile
Higher

CA WELLS **CADWR0000006262**

Well ID:	01S03W24R001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S03W24R001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S03W24R001S&store_num=		
GeoTracker Data:	Not Reported		

2
SE
0 - 1/8 Mile
Higher

FED USGS **USGS40000140387**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S003W25A001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19290101	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	100
Well Hole Depth Units:	ft		

3
NW
1/8 - 1/4 Mile
Lower

FED USGS **USGS40000140443**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S003W24R001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19480101	Well Depth:	390
Well Depth Units:	ft	Well Hole Depth:	432
Well Hole Depth Units:	ft		

A4
ESE
1/4 - 1/2 Mile
Higher

CA WELLS **CADWR9000006574**

State Well #:	01S02W30C001S	Station ID:	6575
Well Name:	Not Reported	Basin Name:	San Bernardino
Well Use:	Unknown	Well Type:	Unknown

Well Depth:	0	Well Completion Rpt #:	Not Reported

A5
ESE **FED USGS** **USGS40000140386**
1/4 - 1/2 Mile
Higher

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W30C001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19280829	Well Depth:	248
Well Depth Units:	ft	Well Hole Depth:	285
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	380	Level reading date:	1992-08-13
Feet below surface:	Not Reported	Feet to sea level:	Not Reported
Note:	The measurement was discontinued.		
Level reading date:	1992-08-12	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1992-06-12	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1991-11-27	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1990-12-04	Feet below surface:	119.97
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1989-12-01	Feet below surface:	116.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-12-09	Feet below surface:	107.87
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1987-06-17	Feet below surface:	106.42
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-11-20	Feet below surface:	106.05
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1986-06-18	Feet below surface:	107.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-10-15	Feet below surface:	104.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1985-09-24	Feet below surface:	104.76
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1984-01-30	Feet below surface:	100.9
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1983-12-06	Feet below surface:	100.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-10-27	Feet below surface:	102.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-09-02	Feet below surface:	102.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-07-25	Feet below surface:	93.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-06-01	Feet below surface:	93.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-04-28	Feet below surface:	94.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-03-29	Feet below surface:	94.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1983-02-23	Feet below surface:	93.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-06-07	Feet below surface:	97.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-03-14	Feet below surface:	99.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1982-01-15	Feet below surface:	103.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-11-14	Feet below surface:	105.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-08-15	Feet below surface:	107.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-07-23	Feet below surface:	108.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-06-16	Feet below surface:	105.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-06-15	Feet below surface:	105.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-05-16	Feet below surface:	102.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-04-15	Feet below surface:	100.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-03-16	Feet below surface:	97.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-02-19	Feet below surface:	91.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1981-02-18	Feet below surface:	91.7
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1981-01-23	Feet below surface:	84.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-12-19	Feet below surface:	78.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-11-26	Feet below surface:	78.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-10-24	Feet below surface:	80.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-09-18	Feet below surface:	82.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-08-15	Feet below surface:	84.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-07-23	Feet below surface:	86.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-06-15	Feet below surface:	83.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-05-15	Feet below surface:	84.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-05-01	Feet below surface:	84.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-04-17	Feet below surface:	81.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-03-14	Feet below surface:	82.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-02-12	Feet below surface:	80.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1980-01-21	Feet below surface:	88.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-12-17	Feet below surface:	85.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-11-16	Feet below surface:	79.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10-12	Feet below surface:	80.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-10-01	Feet below surface:	80.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-09-13	Feet below surface:	83.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-08-10	Feet below surface:	88.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-07-13	Feet below surface:	95.6
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1979-05-21	Feet below surface:	96.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-04-16	Feet below surface:	93.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-03-15	Feet below surface:	95.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-02-21	Feet below surface:	98.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1979-01-19	Feet below surface:	104.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-12-15	Feet below surface:	117.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-12-01	Feet below surface:	125.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-11-16	Feet below surface:	125.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-10-12	Feet below surface:	125.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-10-01	Feet below surface:	125.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-09-14	Feet below surface:	126.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-08-11	Feet below surface:	127.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-08-01	Feet below surface:	127.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-07-14	Feet below surface:	130.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-06-16	Feet below surface:	138.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-05-12	Feet below surface:	125.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-05-01	Feet below surface:	125.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-04-12	Feet below surface:	124.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-03-16	Feet below surface:	124.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-03-01	Feet below surface:	124.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-02-17	Feet below surface:	122.6
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1978-02-01	Feet below surface:	122.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1978-01-13	Feet below surface:	127.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-12-15	Feet below surface:	128.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-12-01	Feet below surface:	128.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-11-16	Feet below surface:	129.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-10-11	Feet below surface:	128.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-09-23	Feet below surface:	147.5
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1977-08-25	Feet below surface:	126.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-08-01	Feet below surface:	126.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-07-07	Feet below surface:	140.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-06-10	Feet below surface:	128.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-05-12	Feet below surface:	126.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-04-14	Feet below surface:	125.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-03-11	Feet below surface:	122.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-02-11	Feet below surface:	122.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1977-01-19	Feet below surface:	122.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-12-17	Feet below surface:	122.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-11-30	Feet below surface:	121.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-11-19	Feet below surface:	121.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-10-15	Feet below surface:	128.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-09-10	Feet below surface:	124.2
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1976-08-13	Feet below surface:	123.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-07-15	Feet below surface:	126.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-06-11	Feet below surface:	121.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-05-12	Feet below surface:	119.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-04-16	Feet below surface:	117.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-03-13	Feet below surface:	120.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-03-12	Feet below surface:	120.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-02-13	Feet below surface:	118.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1976-01-16	Feet below surface:	122.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-12-11	Feet below surface:	125.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-11-14	Feet below surface:	125.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-11-12	Feet below surface:	125.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-10-10	Feet below surface:	122.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-09-18	Feet below surface:	122.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-09-12	Feet below surface:	122.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-08-14	Feet below surface:	119.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-07-10	Feet below surface:	117.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-06-13	Feet below surface:	116.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-05-15	Feet below surface:	117.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-04-09	Feet below surface:	115.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-03-13	Feet below surface:	115.6
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1975-02-12	Feet below surface:	116.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1975-01-16	Feet below surface:	116.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-12-23	Feet below surface:	115.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1974-11-21	Feet below surface:	118.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-03-22	Feet below surface:	104.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-01-23	Feet below surface:	98.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-12-29	Feet below surface:	97.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-11-27	Feet below surface:	74.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-10-11	Feet below surface:	100.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-07-31	Feet below surface:	96.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-06-17	Feet below surface:	90.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-04-25	Feet below surface:	92.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-03-24	Feet below surface:	86.60
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-02-14	Feet below surface:	92.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-08-13	Feet below surface:	122.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1969-06-17	Feet below surface:	112.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-05-03	Feet below surface:	124.80
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1969-04-01	Feet below surface:	107.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-01-29	Feet below surface:	110.30
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-08-20	Feet below surface:	133.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1968-07-23	Feet below surface:	124.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.

Level reading date:	1968-06-18	Feet below surface:	121.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1968-04-11	Feet below surface:	110.40
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-02-05	Feet below surface:	109.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-12-27	Feet below surface:	113.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-11-25	Feet below surface:	119.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-11-04	Feet below surface:	121.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-09-30	Feet below surface:	127.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-07-28	Feet below surface:	129.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-26	Feet below surface:	122.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-04-26	Feet below surface:	121.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-01-10	Feet below surface:	128.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-06-29	Feet below surface:	134.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-05-21	Feet below surface:	131.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-04-06	Feet below surface:	131.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-02-24	Feet below surface:	130.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-01-18	Feet below surface:	133.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-12-28	Feet below surface:	135.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-12-02	Feet below surface:	141.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-09-27	Feet below surface:	155.7
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1965-07-20	Feet below surface:	154.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1965-05-04	Feet below surface:	135.7
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1965-03-23	Feet below surface:	153.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1965-02-25	Feet below surface:	141.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-01-28	Feet below surface:	136.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-12-30	Feet below surface:	142.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-11-23	Feet below surface:	147.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-09-25	Feet below surface:	159.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-06-28	Feet below surface:	143.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-04-06	Feet below surface:	135.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-03-30	Feet below surface:	135.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-12-21	Feet below surface:	152.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-11-28	Feet below surface:	149.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-09-26	Feet below surface:	147.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-08-27	Feet below surface:	169.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-08-20	Feet below surface:	181.5
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-07-31	Feet below surface:	152.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-06-27	Feet below surface:	161.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-05-29	Feet below surface:	145.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-04-25	Feet below surface:	150.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-03-20	Feet below surface:	144.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-02-25	Feet below surface:	141.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-01-30	Feet below surface:	147.5
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1962-11-25	Feet below surface:	149.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-10-26	Feet below surface:	168.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1962-09-13	Feet below surface:	166.5
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1962-07-18	Feet below surface:	154.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1962-06-19	Feet below surface:	137.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-05-22	Feet below surface:	135.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-04-11	Feet below surface:	133.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-03-09	Feet below surface:	137.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-02-23	Feet below surface:	140.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-01-18	Feet below surface:	158.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-12-19	Feet below surface:	142.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-11-27	Feet below surface:	157.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-10-03	Feet below surface:	156.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-08-07	Feet below surface:	154.7
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-07-12	Feet below surface:	153.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-05-22	Feet below surface:	150.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-04-13	Feet below surface:	148.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-03-08	Feet below surface:	137.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-02-16	Feet below surface:	142.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-01-28	Feet below surface:	136.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-12-28	Feet below surface:	146.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.

Level reading date:	1960-11-29	Feet below surface:	134.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-08-03	Feet below surface:	146.5
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1960-05-26	Feet below surface:	141.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1960-03-25	Feet below surface:	123.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-03-03	Feet below surface:	124.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-01-13	Feet below surface:	110.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-12-05	Feet below surface:	129.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-11-04	Feet below surface:	144.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-09-17	Feet below surface:	138.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-08-05	Feet below surface:	145.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-06-10	Feet below surface:	139.7
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-05-14	Feet below surface:	147.2
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-04-15	Feet below surface:	122.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-02-27	Feet below surface:	125.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-01-30	Feet below surface:	127.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-12-23	Feet below surface:	135.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-11-17	Feet below surface:	133.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-10-06	Feet below surface:	144.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1958-09-10	Feet below surface:	132.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-08-09	Feet below surface:	134.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-07-21	Feet below surface:	135.9
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1958-06-12	Feet below surface:	136.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-05-07	Feet below surface:	134.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-05-01	Feet below surface:	135.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-04-24	Feet below surface:	135.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-04-17	Feet below surface:	135.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-04-10	Feet below surface:	135.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-03-07	Feet below surface:	137.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-02-10	Feet below surface:	138.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-01-09	Feet below surface:	141.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-12-05	Feet below surface:	152.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-11-08	Feet below surface:	150.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-08-28	Feet below surface:	162.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1957-07-23	Feet below surface:	160.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1957-03-18	Feet below surface:	135.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-02-18	Feet below surface:	138.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-01-15	Feet below surface:	143.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-12-26	Feet below surface:	154.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-10-29	Feet below surface:	150.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-09-27	Feet below surface:	155.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-08-30	Feet below surface:	159.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-04-30	Feet below surface:	132.7
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1956-03-26	Feet below surface:	138.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-02-23	Feet below surface:	134.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-12-05	Feet below surface:	139.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-11-08	Feet below surface:	143.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1955-09-07	Feet below surface:	165.2
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1955-08-03	Feet below surface:	155.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1955-07-06	Feet below surface:	177.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1955-06-07	Feet below surface:	163.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1955-05-03	Feet below surface:	156.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-03-29	Feet below surface:	139.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1955-02-26	Feet below surface:	133.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-12-02	Feet below surface:	141.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-10-28	Feet below surface:	160.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1954-06-04	Feet below surface:	145
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1954-05-23	Feet below surface:	134.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-02-06	Feet below surface:	158.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1953-12-30	Feet below surface:	160.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1953-10-20	Feet below surface:	163.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1953-09-11	Feet below surface:	161.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-10-25	Feet below surface:	149.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-08-08	Feet below surface:	155.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.

Level reading date:	1952-06-30	Feet below surface:	128.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-06-09	Feet below surface:	128.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-03-12	Feet below surface:	134.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-01-14	Feet below surface:	147.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-11-15	Feet below surface:	149.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-11-08	Feet below surface:	152.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-10-03	Feet below surface:	139.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-09-05	Feet below surface:	141.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-08-01	Feet below surface:	172.5
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1950-06-14	Feet below surface:	144.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-04-04	Feet below surface:	122.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-02-08	Feet below surface:	150.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-11-22	Feet below surface:	167.4
Feet to sea level:	Not Reported	Note:	The site had been pumped recently.
Level reading date:	1949-10-29	Feet below surface:	166.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1949-09-03	Feet below surface:	153.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1949-06-24	Feet below surface:	150.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1949-05-25	Feet below surface:	126.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-03-31	Feet below surface:	124.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-01-17	Feet below surface:	137.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-12-05	Feet below surface:	154.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1948-10-08	Feet below surface:	152.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.

Level reading date:	1948-08-07	Feet below surface:	150.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1948-07-06	Feet below surface:	148.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1948-05-31	Feet below surface:	143.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1948-04-17	Feet below surface:	48.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-03-20	Feet below surface:	83.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-10-20	Feet below surface:	146.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1947-09-27	Feet below surface:	166.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1947-09-19	Feet below surface:	145.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1947-08-22	Feet below surface:	144.2
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1947-07-15	Feet below surface:	142.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1947-06-16	Feet below surface:	142.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1947-04-11	Feet below surface:	112.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1947-01-17	Feet below surface:	123.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1946-10-15	Feet below surface:	150.7
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1946-08-15	Feet below surface:	135.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1946-07-01	Feet below surface:	131.5
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1946-04-06	Feet below surface:	106.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1946-01-09	Feet below surface:	110.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1945-10-05	Feet below surface:	134.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1945-06-26	Feet below surface:	130.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1945-04-30	Feet below surface:	102.5
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1945-03-31	Feet below surface:	101.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1945-01-02	Feet below surface:	103.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1944-09-26	Feet below surface:	136.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1944-08-24	Feet below surface:	134.2
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1944-06-29	Feet below surface:	132.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1944-05-01	Feet below surface:	104.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1944-04-01	Feet below surface:	105.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-12-30	Feet below surface:	124.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-10-02	Feet below surface:	139.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1943-07-01	Feet below surface:	107.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-05-28	Feet below surface:	104.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-04-02	Feet below surface:	107.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-02-04	Feet below surface:	112.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1943-01-02	Feet below surface:	114.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-06-29	Feet below surface:	120.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-06-03	Feet below surface:	117.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1942-04-02	Feet below surface:	92.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-03-05	Feet below surface:	94.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-02-04	Feet below surface:	94.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1942-01-02	Feet below surface:	94.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-12-01	Feet below surface:	95.3
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1941-09-29	Feet below surface:	98.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-09-04	Feet below surface:	104.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-07-29	Feet below surface:	111.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-06-01	Feet below surface:	110.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-05-01	Feet below surface:	111.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-04-04	Feet below surface:	112.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-02-28	Feet below surface:	113.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-02-01	Feet below surface:	114.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-01-09	Feet below surface:	122.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-05-01	Feet below surface:	99.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-04-01	Feet below surface:	99.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-03-01	Feet below surface:	98.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-02-01	Feet below surface:	98.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-01-01	Feet below surface:	105.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-12-01	Feet below surface:	103.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-10-02	Feet below surface:	101.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-06-01	Feet below surface:	90.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-05-01	Feet below surface:	88.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-04-01	Feet below surface:	87.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-03-01	Feet below surface:	86.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-02-01	Feet below surface:	85.8
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1939-01-02	Feet below surface:	85.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-12-02	Feet below surface:	86.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-11-01	Feet below surface:	87.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-10-01	Feet below surface:	89.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-09-01	Feet below surface:	91.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-08-01	Feet below surface:	99.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-07-01	Feet below surface:	97.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-06-01	Feet below surface:	99.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-05-01	Feet below surface:	100.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-04-01	Feet below surface:	102.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-03-01	Feet below surface:	103.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-02-02	Feet below surface:	106.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-01-04	Feet below surface:	110.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-12-05	Feet below surface:	119.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-10-02	Feet below surface:	117.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-09-01	Feet below surface:	113.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-08-02	Feet below surface:	116.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-06-03	Feet below surface:	120.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-05-09	Feet below surface:	120.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-08-24	Feet below surface:	189.2
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1932-12-17	Feet below surface:	118.0
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1932-11-15	Feet below surface:	118.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-10-16	Feet below surface:	119.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-08-12	Feet below surface:	124.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-07-15	Feet below surface:	126.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-06-15	Feet below surface:	128.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-01-12	Feet below surface:	134.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-12-12	Feet below surface:	129.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-09-22	Feet below surface:	124.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-05-08	Feet below surface:	117.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1928-08-29	Feet below surface:	110.0
Feet to sea level:	Not Reported	Note:	Not Reported

A6
ESE **CA WELLS** **CAUSGSN00018903**
1/4 - 1/2 Mile
Higher

Well ID:	USGS-340346117080001	Well Type:	UNK
Source:	United States Geological Survey		
Other Name:	USGS-340346117080001	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=USGSNEW&samp_date=&global_id=&assigned_name=USGS-340346117080001&store_num=		
GeoTracker Data:	Not Reported		

A7
ESE **CA WELLS** **CADWR0000005721**
1/4 - 1/2 Mile
Higher

Well ID:	01S02W30C001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S02W30C001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S02W30C001S&store_num=		
GeoTracker Data:	Not Reported		

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
B8 **ENE** **1/4 - 1/2 Mile** **Higher**	**CA WELLS**	**768**

Seq:	768	Prim sta c:	01S/02W-19K01 S
Frds no:	3610037001	County:	36
District:	13	User id:	TAN
System no:	3610037	Water type:	G
Source nam:	AGATE WELL 01 - INACTIVE	Station ty:	WELL/AMBNT/MUN/INTAKE/SUPPLY
Latitude:	340400.0	Longitude:	1170800.0
Precision:	4	Status:	IR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		
System no:	3610037	System nam:	Redlands City Mud-Water Div
Hqname:	Not Reported	Address:	PO BOX 3005
City:	REDLANDS	State:	CA
Zip:	92373	Zip ext:	Not Reported
Pop serv:	69300	Connection:	18447
Area serve:	REDLANDS		
Sample date:	12-JUN-14	Finding:	2.8
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	0.8
Chemical:	RADIUM 228 MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	490.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	8.
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	160.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	190.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	220.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	64.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	14.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		

Sample date:	12-JUN-14	Finding:	15.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	2.8
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	11.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	33.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	12-JUN-14	Finding:	0.57
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	12-JUN-14	Finding:	0.95
Chemical:	GROSS BETA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	1.1
Chemical:	GROSS BETA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	4.8
Chemical:	URANIUM (PCI/L)	Report units:	PCI/L
Dlr:	1.		
Sample date:	12-JUN-14	Finding:	300.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	1.1
Chemical:	LANGELIER INDEX @ 60 C	Report units:	Not Reported
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-JUN-14	Finding:	3100.
Chemical:	CARBON DIOXIDE	Report units:	UG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	0.25
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	12-JUN-14	Finding:	0.87
Chemical:	TOTAL TRIHALOMETHANES	Report units:	UG/L
Dlr:	0.		
Sample date:	12-JUN-14	Finding:	4900.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-JUN-14	Finding:	3.
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L

Dlr:	0.		
Sample date:	12-JUN-14	Finding:	0.46
Chemical:	RADIUM 226 MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	23-JAN-14	Finding:	2.9
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

9
SSE **FED USGS** **USGS40000140287**
1/4 - 1/2 Mile
Higher

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W30E001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19300101	Well Depth:	247
Well Depth Units:	ft	Well Hole Depth:	280
Well Hole Depth Units:	ft		

B10
ENE **CA WELLS** **CADDW0000009731**
1/4 - 1/2 Mile
Higher

Well ID:	3610037-001	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	AGATE WELL 01 - INACTIVE	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3610037-001&store_num=		
GeoTracker Data:	Not Reported		

11
ENE **FED USGS** **USGS40000140438**
1/4 - 1/2 Mile
Higher

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W19P002S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19280101	Well Depth:	166
Well Depth Units:	ft	Well Hole Depth:	195
Well Hole Depth Units:	ft		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

12
SSE
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000029011**

Well ID:	01S02W30E001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S02W30E001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S02W30E001S&store_num=		
GeoTracker Data:	Not Reported		

13
NE
1/2 - 1 Mile
Higher

FRDS PWS **CA3600385**

Epa region:	09	State:	CA
Pwsid:	CA3600385	Pwsname:	BROOKSIDE MHP
Cityserved:	Not Reported	Stateserved:	CA
Zipserved:	Not Reported	Fipscounty:	06071
Status:	Active	Retpopsrvd:	65
Pwssvcconn:	20	Psource longname:	Groundwater
Pwstype:	CWS	Owner:	Private
Contact:	Ray Blanchette	Contactorgname:	Brookside Mobile Home Park
Contactphone:	9096869661	Contactaddress1:	2820 Mill Creek Rd sp #3
Contactaddress2:	Not Reported	Contactcity:	Mentone
Contactstate:	CA	Contactzip:	92359
Pwsactivitycode:	A		

PWS ID:	CA3600385	PWS name:	BROOKSIDE MOBILE HOME PARK
Address:	Not Reported	Care of:	Not Reported
City:	MENTONE	State:	CA
Zip:	92359	Owner:	BROOKSIDE MOBILE HOME PARK
Source code:	Ground water	Population:	100

PWS ID:	CA3600385	PWS type:	System Owner/Responsible Party
PWS name:	BROOKSIDE TRAILER PARK	PWS address:	Not Reported
PWS city:	LA PUENTE	PWS state:	CA
PWS zip:	917440000	PWS name:	Brookside Mobile Home Park
PWS type code:	C	Retail population served:	100
Contact:	Ray Blanchette	Contact address:	2820 Mill Creek Rd sp #3
Contact address:	Mentone	Contact city:	CA
Contact state:	92	Contact zip:	9096869661
Contact telephone:	Not Reported		

PWS ID:	CA3600385	Activity status:	Active
Date system activated:	7706	Date system deactivated:	Not Reported
Retail population:	00000025	System name:	BROOKSIDE TRAILER PARK
System address:	BROOKSIDE TRAILER PARK	System address:	022ND T01SR02W SBB&M
System city:	MENTONE	System state:	CA
System zip:	94234		

Population served:	Under 101 Persons	Treatment:	Untreated
Latitude:	340412	Longitude:	1170800
Violation id:	0000004	Orig code:	S

State: CA
Contamination code: 3100
Violation code: 23
Rule code: 110
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 01/31/2000
Violation Year: 2000
Contamination Name: Coliform (TCR)
Violation name: Monitoring, Routine Major (TCR)
Rule name: TCR
Unit of measure: Not Reported
Cmp bdt: 01/01/2000

Violation id: 0000005
State: CA
Contamination code: 3100
Violation code: 23
Rule code: 110
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 02/29/2000
Orig code: S
Violation Year: 2000
Contamination Name: Coliform (TCR)
Violation name: Monitoring, Routine Major (TCR)
Rule name: TCR
Unit of measure: Not Reported
Cmp bdt: 02/01/2000

Violation id: 0000006
State: CA
Contamination code: 3100
Violation code: 23
Rule code: 110
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 03/31/2000
Orig code: S
Violation Year: 2000
Contamination Name: Coliform (TCR)
Violation name: Monitoring, Routine Major (TCR)
Rule name: TCR
Unit of measure: Not Reported
Cmp bdt: 03/01/2000

Violation id: 0000007
State: CA
Contamination code: 3100
Violation code: 23
Rule code: 110
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 04/30/2000
Orig code: S
Violation Year: 2000
Contamination Name: Coliform (TCR)
Violation name: Monitoring, Routine Major (TCR)
Rule name: TCR
Unit of measure: Not Reported
Cmp bdt: 04/01/2000

Violation id: 0000008
State: CA
Contamination code: 3100
Violation code: 23
Rule code: 110
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 05/31/2000
Orig code: S
Violation Year: 2000
Contamination Name: Coliform (TCR)
Violation name: Monitoring, Routine Major (TCR)
Rule name: TCR
Unit of measure: Not Reported
Cmp bdt: 05/01/2000

Violation id: 0000009
State: CA
Contamination code: 3100
Violation code: 23
Rule code: 110
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 06/30/2000
Orig code: S
Violation Year: 2000
Contamination Name: Coliform (TCR)
Violation name: Monitoring, Routine Major (TCR)
Rule name: TCR
Unit of measure: Not Reported
Cmp bdt: 06/01/2000

Violation id: 0000010
State: CA
Contamination code: 3100
Violation code: 23
Rule code: 110
Violation measur: Not Reported
State mcl: Not Reported
Cmp edt: 09/30/2000
Orig code: S
Violation Year: 2000
Contamination Name: Coliform (TCR)
Violation name: Monitoring, Routine Major (TCR)
Rule name: TCR
Unit of measure: Not Reported
Cmp bdt: 09/01/2000

Violation id:	0100001	Orig code:	S
State:	CA	Violation Year:	2000
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	10/01/2000
Cmp edt:	10/31/2000		

Violation id:	0100002	Orig code:	S
State:	CA	Violation Year:	2000
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	11/01/2000
Cmp edt:	11/30/2000		

Violation id:	0100003	Orig code:	S
State:	CA	Violation Year:	2001
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	02/01/2001
Cmp edt:	02/28/2001		

Violation id:	0100004	Orig code:	S
State:	CA	Violation Year:	2001
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	02/01/2001
Cmp edt:	02/28/2001		

Violation id:	0100006	Orig code:	S
State:	CA	Violation Year:	2001
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	04/01/2001
Cmp edt:	04/30/2001		

Violation id:	0100007	Orig code:	S
State:	CA	Violation Year:	2001
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	06/01/2001
Cmp edt:	06/30/2001		

Violation id:	0100008	Orig code:	S
State:	CA	Violation Year:	2001
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	07/01/2001
Cmp edt:	07/31/2001		

Violation id:	0200001	Orig code:	S
State:	CA	Violation Year:	2001
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	10/01/2001
Cmp edt:	10/31/2001		

Violation id:	0200002	Orig code:	S
State:	CA	Violation Year:	2001
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	11/01/2001
Cmp edt:	11/30/2001		

Violation id:	0900001	Orig code:	S
State:	CA	Violation Year:	2009
Contamination code:	3100	Contamination Name:	Coliform (TCR)
Violation code:	23	Violation name:	Monitoring, Routine Major (TCR)
Rule code:	110	Rule name:	TCR
Violation measur:	Not Reported	Unit of measure:	Not Reported
State mcl:	Not Reported	Cmp bdt:	05/01/2009
Cmp edt:	05/31/2009		

Violation id:	95V0001	Orig code:	F
State:	CA	Violation Year:	1993
Contamination code:	5000	Contamination Name:	Lead and Copper Rule
Violation code:	51	Violation name:	Initial Tap Sampling for Pb and Cu
Rule code:	350	Rule name:	LCR
Violation measur:	0	Unit of measure:	Not Reported
State mcl:	0	Cmp bdt:	07/01/1993
Cmp edt:	Not Reported		

Violation ID:	0000001	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	0000001	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	0000002	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	0000002	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	0000003	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	0000003	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	0000004	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001

Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000004	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000005	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000005	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000006	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000006	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000007	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000007	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000008	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000008	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000009	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000009	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000010	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0000010	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100001	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100001	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	0100002	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100002	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100003	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100003	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100006	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100006	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100007	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100007	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0100008	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	09/01/2001
Enforcement Detail:	St Compliance Meeting conducted		
Enforcement Category:	Informal		
Violation ID:	0100008	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	09/01/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0200001	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0200001	Orig Code:	S
Enforcemnt FY:	2002	Enforcement Action:	12/03/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	0900001	Orig Code:	S
Enforcemnt FY:	2009	Enforcement Action:	07/02/2009
Enforcement Detail:	St Violation/Reminder Notice		
Enforcement Category:	Informal		
Violation ID:	0900001	Orig Code:	S
Enforcemnt FY:	2009	Enforcement Action:	07/02/2009
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	95V0001	Orig Code:	F
Enforcemnt FY:	2005	Enforcement Action:	09/30/2005
Enforcement Detail:	Fed Compliance achieved	Enforcement Category:	Resolving

Violation ID:	9800001	Orig Code:	S
Enforcemnt FY:	2000	Enforcement Action:	03/06/2000
Enforcement Detail:	St Admin Penalty assessed	Enforcement Category:	Formal
Violation ID:	9800001	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9800002	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9800002	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9800002	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9800003	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9800003	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9800004	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9800004	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9800004	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900001	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900001	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900002	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900002	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900003	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900003	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001

Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900004	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900004	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900004	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900005	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900005	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900006	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900006	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900007	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900007	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900007	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900008	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900008	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900009	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900009	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900010	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving

Violation ID:	9900010	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900010	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900011	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900011	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900012	Orig Code:	S
Enforcemnt FY:	2001	Enforcement Action:	08/15/2001
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
Violation ID:	9900012	Orig Code:	S
Enforcemnt FY:	2010	Enforcement Action:	05/20/2010
Enforcement Detail:	St Compliance achieved	Enforcement Category:	Resolving
PWS name:	Brookside Mobile Home Park		
Population served:	100	PWS type code:	C
Violation ID:	0000004	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	1/1/2000 0:00:00	Compliance end date:	1/31/2000 0:00:00
Enforcement date:	No Enf Action as of	Enforcement action:	7/8/2009 0:00:00
Violation measurement:	Not Reported		
PWS name:	Brookside Mobile Home Park		
Population served:	100	PWS type code:	C
Violation ID:	0000005	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	2/1/2000 0:00:00	Compliance end date:	2/29/2000 0:00:00
Enforcement date:	No Enf Action as of	Enforcement action:	7/8/2009 0:00:00
Violation measurement:	Not Reported		
PWS name:	Brookside Mobile Home Park		
Population served:	100	PWS type code:	C
Violation ID:	0000006	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	3/1/2000 0:00:00	Compliance end date:	3/31/2000 0:00:00
Enforcement date:	No Enf Action as of	Enforcement action:	7/8/2009 0:00:00
Violation measurement:	Not Reported		
PWS name:	Brookside Mobile Home Park		
Population served:	100	PWS type code:	C
Violation ID:	0000007	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	4/1/2000 0:00:00	Compliance end date:	4/30/2000 0:00:00
Enforcement date:	No Enf Action as of	Enforcement action:	7/8/2009 0:00:00
Violation measurement:	Not Reported		
PWS name:	Brookside Mobile Home Park		
Population served:	100	PWS type code:	C
Violation ID:	0000008	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	5/1/2000 0:00:00	Compliance end date:	5/31/2000 0:00:00
Enforcement date:	No Enf Action as of	Enforcement action:	7/8/2009 0:00:00

Violation measurement: Not Reported

PWS name: Brookside Mobile Home Park
Population served: 100 PWS type code: C
Violation ID: 0000009 Contaminant: COLIFORM (TCR)
Violation type: Monitoring, Routine Major (TCR)
Compliance start date: 6/1/2000 0:00:00 Compliance end date: 6/30/2000 0:00:00
Enforcement date: No Enf Action as of Enforcement action: 7/8/2009 0:00:00
Violation measurement: Not Reported

PWS name: Brookside Mobile Home Park
Population served: 100 PWS type code: C
Violation ID: 0000010 Contaminant: COLIFORM (TCR)
Violation type: Monitoring, Routine Major (TCR)
Compliance start date: 9/1/2000 0:00:00 Compliance end date: 9/30/2000 0:00:00
Enforcement date: No Enf Action as of Enforcement action: 7/8/2009 0:00:00
Violation measurement: Not Reported

PWS name: Brookside Mobile Home Park
Population served: 100 PWS type code: C
Violation ID: 0100001 Contaminant: COLIFORM (TCR)
Violation type: Monitoring, Routine Major (TCR)
Compliance start date: 10/1/2000 0:00:00 Compliance end date: 10/31/2000 0:00:00
Enforcement date: No Enf Action as of Enforcement action: 7/8/2009 0:00:00
Violation measurement: Not Reported

PWS name: Brookside Mobile Home Park
Population served: 100 PWS type code: C
Violation ID: 0100002 Contaminant: COLIFORM (TCR)
Violation type: Monitoring, Routine Major (TCR)
Compliance start date: 11/1/2000 0:00:00 Compliance end date: 11/30/2000 0:00:00
Enforcement date: No Enf Action as of Enforcement action: 7/8/2009 0:00:00
Violation measurement: Not Reported

PWS name: Brookside Mobile Home Park
Population served: 100 PWS type code: C
Violation ID: 0100003 Contaminant: COLIFORM (TCR)
Violation type: Monitoring, Routine Major (TCR)
Compliance start date: 1/1/2001 0:00:00 Compliance end date: 1/31/2001 0:00:00
Enforcement date: No Enf Action as of Enforcement action: 7/8/2009 0:00:00
Violation measurement: Not Reported

PWS name: Brookside Mobile Home Park
Population served: 100 PWS type code: C
Violation ID: 0100004 Contaminant: COLIFORM (TCR)
Violation type: Monitoring, Routine Major (TCR)
Compliance start date: 2/1/2001 0:00:00 Compliance end date: 2/28/2001 0:00:00
Enforcement date: No Enf Action as of Enforcement action: 7/8/2009 0:00:00
Violation measurement: Not Reported

PWS name: Brookside Mobile Home Park
Population served: 100 PWS type code: C
Violation ID: 0100006 Contaminant: COLIFORM (TCR)
Violation type: Monitoring, Routine Major (TCR)
Compliance start date: 4/1/2001 0:00:00 Compliance end date: 4/30/2001 0:00:00
Enforcement date: No Enf Action as of Enforcement action: 7/8/2009 0:00:00
Violation measurement: Not Reported

PWS name: Brookside Mobile Home Park
Population served: 100 PWS type code: C
Violation ID: 0100007 Contaminant: COLIFORM (TCR)
Violation type: Monitoring, Routine Major (TCR)

Compliance start date:	6/1/2001 0:00:00	Compliance end date:	6/30/2001 0:00:00
Enforcement date:	No Enf Action as of	Enforcement action:	7/8/2009 0:00:00
Violation measurement:	Not Reported		

PWS name:	Brookside Mobile Home Park		
Population served:	100	PWS type code:	C
Violation ID:	0200001	Contaminant:	COLIFORM (TCR)
Violation type:	Monitoring, Routine Major (TCR)		
Compliance start date:	10/1/2001 0:00:00	Compliance end date:	10/31/2001 0:00:00
Enforcement date:	No Enf Action as of	Enforcement action:	7/8/2009 0:00:00
Violation measurement:	Not Reported		

PWS name:	Brookside Mobile Home Park		
Population served:	100	PWS type code:	C
Violation ID:	95V0001	Contaminant:	LEAD & COPPER RULE
Violation type:	Initial Tap Sampling for Pb and Cu		
Compliance start date:	7/1/1993 0:00:00	Compliance end date:	9/30/2005 0:00:00
Enforcement date:	9/30/2005 0:00:00	Enforcement action:	Fed Compliance Achieved
Violation measurement:	0		

C14
WNW
1/2 - 1 Mile
Lower

CA WELLS 18787

Seq:	18787	Prim sta c:	3610037-102GACT
Frds no:	3610037102	County:	36
District:	13	User id:	TAN
System no:	3610037	Water type:	G
Source nam:	REES GAC TREATED	Station ty:	COMP/WELL/SUPPLY
Latitude:	340400.0	Longitude:	1170900.0
Precision:	3	Status:	CT
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	REES WELL - TREATED	Comment 4:	GAC TREATMENT
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3610037	System nam:	Redlands City Mud-Water Div
Hqname:	Not Reported	Address:	PO BOX 3005
City:	REDLANDS	State:	CA
Zip:	92373	Zip ext:	Not Reported
Pop serv:	69300	Connection:	18447
Area serve:	REDLANDS		

C15
WNW
1/2 - 1 Mile
Lower

CA WELLS 822

Seq:	822	Prim sta c:	01S/03W-23A05 S
Frds no:	3610037031	County:	36
District:	13	User id:	TAN
System no:	3610037	Water type:	G
Source nam:	REES WELL	Station ty:	WELL/AMBNT
Latitude:	340400.0	Longitude:	1170900.0
Precision:	5	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	3610037	System nam:	Redlands City Mud-Water Div
Hqname:	Not Reported	Address:	PO BOX 3005
City:	REDLANDS	State:	CA
Zip:	92373	Zip ext:	Not Reported
Pop serv:	69300	Connection:	18447
Area serve:	REDLANDS		

Sample date:	22-FEB-18	Finding:	4.808
Chemical:	PERCHLORATE	Report units:	UG/L
Dlr:	4.		

Sample date:	22-FEB-18	Finding:	3.2477
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	07-NOV-17	Finding:	4.1472
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	02-NOV-17	Finding:	4.0632
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	26-OCT-17	Finding:	3.9491
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	19-OCT-17	Finding:	4.0442
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	12-OCT-17	Finding:	4.0502
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	05-OCT-17	Finding:	4.0685
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	28-SEP-17	Finding:	4.2
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	28-SEP-17	Finding:	420.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		

Sample date:	21-SEP-17	Finding:	430.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		

Sample date:	21-SEP-17	Finding:	4.1352
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	07-SEP-17	Finding:	4.2256
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	31-AUG-17	Finding:	4.5
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	31-AUG-17	Finding:	450.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	24-AUG-17	Finding:	4.3281
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-AUG-17	Finding:	4.3467
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-AUG-17	Finding:	4.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-AUG-17	Finding:	4.4582
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-AUG-17	Finding:	4.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-JUL-17	Finding:	4.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	20-JUL-17	Finding:	4.6258
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-JUL-17	Finding:	4.7208
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-JUL-17	Finding:	4.8378
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-JUN-17	Finding:	4.9585
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-JUN-17	Finding:	5.1177
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-JUN-17	Finding:	17.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	12.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	69.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	220.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L

Dlr:	0.		
Sample date:	15-JUN-17	Finding:	5.3
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-JUN-17	Finding:	230.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	190.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	8.
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	520.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	0.13
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	15-JUN-17	Finding:	5.3258
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-JUN-17	Finding:	3.4
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	36.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	15-JUN-17	Finding:	0.77
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	15-JUN-17	Finding:	6.04
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	15-JUN-17	Finding:	0.397
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	330.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	15-JUN-17	Finding:	5.3
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-JUN-17	Finding:	1.06
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		

Sample date:	15-JUN-17	Finding:	14.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	01-DEC-16	Finding:	4.6409
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-NOV-16	Finding:	4.6577
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-NOV-16	Finding:	4.595
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-NOV-16	Finding:	4.6181
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-NOV-16	Finding:	4.6047
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-OCT-16	Finding:	4.643
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-OCT-16	Finding:	4.6015
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-OCT-16	Finding:	4.6091
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-OCT-16	Finding:	4.5951
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-SEP-16	Finding:	4.5782
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-SEP-16	Finding:	4.4698
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	15-SEP-16	Finding:	4.5421
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	08-SEP-16	Finding:	4.5671
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	01-SEP-16	Finding:	4.5304
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-AUG-16	Finding:	4.6044
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	18-AUG-16	Finding:	4.5237
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-AUG-16	Finding:	4.4288
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-AUG-16	Finding:	4.4662
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-JUL-16	Finding:	420.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	28-JUL-16	Finding:	4.6
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-JUL-16	Finding:	4.5026
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-JUL-16	Finding:	4.4778
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-JUL-16	Finding:	4.5796
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	30-JUN-16	Finding:	4.6115
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	23-JUN-16	Finding:	4.6337
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	16-JUN-16	Finding:	4.5922
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	09-JUN-16	Finding:	4.5891
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	02-JUN-16	Finding:	4.6667
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-MAY-16	Finding:	4.8
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-MAY-16	Finding:	4.5967
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	05-MAY-16	Finding:	4.729
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-APR-16	Finding:	4.7444
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-APR-16	Finding:	4.7446
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-APR-16	Finding:	4.802
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-APR-16	Finding:	4.825
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-FEB-16	Finding:	4.724
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-FEB-16	Finding:	4.9
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	11-FEB-16	Finding:	5.1
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	04-FEB-16	Finding:	4.8329
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	28-JAN-16	Finding:	4.7144
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-JAN-16	Finding:	4.7144
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	21-JAN-16	Finding:	4.7058
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-JAN-16	Finding:	4.733
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-JAN-16	Finding:	4.6943
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-DEC-15	Finding:	4.7118
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	22-DEC-15	Finding:	4.7256
Chemical:	NITRATE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	17-DEC-15	Finding:	4.6862
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-DEC-15	Finding:	4.6862
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-DEC-15	Finding:	4.7202
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-DEC-15	Finding:	4.7202
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-DEC-15	Finding:	4.6391
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	03-DEC-15	Finding:	4.6391
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-NOV-15	Finding:	4.6964
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-NOV-15	Finding:	4.693
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-NOV-15	Finding:	4.7061
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-NOV-15	Finding:	4.7679
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-OCT-15	Finding:	21.2837
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	22-OCT-15	Finding:	21.1874
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-OCT-15	Finding:	21.3753
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	08-OCT-15	Finding:	21.3554
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-OCT-15	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

Sample date:	24-SEP-15	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	17-SEP-15	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-SEP-15	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	03-SEP-15	Finding:	13.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	03-SEP-15	Finding:	35.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	03-SEP-15	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	03-SEP-15	Finding:	170.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	27-AUG-15	Finding:	21.3474
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-AUG-15	Finding:	21.4214
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-AUG-15	Finding:	21.5152
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-AUG-15	Finding:	21.1208
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-JUL-15	Finding:	21.855
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-JUL-15	Finding:	21.683
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-JUL-15	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-JUL-15	Finding:	21.661
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-JUL-15	Finding:	21.936
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr:	2.		
Sample date:	02-JUL-15	Finding:	4.9551
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	25-JUN-15	Finding:	22.02
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	18-JUN-15	Finding:	21.88
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-JUN-15	Finding:	21.902
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	05-JUN-15	Finding:	21.307
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-MAY-15	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-MAY-15	Finding:	22.058
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-MAY-15	Finding:	22.167
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-MAY-15	Finding:	21.851
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-APR-15	Finding:	22.135
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-APR-15	Finding:	22.258
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-APR-15	Finding:	21.935
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-APR-15	Finding:	22.167
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-APR-15	Finding:	22.383
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	26-MAR-15	Finding:	21.805
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

Sample date:	19-MAR-15	Finding:	22.524
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-MAR-15	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	05-MAR-15	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	26-FEB-15	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	19-FEB-15	Finding:	22.699
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-FEB-15	Finding:	23.075
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	05-FEB-15	Finding:	22.994
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-JAN-15	Finding:	23.087
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	22-JAN-15	Finding:	22.943
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-JAN-15	Finding:	23.27
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	31-DEC-14	Finding:	22.871
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	26-DEC-14	Finding:	23.066
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	17-DEC-14	Finding:	22.856
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-DEC-14	Finding:	23.233
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	04-DEC-14	Finding:	23.206
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	25-NOV-14	Finding:	22.97
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr:	2.		
Sample date:	13-NOV-14	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-NOV-14	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-OCT-14	Finding:	24.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	23-OCT-14	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-OCT-14	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-OCT-14	Finding:	22.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-OCT-14	Finding:	16.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	02-OCT-14	Finding:	33.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	02-OCT-14	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	25-SEP-14	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	18-SEP-14	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-SEP-14	Finding:	23.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	04-SEP-14	Finding:	22.388
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-AUG-14	Finding:	22.644
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-AUG-14	Finding:	21.196
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

Sample date:	12-AUG-14	Finding:	21.508
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-AUG-14	Finding:	21.389
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-JUL-14	Finding:	21.321
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-JUL-14	Finding:	21.595
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	17-JUL-14	Finding:	21.201
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-JUL-14	Finding:	20.91
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	03-JUL-14	Finding:	20.497
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	26-JUN-14	Finding:	20.273
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	19-JUN-14	Finding:	20.996
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-JUN-14	Finding:	20.08
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-MAY-14	Finding:	20.149
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-MAR-14	Finding:	3.
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	4300.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-MAR-14	Finding:	0.24
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	06-MAR-14	Finding:	1.1
Chemical:	LANGELIER INDEX @ 60 C	Report units:	Not Reported
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	3.
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L

Dlr:	0.		
Sample date:	06-MAR-14	Finding:	0.77
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	06-MAR-14	Finding:	30.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	06-MAR-14	Finding:	16.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	3.6
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	20.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	11.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	57.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	190.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	170.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	8.1
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	450.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	06-MAR-14	Finding:	280.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	16-JAN-14	Finding:	4000.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	05-DEC-13	Finding:	3800.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	27-NOV-13	Finding:	3800.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	21-NOV-13	Finding:	3800.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	14-NOV-13	Finding:	3800.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	07-NOV-13	Finding:	3800.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	31-OCT-13	Finding:	3900.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	24-OCT-13	Finding:	3800.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	17-OCT-13	Finding:	3800.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-OCT-13	Finding:	3800.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	26-SEP-13	Finding:	3900.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	19-SEP-13	Finding:	3900.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	12-SEP-13	Finding:	4100.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-SEP-13	Finding:	4100.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	29-AUG-13	Finding:	4100.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	18-JUL-13	Finding:	4300.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	13-JUN-13	Finding:	20.432
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-JUN-13	Finding:	21.126
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	30-MAY-13	Finding:	20.586
Chemical:	NITRATE (AS NO3)	Report units:	MG/L

Dlr:	2.		
Sample date:	23-MAY-13	Finding:	21.319
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	16-MAY-13	Finding:	21.146
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-MAY-13	Finding:	21.868
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	02-MAY-13	Finding:	21.421
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	25-APR-13	Finding:	20.737
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	18-APR-13	Finding:	21.333
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	11-APR-13	Finding:	21.703
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	04-APR-13	Finding:	22.057
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-MAR-13	Finding:	22.946
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-MAR-13	Finding:	21.956
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-MAR-13	Finding:	23.655
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	07-MAR-13	Finding:	23.362
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	28-FEB-13	Finding:	24.023
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-FEB-13	Finding:	22.988
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	14-FEB-13	Finding:	23.634
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		

Sample date:	07-FEB-13	Finding:	23.584
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	31-JAN-13	Finding:	23.584
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	24-JAN-13	Finding:	22.289
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	17-JAN-13	Finding:	23.097
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-JAN-13	Finding:	23.325
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	27-DEC-12	Finding:	23.573
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	20-DEC-12	Finding:	22.8
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	13-DEC-12	Finding:	21.743
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-DEC-12	Finding:	22.15
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	29-NOV-12	Finding:	21.527
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	21-NOV-12	Finding:	21.843
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	15-NOV-12	Finding:	21.583
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	08-NOV-12	Finding:	20.665
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	01-NOV-12	Finding:	20.963
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	25-OCT-12	Finding:	20.027
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	09-AUG-12	Finding:	4000.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L

Dlr:	0.4		
Sample date:	28-JUN-12	Finding:	3.
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	28-JUN-12	Finding:	2.4
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		

16
North
1/2 - 1 Mile
Higher

FED USGS **USGS40000140598**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W19D001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19290101	Well Depth:	400
Well Depth Units:	ft	Well Hole Depth:	427
Well Hole Depth Units:	ft		

D17
North
1/2 - 1 Mile
Lower

CA WELLS **CAUSGSN00018278**

Well ID:	USGS-340427117082501	Well Type:	UNK
Source:	United States Geological Survey		
Other Name:	USGS-340427117082501	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=USGSNEW&samp_date=&global_id=&assigned_name=USGS-340427117082501&store_num=		
GeoTracker Data:	Not Reported		

D18
North
1/2 - 1 Mile
Lower

FED USGS **USGS40000140609**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S003W24A001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19260101	Well Depth:	405
Well Depth Units:	ft	Well Hole Depth:	405
Well Hole Depth Units:	ft		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

19
NE
1/2 - 1 Mile
Higher

FED USGS **USGS40000140536**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W19F001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19220101	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	116
Well Hole Depth Units:	ft		

E20
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40000140332**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W30B001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19290101	Well Depth:	222
Well Depth Units:	ft	Well Hole Depth:	264
Well Hole Depth Units:	ft		

21
SW
1/2 - 1 Mile
Lower

FED USGS **USGS40000140235**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S003W25F001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19000101	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	570
Well Hole Depth Units:	ft		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

E22
ESE
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000022991**

Well ID:	01S02W30B002S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S02W30B002S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S02W30B002S&store_num=		
GeoTracker Data:	Not Reported		

23
North
1/2 - 1 Mile
Lower

CA WELLS **CADWR0000019496**

Well ID:	01S03W24A001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S03W24A001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S03W24A001S&store_num=		
GeoTracker Data:	Not Reported		

24
NE
1/2 - 1 Mile
Higher

FED USGS **USGS40000140542**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W19G001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19230101	Well Depth:	183
Well Depth Units:	ft	Well Hole Depth:	318
Well Hole Depth Units:	ft		

25
ENE
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000033759**

Well ID:	01S02W19K001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S02W19K001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S02W19K001S&store_num=		
GeoTracker Data:	Not Reported		

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

26
East
1/2 - 1 Mile
Higher

FED USGS **USGS40000140411**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W19Q001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19280101	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	100
Well Hole Depth Units:	ft		

F27
ESE
1/2 - 1 Mile
Higher

CA WELLS **CADWR9000006565**

State Well #:	01S02W30B003S	Station ID:	6574
Well Name:	Not Reported	Basin Name:	San Bernardino
Well Use:	Unknown	Well Type:	Unknown
Well Depth:	0	Well Completion Rpt #:	Not Reported

28
NNE
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000018214**

Well ID:	01S02W19D001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S02W19D001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S02W19D001S&store_num=		
GeoTracker Data:	Not Reported		

F29
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40000140315**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W30B002S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19290101	Well Depth:	250
Well Depth Units:	ft	Well Hole Depth:	250

Well Hole Depth Units: ft

F30
ESE **FED USGS** **USGS40000140316**
1/2 - 1 Mile
Higher

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	HOLE-07 LYSIMETER AT 106		
Type:	Well: Test hole not completed as a well		
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

F31
ESE **CA WELLS** **CAUSGSN00016042**
1/2 - 1 Mile
Higher

Well ID:	USGS-340334117073201	Well Type:	UNK
Source:	United States Geological Survey		
Other Name:	USGS-340334117073201	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=USGSNEW&samp_date=&global_id=&assigned_name=USGS-340334117073201&store_num=		
GeoTracker Data:	Not Reported		

F32
ESE **CA WELLS** **CADWR0000011131**
1/2 - 1 Mile
Higher

Well ID:	01S02W30B003S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S02W30B003S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S02W30B003S&store_num=		
GeoTracker Data:	Not Reported		

F33
ESE **FED USGS** **USGS40000140301**
1/2 - 1 Mile
Higher

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W30B003S	Type:	Well
Description:	orginal depth 225.3	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported

Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	1929	Well Depth:	226
Well Depth Units:	ft	Well Hole Depth:	246
Well Hole Depth Units:	ft		

Ground water levels,Number of Measurements:	290	Level reading date:	2004-10-25
Feet below surface:	101.24	Feet to sea level:	Not Reported
Note:	Not Reported		

Level reading date:	2004-04-21	Feet below surface:	105.00
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-10-23	Feet below surface:	109.36
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2003-04-24	Feet below surface:	110.04
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-10-28	Feet below surface:	107.77
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2002-04-09	Feet below surface:	91.17
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-10-22	Feet below surface:	88.56
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2001-04-18	Feet below surface:	79.87
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-10-24	Feet below surface:	78.29
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	2000-04-13	Feet below surface:	73.04
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-10-18	Feet below surface:	67.63
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1999-04-12	Feet below surface:	62.15
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-10-21	Feet below surface:	64.82
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1998-04-14	Feet below surface:	72.08
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1997-10-28	Feet below surface:	69.89
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1997-04-16	Feet below surface:	67.23
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1996-10-07	Feet below surface:	61.34
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1996-04-25	Feet below surface:	57.14
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1995-10-24	Feet below surface:	57.79
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1995-04-20	Feet below surface:	66.70
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-10-26	Feet below surface:	63.37
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1994-04-19	Feet below surface:	59.05
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-10-19	Feet below surface:	68.12
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1993-04-12	Feet below surface:	87.28
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1992-08-12	Feet below surface:	100.41
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1972-11-24	Feet below surface:	137.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1971-01-05	Feet below surface:	108.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-11-27	Feet below surface:	89.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1970-03-24	Feet below surface:	59.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-10-23	Feet below surface:	69.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-05-03	Feet below surface:	84.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1969-01-29	Feet below surface:	93.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1968-04-11	Feet below surface:	82.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-09-30	Feet below surface:	97.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-07-28	Feet below surface:	102.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-05-26	Feet below surface:	107.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-04-26	Feet below surface:	109.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1967-01-10	Feet below surface:	121.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-12-12	Feet below surface:	128.0
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1966-09-28	Feet below surface:	133.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-09-08	Feet below surface:	136.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1966-08-04	Feet below surface:	135.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-07-20	Feet below surface:	142.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-05-04	Feet below surface:	142.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-05-02	Feet below surface:	141.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-03-22	Feet below surface:	149.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-02-25	Feet below surface:	150.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1965-01-28	Feet below surface:	149.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-12-30	Feet below surface:	174.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-11-23	Feet below surface:	178.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-10-29	Feet below surface:	179.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-09-25	Feet below surface:	178.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-08-20	Feet below surface:	175.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1964-06-28	Feet below surface:	162.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-05-27	Feet below surface:	140.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-04-06	Feet below surface:	142.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-03-30	Feet below surface:	143.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1964-01-26	Feet below surface:	149.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-12-21	Feet below surface:	150.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-11-28	Feet below surface:	154.9
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1963-10-11	Feet below surface:	174.9
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-09-26	Feet below surface:	164.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-08-20	Feet below surface:	207.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-07-31	Feet below surface:	210.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-07-12	Feet below surface:	203.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-07-05	Feet below surface:	203.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-06-18	Feet below surface:	199.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-05-29	Feet below surface:	189.2
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1963-04-25	Feet below surface:	140.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-03-20	Feet below surface:	145.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-02-25	Feet below surface:	148.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1963-02-01	Feet below surface:	207.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1962-12-25	Feet below surface:	159.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-11-25	Feet below surface:	156.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-10-26	Feet below surface:	213.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1962-09-13	Feet below surface:	210.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1962-07-20	Feet below surface:	140.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-06-15	Feet below surface:	138.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-05-22	Feet below surface:	138.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-04-09	Feet below surface:	135.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-03-21	Feet below surface:	142.5
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1962-03-09	Feet below surface:	147.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-02-27	Feet below surface:	156.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-01-24	Feet below surface:	160.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1962-01-18	Feet below surface:	163.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-12-19	Feet below surface:	157.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-11-27	Feet below surface:	164.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-10-03	Feet below surface:	181.5
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-08-22	Feet below surface:	179.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-07-11	Feet below surface:	182.5
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-06-15	Feet below surface:	180.0
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-05-22	Feet below surface:	219.7
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-04-13	Feet below surface:	173.7
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-03-08	Feet below surface:	178.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1961-02-16	Feet below surface:	128.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1961-01-22	Feet below surface:	130.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-12-28	Feet below surface:	138.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-11-29	Feet below surface:	139.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-08-03	Feet below surface:	160.3
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1960-07-06	Feet below surface:	126.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-05-26	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1960-03-25	Feet below surface:	109.2
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1960-03-03	Feet below surface:	112.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1960-01-13	Feet below surface:	119.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-12-05	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-11-04	Feet below surface:	136.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-09-17	Feet below surface:	188.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-08-05	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-07-15	Feet below surface:	172.8
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-06-09	Feet below surface:	169.7
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-05-14	Feet below surface:	166.4
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1959-04-15	Feet below surface:	104.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-03-13	Feet below surface:	102.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1959-01-30	Feet below surface:	106.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-12-23	Feet below surface:	110.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-11-17	Feet below surface:	116.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-10-06	Feet below surface:	117.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-09-09	Feet below surface:	117.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-08-09	Feet below surface:	121.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-07-21	Feet below surface:	122.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-06-02	Feet below surface:	126.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-05-07	Feet below surface:	129.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-05-01	Feet below surface:	131.4
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1958-04-24	Feet below surface:	130.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-04-17	Feet below surface:	131.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-04-09	Feet below surface:	131.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-03-07	Feet below surface:	135.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-02-10	Feet below surface:	141.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1958-01-09	Feet below surface:	142.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-12-27	Feet below surface:	144.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-12-20	Feet below surface:	145.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-12-11	Feet below surface:	146.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-12-04	Feet below surface:	220.1
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1957-11-27	Feet below surface:	147.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-11-22	Feet below surface:	148.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-11-08	Feet below surface:	151.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-10-31	Feet below surface:	154.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-08-28	Feet below surface:	231.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-07-23	Feet below surface:	230.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-04-16	Feet below surface:	141.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-03-18	Feet below surface:	142.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-02-18	Feet below surface:	147.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1957-01-15	Feet below surface:	154.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-10-29	Feet below surface:	180.4
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1956-04-30	Feet below surface:	128.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-03-26	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1956-02-23	Feet below surface:	127.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1956-01-17	Feet below surface:	130.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-12-05	Feet below surface:	136.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-06-07	Feet below surface:	167.6
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1955-05-03	Feet below surface:	148.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-03-23	Feet below surface:	118.21
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1955-02-26	Feet below surface:	130.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-12-02	Feet below surface:	132.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-07-20	Feet below surface:	123.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-06-16	Feet below surface:	124.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-06-04	Feet below surface:	175.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-04-21	Feet below surface:	127.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1954-02-06	Feet below surface:	147.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1953-12-30	Feet below surface:	144.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-10-26	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1952-08-08	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1952-05-07	Feet below surface:	135.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1952-01-14	Feet below surface:	152.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1951-11-08	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.

Level reading date:	1951-09-05	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1951-07-12	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1951-05-08	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1951-03-08	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1951-01-09	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1950-11-15	Feet below surface:	151.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1950-03-02	Feet below surface:	125.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-12-28	Feet below surface:	138.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-10-29	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1949-09-03	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1949-05-25	Feet below surface:	122.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-03-31	Feet below surface:	119.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1949-01-17	Feet below surface:	130.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-10-08	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1948-07-06	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1948-05-31	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1948-04-17	Feet below surface:	106.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-03-20	Feet below surface:	109.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1948-01-24	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1947-10-20	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1947-07-15	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.

Level reading date: 1947-04-11
Feet to sea level: Not Reported
Feet below surface: Not Reported
Note: The site was being pumped.

Level reading date: 1947-01-17
Feet to sea level: Not Reported
Feet below surface: 82.1
Note: Not Reported

Level reading date: 1946-04-06
Feet to sea level: Not Reported
Feet below surface: 92.3
Note: Not Reported

Level reading date: 1946-01-09
Feet to sea level: Not Reported
Feet below surface: 90.0
Note: Not Reported

Level reading date: 1945-11-01
Feet to sea level: Not Reported
Feet below surface: Not Reported
Note: The site was being pumped.

Level reading date: 1945-10-16
Feet to sea level: Not Reported
Feet below surface: Not Reported
Note: The site was being pumped.

Level reading date: 1945-06-26
Feet to sea level: Not Reported
Feet below surface: Not Reported
Note: The site was being pumped.

Level reading date: 1945-03-31
Feet to sea level: Not Reported
Feet below surface: 72.1
Note: Not Reported

Level reading date: 1945-01-02
Feet to sea level: Not Reported
Feet below surface: 74.9
Note: Not Reported

Level reading date: 1944-06-29
Feet to sea level: Not Reported
Feet below surface: 162.9
Note: The site was being pumped.

Level reading date: 1944-05-01
Feet to sea level: Not Reported
Feet below surface: 71.2
Note: Not Reported

Level reading date: 1943-12-30
Feet to sea level: Not Reported
Feet below surface: 82.9
Note: Not Reported

Level reading date: 1943-07-01
Feet to sea level: Not Reported
Feet below surface: 72.2
Note: Not Reported

Level reading date: 1943-05-28
Feet to sea level: Not Reported
Feet below surface: 72.5
Note: Not Reported

Level reading date: 1943-04-02
Feet to sea level: Not Reported
Feet below surface: 85.7
Note: Not Reported

Level reading date: 1943-01-02
Feet to sea level: Not Reported
Feet below surface: 91.8
Note: Not Reported

Level reading date: 1942-11-28
Feet to sea level: Not Reported
Feet below surface: 93.9
Note: Not Reported

Level reading date: 1942-05-02
Feet to sea level: Not Reported
Feet below surface: 62.9
Note: Not Reported

Level reading date: 1942-04-02
Feet to sea level: Not Reported
Feet below surface: 62.9
Note: Not Reported

Level reading date: 1942-02-04
Feet to sea level: Not Reported
Feet below surface: 64.7
Note: Not Reported

Level reading date: 1942-01-02
Feet to sea level: Not Reported
Feet below surface: 67.3
Note: Not Reported

Level reading date:	1941-12-01	Feet below surface:	74.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-09-04	Feet below surface:	74.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-07-29	Feet below surface:	74.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-06-01	Feet below surface:	77.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-05-01	Feet below surface:	77.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-04-04	Feet below surface:	78.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-02-28	Feet below surface:	81.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-02-01	Feet below surface:	83.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1941-01-03	Feet below surface:	97.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-12-02	Feet below surface:	94.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-11-02	Feet below surface:	101.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-06-01	Feet below surface:	70.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-05-01	Feet below surface:	67.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-04-01	Feet below surface:	66.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-03-01	Feet below surface:	69.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-02-01	Feet below surface:	65.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1940-01-01	Feet below surface:	67.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-12-01	Feet below surface:	69.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-11-01	Feet below surface:	73.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-10-02	Feet below surface:	70.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-08-01	Feet below surface:	77.5
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1939-07-01	Feet below surface:	66.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-06-01	Feet below surface:	57.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-05-01	Feet below surface:	57.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-04-01	Feet below surface:	57.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-03-01	Feet below surface:	58.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-02-01	Feet below surface:	57.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1939-01-02	Feet below surface:	57.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-12-02	Feet below surface:	59.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-11-01	Feet below surface:	60.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-10-01	Feet below surface:	62.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-09-01	Feet below surface:	64.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-08-01	Feet below surface:	66.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-07-01	Feet below surface:	68.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-06-01	Feet below surface:	70.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-05-01	Feet below surface:	71.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-04-01	Feet below surface:	72.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-03-01	Feet below surface:	77.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-02-02	Feet below surface:	77.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1938-01-04	Feet below surface:	78.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-12-05	Feet below surface:	82.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-11-03	Feet below surface:	89.4
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1937-10-02	Feet below surface:	94.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-09-01	Feet below surface:	91.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-08-02	Feet below surface:	93.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-07-09	Feet below surface:	98.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-06-03	Feet below surface:	98.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-05-09	Feet below surface:	99.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1937-01-29	Feet below surface:	105.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-12-24	Feet below surface:	108.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-11-25	Feet below surface:	112.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-10-30	Feet below surface:	119.9
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-06-01	Feet below surface:	103.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-05-01	Feet below surface:	104.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-03-31	Feet below surface:	107.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-02-27	Feet below surface:	110.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1936-01-28	Feet below surface:	115.1
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-12-30	Feet below surface:	116.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-11-30	Feet below surface:	122.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-10-28	Feet below surface:	128.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-07-19	Feet below surface:	109.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-04-12	Feet below surface:	104.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1935-01-17	Feet below surface:	109.9
Feet to sea level:	Not Reported	Note:	Not Reported

Level reading date:	1934-04-10	Feet below surface:	Not Reported
Feet to sea level:	Not Reported	Note:	The site was being pumped.
Level reading date:	1933-12-21	Feet below surface:	110.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-12-17	Feet below surface:	104.5
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-11-15	Feet below surface:	106.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-10-16	Feet below surface:	107.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-09-13	Feet below surface:	105.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-08-12	Feet below surface:	103.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-07-15	Feet below surface:	101.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-06-15	Feet below surface:	102.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-05-14	Feet below surface:	103.7
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-04-12	Feet below surface:	105.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-03-11	Feet below surface:	106.6
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-02-18	Feet below surface:	108.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1932-01-12	Feet below surface:	110.8
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-12-12	Feet below surface:	114.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-11-21	Feet below surface:	117.3
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-05-14	Feet below surface:	103.2
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1931-04-10	Feet below surface:	100.4
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1930-05-08	Feet below surface:	99.0
Feet to sea level:	Not Reported	Note:	Not Reported
Level reading date:	1929	Feet below surface:	84
Feet to sea level:	Not Reported	Note:	Not Reported

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

34
ESE
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000007061**

Well ID:	01S02W30G001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S02W30G001S	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S02W30G001S&store_num=		
GeoTracker Data:	Not Reported		

F35
ESE
1/2 - 1 Mile
Higher

FED USGS **USGS40000140284**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W30G002S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19630101	Well Depth:	580
Well Depth Units:	ft	Well Hole Depth:	580
Well Hole Depth Units:	ft		

G36
ENE
1/2 - 1 Mile
Higher

FED USGS **USGS40000140502**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S002W19K001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	307
Well Depth Units:	ft	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

G37
ENE
1/2 - 1 Mile
Higher

CA WELLS **CAUSGSN00009101**

Well ID:	USGS-340411117073001	Well Type:	UNK
Source:	United States Geological Survey		
Other Name:	USGS-340411117073001	GAMA PFAS Testing:	Not Reported

Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=USGSNEW&samp_date=&global_id=&assigned_name=USGS-340411117073001&store_num=
GeoTracker Data: Not Reported

38
NE
1/2 - 1 Mile
Higher

CA WELLS **CADWR0000012260**

Well ID:	01S02W19G001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S02W19G001S	GAMA PFAS Testing:	Not Reported

Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S02W19G001S&store_num=
GeoTracker Data: Not Reported

39
NNW
1/2 - 1 Mile
Lower

CA WELLS **CADWR0000035017**

Well ID:	01S03W24C001S	Well Type:	UNK
Source:	Department of Water Resources		
Other Name:	01S03W24C001S	GAMA PFAS Testing:	Not Reported

Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=01S03W24C001S&store_num=
GeoTracker Data: Not Reported

40
North
1/2 - 1 Mile
Lower

CA WELLS **CADDW0000010232**

Well ID:	3610037-062	Well Type:	MUNICIPAL
Source:	Department of Health Services		
Other Name:	SAN BERNARDINO AVENUE WELL		
GAMA PFAS Testing:	Not Reported		

Groundwater Quality Data: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=3610037-062&store_num=
GeoTracker Data: Not Reported

41
NW
1/2 - 1 Mile
Lower

FED USGS **USGS40000140599**

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S003W24C001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported

Construction Date:	19290101	Well Depth:	550
Well Depth Units:	ft	Well Hole Depth:	578
Well Hole Depth Units:	ft		

42
ENE **CA WELLS** **CADPR0000001332**
1/2 - 1 Mile
Higher

Well ID:	85141	Well Type:	UNK
Source:	Department of Pesticide Regulation		
Other Name:	85141	GAMA PFAS Testing:	Not Reported
Groundwater Quality Data:	https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DPR&samp_date=&global_id=&assigned_name=85141&store_num=		
GeoTracker Data:	Not Reported		

43
WNW **FED USGS** **USGS40000140523**
1/2 - 1 Mile
Lower

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	001S003W24E001S	Type:	Well
Description:	Not Reported	HUC:	18070203
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	Not Reported	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	156
Well Hole Depth Units:	ft		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92374	85	0

Federal EPA Radon Zone for SAN BERNARDINO County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 92374

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.500 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

PHYSICAL SETTING SOURCE RECORDS SEARCHED

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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APPENDIX C

Quality of Life
Administration

City of
REDLANDS
Incorporated 1888
35 Cajon Street, Redlands, CA 92373
909-798-7655
www.cityofreadlands.org

NOTICE OF VIOLATION and Required Corrections

PURIM, VANITA SONI IRREV TR 11/28/12
[redacted]

RE:
APN: 016829102
Case No: CE-17-0068
Officer: Alexis Gonzales

Dear PURIM, VANITA SONI IRREV TR 11/28/12

March 29, 2017

A recent inspection of the property revealed conditions in violation of the Redlands Municipal Code. You are required to correct these violations within by the compliance date listed below after which the property will be re-inspected.

Corrective Action:	**Compliance Date:**	**Code Section:**
Remove all weeds/tumble weeds/dead vegetation from vacant lot as this is a fire hazard and a public nuisance.	April 13, 2017	08.04.030 - FIRE HAZARD

Violation:	**Code Section:**
All weeds, dry grasses, dead trees, combustible rubbish, or any material growing upon the streets, sidewalks, or upon private property, which by reason of their size, manner of growth and location constitute a fire hazard to any building, improvements, crops or other property, and weeds and grasses which when dry, will in reasonable probability constitute such a fire hazard, are declared to be a public nuisance.	08.04.030 - FIRE HAZARD

If the City is forced to proceed with the abatement proceedings and/or criminal prosecution administrative action and/or citation, the owner(s) of record and/or responsible persons will incur the following direct costs:

-Proceeding Establishment costs
-Hearing Costs,
-Attorney Fees,
-Certified Mailing costs,
-Photograph Costs,
-Staff Costs,
-Any additional costs assessed due to possible judicial or administrative process.

Please note:
A. Any person who receives an administrative citation from the City of Redlands shall be required to pay a fine in the following amounts:
1. A fine of one hundred dollars ($100.00) per code provision violated for the first administrative citation;
2. A fine of two hundred dollars ($200.00) per code provision violated for a second administrative citation for violation of the same code provision issued within a twelve (12) month period; and
3. A fine of five hundred dollars ($500.00) per code provision violated in any subsequent administrative citation issued for violation of the same code provision within a twelve (12) month period.
B. Any violation of this code, condition of approval of permit or entitlement, condition of environmental review, or city agreement that is punishable as a misdemeanor shall be subject to a fine not to exceed one thousand dollars ($1,000) per code prevision violated. (Ord. 2792, 2013)

In addition to the above referenced costs, all contractor abatement costs, plus an additional 20% will be charged to the property owner(s) as a lien upon the property and shall become the personal obligation of the owner(s) of record. By acting immediately to correct the violation(s) referenced, you will avoid these and any future costs.

For additional information regarding these Redlands Municipal Codes, please contact the Code Enforcement Division of the Quality of Life Department at (909) 335-4737.

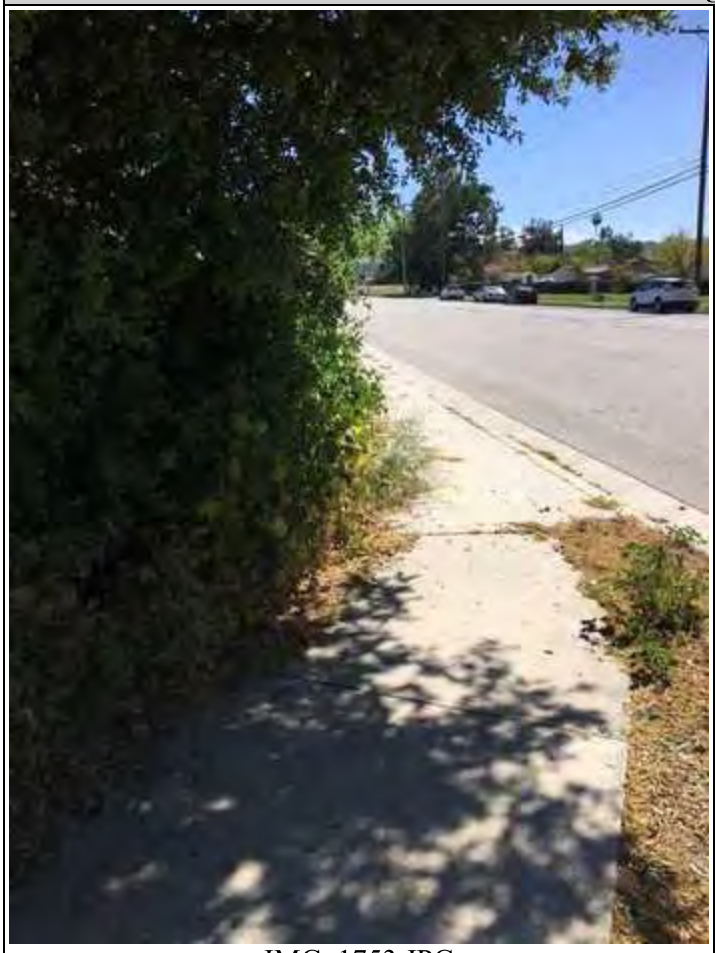
If you have any questions regarding this Final Notice, please contact Alexis Gonzales at (909) 335-4737 ext. 2 or ogonzales@cityofredlands.org.

Please provide the case number: CE-17-0068.

Sincerely,

Alexis Gonzales
Code Enforcement Officer
(909) 335-4737 ext. 2

Photographs



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IMG_1755.JPG



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IMG_1766.JPG

SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street ● San Bernardino, CA 92415-0153 ● (909) 386-8401 ● Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Section
sbcfire.org

Daniel R. Munsey
Fire Chief/Fire Warden

Monica S. Ronchetti
Fire Marshal

May 16, 2023

23051601 Redlands NRL HMC

HAZARD MANAGEMENT CONSULTING
211 WEST AVENIDA CORDOBA
SAN CLEMENTE, CA 92672

ATTENTION: **GAGE COSTALES**

SUBJECT: **CERTIFIED RECORD SEARCH FINDINGS**
APN #: 0168-291-02-0000
REDLANDS, CALIFORNIA

This is to confirm that the OFM Hazardous Materials Division (HMD) has searched its records for any file(s) pertaining to the subject property, as described in your request, and finds that no records exist for the above site description(s).

Records maintained by OFM-HMD date back to mid-1980's. Records searched include:

- Facilities with hazardous waste generator permits, hazardous materials handler permits, underground storage tank permits, universal waste permits, tiered permits, EPCRA facilities, RMP facilities, Cal ARP facilities, and/or waste recycling generators, including inactive and/or out of business records, as well as non-permitted facility actions
- Logs of permits issued for the removal, installation, and/or modification of underground storage tanks
- Records and databases pertaining to illicit dumping, spill reports, release notifications, and complaints
- Incidents responded to by the hazardous materials emergency response team
- Sites undergoing remediation for contaminated soil and/or groundwater

Christina Rivera

Christina Rivera
Office Specialist
Office of the Fire Marshal
Hazardous Materials Division

BOARD OF DIRECTORS

Col. Paul Cook (Ret.)	Jesse Armendarez	Dawn Rowe	Curt Hagman	Joe Baca, Jr.	Leonard X. Hernandez
Vice Chairman, First District	Second District	Chair, Third District	Fourth District	Fifth District	Chief Executive Officer

HMC
HAZARD MANAGEMENT CONSULTING

ESA OWNER/OPERATOR QUESTIONNAIRE

Phase I Environmental Site Assessment
ASTM Standard 1527-21

Site:

In order to assist the purchaser qualify for one of the *Landowner Liability Protections (LLPs)* offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the "*Brownfields Amendments*"), the *Owner/Operator*s are requested to provide the following information (if available) to the *environmental professional*.
(Note: double-click boxes to check or uncheck)

Current Site Condition and Site History

(1) Please list all addresses currently and previously used for the Site.

APN 0168-291-02-0-000
Northwest Corner of Colton Ave and Wabash Ave in Redlands, CA

(2) Please list the providers of the following utilities for the Site:

Water:	City of Redlands
Natural Gas or Propane:	Southern California Gas Company
Electricity:	Southern California Gas Company
Sanitary Waste (or Septic Tank?):	City of Redlands

(3) Are there any groundwater wells at the Site?

☒ No ☐ Yes (if yes, please describe)

(4) Please describe the current use of the Site.

Vacant

211 W. Avenida Cordoba, Suite 200 San Clemente, CA 92672
tel 949/361/3902 fax 949/361/3697 www.hmcinc.biz info@hmcinc.biz

(5) Are you aware of previous uses of the Site?

☐ No ☒ Yes (if yes, please describe)

Agriculture, citurs

(6) Can you provide contact information for previous owners, operators or occupants of the Site?

☒ No ☐ Yes (if yes, please list)

(7) To the best of your knowledge, has the Site been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard, landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?

☒ No ☐ Yes (if yes, please describe)

(8) To the best of your knowledge, have any adjoining properties been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard, landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?

☒ No ☐ Yes (if yes, please describe and provide name and location)

Chemical and Hazardous Materials

(9) Other than routine janitorial and office supplies in usual and customary quantities, are chemicals, petroleum products or hazardous chemicals/substances used or stored on Site, now or previously?

☒ No ☐ Yes (if yes, please describe)

(10) Are liquid or solid wastes generated at the Site other than general municipal waste now or previously?

☒ No ☐ Yes (if yes, please describe)

(11) Are there or have there been wastewater disposal or treatment processes at the Site from equipment washdown or industrial operations?

☒ No ☐ Yes (if yes, please describe, including any pits, sumps, ponds, dry wells, etc.)

(12) Are there or have there been any electrical transformers, capacitors, ballasts, or hydraulic equipment in use at the Site? Have there been leaks? Are there records indicating the presence or absence of PCBs?

☒ No ☐ Yes (if yes, please describe as appropriate)

(13) Do you know of spills or other chemical releases that have taken place at the Site?

☒ No ☐ Yes (if yes, please describe)

(14) Has fill or waste soil been brought onto the Site?

☒ No ☐ Yes (if yes, please describe source of origin if available)

(15) To the best of your knowledge, is or has there been any significantly stained or discolored soil on the Site?

☒ No ☐ Yes (if yes, please describe)

(16) Do you know of any environmental cleanups that have taken place at the *Site*?

☒ No ☐ Yes (if yes, please describe)

(17) Do you know of any adverse environmental conditions or cleanups that have taken place at the neighboring properties?

☒ No ☐ Yes (if yes, please describe)

, Administrative Action, Violation Notices

(18) To your knowledge, are or have there been any above ground or underground tanks or other activities that included the use of significant quantities of hazardous materials at the Site?

☒ No ☐ Yes (if yes, please describe)

(19) Do you know of any pending, threatened or past litigation or administrative actions relative to hazardous materials, hazardous waste or petroleum products associated with the Site?

☒ No ☐ Yes (if yes, please describe)

(20) Do you know of any current or previous notices from any governmental entity regarding possible violations of environmental laws or possible liability relating to hazardous substances or petroleum products?

☒ No ☐ Yes (if yes, please describe)

(21) Are you aware of any environmental cleanup liens against the Site that are filed or recorded under federal, tribal, state or local law?

☒ No ☐ Yes (if yes, please describe and provide dates)

(22) Are you aware of any Activity and Use Limitations (AULs), such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law?

☒ No ☐ Yes (if yes, please describe)

Additional and Supportive Information

Please indicate and provide any other knowledge, or documentation with the Site that may be pertinent to the *environmental professional* (for example, copies of any available prior environmental site assessment **reports**, documents, correspondence, etc., concerning the Site and its environmental condition) and any environmental **permits** such as air quality management district, stormwater, wastewater, underground storage tanks or aboveground tanks, especially in support of “yes” answers above.

Thank you very much for your cooperation.

This questionnaire was completed by:

Name: Vanita Soni Puri

Signature: [Vanita Soni Puri] Date: 05/02/2023

Title:

Please describe the length of and nature of your experience/knowledge of the Site.

Have been a co-owner for several years and have visited the site two times as it's a vacant site.

1. The property covered by this report is vacant land.

2. According to the public records, there has been no conveyance of the land within a period of twenty-four months prior to the date of this report, except as follows:

   None

   NOTE to proposed insured lender only: No Private transfer fee covenant, as defined in Federal Housing Finance Agency Final Rule 12 CFR Part 1228, that was created and first appears in the Public Records on or after February 8, 2011, encumbers the Title except as follows: None

First American Title	CLTA Guarantee Form No. 28 - Condition of Title
Guarantee	ISSUED BY **First American Title Insurance Company** GUARANTEE NUMBER **5026900-6723673**

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE GUARANTEE CONDITIONS ATTACHED HERETO AND MADE A PART OF THIS GUARANTEE.

FIRST AMERICAN TITLE INSURANCE COMPANY
a Nebraska corporation, herein called the Company

GUARANTEES

against loss or damage not exceeding the Amount of Liability stated in Schedule A sustained by the Assured by reason of any incorrectness in the Assurances set forth in Schedule A

First American Title Insurance Company

Dennis J. Gilmore, President

Greg L. Smith, Secretary

By:

Authorized Countersignature

This jacket was created electronically and constitutes an original document

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EXCLUSIONS FROM COVERAGE

Except as expressly provided by the assurances in Schedule A, the Company assumes no liability for loss or damage by reason of the following:

(a) Defects, liens, encumbrances, adverse claims or other matters against the title to any property beyond the lines of the Land.

(b) Defects, liens, encumbrances, adverse claims or other matters , whether or not shown by the Public Records (1) that are created, suffered, assumed or agreed to by one or more of the Assureds; or, (2) that result in no loss to the Assured.

(c) Defects, liens, encumbrances, adverse claims or other matters not shown by the Public Records.

(d) The identity of any party shown or referred to in any of the schedules of this Guarantee.

(e) The validity, legal effect or priority of any matter shown or referred to in any of the schedules of this Guarantee.

(f) (1) Taxes or assessments of any taxing authority that levies taxes or assessments on real property; or, (2) proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not the matters excluded under (1) or (2) are shown by the records of the taxing authority or by the Public Records.

(g) (1) Unpatented mining claims; (2) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (3) water rights, claims or title to water, whether or not the matters excluded under (1), (2) or (3) are shown by the Public Records.

GUARANTEE CONDITIONS

1. Definition of Terms.

The following terms when used in the Guarantee mean:

a. the "Assured": the party or parties named as the Assured in Schedule A, or on a supplemental writing executed by the Company.

b. "Land": the Land described or referred to in Schedule A, and improvements affixed thereto which by law constitute real property. The term "Land" does not include any property beyond the lines of the area described or referred to in Schedule A, nor any right, title, interest, estate or easement in abutting streets, roads, avenues, alleys, lanes, ways or waterways.

c. "Mortgage": mortgage, deed of trust, trust deed, or other security instrument.

d. "Public Records": those records established under California statutes at Date of Guarantee for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without knowledge.

e. "Date of Guarantee": the Date of Guarantee set forth in Schedule A.

f. "Amount of Liability": the Amount of Liability as stated in Schedule A.

2. Notice of Claim to be Given by Assured.

The Assured shall notify the Company promptly in writing in case knowledge shall come to an Assured of any assertion of facts, or claim of title or interest that is contrary to the assurances set forth in Schedule A and that might cause loss or damage for which the Company may be liable under this Guarantee. If prompt notice shall not be given to the Company, then all liability of the Company shall terminate with regard to the matter or matters for which prompt notice is required; provided, however, that failure to notify the Company shall in no case prejudice by the failure and then only to the extent of the prejudice.

3. No Duty to Defend or Prosecute.

The Company shall have no duty to defend or prosecute any action or proceeding to which the Assured is a party, notwithstanding the nature of any allegation in such action or proceeding.

4. Company's Option to Defend or Prosecute Actions; Duty of Assured to Cooperate.

Even though the Company has no duty to defend or prosecute as set forth in Paragraph 3 above:

a. The Company shall have the right, at its sole option and cost, to institute and prosecute any action or proceeding, interpose a defense, as limited in Paragraph 4 (b), or to do any other act which in its opinion may be necessary or desirable to establish the correctness of the assurances set forth in Schedule A or to prevent or reduce loss or damage to the Assured. The Company may take any appropriate action under the terms of this Guarantee, whether or not it shall be liable hereunder, and shall not thereby concede liability or waive any provision of this Guarantee. If the Company shall exercise its rights under this paragraph, it shall do so diligently.

b. If the Company elects to exercise its options as stated in Paragraph 4(a) the Company shall have the right to select counsel of its choice (subject to the right of the Assured to object for reasonable cause) to represent the Assured and shall not be liable for and will not pay the fees of any other counsel, nor will the Company pay any fees, costs or expenses incurred by an Assured in the defense of those causes of action which allege matters not covered by this Guarantee.

c. Whenever the Company shall have brought an action or interposed a defense as permitted by the provisions of this Guarantee, the Company may pursue any litigation to final determination by a court of competent jurisdiction and expressly reserves the right, in its sole discretion, to appeal from an adverse judgment or order.

d. In all cases where this Guarantee permits the Company to prosecute or provide for the defense of any action or proceeding, the Assured shall secure to the Company the right to so prosecute or provide for the defense of any action or proceeding, and all appeals therein, and permit the Company to use, at its option, the name of such Assured for this purpose. Whenever requested by

the Company, the Assured, at the Company's expense, shall give the Company all reasonable aid in any action or proceeding, securing evidence, obtaining witnesses, prosecuting or defending the action or lawful act which in the opinion of the Company may be necessary or desirable to establish the correctness of the assurances set forth in Schedule A to prevent or reduce loss or damage to the Assured. If the Company is prejudiced by the failure of the Assured to furnish the required cooperation, the Company's obligations to the Assured under the Guarantee shall terminate.

5. Proof of Loss or Damage.

a. In the event the Company is unable to determine the amount of loss or damage, the Company may, at its option, require as a condition of payment that the Assured furnish a signed proof of loss. The proof of loss must describe the defect, lien, encumbrance, or other matter that constitutes the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage.

b. In addition, the Assured may reasonably be required to submit to examination under oath by any authorized representative of the Company and shall produce for examination, inspection and copying, at such reasonable times and places as may be designated by any authorized representative of the Company, all records, books, ledgers, checks, correspondence and memoranda, whether bearing a date before or after Date of Guarantee, which reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Assured shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect and copy all records, books, ledgers, checks, correspondence and memoranda in the custody or control of a third party, which reasonably pertain to the loss or damage. All information designated as confidential by the Assured provided to the Company pursuant to this paragraph shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Assured to submit for examination under oath, produce other reasonably requested information or grant permission to secure reasonable necessary information from third parties, as required in the above paragraph, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this Guarantee to the Assured for that claim.

6. Options to Pay or Otherwise Settle Claims: Termination of Liability.

In case of a claim under this Guarantee, the Company shall have the following additional options:

a. To pay or tender payment of the Amount of Liability together with any costs, attorneys' fees, and expenses incurred by the Assured that were authorized by the Company up to the time of payment or tender of payment and that the Company is obligated to pay.

b. To pay or otherwise settle with the Assured any claim assured against under this Guarantee. In addition, the Company will pay any costs, attorneys' fees, and expenses incurred by the Assured that where authorized by the Company up to the time of payment or tender of payment and that the Company is obligated to pay; or

c. To pay or otherwise settle with other parties for the loss or damage provided for under this Guarantee, together with any costs, attorneys' fees, and expenses incurred by the Assured that were authorized by the Company up to the time of payment and that the Company is obligated to pay.

Upon the exercise by the Company of either of the options provided for in 6 (a), (b) or (c) of this paragraph the Company's obligations to the Assured under this Guarantee for the claimed loss or damage, other than the payments required to be made, shall terminate, including any duty to continue any and all litigation initiated by the Company pursuant to Paragraph 4.

7. Limitation Liability.

a. This Guarantee is a contract of Indemnity against actual monetary loss or damage sustained or incurred by the Assured claimant who has suffered loss or damage by reason of reliance upon the assurances set forth in Schedule A and only to the extent herein described, and subject to the Exclusions From Coverage of This Guarantee.

b. If the Company, or the Assured under the direction of the Company at the Company's expense, removes the alleged defect, lien, or encumbrance or cures any other matter assured against by this Guarantee in a reasonably diligent manner by any method, including litigation and the completion of any appeals therefrom, it shall have fully performed its obligations with respect to that matter and shall not be liable for any loss or damage caused thereby.

c. In the event of any litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals therefrom.

d. The Company shall not be liable for loss or damage to the Assured for liability voluntarily assumed by the Assured in settling any claim or suit without the prior written consent of the Company.

8. Reduction of Liability or Termination of Liability.

All payments under this Guarantee, except payments made for costs, attorneys' fees and expenses pursuant to Paragraph 4 shall reduce the Amount of Liability under this Guarantee pro tanto.

9. Payment of Loss.

a. No payment shall be made without producing this Guarantee for endorsement of the payment unless the Guarantee has been lost or destroyed, in which case proof of loss or destruction shall be furnished to the satisfaction of the Company.

b. When liability and the extent of loss or damage has been definitely fixed in accordance with these Conditions, the loss or damage shall be payable within thirty (30) days thereafter.

10. Subrogation Upon Payment or Settlement.

Whenever the Company shall have settled and paid a claim under this Guarantee, all right of subrogation shall vest in the Company unaffected by any act of the Assured claimant.

The Company shall be subrogated to and be entitled to all rights and remedies which the Assured would have had against any person or property in respect to the claim had this Guarantee not been issued. If requested by the Company, the Assured shall transfer to the Company all rights and remedies against any person or property necessary in order to perfect this right of subrogation. The Assured shall permit the Company to sue, compromise or settle in the name of the Assured and to use the name of the Assured in any transaction or litigation involving these rights or remedies.

If a payment on account of a claim does not fully cover the loss of the Assured the Company shall be subrogated to all rights and remedies of the Assured after the Assured shall have recovered its principal, interest, and costs of collection.

11. Arbitration.

Either the Company or the Assured may demand that the claim or controversy shall be submitted to arbitration pursuant to the Title Insurance Arbitration Rules of the American Land Title Association ("Rules"). Except as provided in the Rules, there shall be no joinder or consolidation with claims or controversies of other persons. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the Assured arising out of or relating to this Guarantee, any service of the Company in connection with its issuance or the breach of a Guarantee provision, or to any other controversy or claim arising out of the transaction giving rise to this Guarantee. All arbitrable matters when the amount of liability is $2,000,000 or less shall be arbitrated at the option of either the Company or the Assured. All arbitrable matters when the amount of liability is in excess of $2,000,000 shall be arbitrated only when agreed to by both the Company and the Assured. Arbitration pursuant to this Guarantee and under the Rules shall be binging upon the parties. Judgment upon the aware rendered by the Arbitrator(s) may be entered in any court of competent jurisdiction.

12. Liability Limited to This Guarantee; Guarantee Entire Contract.

a. This Guarantee together with all endorsements, if any, attached hereto by the Company is the entire Guarantee and contract between the Assured and the Company. In interpreting any provision of this Guarantee, this Guarantee shall be construed as a whole.

b. Any claim of loss or damage, whether or not based on negligence, or any action asserting such claim, shall be restricted to this Guarantee.

c. No amendment of or endorsement to this Guarantee can be made except by a writing endorsed hereon or attached hereto signed by either the President, a Vice President, the Secretary, an Assistant Secretary, or validating officer or authorized signatory of the Company.

13. Severability.

In the event any provision of this Guarantee, in whole or in part, is held invalid or unenforceable under applicable law, the Guarantee shall be deemed not to include that provision or such part held to be invalid, but all other provisions shall remain in full force and effect.

14. Choice of Law; Forum.

a. Choice of Law: The Assured acknowledges the Company has underwritten the risks covered by this Guarantee and determined the premium charged therefor in reliance upon the law affecting interests in real property and applicable to the interpretation, rights, remedies, or enforcement of Guaranties of the jurisdiction where the Land is located.

Therefore, the court or an arbitrator shall apply the law of the jurisdiction where the Land is located to determine the validity of claims that are adverse to the Assured and to interpret and enforce the terms of this Guarantee. In neither case shall the court or arbitrator apply its conflicts of law principles to determine the applicable law.

b. Choice of Forum: Any litigation or other proceeding brought by the Assured against the Company must be filed only in a state or federal court within the United State of America or its territories having appropriate jurisdiction.

15. Notices, Where Sent.

All notices required to be given the Company and any statement in writing required to be furnished the Company shall include the number of this Guarantee and shall be addressed to the Company at **First American Title Insurance Company, Attn: Claims National Intake Center, 5 First American Way, Santa Ana, California 92707. Phone: 888-632-1642 (claims.nic@firstam.com).**

First American Title	CLTA Guarantee Form No. 28 - Condition of Title ISSUED BY **First American Title Insurance Company** GUARANTEE NUMBER **5026900-6723673**
Schedule A	

File No.: 6723673

Guarantee No. 6723673 Amount of Liability: $

Date of Guarantee:October 14, 2021 at 7:30 A.M. Fee: $

1. Name of Assured:

2. The estate or interest in the Land which is covered by this Guarantee is:

   FEE

3. The Land referred to in this Guarantee is described as follows:

   Real property in the City of San Bernardino, County of San Bernardino, State of California, described as follows:

   THAT PORTION OF THE SOUTHEAST QUARTER OF SECTION 24, TOWNSHIP 1 SOUTH, RANGE 3 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE CITY OF REDLANDS, ACCORDING TO THE OFFICIAL GOVERNMENT PLAT THEREOF, DESCRIBED AS FOLLOWS:

   BEGINNING AT AN IRON PIPE IN MIDDLE LINE OF WABASH (FORMERLY EMERALD) AVENUE, DISTANT SOUTH 0°17' EAST (MAGNETIC VARIATION 15° EAST) 1975.7 FEET FROM AN IRON ROD AT THE INTERSECTION OF MIDDLE LINE OF LUGONIA (FORMERLY MENTON) AND WABASH AVENUES;

   THENCE FROM SAID POINT OF BEGINNING, RUNNING MIDWAY BETWEEN THE 38TH AND 39TH ORANGE TREE ROWS NORTH FROM COLTON
   AVENUE, NORTH 89°45' WEST 655.7 FEET TO A 3 INCH STAKE;
   THENCE SOUTH 0°25' EAST 702.7 FEET TO AN IRON ROD IN THE MIDDLE LINE OF COLTON AVENUE;
   THENCE ALONG THE MIDDLE LINE OF SAID COLTON AVENUE NORTH 89°51' EAST 654.3 FEET TO A WOODEN STAKE AT INTERSECTION OF MIDDLE LINES OF WABASH AVENUE (FROM THE NORTH) AND COLTON AVENUE, SAID WOODEN STAKE BEING 35.15 FEET EAST OF STONE AT THE INTERSECTION OF THE MIDDLE LINES OF WABASH AVENUE (FROM THE SOUTH) AND COLTON AVENUE;
   THENCE ALONG THE MIDDLE LINE OF SAID WABASH AVENUE NORTH 0°17' WEST 698 FEET TO THE PLACE OF BEGINNING;

   EXCEPTING THERE FROM THE LAND NOW OCCUPIED BY THE CALIFORNIA CENTRAL RAILWAY COMPANY, ACROSS THE SOUTHEAST CORNER THEREOF; AS GRANTED BY DEED RECORDED MARCH 20, 1888 IN BOOK 69, PAGE(S) 553 OF DEEDS;

ALSO EXCEPTING THERE FROM ANY PORTION THEREOF DESCRIBED IN CONVEYANCE EXECUTED BY THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY, A DELAWARE CORPORATION, SUCCESSOR IN INTEREST TO THE CALIFORNIA CENTRAL RAILWAY COMPANY, IN FAVOR OF SAN BERNARDINO ASSOCIATED GOVERNMENTS, A COUNTY TRANSPORTATION COMMISSION AND LOCAL TRANSPORTATION AUTHORITY, RECORDED MARCH 30, 1993 AS INSTRUMENT NO. 93-137041 AND MARCH 30, 1993 AS INSTRUMENT NO. 93-137043, BOTH OF OFFICIAL RECORDS;

ALSO EXCEPTING THERE FROM THAT PORTION OF LAND CONVEYED IN GRANT DEED EXECUTED BY VINEY SONI AND VANDANA SONI, TRUSTEES OF THE SONI REVOCABLE INTER-VIVOS TRUST, DATED MARCH 27, 1984, IN FAVOR OF CITY OF REDLANDS, A MUNICIPAL CORPORATION, RECORDED JUNE 7, 1999 AS INSTRUMENT NO. 99-240498 OF OFFICIAL RECORDS.

APN: 0168-291-02-0-000

4. ASSURANCES:

According to the Public Records as of the Date of Guarantee,

a. Title to the estate or interest in the Land is vested in:

Vanita Soni Puri, Trustee of The Vanita Soni Puri 2012 Irrevocable Trust Dated November 28, 2012, as to an Undivided One-Third Interest; Varun Soni, Trustee of The Varun Soni 2012 Irrevocable Trust Dated November 28, 2012, as to an Undivided One-Third Interest; and Vaneesh Soni, Trustee of The Vaneesh Soni 2012 Irrevocable Trust Dated November 28, 2012, as to an Undivided One-Third Interest; as Tenants in Common

b. Title to the estate or interest is subject to defects, liens, or encumbrances shown in Schedule B which are not necessarily shown in the order of their priority.

First American Title	CLTA Guarantee Form No. 28 - Condition of Title ISSUED BY **First American Title Insurance Company** GUARANTEE NUMBER **5026900-6723673**
Schedule B	

File No.: 6723673

1. General and special taxes and assessments for the fiscal year 2021-2022.

First Installment:	$2,843.86, OPEN
Penalty:	$0.00
Second Installment:	$2,843.84, OPEN
Penalty:	$0.00
Tax Rate Area:	005000
A. P. No.:	0168-291-02-0-000

2. The lien of supplemental taxes, if any, assessed pursuant to Chapter 3.5 commencing with Section 75 of the California Revenue and Taxation Code.

3. THE EFFECT OF PLAT OF HUBBARD'S 2 1/2 ACRE ADDITION TO MENTONE PURPORTING TO SHOW THE LAND AND OTHER PROPERTY, RECORDED IN BOOK 5, PAGE 43, RECORDS OF SAID COUNTY.

4. The effect of a map purporting to show the land and other property, filed BOOK 8, PAGE 38 of Record of Surveys.

5. The effect of a map purporting to show the land and other property, filed BOOK 36, PAGE 63 AND 64 of Record of Surveys.

6. ANY BOUNDARY DISCREPANCIES OR RIGHTS WHICH MAY EXIST OR ARISE BY REASON OF THAT TRACT MAP NO. 13282 RECORDED IN BOOK 200, PAGE 83 AND 84, RECORDS SAID COUNTY.

7. **WE FIND NO OPEN DEED OF TRUST. THE COMPANY WILL REQUIRE SATISFACTORY PROOF, PRIOR TO INSURING THE CONTEMPLATED TRANSACTION, THAT THE SUBJECT PROPERTY IS FREE FROM ANY ENCUMBRANCES. PLEASE PROVIDE THE FOLLOWING:**

   A. AN AFFIDAVIT (Click Here), EXECUTED BY ALL THE SELLERS/BORROWERS STATING THAT THE PROPERTY IS FREE AND CLEAR, AND NOTARIZED IN FRONT OF A FIRST AMERICAN APPROVED NOTARY;

   B. THE OWNER STATEMENT FROM THE ESCROW INSTRUCTIONS; AND

   C. A WRITTEN STATEMENT FROM ESCROW CONFIRMING WHO THE PROCEEDS WILL BE DISBURSED TO.

8. Rights of the public in and to that portion of the Land lying within any Road, Street, Alley or Highway.

9. Water rights, claims or title to water, whether or not shown by the Public Records.

First American Title Company
3400 Central Avenue, Suite 100
Riverside, CA 92506

First American Title

Illegal Restrictive Covenants

Please be advised that any provision contained in this document, or in a document that is attached, linked, or referenced in this document, that under applicable law illegally discriminates against a class of individuals based upon personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or any other legally protected class, is illegal and unenforceable by law.

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CA ENGINEERING

MADERA AT CITRUS TRAIL RESIDENTIAL PROJECT

NW Corner of E. Colton & Wabash
Redlands, California 92374

Preliminary Water Quality Management Plan



Prepared By:

Fred Cornwell, P.E.
CA Engineering, Inc.
13821 Newport Avenue, Suite 110
Tustin, CA 92780
949.724.9480 / fcornwell@ca-eng.net

Prepared For:

Soni 2012 Irrevocable Trusts
1423 Georgina Avenue
Santa Monica, CA 90402
949.922.7075

Date Prepared: July 18, 2022
Date Revised: October 4, 2022

Preliminary Water Quality Management Plan

For:

Madera at Citrus Trail Residential Project

NW Corner of E. Colton Avenue and Wabash Avenue
Redlands, California 92374

APN: 0168-291-02-0-000

Prepared for:

Soni 2012 Irrevocable Trusts
Vanita Soni Puri, Authorized Signatory
1423 Georgina Avenue
Santa Monica, CA 90402
(949) 922-7075 / vanitapuri@gmail.com

Prepared by:

CA Engineering, Inc.
Fred Cornwell, P.E., RCE #45591
13821 Newport Avenue, Suite 110
Tustin, CA 92780
(949) 724-9480 (x2012) / fcornwell@ca-eng.net



Submittal Date: July 18, 2022
Revision Date: October 4, 2022
Approval Date: _____

Project Owner's Certification

This Water Quality Management Plan (WQMP) has been prepared for the Soni 2012 Irrevocable Trusts by CA Engineering, Inc. The WQMP is intended to comply with the requirements of the City of Redlands and the NPDES Areawide Stormwater Program requiring the preparation of a WQMP. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with San Bernardino County's Municipal Storm Water Management Program and the intent of the NPDES Permit for San Bernardino County and the incorporated cities of San Bernardino County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors in interest and the city/county shall be notified of the transfer. The new owner will be informed of its responsibility under this WQMP. A copy of the approved WQMP shall be available on the subject site in perpetuity.

"I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors."

Project Data			
Permit/Application Number(s):		Grading Permit Number(s):	Pending
Tract/Parcel Map Number(s):		Building Permit Number(s):	Pending
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: 0168-291-02-0-000

Owner's Signature			
Owner Name: Soni 2012 Irrevocable Trusts			
Title	Vanita Soni Puri, Authorized Signatory		
Company	Soni 2012 Irrevocable Trusts		
Address	1423 Georgina Avenue, Santa Monica, CA 90402		
Email	vanitapuri@gmail.com		
Telephone #	(949) 922-7075		
Signature		Date	

Preparer's Certification

Project Data			
Permit/Application Number(s):		Grading Permit Number(s):	Pending
Tract/Parcel Map Number(s):		Building Permit Number(s):	Pending
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: 0168-291-02-0-000

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan were prepared under my oversight and meet the requirements of Regional Water Quality Control Board Order No. R8-2010-0036."

Engineer: Fred Cornwell, P.E.		PE Stamp Below
Title	Principal	
Company	CA Engineering, Inc.	
Address	13821 Newport Avenue, Suite 110, Tustin, CA 92780	
Email	fcornwell@ca-eng.net	
Telephone #	(949) 724-9480 (x2012)	
Signature		
Date	10-4-2022	

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Appendix A: Vicinity Map / Existing Hydrologic Characteristics Map / Photos of Existing Site

Appendix B: Receiving Waters Map

Appendix C: San Bernardino County Project Site WAP Report

Appendix D: WQMP Site Plan

APPENDICES INCLUDED IN SECTION 6.2 (Electronic Data Submittal):

Appendix E: Link to Electronic Version of Final WQMP, Water Quality Management Plan and Stormwater BMP Transfer, Access and Maintenance Agreement, Precise Grading Plans

APPENDICES INCLUDED IN SECTION 6.3 (Post Construction):

Appendix F: Operation and Maintenance (O & M) Plan

Appendix G: Record of BMP Implementation, Maintenance and Inspection

Appendix H: Water Quality Management Plan and Stormwater BMP Transfer, Access and Maintenance Agreement

APPENDICES INCLUDED IN SECTION 6.4 (Other Supporting Documentation):

Appendix I: Kristar FloGard +PLUS Catch Basin Insert Filter Specifications (Pretreatment for Infiltration)

Appendix J: BMP Fact Sheet— INF-7: Underground Infiltration Fact Sheet (from Orange County TGD for Project WQMPs)

Appendix K: BMP Educational Materials

- **Commercial Landscape Maintenance Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Stormwater Management Practices for Commercial Landscape Maintenance Brochure (San Bernardino County Stormwater Program Website)**
- **Sustainable Practices for Landscape Maintenance Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **Construction & Development Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Regulatory Information Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Toxic Household Waste Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **Pet Waste Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
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- **SD-13 Storm Drain Signage**

Appendix L: NOAA Point Precipitation Frequency Estimate for 2 Year, 1 Hour Storm

Appendix M: TGR Geotechnical, Inc.'s Geotechnical Investigation Report, Northwest Corner of E. Colton Avenue and N. Wabash Avenue, Redlands, California 92374, APN 0168-291-02, dated April 8, 2022

Appendix N: Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 1); Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 2) (from Orange County TGD for Project WQMPs)

Appendix O: Preliminary Hydrology and Hydraulic Report for Madera at Citrus Trail Residential Project, NW Corner of E. Colton Avenue and Wabash Avenue, Redlands, California, 92374, dated July 13, 2022

Appendix P: Initial Time of Concentration Nomographs, San Bernardino County Hydrology Manual Figure D-1

Section 1 Discretionary Permit(s)

Form 1-1 Project Information

Project Name	Madera at Citrus Trail Residential Project				
Project Owner Contact Name:	Vanita Soni Puri				
Mailing Address:	1423 Georgina Avenue Santa Monica, CA 90402	E-mail Address:	vanitapuri@gmail.com	Telephone:	(949) 922-7075
Permit/Application Number(s):			Tract/Parcel Map Number(s):		
Additional Information/ Comments:	N/A				
Description of Project:	The proposed project site is an approximately 9.01 acre parcel of land located northwest of the intersection of E. Colton Avenue and Wabash Avenue in the city of Redlands, California. The property is bordered by single-family residences to the north, Wabash Avenue to the east (beyond which is an industrial development), E. Colton Avenue to the south (beyond which is a mobile home park), and a mobile home park to the west. The site measures 392,503 square feet and is currently undeveloped land covered in grass and vegetation. The proposed development will involve the construction of 103 single-family homes, as well as associated drive aisles, parking areas, sidewalks, common open space areas, landscaping, and utility improvements. The proposed single-family homes will be two-story structures with two garage spaces per home, and will have a total footprint area of 122,630 square feet. In addition, the proposed development will contain 95,476 square feet of concrete walkways and hardscape, and 95,896 square feet of asphalt drive aisles and parking spaces, for a total impervious area of 314,002 square feet, or 80% of the project area. The balance of the project site will contain 78,501 square feet of landscaping, or 20% of the project area, for a total project site of 392,503 square feet. The private asphalt streets (drive aisles) contained within the proposed development are the only streets, roads, or highway projects planned to be constructed as part of this WQMP. There are no known materials or wastes that are anticipated to be used or produced at the proposed residential development that would be classified as “hazardous.” Further, none of the materials to be used at the proposed residential development will be stored outside. The project will not violate any water quality standards because the project will be required to meet the City’s NPDES permit discharge requirements. The proposed project will have two drainage areas, DA 1 and DA 2, which are depicted on the WQMP Site Plan attached hereto as Appendix D in Section 6.1. DA 1 measures 380,199 square feet and comprises the majority of the site. DA 2 measures 12,304 square feet and is comprised of a small area at the southwest corner of the site. Due to grade breaks at each of the driveway entrances, storm water falling on a total of 2,636 square feet of the driveways will flow offsite without being treated (since it is not possible to capture these flows without allowing offsite flows to enter the onsite storm water treatment system). However, the DCV for the entire site area—392,503 square feet—will be captured and infiltrated.				

	In DA 1, a subsurface infiltration facility will be constructed to retain and infiltrate on site storm water flows, and it will be located immediately to the west of the common open space area near the center of the site. The flows will be collected by catch basins and conveyed, via the on-site storm drain, to the underground infiltration facility. The catch basins will have filter inserts installed to remove sediment, debris, and other pollutants of concern from the storm flows prior to the flows being infiltrated. The infiltration facility will be sized to retain the Design Capture Volume ("DCV"), and will consist of 183 lineal feet of dual 96"perforated CMP pipes placed on a 20' wide gravel bed. (In DA 1, the DCV exceeds the volume reduction needed to meet the HCOC requirement (V_{HCOC}) per San Bernardino County WQMP requirements.) Storm flows that exceed the capacity of this infiltration facility will be directed to a storm drain system that runs southerly to E. Colton Avenue and then westerly in E. Colton Avenue to a proposed catch basin located to the west of the development. The excess storm flows will bubble out of this catch basin into E. Colton Avenue once the hydraulic grade line rises above the street elevation. In DA 2, a subsurface infiltration facility will be constructed under the landscaped area at the southwest corner of the site. The storm water in this area will surface flow to an existing concrete drainage channel that currently outlets to E. Colton Avenue via a parkway culvert. A grated inlet with an insert filter will be installed in the existing drainage channel to collect and pretreat the design storm flows prior to conveying them to the infiltration facility. The infiltration facility will be sized to retain the V_{HCOC}, which exceeds the DCV in DA 2, and will consist of 20 lineal feet of 96" perforated CMP pipe placed on a 10' wide gravel bed. Storm flows that exceed the capacity of this infiltration facility will bypass the inlet and be released to E. Colton Avenue via the existing drainage channel and parkway culvert. The infiltration facilities in DA 1 and DA 2 will satisfy the Hydrologic Condition of Concern (HCOC) requirements which state that the proposed 2-year, 24-hour storm hydrograph volume, time of concentration, and peak runoff must be within 105% of the existing 2-year storm parameters.
Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.	N/A

Section 2 Project Description

2.1 Project Information

This section of the WQMP should provide the information listed below. The information provided for Conceptual/ Preliminary WQMP should give sufficient detail to identify the major proposed site design and LID BMPs and other anticipated water quality features that impact site planning. Final Project WQMP must specifically identify all BMP incorporated into the final site design and provide other detailed information as described herein.

The purpose of this information is to help determine the applicable development category, pollutants of concern, watershed description, and long term maintenance responsibilities for the project, and any applicable water quality credits. This information will be used in conjunction with the information in Section 3, Site Description, to establish the performance criteria and to select the LID BMP or other BMP for the project or other alternative programs that the project will participate in, which are described in Section 4.

Form 2.1-1 Description of Proposed Project

1 Development Category (Select all that apply):

☐ Significant re-development involving the addition or replacement of 5,000 ft^2 or more of impervious surface on an already developed site	☒ New development involving the creation of 10,000 ft^2 or more of impervious surface collectively over entire site	☐ Automotive repair shops with standard industrial classification (SIC) codes 5013, 5014, 5541, 7532- 7534, 7536-7539	☐ Restaurants (with SIC code 5812) where the land area of development is 5,000 ft^2 or more
☐ Hillside developments of 5,000 ft^2 or more which are located on areas with known erosive soil conditions or where the natural slope is 25 percent or more	☐ Developments of 2,500 ft^2 of impervious surface or more adjacent to (within 200 ft) or discharging directly into environmentally sensitive areas or waterbodies listed on the CWA Section 303(d) list of impaired waters.	☐ Parking lots of 5,000 ft^2 or more exposed to storm water	☐ Retail gasoline outlets that are either 5,000 ft^2 or more, or have a projected average daily traffic of 100 or more vehicles per day

☐ Non-Priority / Non-Category Project *May require source control LID BMPs and other LIP requirements. Please consult with local jurisdiction on specific requirements*.

2 Project Area (ft2):	392,503	**3** Number of Dwelling Units:	103	**4** SIC Code:	1521

5 Is Project going to be phased? Yes ☐ No ☒ *If yes, ensure that the WQMP evaluates each phase as a distinct DA, requiring LID BMPs to address runoff at time of completion.*

6 Does Project include roads? Yes ☐ No ☒ *If yes, ensure that applicable requirements for transportation projects are addressed (see Appendix A of TGD for WQMP)*

2.2 Property Ownership/Management

Describe the ownership/management of all portions of the project and site. State whether any infrastructure will transfer to public agencies (City, County, Caltrans, etc.) after project completion. State if a homeowners or property owners association will be formed and be responsible for the long-term maintenance of project stormwater facilities. Describe any lot-level stormwater features that will be the responsibility of individual property owners.

Form 2.2-1 Property Ownership/Management

Describe property ownership/management responsible for long-term maintenance of WQMP stormwater facilities:

All portions of the project and site are owned by the Soni 2012 Irrevocable Trusts. The individual at the Soni 2012 Irrevocable Trusts responsible for this project and all related water quality issues is an authorized signatory of the trusts, Vanita Soni Puri. Ms. Puri's contact information is as follows: 1423 Georgina Avenue, Santa Monica, CA 90402; phone number (949) 922-7075; vanitapuri@gmail.com. All maintenance responsibilities, including the implementation and maintenance of BMPs for the Madera at Citrus Trail Residential Project, shall be performed by the Soni 2012 Irrevocable Trusts until such time as ownership of the property is transferred, at which time all BMP implementation and maintenance responsibilities shall be transferred to the new owner. No infrastructure will be transferred to a public agency after the project is complete. A property owner's association (POA) will be formed for long-term maintenance of project stormwater facilities.

2.3 Potential Stormwater Pollutants

Determine and describe expected stormwater pollutants of concern based on land uses and site activities (refer to Table 3-3 in the TGD for WQMP).

Form 2.3-1 Pollutants of Concern

Pollutant	Please check: E=Expected, N=Not Expected		Additional Information and Comments
Pathogens (Bacterial / Virus)	E ☒	N ☐	Potentially caused by animal fecal wastes or the decomposition of excess organic waste. Mitigation measures: (N3) Landscape Management – dispose of grass cuttings and trimmings in trash receptacles to prevent entry to storm drain; (N11) Litter/Debris Control – ensure pet waste is disposed of in trash receptacles; and (N15) Vacuum Sweeping of Private Streets.
Nutrients - Phosphorous	E ☒	N ☐	Potentially caused by use of fertilizers. Mitigation measure: (N3) Landscape Management – implement fertilizer application restrictions.
Nutrients - Nitrogen	E ☒	N ☐	Potentially caused by use of fertilizers. Mitigation measure: (N3) Landscape Management – implement fertilizer application restrictions.
Noxious Aquatic Plants	E ☐	N ☒	
Sediment	E ☒	N ☐	Potentially caused by dirt on pavement being hosed off. Mitigation measures: (N14) Catch Basin Inspection – maintain installed catch basin insert filters; and (N15) Vacuum Sweeping of Private Streets.
Metals	E ☐	N ☒	
Oil and Grease	E ☒	N ☐	Potentially caused by vehicles leaking oil. Mitigation measures: (N14) Catch Basin Inspection – maintain installed catch basin insert filters; and (N15) Vacuum Sweeping of Private Streets.
Trash/Debris	E ☒	N ☐	Potentially caused by trash and biodegradable organic matter (such as leaves, grass cuttings, and food waste) being allowed to enter storm drain system. Mitigation measures: (N3) Landscape Management – dispose of grass cuttings and trimmings in trash receptacles to prevent entry to storm drain; (N11) Litter/Debris Control – ensure trash and food waste is disposed of in trash receptacles; and (N15) Vacuum Sweeping of Private Streets.
Pesticides / Herbicides	E ☒	N ☐	Potentially caused by use of pesticides and herbicides. Mitigation measure: (N3) Landscape Management – implement pesticide and herbicide application restrictions.
Organic Compounds	E ☒	N ☐	Potentially caused by hosing solvents and cleaning compounds off of vehicles or pavement. Mitigation measures: (N2) Activity Restrictions - implement use /activity restrictions for the project through the use of conditions, covenants and restrictions (CCRs); and (N14) Catch Basin Inspection – maintain installed catch basin insert filters.
Other:	E ☐	N ☐	

2.4 Water Quality Credits

A water quality credit program is applicable for certain types of development projects if it is not feasible to meet the requirements for on-site LID. Proponents for eligible projects, as described below, can apply for water quality credits that would reduce project obligations for selecting and sizing other treatment BMP or participating in other alternative compliance programs. Refer to Section 6.2 in the TGD for WQMP to determine if water quality credits are applicable for the project.

Form 2.4-1 Water Quality Credits

1 Project Types that Qualify for Water Quality Credits: *Select all that apply*			
☐ Redevelopment projects that reduce the overall impervious footprint of the project site. [Credit = % impervious reduced]	Higher density development projects ☐ Vertical density [20%] ☐ 7 units/ acre [5%]	☐ Mixed use development, (combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that demonstrate environmental benefits not realized through single use projects) [20%]	☐ Brownfield redevelopment (redevelop real property complicated by presence or potential of hazardous contaminants) [25%]
☐ Redevelopment projects in established historic district, historic preservation area, or similar significant core city center areas [10%]	☐ Transit-oriented developments (mixed use residential or commercial area designed to maximize access to public transportation) [20%]	☐ In-fill projects (conversion of empty lots & other underused spaces < 5 acres, substantially surrounded by urban land uses, into more beneficially used spaces, such as residential or commercial areas) [10%]	☐ Live-Work developments (variety of developments designed to support residential and vocational needs) [20%]
2 Total Credit % 0 *(Total all credit percentages up to a maximum allowable credit of 50 percent)*			
Description of Water Quality Credit Eligibility (if applicable)	N/A		

Section 3 Site and Watershed Description

Describe the project site conditions that will facilitate the selection of BMP through an analysis of the physical conditions and limitations of the site and its receiving waters. Identify distinct drainage areas (DA) that collect flow from a portion of the site and describe how runoff from each DA (and sub-watershed DMAs) is conveyed to the site outlet(s). Refer to Section 3.2 in the TGD for WQMP. The form below is provided as an example. Then complete Forms 3.2 and 3.3 for each DA on the project site. ***If the project has more than one drainage area for stormwater management, then complete additional versions of these forms for each DA / outlet.***

Form 3-1 Site Location and Hydrologic Features

Site coordinates *take GPS measurement at approximate center of site*	Latitude 34.063821	Longitude -117.140048	Thomas Bros Map page 608

1 San Bernardino County climatic region: ☒ Valley ☐ Mountain

2 Does the site have more than one drainage area (DA): Yes☒ No☐ *If no, proceed to Form 3-2. If yes, then use this form to show a conceptual schematic describing DMAs and hydrologic feature connecting DMAs to the site outlet(s). An example is provided below that can be modified for proposed project or a drawing clearly showing DMA and flow routing may be attached*



Conveyance	Briefly describe on-site drainage features to convey runoff that is not retained within a DMA
DA1 DMA C flows to DA1 DMA A	*Ex. Bioretention overflow to vegetated bioswale with 4' bottom width, 5:1 side slopes and bed slope of 0.01. Conveys runoff for 1000' through DMA 1 to existing catch basin on SE corner of property*
DA1 to Outlet 1	DA 1 measures 380,199 square feet and comprises the majority of the site. In DA 1, a subsurface infiltration facility will be constructed to retain and infiltrate on site storm water flows, and it will be located immediately to the west of the common open space area near the center of the site. The flows will be collected by catch basins and conveyed, via the on-site storm drain, to the underground infiltration facility. The catch basins will have filter inserts installed to remove sediment, debris, and other pollutants of concern from the storm flows prior to the flows being infiltrated. The infiltration facility will be sized to retain the Design Capture Volume ("DCV"), and will consist of 183 lineal feet of dual 96"perforated CMP pipes placed on a 20' wide gravel bed. (In DA 1, the DCV exceeds the volume reduction needed to meet the HCOC requirement (V_{HCOC}) per San Bernardino County WQMP requirements.) Storm flows that exceed the capacity of this infiltration facility will be directed to a storm drain system that runs southerly to E. Colton Avenue and then westerly in E. Colton Avenue to a proposed catch basin located to the west of the development. The excess storm flows will bubble out of this catch basin into E. Colton Avenue once the hydraulic grade line rises above the street elevation.

DA2 to Outlet 2	DA 2 measures 12,304 square feet and is comprised of a small area at the southwest corner of the site. In DA 2, a subsurface infiltration facility will be constructed under the landscaped area at the southwest corner of the site. The storm water in this area will surface flow to an existing concrete drainage channel that currently outlets to E. Colton Avenue via a parkway culvert. A grated inlet with an insert filter will be installed in the existing drainage channel to collect and pretreat the design storm flows prior to conveying them to the infiltration facility. The infiltration facility will be sized to retain the V_{HCOC}, which exceeds the DCV in DA 2, and will consist of 20 lineal feet of 96" perforated CMP pipe placed on a 10' wide gravel bed. Storm flows that exceed the capacity of this infiltration facility will bypass the inlet and be released to E. Colton Avenue via the existing drainage channel and parkway culvert.

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1

For Drainage Area 1's sub-watershed DMA, provide the following characteristics ***See the Existing Hydrologic Characteristics Map in Appendix A hereof***	DMA A	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	380,199			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC II			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	HSG A			
5 Longest flowpath length (ft)	1,000			
6 Longest flowpath slope (ft/ft)	0.015			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Grass			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating.* ***The photos of the site in Appendix A hereof were taken on 10/3/2022 and show the pervious area condition as "Barren." Historical wet season photos of the site, which are also included in Appendix A hereof, show the pervious area condition as "Grass-Good."***	Good			

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 2				
For Drainage Area 1's sub-watershed DMA, provide the following characteristics ***See the Existing Hydrologic Characteristics Map in Appendix A hereof***	DMA A	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	12,304			
2 Existing site impervious area (ft^2)	0			
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	AMC II			
4 Hydrologic soil group *Refer to Watershed Mapping Tool – http://permitrack.sbcounty.gov/wap/*	HSG B			
5 Longest flowpath length (ft)	155			
6 Longest flowpath slope (ft/ft)	0.025			
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	Grass			
8 Pre-developed pervious area condition: *Based on the extent of wet season vegetated cover good >75%; Fair 50-75%; Poor <50% Attach photos of site to support rating* ***The photos of the site in Appendix A hereof were taken on 10/3/2022 and show the pervious area condition as "Barren." Historical wet season photos of the site, which are also included in Appendix A hereof, show the pervious area condition as "Grass-Good."***	Good			

Form 3-3 Watershed Description for Drainage Area 1

Receiving waters *Refer to Watershed Mapping Tool -* *http://permitrack.sbcounty.gov/wap/* *See 'Drainage Facilities" link at this website*	Zanja Creek; Mission Channel; Santa Ana River Reach 4; Santa Ana River Reach 3
Applicable TMDLs *Refer to Local Implementation Plan*	Santa Ana River Reach 3—Indicator Bacteria
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool –* *http://permitrack.sbcounty.gov/wap/ and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml*	Santa Ana River Reach 4—Indicator Bacteria Santa Ana River Reach 3—Copper; Indicator Bacteria; Lead
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool –* *http://permitrack.sbcounty.gov/wap/*	None
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool –* *http://permitrack.sbcounty.gov/wap/*	Zanja Creek; Mission Channel; Santa Ana River Reach 4; Santa Ana River Reach 3
Hydrologic Conditions of Concern	☒ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☐ No
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

Form 3-3 Watershed Description for Drainage Area 2

Receiving waters *Refer to Watershed Mapping Tool -* *http://permitrack.sbcounty.gov/wap/* *See 'Drainage Facilities" link at this website*	Zanja Creek; Mission Channel; Santa Ana River Reach 4; Santa Ana River Reach 3
Applicable TMDLs *Refer to Local Implementation Plan*	Santa Ana River Reach 3—Indicator Bacteria
303(d) listed impairments *Refer to Local Implementation Plan and Watershed Mapping Tool –* *http://permitrack.sbcounty.gov/wap/ and State Water Resources Control Board website – http://www.waterboards.ca.gov/santaana/water_issues/programs/tmdl/index.shtml*	Santa Ana River Reach 4—Indicator Bacteria Santa Ana River Reach 3—Copper; Indicator Bacteria; Lead
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool –* *http://permitrack.sbcounty.gov/wap/*	None
Unlined Downstream Water Bodies *Refer to Watershed Mapping Tool –* *http://permitrack.sbcounty.gov/wap/*	Zanja Creek; Mission Channel; Santa Ana River Reach 4; Santa Ana River Reach 3
Hydrologic Conditions of Concern	☒ Yes *Complete Hydrologic Conditions of Concern (HCOC) Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-10 in submittal* ☐ No
Watershed–based BMP included in a RWQCB approved WAP	☐ Yes *Attach verification of regional BMP evaluation criteria in WAP* • *More Effective than On-site LID* • *Remaining Capacity for Project DCV* • *Upstream of any Water of the US* • *Operational at Project Completion* • *Long-Term Maintenance Plan* ☒ No

Section 4 Best Management Practices (BMP)

4.1 Source Control BMP

4.1.1 Pollution Prevention

Non-structural and structural source control BMP are required to be incorporated into all new development and significant redevelopment projects. Form 4.1-1 and 4.1-2 are used to describe specific source control BMPs used in the WQMP or to explain why a certain BMP is not applicable. Table 7-3 of the TGD for WQMP provides a list of applicable source control BMP for projects with specific types of potential pollutant sources or activities. The source control BMP in this table must be implemented for projects with these specific types of potential pollutant sources or activities.

The preparers of this WQMP have reviewed the source control BMP requirements for new development and significant redevelopment projects. The preparers have also reviewed the specific BMP required for project as specified in Forms 4.1-1 and 4.1-2. All applicable non-structural and structural source control BMP shall be implemented in the project.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N1	Education of Property Owners, Tenants and Occupants on Stormwater BMPs	☒	☐	The owner shall be familiar with the contents of this WQMP and shall provide BMP information materials to the first residents/occupants/tenants on management practices for residential developments that contribute to the protection of stormwater quality. (See Appendix K in Section 6.4 for the BMP Educational Materials.) For developments with POA and residential projects of more than fifty (50) dwelling units, project conditions of approval will require that the POA periodically provide environmental awareness education materials, made available by the municipalities, to all members. Among other things, these materials will describe the use of chemicals (including household type) that should be limited to the property, with no discharge of wastes via hosing or other direct discharge to gutters, catch basins and storm drains. The applicable educational materials in Appendix K are the following: Sustainable Practices for Landscape Maintenance Brochure for Homeowners; Toxic Household Waste Brochure for Homeowners; and Pet Waste Brochure for Homeowners.
N2	Activity Restrictions	☒	☐	The owner will implement use /activity restrictions for the project for the purpose of surface water quality protection through the use of conditions, covenants and restrictions (CCRs). The applicable educational materials in Appendix K are the following: Sustainable Practices for Landscape Maintenance Brochure for Homeowners; Toxic Household Waste Brochure for Homeowners; and Pet Waste Brochure for Homeowners.
N3	Landscape Management BMPs	☒	☐	The owner will identify on-going landscape maintenance requirements consistent with applicable local stormwater quality ordinances that will include fertilizer and/or pesticide application restrictions and mowing and trimmings containment and disposal. The applicable educational materials in Appendix K are the following: Commercial Landscape Maintenance Fact Sheet; Stormwater Management Practices for Commercial Landscape Maintenance Brochure; Sustainable Practices for Landscape Maintenance Brochure for Homeowners; Pet Waste Brochure for Homeowners; SD-10 Site Design & Landscape Planning; and SD-12 Efficient Irrigation.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N4	BMP Maintenance	☒	☐	The owner will be responsible for implementation of each non- structural BMP and scheduled cleaning and/or maintenance of all structural BMP facilities per the maintenance narratives in Form 5-1 of this document. The applicable educational materials in Appendix K are the following: Commercial Landscape Maintenance Fact Sheet; Stormwater Management Practices for Commercial Landscape Maintenance Brochure; Sustainable Practices for Landscape Maintenance Brochure for Homeowners; Pet Waste Brochure for Homeowners; SC-35 Safer Alternative Products; SC-41 Building & Grounds Maintenance; SC-42 Building Repair and Construction; SC-43 Parking / Storage Area Maintenance; SC-44 Drainage System Maintenance; SD-10 Site Design & Landscape Planning; SD-12 Efficient Irrigation; and SD-13 Storm Drain Signage.
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	Not applicable. No hazardous materials are anticipated to be present at the proposed project.
N6	Local Water Quality Ordinances	☒	☐	The owner will comply with any applicable local water quality ordinances. The applicable educational materials in Appendix K are the following: Regulatory Information Fact Sheet.
N7	Spill Contingency Plan	☒	☐	The owner will prepare a Spill Contingency Plan based on specified types of building or suite occupancies. The Plan will mandate stockpiling of cleanup materials, notification of responsible agencies, disposal of cleanup materials, documentation, etc. The applicable educational materials in Appendix K are the following: Construction & Development Fact Sheet; SC-41 Building & Grounds Maintenance; SC-42 Building Repair and Construction; and SC-43 Parking / Storage Area Maintenance.
N8	Underground Storage Tank Compliance	☐	☒	Not applicable. No underground storage tanks are proposed.
N9	Hazardous Materials Disclosure Compliance	☐	☒	Not applicable. No hazardous materials are currently anticipated to be used or produced at the proposed project.
N10	Uniform Fire Code Implementation	☒	☐	The owner shall require all residents to abide by the Uniform Fire Code.

Form 4.1-1 Non-Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, if not applicable, state reason
		Included	Not Applicable	
N11	Litter/Debris Control Program	☒	☐	The owner/POA will implement trash management and litter control procedures throughout the site aimed at reducing pollution of drainage water. The owner/POA may contract with its landscape maintenance firm to provide this service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting/reporting trash disposal violations by tenants/homeowners. The applicable educational materials in Appendix K are the following: Commercial Landscape Maintenance Fact Sheet; Stormwater Management Practices for Commercial Landscape Maintenance Brochure; Sustainable Practices for Landscape Maintenance Brochure for Homeowners; Pet Waste Brochure for Homeowners; SC-41 Building & Grounds Maintenance; SC-42 Building Repair and Construction; and SC-43 Parking / Storage Area Maintenance.
N12	Employee Training	☐	☒	Not applicable. No employees are anticipated.
N13	Housekeeping of Loading Docks	☐	☒	Not applicable. No loading docks are proposed.
N14	Catch Basin Inspection Program	☒	☐	On-site catch basins shall be inspected, cleaned and maintained on an annual basis, in the early fall prior to the start of the rainy season, and before and after all major storms. Catch basins shall be monitored for evidence of illegal dumping on an as-needed frequency. The applicable educational materials in Appendix K are the following: SC-44 Drainage System Maintenance.
N15	Vacuum Sweeping of Private Streets and Parking Lots	☒	☐	The owner/POA will ensure that the project's drive aisles and parking areas will be swept on a monthly basis, or more often if necessary, using a vacuum assisted sweeper. The applicable educational materials in Appendix K are the following: SC-43 Parking / Storage Area Maintenance.
N16	Other Non-structural Measures for Public Agency Projects	☐	☒	Not applicable. The project is not a Public Agency Project.
N17	Comply with all other applicable NPDES permits	☒	☐	The owner shall comply with the statewide General Construction Permit during the entire period of construction by filing an NOI and SWPPP with the State Water Board and complying with all BMP implementation and reporting requirements. The applicable educational materials in Appendix K are the following: Regulatory Information Fact Sheet.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S1	Provide storm drain system stencilling and signage (CASQA New Development BMP Handbook SD-13)	☒	☐	Provide storm drain system stenciling and signage. The stencil shall be blue on a white background with lettering 2-1/2'" in height and reading "No Dumping - Drains to River." A fish or similar water dependent creature silhouette may be included subject to City approval. In lieu of a stencil, a catch basin curb marker, circular or rectangular, at least 4" in height or diameter, may be used. The message will be the same and is subject to City approval. A painted circular stencil shall not be bigger than 8" in diameter. Legibility will be checked and repainted annually. The applicable educational materials in Appendix K are the following: SD-13 Storm Drain Signage.
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☐	☒	Not applicable. No outdoor material storage areas are proposed.
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☐	☒	Not applicable. No trash or waste storage areas are proposed.
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control (Statewide Model Landscape Ordinance; CASQA New Development BMP Handbook SD-12)	☒	☐	Irrigation systems shall include reducers or shut off valves triggered by a pressure drop. Timers will be used to avoid over watering and watering cycles shall be adjusted seasonally. Plants with similar watering requirements will be grouped. and native or drought tolerant species will be used where appropriate. The applicable educational materials in Appendix K are the following: SD-12 Efficient Irrigation.
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☒	☐	Landscaped areas will be finish-graded at a minimum of 1-2 inches below top of curb or sidewalk for increased retention of stormwater/irrigation water. The applicable educational materials in Appendix K are the following: SD-10 Site Design & Landscape Planning.
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☐	☒	Not applicable. The site has no slopes or channels.
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	Not applicable. No loading docks are proposed.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One		Describe BMP Implementation OR, If not applicable, state reason
		Included	Not Applicable	
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	Not applicable. No maintenance bays are proposed.
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Not applicable. No vehicle wash areas are proposed.
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	Not applicable. No outdoor processing areas are proposed.
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	Not applicable. No equipment wash areas are proposed.
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	Not applicable. No fueling areas are proposed.
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	Not applicable. No hillside landscaping is proposed (the site has no hills).
S14	Wash water control for food preparation areas	☐	☒	Not applicable. No food preparation areas are proposed.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	Not applicable. No community car wash racks are proposed.

4.1.2 Preventative LID Site Design Practices

Site design practices associated with new LID requirements in the MS4 Permit should be considered in the earliest phases of a project. Preventative site design practices can result in smaller DCV for LID BMP and hydromodification control BMP by reducing runoff generation. Describe site design and drainage plan including:

- A narrative of site design practices utilized or rationale for not using practices
- A narrative of how site plan incorporates preventive site design practices
- Include an attached Site Plan layout which shows how preventative site design practices are included in WQMP

Refer to Section 5.2 of the TGD for WQMP for more details.

Form 4.1-3 Preventative LID Site Design Practices Checklist

Site Design Practices *If yes, explain how preventative site design practice is addressed in project site plan. If no, other LID BMPs must be selected to meet targets*
Minimize impervious areas: Yes ☒ No ☐ Explanation: The width of the drive aisles and sidewalks for the proposed development has been reduced to the maximum extent practicable. Further, landscaping is planned to be installed to the maximum extent practicable.
Maximize natural infiltration capacity: Yes ☒ No ☐ Explanation: The site is underlain by soils with a design infiltration rate of 3.99 inches per hour, and all stormwater flows will be infiltrated on-site via underground infiltration facilities (after pretreatment utilizing catch basin filter inserts).
Preserve existing drainage patterns and time of concentration: Yes ☒ No ☐ Explanation: The existing drainage patterns have been preserved.
Disconnect impervious areas: Yes ☒ No ☐ Explanation: All impervious area runoff for a design storm event will be captured and directed into the underground infiltration systems which will disconnect impervious areas.
Protect existing vegetation and sensitive areas: Yes ☐ No ☒ Explanation: The existing vegetation at the site consists mainly of grasses that only grow during the rainy season. This vegetation cannot be protected during the development of the site.
Re-vegetate disturbed areas: Yes ☒ No ☐ Explanation: Landscaping is proposed to the maximum extent practicable.
Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: Yes ☒ No ☐ Explanation: The areas where the underground infiltration facilities are to be located will not be compacted more than is necessary.
Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: Yes ☐ No ☒ Explanation: No vegetated drainage swales are proposed.
Stake off areas that will be used for landscaping to minimize compaction during construction : Yes ☒ No ☐ Explanation: The proposed landscape areas will not be compacted more than is necessary.

4.2 Project Performance Criteria

The purpose of this section of the Project WQMP is to establish targets for post-development hydrology based on performance criteria specified in the MS4 Permit. These targets include runoff volume for water quality control (referred to as LID design capture volume), and runoff volume, time of concentration, and peak runoff for protection of any downstream waterbody segments with a HCOC. ***If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DA / outlet.***

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), the San Bernardino County Stormwater Program requires use of the P_6 method (MS4 Permit Section XI.D.6a.ii) – Form 4.2-1
- For HCOC pre- and post-development hydrologic calculation, the San Bernardino County Stormwater Program requires the use of the Rational Method (San Bernardino County Hydrology Manual Section D). Forms 4.2-2 through Form 4.2-5 calculate hydrologic variables including runoff volume, time of concentration, and peak runoff from the project site pre- and post-development using the Hydrology Manual Rational Method approach. For projects greater than 640 acres (1.0 mi^2), the Rational Method and these forms should not be used. For such projects, the Unit Hydrograph Method (San Bernardino County Hydrology Manual Section E) shall be applied for hydrologic calculations for HCOC performance criteria.

Refer to Section 4 in the TGD for WQMP for detailed guidance and instructions.

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 1)

1 Project area DA 1 (ft^2): 380,199	**2** Imperviousness after applying preventative site design practices (Imp%): 80%	**3** Runoff Coefficient (Rc): 0.599 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.491 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.727 *P_6 = Item 4 * C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 27,084 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 2)

1 Project area DA 1 (ft^2): 12,304	**2** Imperviousness after applying preventative site design practices (Imp%): 80%	**3** Runoff Coefficient (Rc): 0.599 *$R_c = 0.858(Imp\%)^{\wedge 3} - 0.78(Imp\%)^{\wedge 2} + 0.774(Imp\%) + 0.04$*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.491 *http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html*		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.727 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (Valley = 1.4807; Mountain = 1.909; Desert = 1.2371)*		
6 Drawdown Rate *Use 48 hours as the default condition. Selection and use of the 24 hour drawdown time condition is subject to approval by the local jurisdiction. The necessary BMP footprint is a function of drawdown time. While shorter drawdown times reduce the performance criteria for LID BMP design capture volume, the depth of water that can be stored is also reduced.*		24-hrs ☐ 48-hrs ☒
7 Compute design capture volume, DCV (ft^3): 876 *DCV = 1/12 * [Item 1* Item 3 *Item 5 * C_2], where C_2 is a function of drawdown rate (24-hr = 1.582; 48-hr = 1.963)* *Compute separate DCV for each outlet from the project site per schematic drawn in Form 3-1 Item 2*		

Form 4.2-2 Summary of HCOC Assessment (DA 1)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☒ No ☐

Go to: *http://permitrack.sbcounty.gov/wap/*

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below

(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 2,615 *Form 4.2-3 Item 12*	**2** 34.75 *Form 4.2-4 Item 13*	**3** -1.92 *Form 4.2-5 Item 10*
Post-developed	**4** 28,119 *Form 4.2-3 Item 13*	**5** 13.59 *Form 4.2-4 Item 14*	**6** 8.30 *Form 4.2-5 Item 14*
Difference	**7** 25,504 *Item 4 – Item 1*	**8** 21.16 *Item 2 – Item 5*	**9** 10.22 *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** 975% *Item 7 / Item 1*	**11** 60.9% *Item 8 / Item 2*	**12** -532% *Item 9 / Item 3*

Form 4.2-2 Summary of HCOC Assessment (DA 2)

Does project have the potential to cause or contribute to an HCOC in a downstream channel: Yes ☒ No ☐

Go to: *http://permitrack.sbcounty.gov/wap/*

If "Yes", then complete HCOC assessment of site hydrology for 2yr storm event using Forms 4.2-3 through 4.2-5 and insert results below

(Forms 4.2-3 through 4.2-5 may be replaced by computer software analysis based on the San Bernardino County Hydrology Manual)

If "No," then proceed to Section 4.3 Project Conformance Analysis

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	**1** 105 *Form 4.2-3 Item 12*	**2** 14.8 *Form 4.2-4 Item 13*	**3** 0.12 *Form 4.2-5 Item 10*
Post-developed	**4** 1,218 *Form 4.2-3 Item 13*	**5** 7.75 *Form 4.2-4 Item 14*	**6** 0.385 *Form 4.2-5 Item 14*
Difference	**7** 1,113 *Item 4 – Item 1*	**8** 7.05 *Item 2 – Item 5*	**9** 0.265 *Item 6 – Item 3*
Difference (as % of pre-developed)	**10** 1060% *Item 7 / Item 1*	**11** 47.6% *Item 8 / Item 2*	**12** 221% *Item 9 / Item 3*

Form 4.2-3 HCOC Assessment for Runoff Volume (DA 1)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Grass (Good)							
2a Hydrologic Soil Group (HSG)	HSG A							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	380,199							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	38							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	Pavement/Rooftop	Commercial L/S						
2b Hydrologic Soil Group (HSG)	HSG A	HSG A						
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	304,159	76,040						
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	98	32						

5 Pre-Developed area-weighted CN: 38	**7** Pre-developed soil storage capacity, S (in): 16.32 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 3.26 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 84.8	**8** Post-developed soil storage capacity, S (in): 1.79 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 0.36 *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in): 2.14
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 2,615
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 28,119
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft^3): 24,098
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

Form 4.2-3 HCOC Assessment for Runoff Volume (DA 2)

Weighted Curve Number Determination for: Pre-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1a Land Cover type	Grass (Good)							
2a Hydrologic Soil Group (HSG)	HSG B							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	12,304							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	61							
Weighted Curve Number Determination for: Post-developed DA	DMA A	DMA B	DMA C	DMA D	DMA E	DMA F	DMA G	DMA H
1b Land Cover type	Pavement/Rooftop	Commercial L/S						
2b Hydrologic Soil Group (HSG)	HSG B	HSG B						
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	9,843	2,461						
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	98	56						

5 Pre-Developed area-weighted CN: 61	**7** Pre-developed soil storage capacity, S (in): 6.39 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 1.28 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 89.6	**8** Post-developed soil storage capacity, S (in): 1.16 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 0.23 *I_a = 0.2 * Item 8*

11 Precipitation for 2 yr, 24 hr storm (in): 2.14
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 105
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 9)^2 / ((Item 11 – Item 9 + Item 7)*

13 Post-developed Volume (ft^3): 1,218
*V_{pre} =(1 / 12) * (Item sum of Item 3) * [(Item 11 – Item 10)^2 / ((Item 11 – Item 10 + Item 8)*

14 Volume Reduction needed to meet HCOC Requirement, (ft^3): 1,052
*V_{HCOC} = (Item 13 * 0.95) – Item 12*

Form 4.2-4 HCOC Assessment for Time of Concentration (DA 1)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA1 *Use additional forms if there are more than 4 DMA*				Post-developed DA1 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	1,000				679			
2 Change in elevation (ft)	14.9				3.4			
3 Slope (ft/ft), S_o = *Item 2 / Item 1*	0.015				0.005			
4 Land cover	Undeveloped (Good Cover)				Single-Family (PI = 80)			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP* ***(See Appendix P for Nomographs)***	34.5				12.5			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	62				530			
7 Cross-sectional area of channel (ft^2)	12.56				12.56			
8 Wetted perimeter of channel (ft)	12.56				12.57			
9 Manning's roughness of channel (n)	0.045				0.013			
10 Channel flow velocity (ft/sec) V_{fps} = *(1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	4.06				8.1			
11 Travel time to outlet (min) T_t = *Item 6 / (Item 10 * 60)*	0.25				1.09			
12 Total time of concentration (min) T_c = *Item 5 + Item 11*	34.75				13.59			

13 Pre-developed time of concentration (min): 34.75 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 13.59 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet HCOC requirement (min): 19.42 $T_{C\text{-}HCOC}$ = *(Item 13 * 0.95) – Item 14*

Form 4.2-4 HCOC Assessment for Time of Concentration (DA 2)

Compute time of concentration for pre and post developed conditions for each DA *(For projects using the Hydrology Manual complete the form below)*

Variables	Pre-developed DA2 *Use additional forms if there are more than 4 DMA*				Post-developed DA2 *Use additional forms if there are more than 4 DMA*			
	DMA A	DMA B	DMA C	DMA D	DMA A	DMA B	DMA C	DMA D
1 Length of flowpath (ft) *Use Form 3-2 Item 5 for pre-developed condition*	155				205			
2 Change in elevation (ft)	3.9				1.03			
3 Slope (ft/ft), S_o *= Item 2 / Item 1*	0.025				0.005			
4 Land cover	Undeveloped (Good Cover)				Single-Family (PI = 80)			
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP* ***(See Appendix P for Nomographs)***	14.8				7.75			
6 Length of conveyance from DMA outlet to project site outlet (ft) *May be zero if DMA outlet is at project site outlet*	0				0			
7 Cross-sectional area of channel (ft^2)	12.56				8			
8 Wetted perimeter of channel (ft)	12.56				6.4			
9 Manning's roughness of channel (n)	0.045				0.013			
10 Channel flow velocity (ft/sec) V_{fps} *= (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	5.24				9.4			
11 Travel time to outlet (min) T_t *= Item 6 / (Item 10 * 60)*	0				0			
12 Total time of concentration (min) T_c *= Item 5 + Item 11*	14.8				7.75			

13 Pre-developed time of concentration (min): 14.8 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 7.75 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet HCOC requirement (min): 6.31 $T_{C\text{-}HCOC}$ *= (Item 13 * 0.95) – Item 14*

Form 4.2-5 HCOC Assessment for Peak Runoff (DA 1)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.6 LOG Form 4.2-4 Item 5 /60)*		0.684			1.258		
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		8.67			8.67		
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		1			0.20		
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*		0.93			0.97		
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0.93			0.194		
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*		-1.92			8.30		
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: -1.92

*Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*

9 Pre-developed Q_p at T_c for DMA B:

*Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*

10 Pre-developed Q_p at T_c for DMA C:

*Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*

10 Peak runoff from pre-developed condition confluence analysis (cfs): -1.92 *Maximum of Item 8, 9, and 10 (including additional forms as needed)*

11 Post-developed Q_p at T_c for DMA A: 8.30

Same as Item 8 for post-developed values

12 Post-developed Q_p at T_c for DMA B:

Same as Item 9 for post-developed values

13 Post-developed Q_p at T_c for DMA C:

Same as Item 10 for post-developed values

14 Peak runoff from post-developed condition confluence analysis (cfs): 8.30 *Maximum of Item 11, 12, and 13 (including additional forms as needed)*

15 Peak runoff reduction needed to meet HCOC Requirement (cfs): 9.81 *$Q_{p\text{-}HCOC}$ = (Item 14 * 0.95) – Item 10*

Form 4.2-5 HCOC Assessment for Peak Runoff (DA 2)

Compute peak runoff for pre- and post-developed conditions

Variables		Pre-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*			Post-developed DA to Project Outlet (*Use additional forms if more than 3 DMA)*		
		DMA A	DMA B	DMA C	DMA A	DMA B	DMA C
1 Rainfall Intensity for storm duration equal to time of concentration *I_{peak} = 10^(LOG Form 4.2-1 Item 4 - 0.6 LOG Form 4.2-4 Item 5 /60)*		1.137			1.676		
2 Drainage Area of each DMA (Acres) *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0.28			0.28		
3 Ratio of pervious area to total area *For DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		1			0.20		
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*		0.68			0.75		
5 Maximum loss rate (in/hr) *F_m = Item 3 * Item 4* *Use area-weighted F_m from DMA with outlet at project site outlet, include upstream DMA (Using example schematic in Form 3-1, DMA A will include drainage from DMA C)*		0.68			0.15		
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*		0.115			0.385		
7 Time of concentration adjustment factor for other DMA to site discharge point *Form 4.2-4 Item 12 DMA / Other DMA upstream of site discharge point (If ratio is greater than 1.0, then use maximum value of 1.0)*	DMA A	*n/a*			*n/a*		
	DMA B		*n/a*			*n/a*	
	DMA C			*n/a*			*n/a*

8 Pre-developed Q_p at T_c for DMA A: 0.12

*Q_p = Item 6_{DMAA} + [Item 6_{DMAB} * (Item 1_{DMAA} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAA/2}$] + [Item 6_{DMAC} * (Item 1_{DMAA} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAA/3}$]*

9 Pre-developed Q_p at T_c for DMA B:

*Q_p = Item 6_{DMAB} + [Item 6_{DMAA} * (Item 1_{DMAB} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAB/1}$] + [Item 6_{DMAC} * (Item 1_{DMAB} - Item 5_{DMAC})/(Item 1_{DMAC} - Item 5_{DMAC})* Item $7_{DMAB/3}$]*

10 Pre-developed Q_p at T_c for DMA C:

*Q_p = Item 6_{DMAC} + [Item 6_{DMAA} * (Item 1_{DMAC} - Item 5_{DMAA})/(Item 1_{DMAA} - Item 5_{DMAA})* Item $7_{DMAC/1}$] + [Item 6_{DMAB} * (Item 1_{DMAC} - Item 5_{DMAB})/(Item 1_{DMAB} - Item 5_{DMAB})* Item $7_{DMAC/2}$]*

10 Peak runoff from pre-developed condition confluence analysis (cfs): 0.12 *Maximum of Item 8, 9, and 10 (including additional forms as needed)*

11 Post-developed Q_p at T_c for DMA A: 0.385

Same as Item 8 for post-developed values

12 Post-developed Q_p at T_c for DMA B:

Same as Item 9 for post-developed values

13 Post-developed Q_p at T_c for DMA C:

Same as Item 10 for post-developed values

14 Peak runoff from post-developed condition confluence analysis (cfs): 0.385 *Maximum of Item 11, 12, and 13 (including additional forms as needed)*

15 Peak runoff reduction needed to meet HCOC Requirement (cfs): 0.246 *$Q_{p\text{-}HCOC}$ = (Item 14 * 0.95) – Item 10*

4.3 Project Conformance Analysis

Complete the following forms for each project site DA to document that the proposed LID BMPs conform to the project DCV developed to meet performance criteria specified in the MS4 Permit (WQMP Template Section 4.2). For the LID DCV, the forms are ordered according to hierarchy of BMP selection as required by the MS4 Permit (see Section 5.3.1 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design and Hydrologic Source Controls (Form 4.3-2)
- Retention and Infiltration (Form 4.3-3)
- Harvested and Use (Form 4.3-4) or
- Biotreatment (Form 4.3-5).

At the end of each form, additional fields facilitate the determination of the extent of mitigation provided by the specific BMP category, allowing for use of the next category of BMP in the hierarchy, if necessary.

The first step in the analysis, using Section 5.3.2.1 of the TGD for WQMP, is to complete Forms 4.3-1 and 4.3-3) to determine if retention and infiltration BMPs are infeasible for the project. For each feasibility criterion in Form 4.3-1, if the answer is "Yes," provide all study findings that includes relevant calculations, maps, data sources, etc. used to make the determination of infeasibility.

Next, complete Forms 4.3-2 and 4.3-4 to determine the feasibility of applicable HSC and harvest and use BMPs, and, if their implementation is feasible, the extent of mitigation of the DCV.

If no site constraints exist that would limit the type of BMP to be implemented in a DA, evaluate the use of combinations of LID BMPs, including all applicable HSC BMPs to maximize on-site retention of the DCV. If no combination of BMP can mitigate the entire DCV, implement the single BMP type, or combination of BMP types, that maximizes on-site retention of the DCV within the minimum effective area.

If the combination of LID HSC, retention and infiltration, and harvest and use BMPs are unable to mitigate the entire DCV, then biotreatment BMPs may be implemented by the project proponent. If biotreatment BMPs are used, then they must be sized to provide sufficient capacity for effective treatment of the remainder of the volume-based performance criteria that cannot be achieved with LID BMPs (TGD for WQMP Section 5.4.4.2). **Under no circumstances shall any portion of the DCV be released from the site without effective mitigation and/or treatment**.

Form 4.3-1 Infiltration BMP Feasibility (DA 1)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

[1] Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒
Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒
(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)

[3] Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[4] Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒
See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

[7] Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒
If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.

[8] Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒
If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP. If no, then proceed to Item 9, below.

[9] All answers to Item 1 through Item 6 are "No":
Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP. Proceed to Form 4.3-2, Hydrologic Source Control BMP.

Form 4.3-1 Infiltration BMP Feasibility (DA 2)

Feasibility Criterion – Complete evaluation for each DA on the Project Site

[1] Would infiltration BMP pose significant risk for groundwater related concerns? Yes ☐ No ☒
Refer to Section 5.3.2.1 of the TGD for WQMP

If Yes, Provide basis: (attach)

[2] Would installation of infiltration BMP significantly increase the risk of geotechnical hazards? Yes ☐ No ☒
(Yes, if the answer to any of the following questions is yes, as established by a geotechnical expert):

- The location is less than 50 feet away from slopes steeper than 15 percent
- The location is less than eight feet from building foundations or an alternative setback.
- A study certified by a geotechnical professional or an available watershed study determines that stormwater infiltration would result in significantly increased risks of geotechnical hazards.

If Yes, Provide basis: (attach)

[3] Would infiltration of runoff on a Project site violate downstream water rights? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[4] Is proposed infiltration facility located on hydrologic soil group (HSG) D soils or does the site geotechnical investigation indicate presence of soil characteristics, which support categorization as D soils? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[5] Is the design infiltration rate, after accounting for safety factor of 2.0, below proposed facility less than 0.3 in/hr (accounting for soil amendments)? Yes ☐ No ☒

If Yes, Provide basis: (attach)

[6] Would on-site infiltration or reduction of runoff over pre-developed conditions be partially or fully inconsistent with watershed management strategies as defined in the WAP, or impair beneficial uses? Yes ☐ No ☒
See Section 3.5 of the TGD for WQMP and WAP

If Yes, Provide basis: (attach)

[7] Any answer from Item 1 through Item 3 is "Yes": Yes ☐ No ☒
If yes, infiltration of any volume is not feasible onsite. Proceed to Form 4.3-4, Harvest and Use BMP. If no, then proceed to Item 8 below.

[8] Any answer from Item 4 through Item 6 is "Yes": Yes ☐ No ☒
If yes, infiltration is permissible but is not required to be considered. Proceed to Form 4.3-2, Hydrologic Source Control BMP.
If no, then proceed to Item 9, below.

[9] All answers to Item 1 through Item 6 are "No":
Infiltration of the full DCV is potentially feasible, LID infiltration BMP must be designed to infiltrate the full DCV to the MEP.
Proceed to Form 4.3-2, Hydrologic Source Control BMP.

4.3.1 Site Design Hydrologic Source Control BMP

Section XI.E. of the Permit emphasizes the use of LID preventative measures; and the use of LID HSC BMPs reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable HSC shall be provided except where they are mutually exclusive with each other, or with other BMPs. Mutual exclusivity may result from overlapping BMP footprints such that either would be potentially feasible by itself, but both could not be implemented. Please note that while there are no numeric standards regarding the use of HSC, if a project cannot feasibly meet BMP sizing requirements or cannot fully address HCOCs, feasibility of all applicable HSC must be part of demonstrating that the BMP system has been designed to retain the maximum feasible portion of the DCV. Complete Form 4.3-2 to identify and calculate estimated retention volume from implementing site design HSC BMP. Refer to Section 5.4.1 in the TGD for more detailed guidance.

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA 1)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3): 0 $V_{retention}$ *=Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) $V_{retention}$ *= (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3): 0 $V_{retention}$ *=Sum of Item 12 for all BMPs*			

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 1)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) $V_{retention}$ *= Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): 0 $V_{retention}$ *=Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 22-25. If no, proceed to Item 26*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) $V_{retention}$ *= Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): 0 $V_{retention}$ *= Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrel/cisterns: Yes☐ No ☒ *If yes, complete Items 27-29; If no, proceed to Item 30*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
27 Number of rain barrels/cisterns			
28 Runoff volume retention from rain barrels/cisterns (ft^3) $V_{retention}$ *= Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): 0 $V_{retention}$ *=Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: 0 *Sum of Items 5, 13, 20, 25 and 29*			

Form 4.3-2 Site Design Hydrologic Source Control BMPs (DA 2)

1 Implementation of Impervious Area Dispersion BMP (i.e. routing runoff from impervious to pervious areas), excluding impervious areas planned for routing to on-lot infiltration BMP: Yes ☐ No ☒ *If yes, complete Items 2-5; If no, proceed to Item 6*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Total impervious area draining to pervious area (ft^2)			
3 Ratio of pervious area receiving runoff to impervious area			
4 Retention volume achieved from impervious area dispersion (ft^3) *V = Item2 * Item 3 * (0.5/12), assuming retention of 0.5 inches of runoff*			
5 Sum of retention volume achieved from impervious area dispersion (ft^3): 0 $V_{retention}$ *=Sum of Item 4 for all BMPs*			
6 Implementation of Localized On-lot Infiltration BMPs (e.g. on-lot rain gardens): Yes ☐ No ☒ *If yes, complete Items 7-13 for aggregate of all on-lot infiltration BMP in each DA; If no, proceed to Item 14*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
7 Ponding surface area (ft^2)			
8 Ponding depth (ft)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft)			
11 Average porosity of amended soil/gravel			
12 Retention volume achieved from on-lot infiltration (ft^3) $V_{retention}$ *= (Item 7 *Item 8) + (Item 9 * Item 10 * Item 11)*			
13 Runoff volume retention from on-lot infiltration (ft^3): 0 $V_{retention}$ *=Sum of Item 12 for all BMPs*			

Form 4.3-2 cont. Site Design Hydrologic Source Control BMPs (DA 2)

14 Implementation of evapotranspiration BMP (green, brown, or blue roofs): Yes ☐ No ☒ *If yes, complete Items 15-20. If no, proceed to Item 21*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Rooftop area planned for ET BMP (ft^2)			
16 Average wet season ET demand (in/day) *Use local values, typical ~ 0.1*			
17 Daily ET demand (ft^3/day) *Item 15 * (Item 16 / 12)*			
18 Drawdown time (hrs) *Copy Item 6 in Form 4.2-1*			
19 Retention Volume (ft^3) $V_{retention}$ *= Item 17 * (Item 18 / 24)*			
20 Runoff volume retention from evapotranspiration BMPs (ft^3): 0 $V_{retention}$ *=Sum of Item 19 for all BMPs*			
21 Implementation of Street Trees: Yes ☐ No ☒ *If yes, complete Items 22-25. If no, proceed to Item 26*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
22 Number of Street Trees			
23 Average canopy cover over impervious area (ft^2)			
24 Runoff volume retention from street trees (ft^3) $V_{retention}$ *= Item 22 * Item 23 * (0.05/12) assume runoff retention of 0.05 inches*			
25 Runoff volume retention from street tree BMPs (ft^3): 0 $V_{retention}$ *= Sum of Item 24 for all BMPs*			
26 Implementation of residential rain barrel/cisterns: Yes☐ No ☒ *If yes, complete Items 27-29; If no, proceed to Item 30*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
27 Number of rain barrels/cisterns			
28 Runoff volume retention from rain barrels/cisterns (ft^3) $V_{retention}$ *= Item 27 * 3*			
29 Runoff volume retention from residential rain barrels/Cisterns (ft3): 0 $V_{retention}$ *=Sum of Item 28 for all BMPs*			
30 Total Retention Volume from Site Design Hydrologic Source Control BMPs: 0 *Sum of Items 5, 13, 20, 25 and 29*			

4.3.2 Infiltration BMPs

Use Form 4.3-3 to compute on-site retention of runoff from proposed retention and infiltration BMPs. Volume retention estimates are sensitive to the percolation rate used, which determines the amount of runoff that can be infiltrated within the specified drawdown time. The infiltration safety factor reduces field measured percolation to account for potential inaccuracy associated with field measurements, declining BMP performance over time, and compaction during construction. Appendix D of the TGD for WQMP provides guidance on estimating an appropriate safety factor to use in Form 4.3-3.

If site constraints limit the use of BMPs to a single type and implementation of retention and infiltration BMPs mitigate no more than 40% of the DCV, then they are considered infeasible and the Project Proponent may evaluate the effectiveness of BMPs lower in the LID hierarchy of use (Section 5.5.1 of the TGD for WQMP)

If implementation of infiltrations BMPs is feasible as determined using Form 4.3-1, then LID infiltration BMPs shall be implemented to the MEP (section 4.1 of the TGD for WQMP).

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Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 27,084 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*			
BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 1 DMA BMP Type Underground Infiltration	DA DMA BMP Type	DA DMA BMP Type
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	7.98		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	3.99		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	N/A		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	N/A		
8 Infiltrating surface area, SA_{BMP} (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	3,660		
9 Amended soil depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	N/A		
10 Amended soil porosity	N/A		
11 Gravel depth, d_{media} (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	N/A		
12 Gravel porosity	0.35		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	N/A		
15 Underground Retention Volume (ft^3) ***Formula from Table 5-4 of the TGD: Vret = (Pdesign / 12 * SAinf * Tfill) + (SAreservoir * dreservoir * naggregate)***	27,148 (See WQMP Site Plan for calculations)		
16 Total Retention Volume from LID Infiltration BMPs: 27,148 (ft^3) *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*			
17 Fraction of DCV achieved with infiltration BMP: 100.2% *Retention% = Item 16 / Form 4.2-1 Item 7*			
18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐ *If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.*			

Form 4.3-3 Infiltration LID BMP - including underground BMPs (DA 2)

1 Remaining LID DCV not met by site design HSC BMP (ft^3): 876 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30*

BMP Type *Use columns to the right to compute runoff volume retention from proposed infiltration BMP (select BMP from Table 5-4 in TGD for WQMP) - Use additional forms for more BMPs*	DA 2 DMA BMP Type Underground Infiltration	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix D of the TGD for WQMP for minimum requirements for assessment methods*	7.98		
3 Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2		
4 Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	3.99		
5 Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48		
6 Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*	N/A		
7 Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*	N/A		
8 Infiltrating surface area, *SA_{BMP}* (ft^2) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*	200		
9 Amended soil depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 in the TGD for WQMP for reference to BMP design details*	N/A		
10 Amended soil porosity	N/A		
11 Gravel depth, *d_{media}* (ft) *Only included in certain BMP types, see Table 5-4 of the TGD for WQMP for BMP design details*	N/A		
12 Gravel porosity	0.35		
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*	3		
14 Above Ground Retention Volume (ft^3) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*	N/A		
15 Underground Retention Volume (ft^3) ***Formula from Table 5-4 of the TGD: Vret = (Pdesign / 12 * SAinf * Tfill) + (SAreservoir * dreservoir * naggregate)***	1,484 (See WQMP Site Plan for calculations)		

16 Total Retention Volume from LID Infiltration BMPs: 1,484 (ft^3) *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

17 Fraction of DCV achieved with infiltration BMP: 169% *Retention% = Item 16 / Form 4.2-1 Item 7*

18 Is full LID DCV retained onsite with combination of hydrologic source control and LID retention/infiltration BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10; If no, then reduce Item 3, Factor of Safety to 2.0 and increase Item 8, Infiltrating Surface Area, such that the portion of the site area used for retention and infiltration BMPs equals or exceeds the minimum effective area thresholds (Table 5-7 of the TGD for WQMP) for the applicable category of development and repeat all above calculations.

4.3.3 Harvest and Use BMP

Harvest and use BMP may be considered if the full LID DCV cannot be met by maximizing infiltration BMPs. Use Form 4.3-4 to compute on-site retention of runoff from proposed harvest and use BMPs.

Volume retention estimates for harvest and use BMPs are sensitive to the on-site demand for captured stormwater. Since irrigation water demand is low in the wet season, when most rainfall events occur in San Bernardino County, the volume of water that can be used within a specified drawdown period is relatively low. The bottom portion of Form 4.3-4 facilitates the necessary computations to show infeasibility if a minimum incremental benefit of 40 percent of the LID DCV would not be achievable with MEP implementation of on-site harvest and use of stormwater (Section 5.5.4 of the TGD for WQMP).

Form 4.3-4 Harvest and Use BMPs (DA 1)

1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3): 0 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16*			
BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Describe cistern or runoff detention facility			
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*			
4 Landscaped area planned for use of harvested stormwater (ft^2)			
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day			
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*			
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*			
8 Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*			
9 Total Retention Volume (ft^3) from Harvest and Use BMP *Sum of Item 8 for all harvest and use BMP included in plan*			
10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest & use BMPs? Yes ☒ No ☐ *If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.*			

Form 4.3-4 Harvest and Use BMPs (DA 2)

1 Remaining LID DCV not met by site design HSC or infiltration BMP (ft^3): 0

V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16

BMP Type(s) *Compute runoff volume retention from proposed harvest and use BMP (Select BMPs from Table 5-4 of the TGD for WQMP) - Use additional forms for more BMPs*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
2 Describe cistern or runoff detention facility			
3 Storage volume for proposed detention type (ft^3) *Volume of cistern*			
4 Landscaped area planned for use of harvested stormwater (ft^2)			
5 Average wet season daily irrigation demand (in/day) Use local values, typical ~ 0.1 in/day			
6 Daily water demand (ft^3/day) *Item 4 * (Item 5 / 12)*			
7 Drawdown time (hrs) *Copy Item 6 from Form 4.2-1*			
8 Retention Volume (ft^3) *$V_{retention}$ = Minimum of (Item 3) or (Item 6 * (Item 7 / 24))*			

9 Total Retention Volume (ft^3) from Harvest and Use BMP *Sum of Item 8 for all harvest and use BMP included in plan*

10 Is the full DCV retained with a combination of LID HSC, retention and infiltration, and harvest & use BMPs? Yes ☒ No ☐

If yes, demonstrate conformance using Form 4.3-10. If no, then re-evaluate combinations of all LID BMP and optimize their implementation such that the maximum portion of the DCV is retained on-site (using a single BMP type or combination of BMP types). If the full DCV cannot be mitigated after this optimization process, proceed to Section 4.3.4.

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration, and harvest and use BMPs. A key consideration when using biotreatment BMP is the effectiveness of the proposed BMP in addressing the pollutants of concern for the project (see Table 5-5 of the TGD for WQMP).

Use Form 4.3-5 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV w. Biotreatment computations are included as follows:

- Use Form 4.3-6 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-7 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-8 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 1)

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft^3): 0 *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*	List pollutants of concern *Copy from Form 2.3-1.*	
2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume*
	☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment
3 Volume biotreated in volume based biotreatment BMP (ft^3): 0 *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*
6 Flow-based biotreatment BMP capacity provided (cfs): 0 *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*		
7 Metrics for MEP determination: • Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*		

Form 4.3-5 Selection and Evaluation of Biotreatment BMP (DA 2)

1 Remaining LID DCV not met by site design HSC, infiltration, or harvest and use BMP for potential biotreatment (ft^3): 0 *Form 4.2-1 Item 7 - Form 4.3-2 Item 30 – Form 4.3-3 Item 16- Form 4.3-4 Item 9*

List pollutants of concern *Copy from Form 2.3-1.*

2 Biotreatment BMP Selected *(Select biotreatment BMP(s) necessary to ensure all pollutants of concern are addressed through Unit Operations and Processes, described in Table 5-5 of the TGD for WQMP)*	Volume-based biotreatment *Use Forms 4.3-6 and 4.3-7 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-8 to compute treated volume*
	☐ Bioretention with underdrain ☐ Planter box with underdrain ☐ Constructed wetlands ☐ Wet extended detention ☐ Dry extended detention	☐ Vegetated swale ☐ Vegetated filter strip ☐ Proprietary biotreatment

3 Volume biotreated in volume based biotreatment BMP (ft^3): 0 *Form 4.3-6 Item 15 + Form 4.3-7 Item 13*	**4** Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft^3): *Item 1 – Item 3*	**5** Remaining fraction of LID DCV for sizing flow based biotreatment BMP: % *Item 4 / Item 1*

6 Flow-based biotreatment BMP capacity provided (cfs): 0 *Use Figure 5-2 of the TGD for WQMP to determine flow capacity required to provide biotreatment of remaining percentage of unmet LID DCV (Item 5), for the project's precipitation zone (Form 3-1 Item 1)*

7 Metrics for MEP determination:

- Provided a WQMP with the portion of site area used for suite of LID BMP equal to minimum thresholds in Table 5-7 of the TGD for WQMP for the proposed category of development: ☐ *If maximized on-site retention BMPs is feasible for partial capture, then LID BMP implementation must be optimized to retain and infiltrate the maximum portion of the DCV possible within the prescribed minimum effective area. The remaining portion of the DCV shall then be mitigated using biotreatment BMP.*

Form 4.3-6 Volume Based Biotreatment (DA 1 & DA 2) – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type N/A *(Bioretention w/underdrain, planter box w/underdrain, other comparable BMP)*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*			
2 Amended soil infiltration rate *Typical ~ 5.0*			
3 Amended soil infiltration safety factor *Typical ~ 2.0*			
4 Amended soil design percolation rate (in/hr) P_{design} *= Item 2 / Item 3*			
5 Ponded water drawdown time (hr) *Copy Item 6 from Form 4.2-1*			
6 Maximum ponding depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Ponding Depth (ft) d_{BMP} *= Minimum of (1/12 * Item 4 * Item 5) or Item 6*			
8 Amended soil surface area (ft^2)			
9 Amended soil depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Amended soil porosity, *n*			
11 Gravel depth (ft) *see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
12 Gravel porosity, *n*			
13 Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			
14 Biotreated Volume (ft^3) $V_{biotreated}$ *= Item 8 * [(Item 7/2) + (Item 9 * Item 10) +(Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			
15 Total biotreated volume from bioretention and/or planter box with underdrains BMP: *Sum of Item 14 for all volume-based BMPs included in this form*			

Form 4.3-7 Volume Based Biotreatment (DA 1 & DA 2) – Constructed Wetlands and Extended Detention

Biotreatment BMP Type N/A *Constructed wetlands, extended wet detention, extended dry detention, or other comparable proprietary BMP. If BMP includes multiple modules (e.g. forebay and main basin), provide separate estimates for storage and pollutants treated in each module.*	DA DMA BMP Type		DA DMA BMP Type *(Use additional forms for more BMPs)*	
	Forebay	Basin	Forebay	Basin
1 Pollutants addressed with BMP forebay and basin *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in Table 5-5 of the TGD for WQMP*				
2 Bottom width (ft)				
3 Bottom length (ft)				
4 Bottom area (ft^2) A_{bottom} = *Item 2 * Item 3*				
5 Side slope (ft/ft)				
6 Depth of storage (ft)				
7 Water surface area (ft^2) $A_{surface}$ =*(Item 2 + (2 * Item 5 * Item 6)) * (Item 3 + (2 * Item 5 * Item 6))*				
8 Storage volume (ft^3) *For BMP with a forebay, ensure fraction of total storage is within ranges specified in BMP specific fact sheets, see Table 5-6 of the TGD for WQMP for reference to BMP design details* V =*Item 6 / 3 * [Item 4 + Item 7 + (Item 4 * Item 7)^0.5]*				
9 Drawdown Time (hrs) *Copy Item 6 from Form 2.1*				
10 Outflow rate (cfs) Q_{BMP} = *(Item* $8_{forebay}$ + *Item* 8_{basin}*) / (Item 9 * 3600)*				
11 Duration of design storm event (hrs)				
12 Biotreated Volume (ft^3) $V_{biotreated}$ = *(Item* $8_{forebay}$ + *Item* 8_{basin}*) +(Item 10 * Item 11 * 3600)*				
13 Total biotreated volume from constructed wetlands, extended dry detention, or extended wet detention : *(Sum of Item 12 for all BMP included in plan)*				

Form 4.3-8 Flow Based Biotreatment (DA 1 & DA 2)

Biotreatment BMP Type N/A *Vegetated swale, vegetated filter strip, or other comparable proprietary BMP*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
1 Pollutants addressed with BMP *List all pollutant of concern that will be effectively reduced through specific Unit Operations and Processes described in TGD Table 5-5*			
2 Flow depth for water quality treatment (ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
3 Bed slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
4 Manning's roughness coefficient			
5 Bottom width (ft) b_w *= (Form 4.3-5 Item 6 * Item 4) / (1.49 * Item 2^1.67 * Item 3^0.5)*			
6 Side Slope (ft/ft) *BMP specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
7 Cross sectional area (ft^2) *A = (Item 5 * Item 2) + (Item 6 * Item 2^2)*			
8 Water quality flow velocity (ft/sec) *V = Form 4.3-5 Item 6 / Item 7*			
9 Hydraulic residence time (min) *Pollutant specific, see Table 5-6 of the TGD for WQMP for reference to BMP design details*			
10 Length of flow based BMP (ft) *L = Item 8 * Item 9 * 60*			
11 Water surface area at water quality flow depth (ft^2) SA_{top} *= (Item 5 + (2 * Item 2 * Item 6)) * Item 10*			

4.3.5 Conformance Summary

Complete Form 4.3-9 to demonstrate how on-site LID DCV is met with proposed site design hydrologic source control, infiltration, harvest and use, and/or biotreatment BMP. The bottom line of the form is used to describe the basis for infeasibility determination for on-site LID BMP to achieve full LID DCV, and provides methods for computing remaining volume to be addressed in an alternative compliance plan. If the project has more than one outlet, then complete additional versions of this form for each outlet.

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)

1 Total LID DCV for the Project DA-1 (ft^3): 27,084 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 27,148 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): 0 *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): 0 *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

Form 4.3-9 Conformance Summary and Alternative Compliance Volume Estimate (DA 2)

1 Total LID DCV for the Project DA-1 (ft^3): 876 *Copy Item 7 in Form 4.2-1*

2 On-site retention with site design hydrologic source control LID BMP (ft^3): 0 *Copy Item 30 in Form 4.3-2*

3 On-site retention with LID infiltration BMP (ft^3): 1,484 *Copy Item 16 in Form 4.3-3*

4 On-site retention with LID harvest and use BMP (ft^3): 0 *Copy Item 9 in Form 4.3-4*

5 On-site biotreatment with volume based biotreatment BMP (ft^3): 0 *Copy Item 3 in Form 4.3-5*

6 Flow capacity provided by flow based biotreatment BMP (cfs): 0 *Copy Item 6 in Form 4.3-5*

7 LID BMP performance criteria are achieved if answer to any of the following is "Yes":

- Full retention of LID DCV with site design HSC, infiltration, or harvest and use BMP: Yes ☒ No ☐
  If yes, sum of Items 2, 3, and 4 is greater than Item 1
- Combination of on-site retention BMPs for a portion of the LID DCV and volume-based biotreatment BMP that address all pollutants of concern for the remaining LID DCV: Yes ☐ No ☒
  If yes, a) sum of Items 2, 3, 4, and 5 is greater than Item 1, and Items 2, 3 and 4 are maximized; or b) Item 6 is greater than Form 4.3--5 Item 6 and Items 2, 3 and 4 are maximized
- On-site retention and infiltration is determined to be infeasible and biotreatment BMP provide biotreatment for all pollutants of concern for full LID DCV: Yes ☐ No ☒
  If yes, Form 4.3-1 Items 7 and 8 were both checked yes

8 If the LID DCV is not achieved by any of these means, then the project may be allowed to develop an alternative compliance plan. Check box that describes the scenario which caused the need for alternative compliance:

- Combination of HSC, retention and infiltration, harvest and use, and biotreatment BMPs provide less than full LID DCV capture: ☐
  Checked yes for Form 4.3-5 Item 7, Item 6 is zero, and sum of Items 2, 3, 4, and 5 is less than Item 1. If so, apply water quality credits and calculate volume for alternative compliance, V_{alt} *= (Item 1 – Item 2 – Item 3 – Item 4 – Item 5) * (100 - Form 2.4-1 Item 2)%*
- An approved Watershed Action Plan (WAP) demonstrates that water quality and hydrologic impacts of urbanization are more effective when managed in at an off-site facility: ☐
  Attach appropriate WAP section, including technical documentation, showing effectiveness comparisons for the project site and regional watershed

4.3.6 Hydromodification Control BMP

Use Form 4.3-10 to compute the remaining runoff volume retention, after LID BMP are implemented, needed to address HCOC, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential HCOC. Describe hydromodification control BMP that address HCOC, which may include off-site BMP and/or in-stream controls. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-10 Hydromodification Control BMPs (DA 1)

1 Volume reduction needed for HCOC performance criteria (ft^3): 24,098 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): 27,148 *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*
3 Remaining volume for HCOC volume capture (ft^3): -3,050 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): 0 *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☒ **(See Hydrology Report attached hereto as Appendix O in Section 6.4.)**
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☒ **(See Hydrology Report attached hereto as Appendix O in Section 6.4.)**
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

Form 4.3-10 Hydromodification Control BMPs (DA 2)

1 Volume reduction needed for HCOC performance criteria (ft^3): 1,052 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*

2 On-site retention with site design hydrologic source control, infiltration, and harvest and use LID BMP (ft^3): 1,484 *Sum of Form 4.3-9 Items 2, 3, and 4 Evaluate option to increase implementation of on-site retention in Forms 4.3-2, 4.3-3, and 4.3-4 in excess of LID DCV toward achieving HCOC volume reduction*

3 Remaining volume for HCOC volume capture (ft^3): -432
Item 1 – Item 2

4 Volume capture provided by incorporating additional on-site or off-site retention BMPs (ft^3): 0 *Existing downstream BMP may be used to demonstrate additional volume capture (if so, attach to this WQMP a hydrologic analysis showing how the additional volume would be retained during a 2-yr storm event for the regional watershed)*

5 If Item 4 is less than Item 3, incorporate in-stream controls on downstream waterbody segment to prevent impacts due to hydromodification ☐ *Attach in-stream control BMP selection and evaluation to this WQMP*

6 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☐ No ☒

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate increase in time of concentration achieved by proposed LID site design, LID BMP, and additional on-site or off-site retention BMP ☒ **(See Hydrology Report attached hereto as Appendix O in Section 6.4.)**
  BMP upstream of a waterbody segment with a potential HCOC may be used to demonstrate increased time of concentration through hydrograph attenuation (if so, show that the hydraulic residence time provided in BMP for a 2-year storm event is equal or greater than the addition time of concentration requirement in Form 4.2-4 Item 15)
- Increase time of concentration by preserving pre-developed flow path and/or increase travel time by reducing slope and increasing cross-sectional area and roughness for proposed on-site conveyance facilities ☐
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

7 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☐ No ☒

If yes, HCOC performance criteria is achieved. If no, select one or more mitigation options below:

- Demonstrate reduction in peak runoff achieved by proposed LID site design, LID BMPs, and additional on-site or off-site retention BMPs ☒ **(See Hydrology Report attached hereto as Appendix O in Section 6.4.)**
  BMPs upstream of a waterbody segment with a potential HCOC may be used to demonstrate additional peak runoff reduction through hydrograph attenuation (if so, attach to this WQMP, a hydrograph analysis showing how the peak runoff would be reduced during a 2-yr storm event)
- Incorporate appropriate in-stream controls for downstream waterbody segment to prevent impacts due to hydromodification, in a plan approved and signed by a licensed engineer in the State of California ☐

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, harvest and use, or biotreat the DCV via on-site LID practices. A project proponent must develop an alternative compliance plan to address the remainder of the LID DCV. Depending on project type some projects may qualify for water quality credits that can be applied to reduce the DCV that must be treated prior to development of an alternative compliance plan (see Form 2.4-1, Water Quality Credits). Form 4.3-9 Item 8 includes instructions on how to apply water quality credits when computing the DCV that must be met through alternative compliance. Alternative compliance plans may include one or more of the following elements:

- On-site structural treatment control BMP - All treatment control BMP should be located as close to possible to the pollutant sources and should not be located within receiving waters;
- Off-site structural treatment control BMP - Pollutant removal should occur prior to discharge of runoff to receiving waters;
- Urban runoff fund or In-lieu program, if available

Depending upon the proposed alternative compliance plan, approval by the executive officer may or may not be required (see Section 6 of the TGD for WQMP).

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMP included as part of the project WQMP are required to be maintained through regular scheduled inspection and maintenance (refer to Section 8, Post Construction BMP Requirements, in the TGD for WQMP). Fully complete Form 5-1 summarizing all BMP included in the WQMP. Attach additional forms as needed. The WQMP shall also include a detailed Operation and Maintenance Plan for all BMP and may require a Maintenance Agreement (consult the jurisdiction's LIP). If a Maintenance Agreement is required, it must also be attached to the WQMP.

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Responsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N1. Education of Property Owners, Tenants and Occupants on Stormwater BMPs	Soni 2012 Irrevocable Trusts (Owner)	The owner shall be familiar with the contents of this WQMP and shall provide BMP information materials to the first residents/occupants/tenants on management practices for residential developments that contribute to the protection of stormwater quality. (See Appendix K in Section 6.4 for the applicable BMP Educational Materials.) For developments with POA and residential projects of more than fifty (50) dwelling units, project conditions of approval will require that the POA periodically provide environmental awareness education materials, made available by the municipalities, to all members. Among other things, these materials will describe the use of chemicals (including household type) that should be limited to the property, with no discharge of wastes via hosing or other direct discharge to gutters, catch basins and storm drains. Educational materials are available from the San Bernardino Stormwater Program and can be downloaded at: http://www.sbcountystormwater.org/gov_out.html.	Frequency: Continuous
N2. Activity Restrictions	Soni 2012 Irrevocable Trusts (Owner)	The owner will implement use /activity restrictions for the project for the purpose of surface water quality protection through the use of conditions, covenants and restrictions (CCRs).	Frequency: Continuous
N3. Landscape Management BMPs	Soni 2012 Irrevocable Trusts (Owner)	The owner will identify on-going landscape maintenance requirements consistent with applicable local stormwater quality ordinances that will include fertilizer and/or pesticide application restrictions and mowing and trimmings containment and disposal.	Frequency: Continuous

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Responsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N4. BMP Maintenance	Soni 2012 Irrevocable Trusts (Owner)	The owner will be responsible for implementation of each non- structural BMP and scheduled cleaning and/or maintenance of all structural BMP facilities per this Form.	Frequency: Continuous
N6. Local Water Quality Ordinances	Soni 2012 Irrevocable Trusts (Owner)	The owner will comply with any applicable local water quality ordinances.	Frequency: Continuous
N7. Spill Contingency Plan	Soni 2012 Irrevocable Trusts (Owner)	The owner will prepare a Spill Contingency Plan based on specified types of building or suite occupancies. The Plan will mandate stockpiling of cleanup materials, notification of responsible agencies, disposal of cleanup materials, documentation, etc.	Frequency: Upon Occupancy
N10. Uniform Fire Code Implementation	Soni 2012 Irrevocable Trusts (Owner)	The owner shall require all residents to abide by the Uniform Fire Code.	Frequency: Continuous
N11. Litter / Debris Control Program	Soni 2012 Irrevocable Trusts (Owner)	The owner/POA will implement trash management and litter control procedures throughout the site aimed at reducing pollution of drainage water. The owner/POA may contract with its landscape maintenance firm to provide this service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting/reporting trash disposal violations by tenants/homeowners.	Frequency: Weekly
N14. Catch Basin Inspection Program	Soni 2012 Irrevocable Trusts (Owner)	On-site catch basins shall be inspected, cleaned and maintained on an annual basis, in the early fall prior to the start of the rainy season, and before and after all major storms. Catch basins shall be monitored for evidence of illegal dumping on an as-needed frequency.	Frequency: Annually, and before and after all major storms
N15. Vacuum Sweeping of Private Streets and Parking Lots	Soni 2012 Irrevocable Trusts (Owner)	The owner/POA will ensure that the project's drive aisles and parking areas will be swept on a monthly basis, or more often if necessary, using a vacuum assisted sweeper.	Frequency: Monthly, or more often if necessary
N17. Comply With All Other Applicable NPDES Permits	Soni 2012 Irrevocable Trusts (Owner)	The owner shall comply with the statewide General Construction Permit during the entire period of construction by filing an NOI and SWPPP with the State Water Board and complying with all BMP implementation and reporting requirements.	Frequency: Continuous

Form 5-1 BMP Inspection and Maintenance (use additional forms as necessary)

BMP	Responsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
S1. Storm Drain System Stenciling and Signage	Soni 2012 Irrevocable Trusts (Owner)	Provide storm drain system stenciling and signage. The stencil shall be blue on a white background with lettering 2-1/2'" in height and reading "No Dumping -Drains to River." A fish or similar water dependent creature silhouette may be included subject to City approval. In lieu of a stencil, a catch basin curb marker, circular or rectangular, at least 4" in height or diameter, may be used. The message will be the same and is subject to City approval. A painted circular stencil shall not be bigger than 8" in diameter. Legibility will be checked and repainted annually.	Frequency: Annually
S4. Use Efficient Irrigation Systems & Landscape Design	Soni 2012 Irrevocable Trusts (Owner)	Irrigation systems shall include reducers or shut off valves triggered by a pressure drop. Timers will be used to avoid over watering and watering cycles shall be adjusted seasonally. Plants with similar watering requirements will be grouped, and native or drought tolerant species will be used where appropriate.	Frequency: Continuous
S5. Finish Grade of Land-scaped Areas at a Minimum of 1-2 Inches Below Top of Curb, Sidewalk or Pavement	Soni 2012 Irrevocable Trusts (Owner)	Landscaped areas will be finish-graded at a minimum of 1-2 inches below top of curb or sidewalk for increased retention of stormwater/irrigation water.	Frequency: Continuous
LID BMP #1— Onsite Infiltration (Underground Chamber)	Soni 2012 Irrevocable Trusts (Owner)	Quarterly inspections of the underground infiltration BMPs shall be conducted utilizing the designed manholes/inspection ports. The BMPs shall be cleaned when inspection reveals that accumulated sediment or trash is clogging the system. Accumulated sediment and trash can be evacuated through the manholes.	Frequency: Quarterly And Immediately After Major Storm Events
LID BMP #2— Treatment Control Measures (Proprietary Catch Basin Insert Filters— Pretreatment for Onsite Infiltration)	Soni 2012 Irrevocable Trusts (Owner)	Twice a year, prior to and after the rainy season, and after major storm events, the catch basin insert filters shall be visually inspected for damage, have all sediment and debris removed, and the filter medium pouches shall be replaced if necessary. The owner may conduct this maintenance itself, or may enter into a service contract for the maintenance of the insert filters as detailed in the Kristar FloGard +Plus Specifications /Maintenance Requirements brochure, a copy of which is attached hereto as Appendix I in Section 6.4.	Frequency: Every Six Months (Approximately April 1st and October 1st) and Immediately After Major Storm Events

Section 6 WQMP Attachments

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

Appendix A: Vicinity Map / Existing Hydrologic Characteristics Map / Photos of Existing Site

Appendix B: Receiving Waters Map

Appendix C: San Bernardino County Project Site WAP Report

Appendix D: WQMP Site Plan

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (as described in their local Local Implementation Plan), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

Appendix E: Link to Electronic Version of Final WQMP, Water Quality Management Plan and Stormwater BMP Transfer, Access and Maintenance Agreement, Precise Grading Plans

6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

Appendix F: Operation and Maintenance (O & M) Plan

Appendix G: Record of BMP Implementation, Maintenance and Inspection

Appendix H: Water Quality Management Plan and Stormwater BMP Transfer, Access and Maintenance Agreement

6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C, C&R's & Lease Agreements

Appendix I: Kristar FloGard +PLUS Catch Basin Insert Filter Specifications (Pretreatment for Infiltration)

Appendix J: BMP Fact Sheet— INF-7: Underground Infiltration Fact Sheet (from Orange County TGD for Project WQMPs)

Appendix K: BMP Educational Materials

- **Commercial Landscape Maintenance Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Stormwater Management Practices for Commercial Landscape Maintenance Brochure (San Bernardino County Stormwater Program Website)**
- **Sustainable Practices for Landscape Maintenance Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **Construction & Development Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Regulatory Information Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Toxic Household Waste Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **Pet Waste Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **SC-35 Safer Alternative Products**
- **SC-41 Building & Grounds Maintenance**

- **SC-42 Building Repair and Construction**
- **SC-43 Parking / Storage Area Maintenance**
- **SC-44 Drainage System Maintenance**
- **SD-10 Site Design & Landscape Planning**
- **SD-12 Efficient Irrigation**
- **SD-13 Storm Drain Signage**

Appendix L: **NOAA Point Precipitation Frequency Estimate for 2 Year, 1 Hour Storm**

Appendix M: **TGR Geotechnical, Inc.'s Geotechnical Investigation Report, Northwest Corner of E. Colton Avenue and N. Wabash Avenue, Redlands, California 92374, APN 0168-291-02, dated April 8, 2022**

Appendix N: **Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 1); Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 2) (from Orange County TGD for Project WQMPs)**

Appendix O: **Preliminary Hydrology and Hydraulic Report for Madera at Citrus Trail Residential Project, NW Corner of E. Colton Avenue and Wabash Avenue, Redlands, California, 92374, dated July 13, 2022**

Appendix P: **Initial Time of Concentration Nomographs, San Bernardino County Hydrology Manual Figure D-1**

6.1. Site Plan and Drainage Plan

Include a site plan and drainage plan sheet set containing the following minimum information:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural Source Control BMP locations
- Site Design Hydrologic Source Control BMP locations
- LID BMP details
- Drainage delineations and flow information
- Drainage connections

APPENDICES INCLUDED IN SECTION 6.1 (Site Plan and Drainage Plan):

Appendix A: Vicinity Map / Existing Hydrologic Characteristics Map / Photos of Existing Site

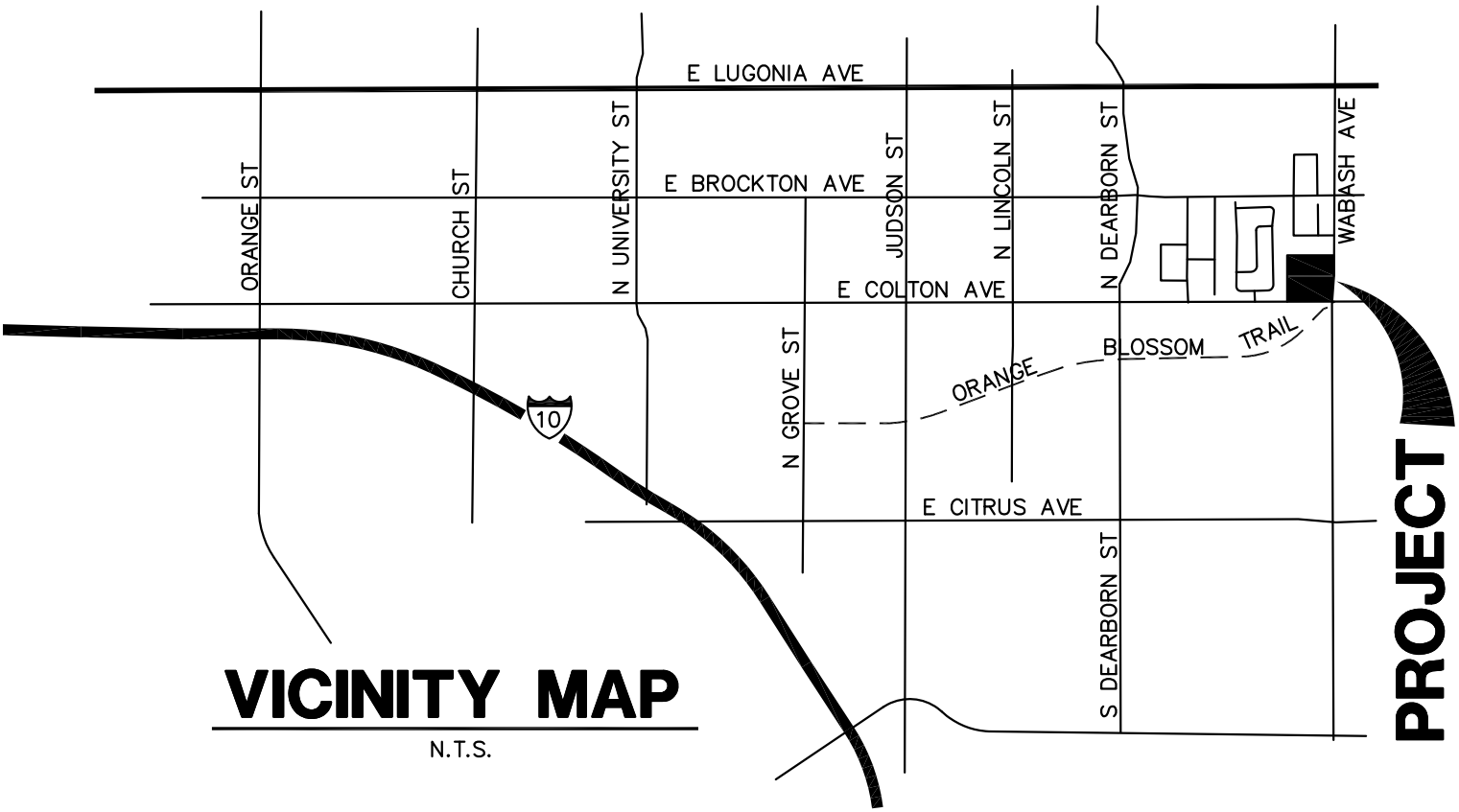
Appendix B: Receiving Waters Map

Appendix C: San Bernardino County Project Site WAP Report

Appendix D: WQMP Site Plan

APPENDIX A

Vicinity Map / Existing Hydrologic Characteristics Map / Photos of Existing Site



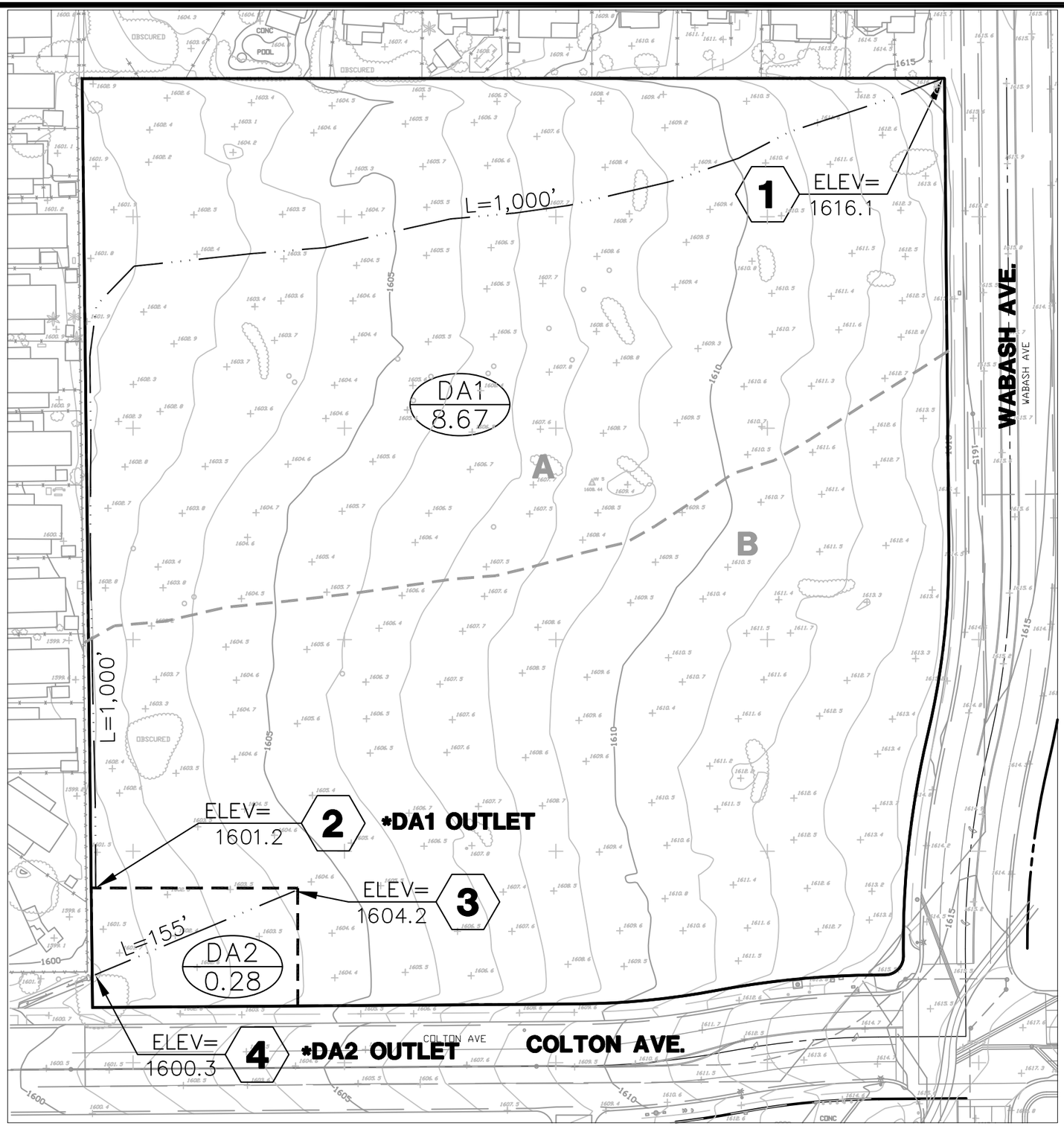
VICINITY MAP

N.T.S.

PROJECT ADDRESS

NW Corner of E. Colton Avenue and Wabash Avenue

Redlands, California



LEGEND:

NODE # — SOIL TYPE

ELEV. 527.8 — 4 — B

F.S. ELEVATION AT NODE(ft)

SITE BOUNDARY

SUBAREA BOUNDARY

SOIL TYPE BOUNDARY

L=205'

FLOWPATH

DA2 / 1.83 — SUBAREA DESIGNATION / TRIBUTARY AREA (AC.)

NORTH

0 — 80

SCALE: 1"=80'

CITY OF REDLANDS

EXISTING HYDROLOGIC CHARACTERISTICS MAP

COLTON & WABASH, REDLANDS

Southeast Corner of Project Site, Looking North



Southeast Corner of Project Site, Looking West



Near Southwest Corner of Project Site, Looking Northwest

Northeast Corner of Project Site, Looking West



Northeast Corner of Project Site, Looking South



2/2016
E Brockton Ave
Alpine Ct
Alpine Ct
Wabash Ave
Nice Ave
Opal Ave
Nice Ave
STOR-N-LOCK Self Storage
Mission Steel Fabrication
Merced St
Kensington Dr
Waterford Ave
Thurman Family Child Care
Redlands Ranch
E Colton Ave
E Colton Ave
E Colton Ave & Wabash Ave
E Colton Ave
E Colton
C & S Powder Coating
Vines Storage
Orchard Dr
Orange Grove Mobile Estates
P & R Paper, A Division of Imperial Dade
Wabash Ave
Opal Ave
Crafton Park
Del Flora Apartments Redlands
Independence Ave
Independence Ave
1985
Google Earth
Imagery Date: 2/9/2016 lat 34.065798° lon -117.141629° elev 1605 ft eye alt 5228 ft

4/2020
E Brockton Ave
Alpine Ct
Alpine Ct
Wabash Ave
Nice Ave
Opal Ave
Nice Ave
STOR-N-LOCK Self Storage
Mission Steel Fabrication
Merced St
Kensington Dr
Waterford Ave
Thurman Family Child Care
Redlands Ranch
E Colton Ave
E Colton Ave
E Colton Ave & Wabash Ave
E Colton Ave
E Colton
C & S Powder Coating
Vines Storage
Orchard Dr
Orange Grove Mobile Estates
Wabash Ave
Image © 2022 Maxar Technologies
Crafton Park
P & R Paper, A Division of Imperial Dade
Opal Ave
Del Flora Apartments Redlands
Independence Ave
Independence Ave
Google Earth
Imagery Date: 4/15/2020 lat 34.066177° lon -117.141762° elev 1600 ft eye alt 5228 ft

APPENDIX B

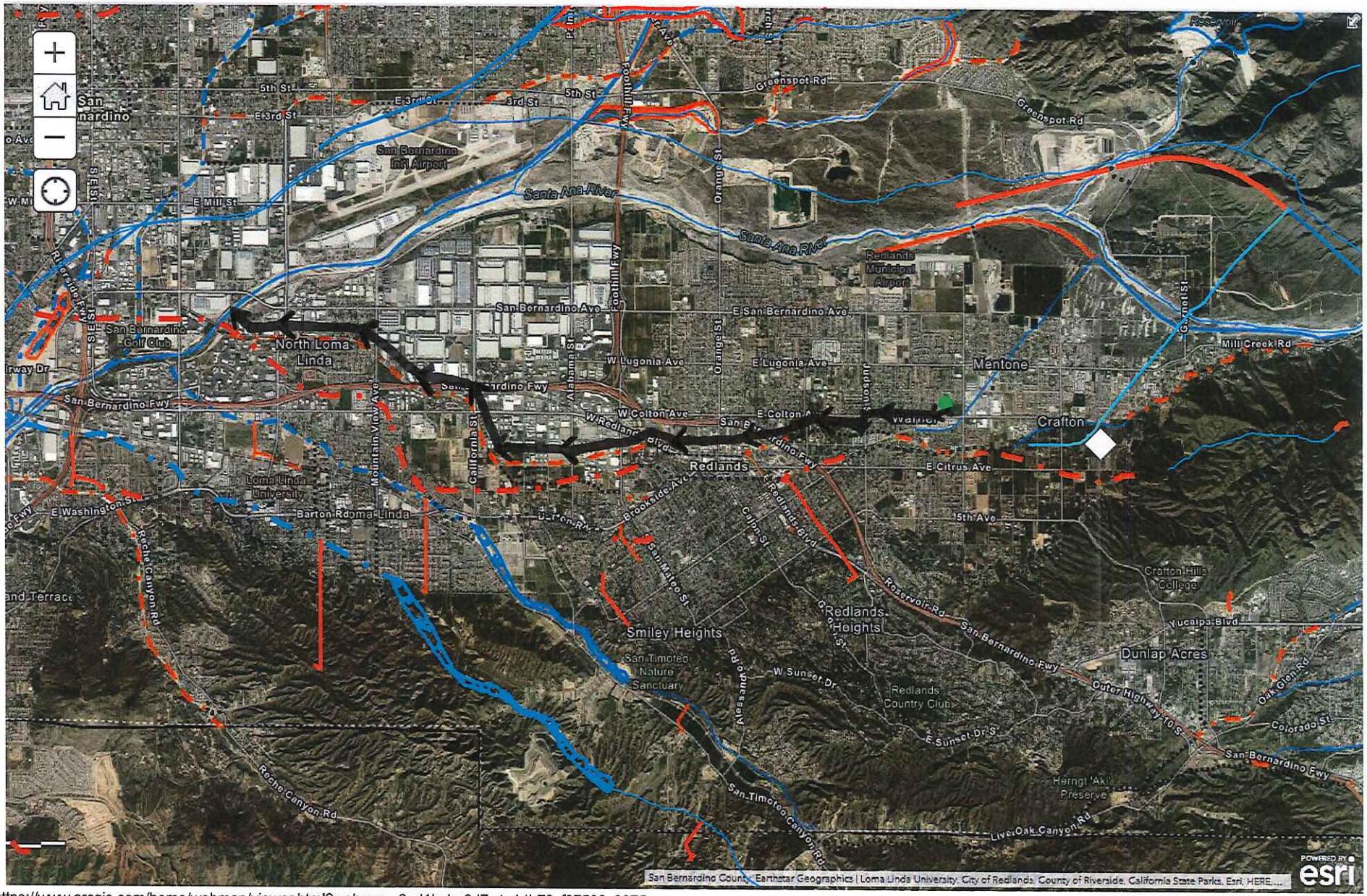
Receiving Waters Map

ArcGIS ▾ Flood Control Facilities

Details | Basemap |

Project Site: NW Corner of E. Colton Avenue and Wabash Avenue, Redlands, CA

Drainage Flow from Project Site to Santa Ana River



https://www.arcgis.com/home/webmap/viewer.html?webmap=6ed1bcba6d7c4e14b76cf07593c9875c

Receiving Waters Map

APPENDIX C

San Bernardino County Project Site
WAP Report



WQMP Project Report

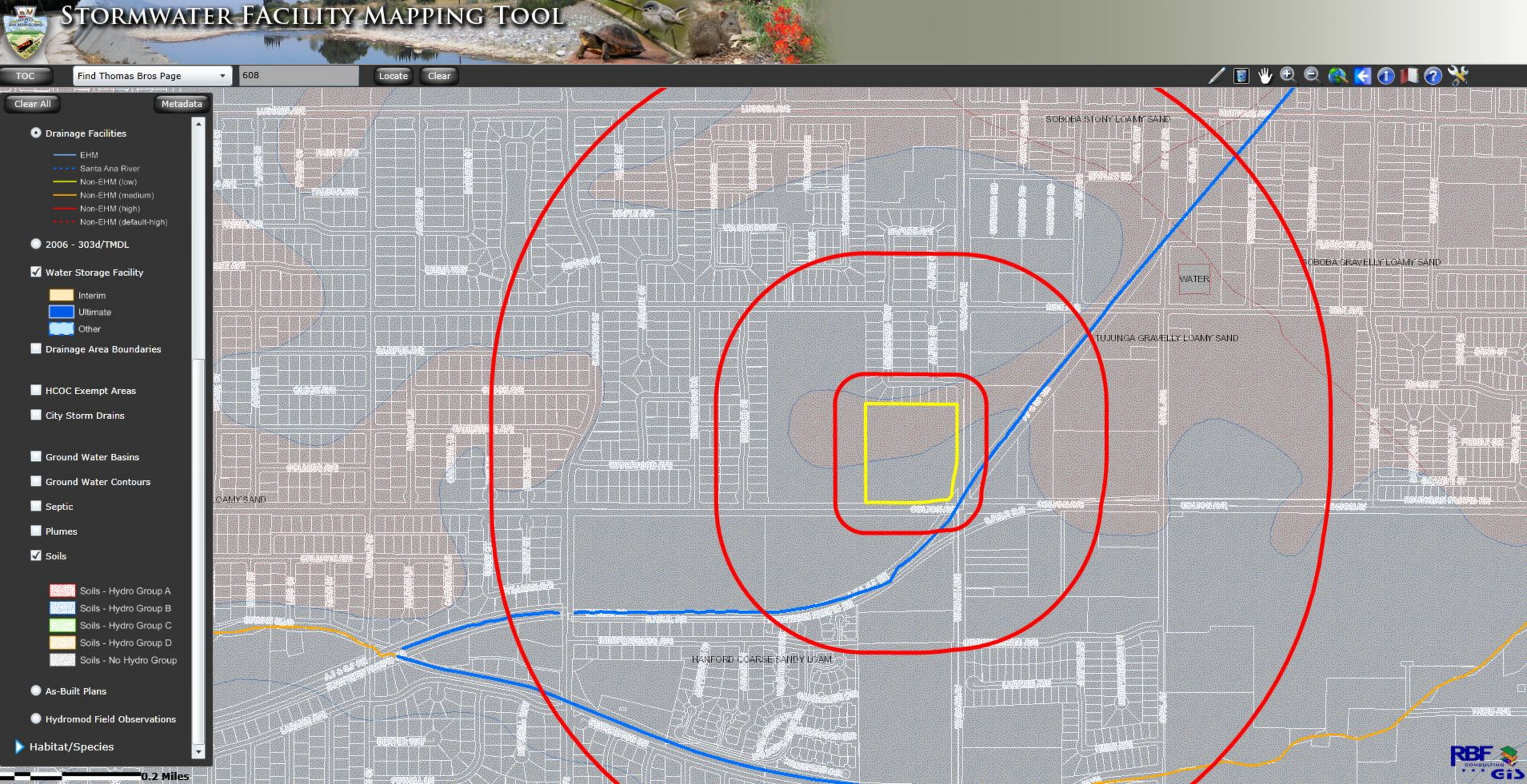
County of San Bernardino Stormwater Program

Santa Ana River Watershed Geodatabase

Tuesday, June 21, 2022

Note: The information provided in this report and on the Stormwater Geodatabase for the County of San Bernardino Stormwater Program is intended to provide basic guidance in the preparation of the applicant's Water Quality Management Plan (WQMP) and should not be relied upon without independent verification.

Project Site Parcel Number(s):	016829102
Project Site Acreage:	9
HCOC Exempt Area:	No
Closest Receiving Waters: (Applicant to verify based on local drainage facilities and topography.)	**System Number** - 0-000-00 **Facility Name** - **Owner** - SBCFCD
Closest channel segment's susceptibility to Hydromodification:	EHM
Highest downstream hydromodification susceptibility:	High
Is this drainage segment subject to TMDLs?	No
Are there downstream drainage segments subject to TMDLs?	No
Is this drainage segment a 303d listed stream?	No
Are there 303d listed streams downstream?	Yes
Are there unlined downstream waterbodies?	No
Project Site Onsite Soil Group(s):	A, B
Environmentally Sensitive Areas within 200':	None
Groundwater Depth (FT):	-171
Parcels with potential septic tanks within 1000':	No
Known Groundwater Contamination Plumes within 1000':	No
Studies and Reports Related to Project Site:	CSDP 4 CALC SHEET FOR HYDRO CSDP 4 Hydrological Design Criteria SBVMWD High Groundwater / Pressure Zone Area


STORMWATER FACILITY MAPPING TOOL
TOC
Find Thomas Bros Page
608
Locate
Clear
Clear All
Metadata
Drainage Facilities
EHM
Santa Ana River
Non-EHM (low)
Non-EHM (medium)
Non-EHM (high)
Non-EHM (default-high)
2006 - 303d/TMDL
Water Storage Facility
Interim
Ultimate
Other
Drainage Area Boundaries
HCOC Exempt Areas
City Storm Drains
Ground Water Basins
Ground Water Contours
Septic
Plumes
Soils
Soils - Hydro Group A
Soils - Hydro Group B
Soils - Hydro Group C
Soils - Hydro Group D
Soils - No Hydro Group
As-Built Plans
Hydromod Field Observations
Habitat/Species
0.2 Miles
SOBOBA STONY LOAMY SAND
WATER
SOBOBA GRAVELLY LOAMY SAND
TUJUNGA GRAVELLY LOAMY SAND
HANFORD COARSE SANDY LOAM
RBF CONSULTING GIS

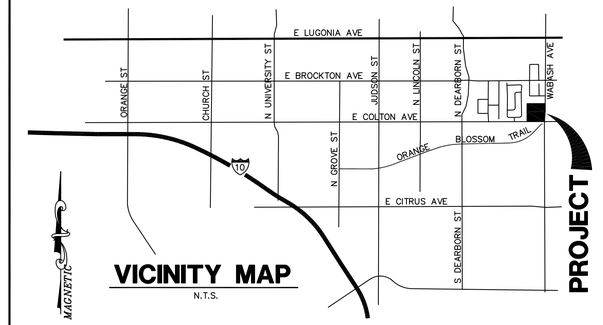
APPENDIX D

WQMP Site Plan



BMP LEGEND

- DRAINAGE AREAS **DA 1**
- SURFACE FLOW DIRECTION
- STORM DRAIN FLOW DIRECTION
- UNDERGROUND INFILTRATION PIPE PER DETAIL HEREON
- LANDSCAPE AREA EFFICIENT IRRIGATION
  LANDSCAPE AREA RUNOFF-MINIMIZING DESIGN
- PROPOSED BUILDING
- ASPHALT CONCRETE DRIVE AISLES
- CONCRETE DRIVEWAY APPROACH
- CATCH BASIN WITH INSERT FILTER & STORM DRAIN STENCIL SIGNAGE



VICINITY MAP

N.T.S.

PROJECT DATA:

TOTAL SITE AREA OF PROPOSED DEVELOPMENT: 9.01 AC (392,503 SF)

BUILDING AREA: 122,630 SF
DRIVEWAYS / DRIVE AISLES / PARKING AREAS: 95,896 SF
WALKWAYS / CONC. HARDSCAPE: 95,476 SF

78,501 SF LANDSCAPING PROVIDED (20.0% PERVIOUS AREA)

CURRENT USE: VACANT
PROPOSED USE: RESIDENTIAL

WATERSHED:
SANTA ANA RIVER

LID DCV CALCULATION

AREA 1

AREA – 8.73 AC (380,199 SF)
RUNOFF COEFFICIENT (80% IMPERVIOUS)
C = 0.858 * (0.80)^3 –0.78 * (0.80)^2 + 0.774 * (0.80) + .04 = 0.599
2YR 1 HR STORM – 0.491 IN
P6 = 1.4807 * 0.491 = 0.727 IN
DCV = 380,199 SF * 0.599 * 0.727 IN / 12IN/FT * 1.963 = 27,084 CF

BMP VOLUME CALCULATION

BMP VOLUME
PIPE CROSS SECTIONAL AREA – (50.26) * 2 CF/LF = 100.52 CF/LF
ROCK CROSS SECTIONAL AREA – 79.48 CF/LF ROCK AREA * .35 = 27.82 CF/LF
TOTAL CROSS SECTIONAL AREA – 128.34 CF/LF * 183 LF = 23,486 CF
EFFECTIVE DEPTH – 23,486 CF / 3,660 SF BOTTOM = 6.42'

Vret = (Pdesign/12 * SAinf * Tfill) + (SAres * Dres * Nagg)
Pdesign = 7.98" MEASURED / 2.00 S.F. = 3.99"/HR
SAinf = 3,660 SF
SAres = 3,660 SF
Tfill = 3 HRS
Dres = EFFECTIVE DEPTH = 6.42'
Nagg = 1.0 (EFFECTIVE DEPTH ACCOUNTED FOR ROCK)
Vret = (3.99/12 * 3,660 * 3) + (3,660 * 6.42 * 1)
Vret = 27,148 CF
BMP VOLUME (27,148 CF) > DCV VOLUME (27,084 CF)

EXISTING CN = 38 (AREA WEIGHTED)
PROPOSED CN = 84.8 (AREA WEIGHTED)
V_{HCOC}= VOLUME REDUCTION NEEDED TO MEET HCOC REQUIREMENTS
PRE-RV = PRE-DEVELOPED RUNOFF VOLUME = 2,615 CF
POST-RV = POST DEVELOPED RUNOFF VOLUME = 28,119 CF
V_{HCOC}= (POST-RV * 0.95) – PRE-RV = (28,199 CF * 0.95) – 2,615 CF
= 24,098 CF
BMP VOLUME (27,148 CF) > V_{HCOC} (24,098 CF)

LID DCV CALCULATION

AREA 2

AREA – 0.28 AC (12,304 SF)
RUNOFF COEFFICIENT (80% IMPERVIOUS)
C = 0.858 * (0.80)^3 –0.78 * (0.80)^2 + 0.774 * (0.80) + .04 = 0.599
2YR 1 HR STORM – 0.491 IN
P6 = 1.4807 * 0.594 = 0.727 IN
DCV = 12,304 SF * 0.599 * 0.727 IN / 12IN/FT * 1.963 = 876 CF

BMP VOLUME CALCULATION

BMP VOLUME
PIPE CROSS SECTIONAL AREA – (50.26) CF/LF
ROCK CROSS SECTIONAL AREA – 39.74 CF/LF ROCK AREA * .35 = 13.91 CF/LF
TOTAL CROSS SECTIONAL AREA – 64.17 CF/LF * 20 LF = 1,283 CF
EFFECTIVE DEPTH – 1,283 CF / 200 SF BOTTOM = 6.42'

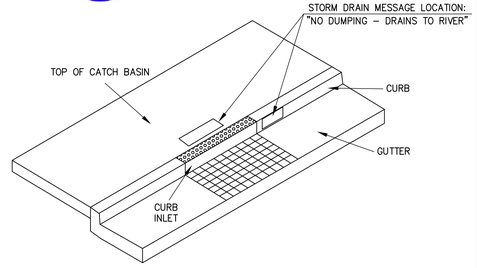
Vret = (Pdesign/12 * SAinf * Tfill) + (SAres * Dres * Nagg)
Pdesign = 7.98" MEASURED / 2.00 S.F. = 3.99"/HR
SAinf = 200 SF
SAres = 200 SF
Tfill = 3 HRS
Dres = EFFECTIVE DEPTH = 6.42'
Nagg = 1.0 (EFFECTIVE DEPTH ACCOUNTED FOR ROCK)
Vret = (3.99/12 * 200 * 3) + (200 * 6.42 * 1)
Vret = 1,484 CF
BMP VOLUME (1,484 CF) > DCV VOLUME (876 CF)

EXISTING CN = 61 (AREA WEIGHTED)
PROPOSED CN = 89.6 (AREA WEIGHTED)
V_{HCOC}= VOLUME REDUCTION NEEDED TO MEET HCOC REQUIREMENTS
PRE-RV = PRE-DEVELOPED RUNOFF VOLUME = 105 CF
POST-RV = POST DEVELOPED RUNOFF VOLUME = 1,218 CF
V_{HCOC}= (POST-RV * 0.95) – PRE-RV = (1,218 CF * 0.95) – 105 CF
= 1,052 CF
BMP VOLUME (1,484 CF) > V_{HCOC} (1,052 CF)

STENCIL SAMPLE*



*THE STENCIL SHALL BE BLUE ON A WHITE BACKGROUND WITH LETTERING 2-1/2" IN HEIGHT AND READING "NO DUMPING –DRAINS TO RIVER". A FISH OR SIMILAR WATER DEPENDENT CREATURE SILHOUETTE MAY BE INCLUDED SUBJECT TO CITY APPROVAL. IN LIEU OF A STENCIL, A CATCH BASIN CURB MARKER, CIRCULAR OR RECTANGULAR, AT LEAST 4" IN HEIGHT OR DIAMETER, MAY BE USED. THE MESSAGE WILL BE THE SAME AND IS SUBJECT TO CITY APPROVAL. A PAINTED CIRCULAR STENCIL SHALL NOT BE BIGGER THAN 8"IN DIAMETER. LEGIBILITY WILL BE CHECKED AND REPAINTED ANNUALLY.



STORM DRAIN STENCIL SIGNAGE - CURB INLET

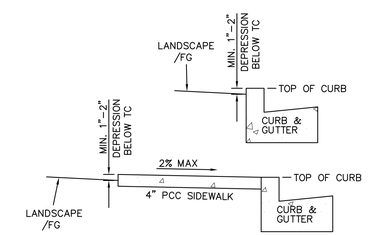
NTS

BMP LOCATIONS

AREA#1 – LATITUDE: 34.063951° / LONGITUDE: –117.140385°
AREA#2 – LATITUDE: 34.062953° / LONGITUDE: –117.140843°

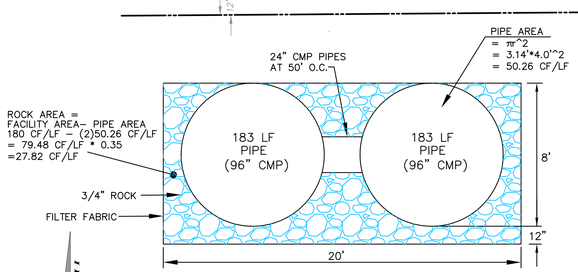
FEASIBILITY CONSTRAINTS

THERE ARE NO FEASIBILITY CONSTRAINTS FOR INFILTRATION



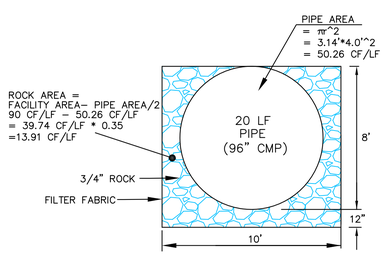
LANDSCAPE DEPRESSION DETAIL

SCALE: 1"=2'



DUAL INFILTRATION BMP CROSS SECTION

SCALE: 1"=4'



INFILTRATION BMP CROSS SECTION

SCALE: 1"=4'

NORTH

GRAPHIC SCALE
0 50
(IN FEET)
1 inch = 50 ft.

PRELIMINARY WQMP SITE PLAN
COLTON AVE + WABASH AVE
REDLANDS, CA

Soni 2012 Irrevocable Trusts
1423 Georgina Avenue Santa Monica
Santa Monica, CA 90402
(949) 922-7075
Contact: Vanita Soni Puri

REGISTERED PROFESSIONAL ENGINEER FRED CORNWELL No. 45591 CIVIL STATE OF CALIFORNIA

FRED CORNWELL R.C.E. 45591 DATE

PREPARED BY:
CA ENGINEERING, INC.
Planning • Engineering • Surveying
13821 NEWPORT AVE., STE 110
TUSTIN, CA 92780
949-724-9480 949-724-9484 FAX

DATE	BY	REVISION

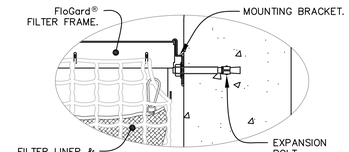
SHEET C1.3
DATE Oct 05 2022
JOB NO. 816-1
Sht. C-2

FloGard®

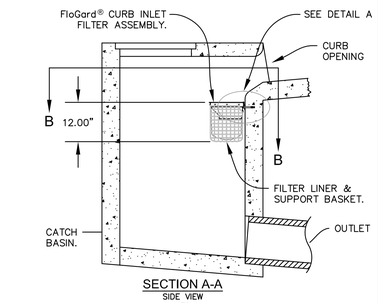
Catch Basin Insert Filter

Curb Inlet Style

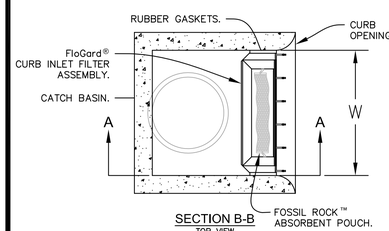
DRAWING NO. FGP-0002



DETAIL A
MOUNTING BRACKET & EXPANSION BOLTS
SEE NOTE 2
NTS



SECTION A-A
SIDE VIEW
NTS



SECTION B-B
TOP VIEW
NTS

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be Fossil Rock, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

6.2 Electronic Data Submittal

Minimum requirements include submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open. If the local jurisdiction requires specialized electronic document formats (as described in their local Local Implementation Plan), this section will describe the contents (e.g., layering, nomenclature, geo-referencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

APPENDICES INCLUDED IN SECTION 6.2 (Electronic Data Submittal):

Appendix E: Link to Electronic Version of Final WQMP, Water Quality Management Plan and Stormwater BMP Transfer, Access and Maintenance Agreement, Precise Grading Plans

APPENDIX E

Link to Electronic Version of Final WQMP, Water Quality Management Plan and Stormwater BMP Transfer, Access and Maintenance Agreement, Precise Grading Plans

(To Be Provided in Final Approved WQMP)

6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

APPENDICES INCLUDED IN SECTION 6.3 (Post Construction):

Appendix F: Operation and Maintenance (O & M) Plan

Appendix G: Record of BMP Implementation, Maintenance and Inspection

Appendix H: Water Quality Management Plan and Stormwater BMP Transfer, Access and Maintenance Agreement

APPENDIX F

Operation and Maintenance (O & M) Plan

OPERATION AND MAINTENANCE (O&M) PLAN

Water Quality Management Plan
for

Madera at Citrus Trail Residential Project

NW Corner of E. Colton Avenue and Wabash Avenue
Redlands, California 92374

Appendix F, Operation and Maintenance Plan
Note: OWNER = Soni 2012 Irrevocable Trusts

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Non-Structural Source Control BMPs			
Y	N1. Education of Property Owners, Tenants and Occupants on Stormwater BMPs The owner shall be familiar with the contents of the Project WQMP and shall provide BMP information materials to the first residents/occupants/tenants on management practices for residential developments that contribute to the protection of stormwater quality. (See Appendix K in Section 6.4 of the Project WQMP for the applicable BMP Educational Materials.) For developments with POA and residential projects of more than fifty (50) dwelling units, project conditions of approval will require that the POA periodically provide environmental awareness education materials, made available by the municipalities, to all members. Among other things, these materials will describe the use of chemicals (including household type) that should be limited to the property, with no discharge of wastes via hosing or other direct discharge to gutters, catch basins and storm drains. Educational materials are available from the San Bernardino Stormwater Program and can be downloaded at: http://www.sbcountystormwater.org/gov_out.html.	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	N2. Activity Restrictions The owner will implement use /activity restrictions for the project for the purpose of surface water quality protection through the use of conditions, covenants and restrictions (CCRs).	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
Y	N3. Landscape Management BMPs The owner will identify on-going landscape maintenance requirements consistent with applicable local stormwater quality ordinances that will include fertilizer and/or pesticide application restrictions and mowing and trimmings containment and disposal.	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
Y	N4. BMP Maintenance The owner will be responsible for implementation of each non- structural BMP and scheduled cleaning and/or maintenance of all structural BMP facilities per the maintenance narratives in this document.	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
N	N5. Title 22 CCR Compliance		
Y	N6. Local Water Quality Ordinances The owner will comply with any applicable local water quality ordinances.	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	N7. Spill Contingency Plan The owner will prepare a Spill Contingency Plan based on specified types of building occupancies. The Plan will mandate stockpiling of cleanup materials, notification of responsible agencies, disposal of cleanup materials, documentation, etc.	Frequency: Upon occupancy	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
N	N8. Underground Storage Tank Compliance		
N	N9. Hazardous Materials Disclosure Compliance		
Y	N10. Uniform Fire Code Implementation The owner shall require all residents to abide by the Uniform Fire Code.	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
Y	N11. Litter/Debris Control Program The owner/POA will implement trash management and litter control procedures throughout the site aimed at reducing pollution of drainage water. The owner/POA may contract with its landscape maintenance firm to provide this service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting/reporting trash disposal violations by tenants/homeowners.	Frequency: Weekly	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
N	N12. Employee Training		
N	N13. Housekeeping of Loading Docks		

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	N14. Catch Basin Inspection Program On-site catch basins shall be inspected, cleaned and maintained on an annual basis, in the early fall prior to the start of the rainy season, and before and after all major storms. Catch basins shall be monitored for evidence of illegal dumping on an as-needed frequency.	Frequency: Annually, and before and after all major storms	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
Y	N15. Vacuum Sweeping of Private Streets and Parking Lots The owner/POA will ensure that the project's drive aisles and parking areas will be swept on a monthly basis, or more often if necessary, using a vacuum assisted sweeper.	Frequency: Monthly, or more often if necessary	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
N	N16. Other Non-structural Measures for Public Agency Projects		

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	N17. Comply With All Other Applicable NPDES Permits The owner shall comply with the statewide General Construction Permit during the entire period of construction by filing an NOI and SWPPP with the State Water Board and complying with all BMP implementation and reporting requirements. Following building occupation, the owner shall require all tenants needing coverage under the State's General Industrial Activities Permit to acquire coverage.	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
	Structural Source Control BMPs		
Y	S1. Provide Storm Drain System Stenciling and Signage Storm drain stencils are highly visible source control messages, typically placed directly adjacent to storm drain inlets. The stencils contain a brief statement that prohibits the dumping of improper materials into the MS4. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message. Stencils and signs alert the public to the destination of pollutants discharged into stormwater. The following requirements will be included in the project design and shown on the project plans: - Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language (such as: "No Dumping – Flows to Creek") and/or graphical icons to discourage illegal dumping. - Maintain legibility of stencils and signs.	Frequency: Annually	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
N	S2. Design and Construct Outdoor Material Storage Areas to Reduce Pollution Introduction		
N	S3. Design and Construct Trash and Waste Storage Areas to Reduce Pollution Introduction		

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	S4. Use Efficient Irrigation Systems & Landscape Design, Water Conservation, Smart Controllers, and Source Control The following methods to reduce excessive irrigation runoff and pollutant introduction will be incorporated for all landscaped areas where applicable: (1) employing rain shutoff devices to prevent irrigation after precipitation; (2) designing irrigation systems to each landscape area's specific water requirements; (3) using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines; (4) the timing and application methods of irrigation water shall be designed to minimize the runoff of excess irrigation water into the municipal storm drain system; (5) employing other comparable, equally effective, methods to reduce irrigation water runoff; grouping plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration; (6) choosing plants with low irrigation requirements (for example, native or drought tolerant species); (7) using mulches (such as wood chips or shredded wood products) in planter areas without ground cover to minimize sediment in runoff; (8) installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and using native plant material where possible and/or as recommended by the landscape architect; (9) leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible; and (10) choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth.	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Y	S5. Finish Grade of Landscaped Areas at a Minimum of 1-2 Inches Below Top of Curb, Sidewalk or Pavement All landscape pockets, fingers, setback areas, parkway strips, street medians, etc., will be finish-graded at a minimum of 1-2 inches below top of curb or sidewalk for increased retention/infiltration of stormwater and irrigation water.	Frequency: Continuous	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
N	S6. Protect Slopes and Channels and Provide Energy Dissipation		
N	S7. Covered Dock Areas		
N	S8. Covered Maintenance Bays With Spill Containment Plans		
N	S9. Vehicle Wash Areas With Spill Containment Plans		
N	S10. Covered Outdoor Processing Areas		
N	S11. Equipment Wash Areas With Spill Containment Plans		

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
N	S12. Fueling Areas		
N	S13. Hillside Landscaping		
N	S14. Wash Water Control for Food Preparation Areas		
N	S15. Community Car Wash Racks		

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Low Impact Development BMPs			
Y	LID BMP #1— Onsite Infiltration (Underground Chamber) Quarterly inspections of the underground infiltration BMPs shall be conducted utilizing the designed manholes/inspection ports. The BMPs shall be cleaned when inspection reveals that accumulated sediment or trash is clogging the system. Accumulated sediment and trash can be evacuated through the manholes.	Frequency: Quarterly And Immediately After Major Storm Events	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com
Y	LID BMP #2— Treatment Control Measures (Proprietary Catch Basin Insert Filters— Pretreatment for Onsite Infiltration) (Kristar FloGard +Plus Insert Filters or Approved Equivalent) Twice a year, prior to and after the rainy season, and after major storm events, the catch basin insert filters shall be visually inspected for damage, have all sediment and debris removed, and the filter medium pouches shall be replaced if necessary. The owner may conduct this maintenance itself, or may enter into a service contract for the maintenance of the insert filters as detailed in the Kristar FloGard +Plus Specifications /Maintenance Requirements brochure, a copy of which is attached hereto.	Frequency: Every Six Months (Approximately April 1st and October 1st) and Immediately After Major Storm Events	Soni 2012 Irrevocable Trusts 1423 Georgina Avenue Santa Monica, CA 90402 (949) 922-7075 vanitapuri@gmail.com

Required Permits

No permits are required for the implementation, operation, and maintenance of the BMPs described in this plan.

Recordkeeping

All records must be maintained for at least five (5) years and must be made available for review upon request.



KRISTAR

FloGard®+PLUS

Catch Basin Insert Filter

FloGard®+PLUS Catch Basin Insert Filter

GENERAL FILTER CONFIGURATION

FloGard®+PLUS catch basin insert filter shall provide solids filtration through a filter screen or filter liner, and hydrocarbon capture shall be effected using a non-leaching absorbent material contained in a pouch or similar removable restraint. Hydrocarbon absorbent shall not be placed at an exposed location at the entry to the filter that would allow blinding by debris and sediment without provision for self-cleaning in operation.

Filter shall conform to the dimensions of the inlet in which it is applied, allow removal and replacement of all internal components, and allow complete inspection and cleaning in the field.

FLOW CAPACITY

Filter shall provide two internal high-flow bypass locations that in total exceed the inlet peak flow capacity. Filter shall provide filtered flow capacity in excess of the required "first flush" treatment flow. Unit shall not impede flow into or through the catch basin when properly sized and installed.

MATERIALS

Filter support frame shall be constructed of type 304 stainless steel. Filter screen, when used in place of filter liner, shall be type 304 or 316 stainless steel, with an apparent opening size of not less than 4 U.S. mesh. Filter liner, when used in place of filter screen, shall be woven polypropylene geotextile fabric liner with an apparent opening size (AOS) of not less than 40 U.S. mesh as determined by ASTM D 4751. Filter liner shall include a support basket of polypropylene geogrid with stainless steel cable reinforcement.

Filter frame shall be rated at a minimum 25-year service life. All other materials, with the exception of the hydrocarbon absorbent, shall have a rated service life in excess of 2 years.

FloGard®+PLUS TEST RESULTS SUMMARY

Testing Agency	% TSS Removal	% Oil and Grease Removal	% PAH Removal
UCLA	80	70 to 80	
U of Auckland Tonking & Taylor Ltd. (for city of Auckland)	78 to 95		
U of Hawaii (for city of Honolulu)	80		20 to 40

FEATURES

- Easy to install, inspect and maintain
- Can be retrofitted to existing drain catch basins – or used in new projects
- Economical and efficient
- Catches pollutants where they are easiest to catch (at the inlet)
- No standing water – minimizes vector, bacteria and odor problems
- Can be incorporated as part of a "Treatment Train"

BENEFITS

- Lower installation, inspection and maintenance costs
- Versatile installation applications
- Higher return on investment
- Allows for installation on small and confined sites
- Minimizes vector, bacteria and odor problems
- Allows user to target specific pollutants

Innovative stormwater management products

FloGard® +PLUS
Catch Basin Insert Filter



INSTALLATION AND MAINTENANCE
Filter shall be installed and maintained in accordance with manufacturer's general instructions and recommendations.

PERFORMANCE
Filter shall provide 80% removal of total suspended solids (TSS) from treated flow with a particle size distribution consistent with typical urban street deposited sediments. Filter shall capture at least 70% of oil and grease and 40% of total phosphorus (TP) associated with organic debris from treated flow. Unit shall provide for isolation of trapped pollutants, including debris, sediments, and floatable trash and hydrocarbons, from bypass flow such that re-suspension and loss of pollutants is minimized during peak flow events.

FloGard®+PLUS COMPETITIVE FEATURE COMPARISON

Evaluation of FloGard+PLUS Units (Based on flow-comparable units) (Scale 1-10, 10 being best)	**FloGard+PLUS**	**Other Insert Filter Types****
Flow Rate	10	7
Removal Efficiency*	80%	45%
Capacity – Sludge and Oil	7	7
Service Life	10	3
Installation – Ease of Handling / Installation	8	6
Ease of Inspections & Maintenance	7	7
Value	**10**	**2**

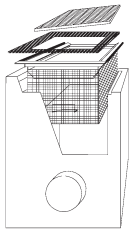
*approximate, based on field sediment removal testing in urban street application **average

Long-Term Cost Comparison (Scale 1-10, 10 being lowest cost, higher number being best)	**FloGard+PLUS**	**Other Insert Filter Types**
Unit cost — initial ($/cfs treated)	10	4
Installation cost ($/cfs treated)	9	6
Adsorbent replacement (annual avg $/cfs treated)	10	2
Unit materials replacement (annual avg $/cfs treated)	10	10
Maintenance cost (annual avg $/cfs treated)	9	6
Total first yr ($/cfs treated)	10	5
Total Annual Avg ($/cfs treated, avg over 20 yrs)*	**10**	**5**

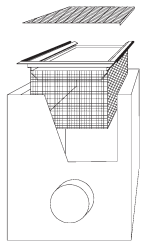
*assumes 3% annual inflation



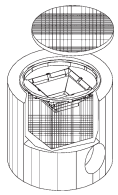
Captured debris from FloGard+PLUS, Dana Point, CA



FloGard+PLUS Combination Inlet



FloGard+PLUS Flat Grate



FloGard+PLUS Round Gated Inlet

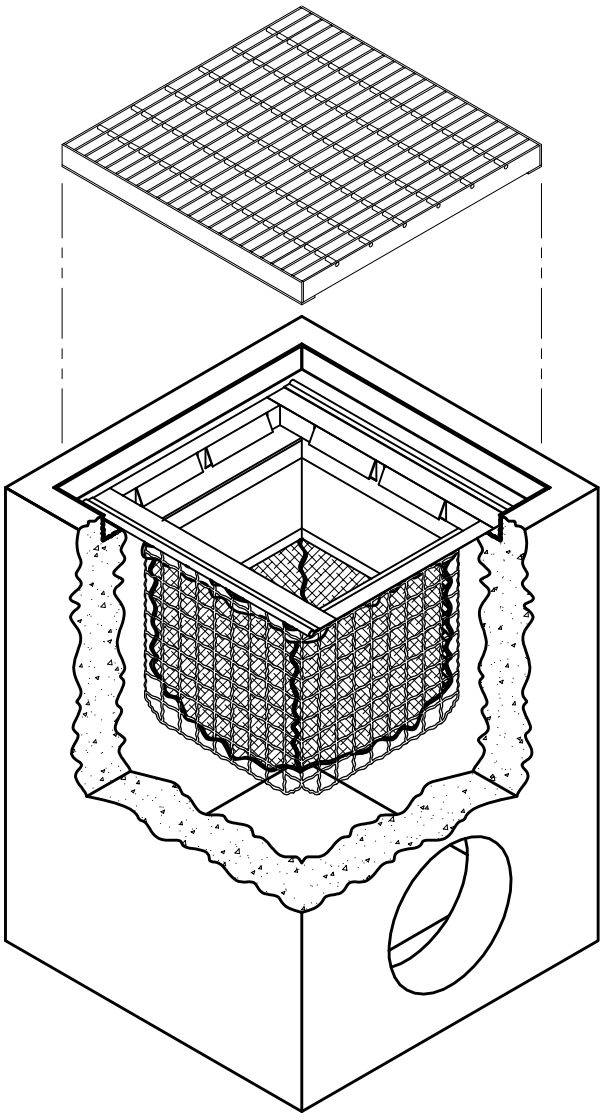
KriStar Enterprises, Inc.
P.O. Box 6419
Santa Rosa, CA 95406-1419

PH: 800-579-8819
FAX: 707-524-8186
www.kristar.com

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FGP-T 11.19.18.04.2M

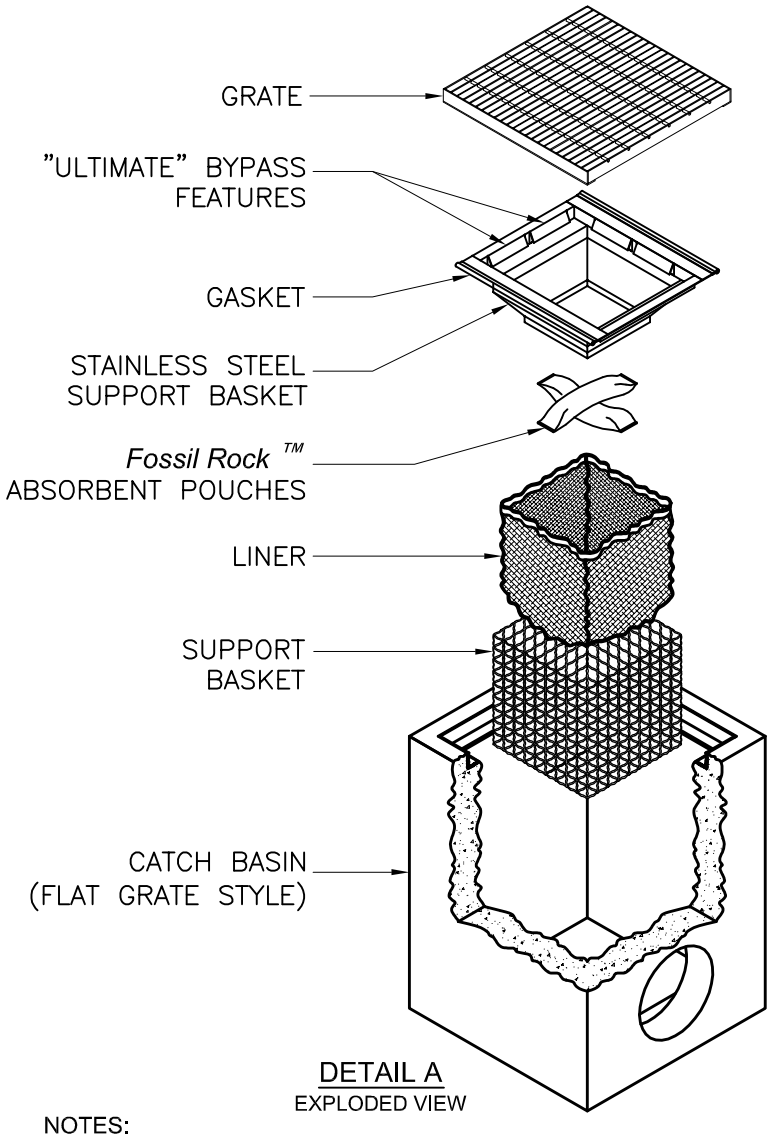
FloGard® is a registered trademarks of KriStar Enterprises, Inc.

FGP-0001



FLOGARD+PLUS® FILTER
-INSTALLED INTO CATCH BASIN-

U.S. PATENT # 6,00,023 & 6,877,029



DETAIL A
EXPLODED VIEW

NOTES:

1. FloGard®+Plus (frame mount) high capacity catch basin inserts are available in most sizes and styles (see specifier chart, sheet 2 of 2). Refer to the FloGard®+Plus (wall mount) insert for devices to fit non-standard, or combination style catch basins.
2. Filter insert shall have both an "initial" filtering bypass and "ultimate" high flow bypass feature.
3. Filter support frame shall be constructed from stainless steel Type 304.
4. Allow a minimum of 2.0 feet, of clearance between the bottom of the grate and top of outlet pipe(s), or refer to the FloGard® insert for "shallow" installations.
5. Filter medium shall be *Fossil Rock* ™, installed and maintained in accordance with manufacturer specifications.
6. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
7. Filtered flow r\rate includes a safety factor of two.

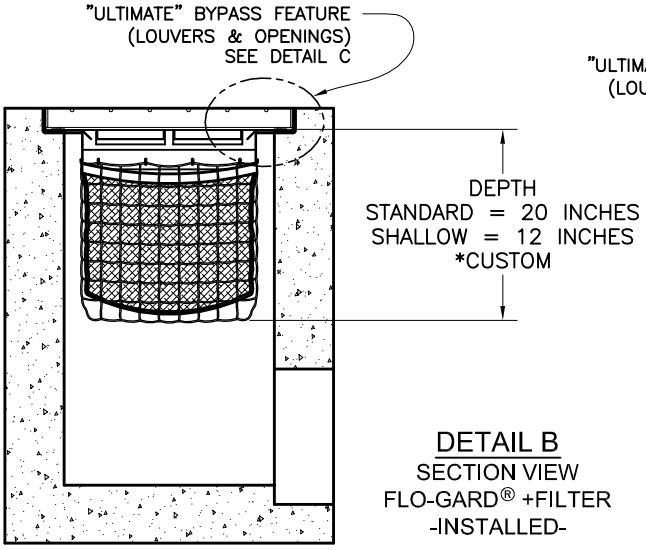
TITLE

FloGard®+PLUS
CATCH BASIN FILTER INSERT
(Frame Mount)
FLAT GRATED INLET

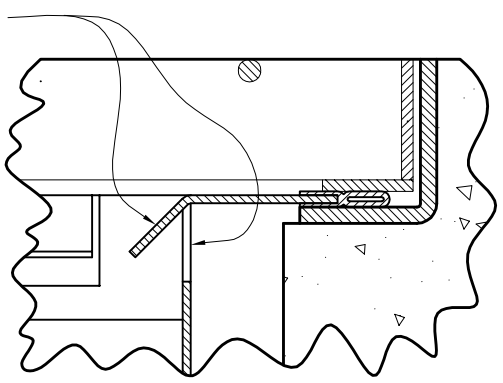
KriStar Enterprises, Inc.
P.O. Box 6419, Santa Rosa, CA 95406
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	SHEET
FGP-0001	A	0001	JPR 09/01/06	1 OF 2

U.S. PATENT # 6,00,023 & 6,877,029



DETAIL B
SECTION VIEW
FLO-GARD® +FILTER
-INSTALLED-



DETAIL C
"ULTIMATE"
BYPASS FEATURES

* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART

MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data in these columes is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO. SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-1530F	15 X 30	15 X 35	6.9	2.3	1.6	FGP-1530F8	1.3	.9
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-1624F	16 X 24	16 X 26	5.0	1.5	1.2	FGP-1624F8	.85	.7
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1820F	16 X 19	18 X 21	5.9	2.1	1.4	FGP-1820F8	1.2	.8
FGP-1824F	16 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	18 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-2142F	21 X 40	24 X 40	9.1	4.3	2.4	FGP-2142F8	2.45	1.35
FGP-2148F	19 X 46	22 X 48	9.8	4.7	2.6	FGP-2148F8	2.7	1.5
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	26 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-28F	28 X 28	32 X 32	6.3	2.2	1.5	FGP-28F8	1.25	.85
FGP-2440F	24 X 36	28 X 40	8.3	4.2	2.3	FGP-2440F8	2.4	1.3
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-SD24F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-SD24F8	1.25	.85
FGP-1836FGO	18 X 36	20 X 40	6.9	2.3	1.6	FGP-1836F8GO	1.3	.9
FGP-2436FGO	20 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8GO	1.95	1.15
FGP-48FGO	18 X 48	20 X 54	6.3	2.2	1.5	FGP-48F8GO	1.25	.85

TITLE

FloGard® +PLUS

CATCH BASIN FILTER INSERT

(Frame Mount)

FLAT GRATED INLET

KriStar Enterprises, Inc.

P.O. Box 6419, Santa Rosa, CA 95406

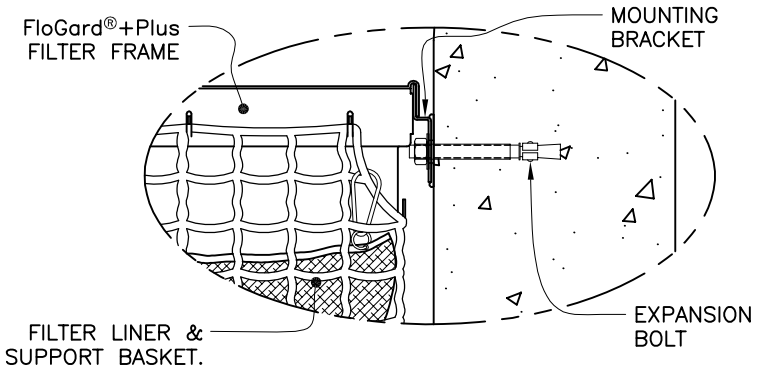
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	SHEET
FGP-0001	A	0001	JPR 09/01/06	SHEET 2 OF 2

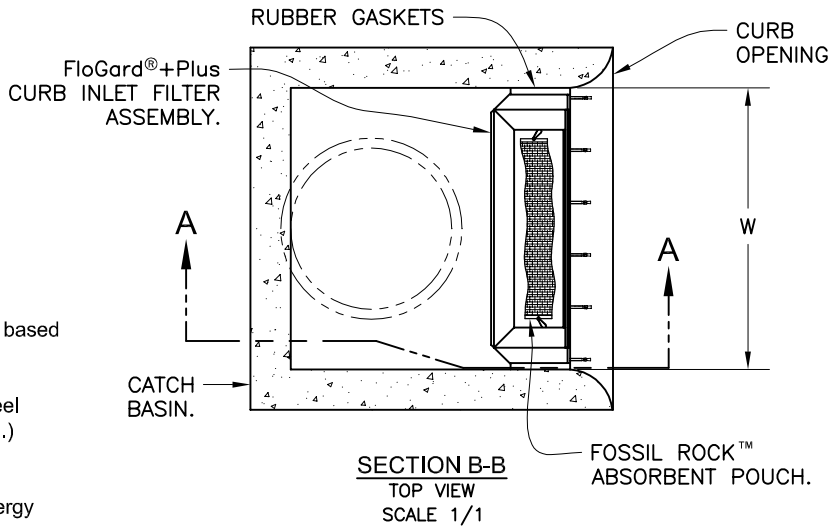
FGP-0002

SPECIFIER CHART

MODEL NO.	Curb Opening Width - W -	Storage Capacity - Cu. Ft. -	Filtered Flow Rate - GPM/CFS -	Bypass Flow Rate - GPM/CFS -
FGP-24CI	2.0' (24")	.95	338 / .75	2,513 / 5.6
FGP-30CI	2.5' (30")	1.20	450 / 1.00	3,008 / 6.7
FGP-36CI	3.0' (36")	1.50	563 / 1.25	3,547 / 7.9
FGP-42CI	3.5' (42")	1.80	675 / 1.50	3,951 / 8.8
FGP-48CI	4.0' (48")	2.10	768 / 1.76	4,445 / 9.9
FGP-5.0CI	5.0' (60")	2.40	900 / 2.00	5,208 / 11.6
FGP-6.0CI	6.0' (72")	3.05	1,126 / 2.51	6,196 / 13.8
FGP-7.0CI	7.0' (84")	3.65	1,350 / 3.01	7,139 / 15.9
FGP-8.0CI	8.0' (96")	4.25	1,576 / 3.51	8,082 / 18.0
FGP-10.0CI	10.0' (120")	4.85	1,800 / 4.01	9,833 / 21.9
FGP-12.0CI	12.0' (144")	6.10	2,252 / 5.02	11,764 / 26.2
FGP-14.0CI	14.0' (168")	7.30	2,700 / 6.02	13,515 / 30.1
FGP-16.0CI	16.0' (192")	8.55	3.152 / 7.02	15,446 / 34.4
FGP-18.0CI	18.0' (216")	9.45	3,490 / 7.78	17,152 / 38.2
FGP-21.0CI	21.0' (252")	10.95	4,050 / 9.02	19,891 / 44.3
FGP-28.0CI	28.0 (336")	14.60	5,400 / 12.03	26,311 / 58.6



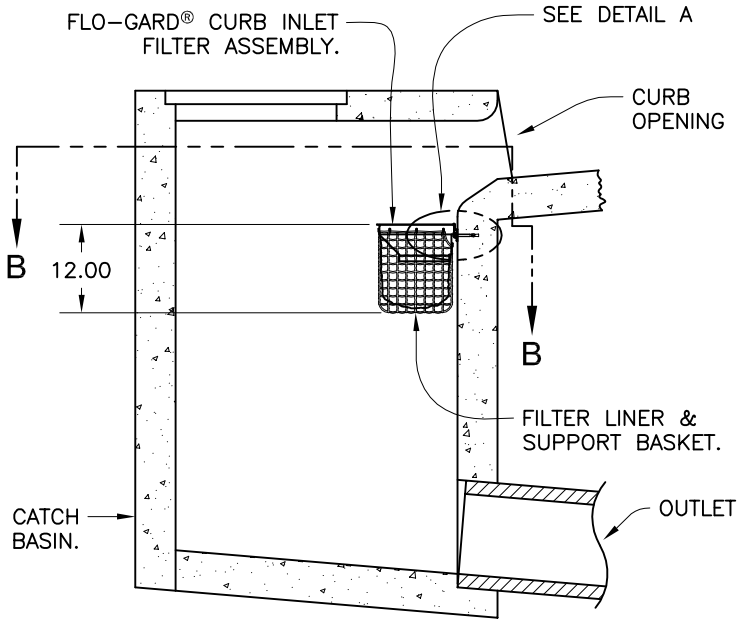
DETAIL A
MOUNTING BRACKET & EXPANSION BOLTS
SEE NOTE 2
SCALE 6/1



SECTION B-B
TOP VIEW
SCALE 1/1

NOTES:

1. FloGard®+PLUS filter inserts shall be installed across the entire width of curb opening. Storage capacity and clean flow rates are based on full width installation.
2. Filter insert shall be attached to the catch basin with stainless steel expansion anchor bolts & washers (3/8" x 2-1/2" minimum length.) See detail A.
3. FloGard®+PLUS filter inserts are designed with a debris trap/energy dissipator for the retention of floatables and collected sediments .
4. Filter support frame shall be constructed from stainless steel Type 304.
5. Filter liner shall be constructed from durable polypropylene, woven, monofilament, geotextile. Filter liner shall not allow the retention of water between storm events.
6. Filter inserts are supplied with "clip-in" filter pouches utilizing FOSSIL ROCK™ filter medium for the collection and retention of petroleum hydrocarbons (oils & greases).
7. FloGard®+PLUS filter inserts and FOSSIL ROCK ™ filter medium pouches must be maintained in accordance with manufacturer recommendations.
8. FloGard +PLUS filter inserts are available in standard lengths of 24", 30",35", 42" & 48" and may be installed in various length combinations (end to end) to fit length of noted catch basin.
9. Clean flow rates are "calculated" based on liner flow rate of 140 gallons per minute per square foot of material, a factor of .50 has been applied to allow for anticipated sediment & debris loading. An additional safety factor of between .25 & .50 may be applied to allow for site specific sediment loading.
10. Storage capacity reflects maximum solids collection prior to impending "initial" filtering bypass. The "ultimate" high-flow bypass will not become impeded due to maximum solids loading.



SECTION A-A
SIDE VIEW
SCALE 1/1

TITLE

FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Curb Inlet Style)

KriStar Enterprises, Inc.
360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	
FGP-0002	D	0059 JPR 12/30/08	JPR 11/3/06	SHEET 1 OF 1

GENERAL SPECIFICATIONS FOR MAINTENANCE OF *FLO-GARD+PLUS*® CATCH BASIN INSERT FILTERS

SCOPE:

Federal, State and Local Clean Water Act regulations and those of insurance carriers require that stormwater filtration systems be maintained and serviced on a recurring basis. The intent of the regulations is to ensure that the systems, on a continuing basis, efficiently remove pollutants from stormwater runoff thereby preventing pollution of the nation's water resources. These specifications apply to the FloGard+Plus® Catch Basin Insert Filter.

RECOMMENDED FREQUENCY OF SERVICE:

Drainage Protection Systems (DPS) recommends that installed Flo-Gard+Plus® Catch Basin Insert Filters be serviced on a recurring basis. Ultimately, the frequency depends on the amount of runoff, pollutant loading and interference from debris (leaves, vegetation, cans, paper, etc.); however, it is recommended that each installation be serviced a minimum of three times per year, with a change of filter medium once per year. DPS technicians are available to do an on-site evaluation, upon request.

RECOMMENDED TIMING OF SERVICE:

DPS guidelines for the timing of service are as follows:

1. For areas with a definite rainy season: Prior to, during and following the rainy season.
2. For areas subject to year-round rainfall: On a recurring basis (at least three times per year).
3. For areas with winter snow and summer rain: Prior to and just after the snow season and during the summer rain season.
4. For installed devices not subject to the elements (washracks, parking garages, etc.): On a recurring basis (no less than three times per years).

SERVICE PROCEDURES:

1. The catch basin grate shall be removed and set to one side. The catch basin shall be visually inspected for defects and possible illegal dumping. If illegal dumping has occurred, the proper authorities and property owner representative shall be notified as soon as practicable.
2. Using an industrial vacuum, the collected materials shall be removed from the liner. (Note: DPS uses a truck-mounted vacuum for servicing Flo-Gard+Plus® catch basin inserts.)
3. When all of the collected materials have been removed, the filter medium pouches shall be removed by unsnapping the tether from the D-ring and set to one side. The filter liner, gaskets, stainless steel frame and mounting brackets, etc. shall be inspected for continued serviceability. Minor damage or defects found shall be corrected on-the-spot and a notation made on the Maintenance Record. More extensive deficiencies that affect the efficiency of the filter (torn liner, etc.), if approved by the customer representative, will be corrected and an invoice submitted to the representative along with the Maintenance Record.
4. The filter medium pouches shall be inspected for defects and continued serviceability and replaced as necessary and the pouch tethers re-attached to the liner's D-ring. See below.
5. The grate shall be replaced.

REPLACEMENT AND DISPOSAL OF EXPOSED FILTER MEDIUM AND COLLECTED DEBRIS

The frequency of filter medium pouch exchange will be in accordance with the existing DPS-Customer Maintenance Contract. DPS recommends that the medium be changed at least once per year. During the appropriate service, or if so determined by the service technician during a non-scheduled service, the filter medium pouches will be replaced with new pouches. Once the exposed pouches and debris have been removed, DPS has possession and must dispose of it in accordance with local, state and federal agency requirements.

DPS also has the capability of servicing all manner of catch basin inserts and catch basins without inserts, underground oil/water separators, stormwater interceptors and other such devices. All DPS personnel are highly qualified technicians and are confined space trained and certified. Call us at (888) 950-8826 for further information and assistance.

APPENDIX G

Record of BMP Implementation, Maintenance and Inspection

RECORD OF BMP IMPLEMENTATION, MAINTENANCE AND INSPECTION

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

APPENDIX H

Water Quality Management Plan and Stormwater BMP Transfer, Access and Maintenance Agreement

AND WHEN RECORDED MAIL TO

City Clerk
City of Redlands
35 Cajon Street
Redlands, CA 92373

SPACE ABOVE THIS LINE FOR RECORDER'S USE

WATER QUALITY MANAGEMENT PLAN AND STORMWATER BMP TRANSFER, ACCESS AND MAINTENANCE AGREEMENT

CITY OF REDLANDS, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

This Agreement is made and entered into this _____ day of _____, 20__, by and between the CITY OF REDLANDS, a municipal corporation, hereinafter referred to as CITY, and **Soni 2012 Irrevocable Trusts**, hereinafter referred to as OWNER.

WHEREAS, the Owner is the legal property owner of the real property situated in the State of California, County of San Bernardino, located at **the NW Corner of E. Colton Avenue and Wabash Avenue** in the City of Redlands, more commonly referred to as San Bernardino County Tax Assessor Parcel No. **0168-291-02-0-000** described in Exhibit A and depicted in Exhibit B attached hereto and incorporated herein by this reference; and

WHEREAS, at the time of initial approval of the development project known as the **Madera at Citrus Trail Residential Project** within the Property described herein, the City required the project to employ Best Management Practices, hereinafter referred to as "BMPs," to minimize pollutants in urban runoff; and

WHEREAS, the Owner has chosen to install and/or implement BMPs as described in the Water Quality Management Plan, on file with the City, hereinafter referred to as "WQMP," to minimize pollutants in urban runoff and to minimize other adverse impacts of urban runoff; and

WHEREAS, said WQMP has been certified by the Owner and reviewed and approved by the City; and

WHEREAS, said BMPs, with installation and/or implementation on private property and draining only private property, are part of a private facility with all maintenance or replacement therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of all BMPs in the WQMP and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. The Owner hereby provides the City or the City's designee complete access, of any duration, to the BMPs and their immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by City's Director of Public Works with no advance notice, for the purpose of inspection, sampling, testing of the BMPs, and in case of emergency, to undertake all necessary repairs or other preventative measures at the owner's expense as provided in paragraph 3 below. The City shall make every effort at all times to minimize or avoid interference with the Owner's use of the Property.

2. The Owner shall use its best efforts diligently to maintain all BMPs in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by the Owner and the Owner's representative or contractor in the removal and extraction of any material(s) from the BMPs and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.

3. In the event the Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the City, the City is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or the Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the Civil Code from the date of the notice of expense until paid in full.

4. The City may require the Owner to post security in form and for a time period satisfactory to the City to guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under this Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of this Agreement. As an additional remedy, the Director may withdraw any previous stormwater-related approval with respect to the property on which BMPs have been installed and/or implemented until such time as the Owner repays to the City its reasonable costs incurred in accordance with paragraph 3 above.

5. This Agreement shall be recorded in the Office of the Recorder of San Bernardino County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.

6. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

7. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien against the Property.

8. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. The Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. The Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. The Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.

9. Time is of the essence in the performance of this Agreement.

10. Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

IF TO CITY:	IF TO OWNER:
_____	Vanita Soni Puri
Director of Public Works	Authorized Signatory
35 Cajon Street	1423 Georgina Avenue
Redlands, CA 92373	Santa Monica, CA 90402

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

APPROVED AS TO FORM;

By: (Signature Not Required)
City Attorney

City of Redlands

By: _____
City Manager

ATTEST:

_____
City Clerk

APPROVED AS TO CONTENT:

By: _____
Director of Public Works
City of Redlands

Owner: Soni 2012 Irrevocable Trusts
(Company)

By: _____
(Signature and Date)

Name: Vanita Soni Puri
(Please Print or Type Name)

Title: Authorized Signatory
(Please Print or Type Title)

NOTE: OWNER'S SIGNATURE MUST BE NOTARIZED FOR RECORDATION

EXHIBIT A

LEGAL DESCRIPTION

REAL PROPERTY IN THE CITY OF REDLANDS, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

THAT PORTION OF THE SOUTHEAST QUARTER OF SECTION 24, TOWNSHIP 1 SOUTH, RANGE 3 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE CITY OF REDLANDS, ACCORDING TO THE OFFICIAL GOVERNMENT PLAT THEREOF, DESCRIBED AS FOLLOWS:

BEGINNING AT AN IRON PIPE IN MIDDLE LINE OF WABASH (FORMERLY EMERALD) AVENUE, DISTANT SOUTH 0°17' EAST (MAGNETIC VARIATION 15° EAST) 1975.7 FEET FROM AN IRON ROD AT THE INTERSECTION OF MIDDLE LINE OF LUGONIA (FORMERLY MENTON) AND WABASH AVENUES;

THENCE FROM SAID POINT OF BEGINNING, RUNNING MIDWAY BETWEEN THE 38TH AND 39TH ORANGE TREE ROWS NORTH FROM COLTON
AVENUE, NORTH 89°45' WEST 655.7 FEET TO A 3 INCH STAKE;
THENCE SOUTH 0°25' EAST 702.7 FEET TO AN IRON ROD IN THE MIDDLE LINE OF COLTON AVENUE;
THENCE ALONG THE MIDDLE LINE OF SAID COLTON AVENUE NORTH 89°51' EAST 654.3 FEET TO A WOODEN STAKE AT INTERSECTION OF MIDDLE LINES OF WABASH AVENUE (FROM THE NORTH) AND COLTON AVENUE, SAID WOODEN STAKE BEING 35.15 FEET EAST OF STONE AT THE INTERSECTION OF THE MIDDLE LINES OF WABASH AVENUE (FROM THE SOUTH) AND COLTON AVENUE;
THENCE ALONG THE MIDDLE LINE OF SAID WABASH AVENUE NORTH 0°17' WEST 698 FEET TO THE PLACE OF BEGINNING;

EXCEPTING THERE FROM THE LAND NOW OCCUPIED BY THE CALIFORNIA CENTRAL RAILWAY COMPANY, ACROSS THE SOUTHEAST CORNER THEREOF; AS GRANTED BY DEED RECORDED MARCH 20, 1888 IN BOOK 69, PAGE(S) 553 OF DEEDS;

ALSO EXCEPTING THERE FROM ANY PORTION THEREOF DESCRIBED IN CONVEYANCE EXECUTED BY THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY, A DELAWARE CORPORATION, SUCCESSOR IN INTEREST TO THE CALIFORNIA CENTRAL RAILWAY COMPANY, IN FAVOR OF SAN BERNARDINO ASSOCIATED GOVERNMENTS, A COUNTY TRANSPORTATION COMMISSION AND LOCAL TRANSPORTATION AUTHORITY, RECORDED MARCH 30, 1993 AS INSTRUMENT NO. 93- 137041 AND MARCH 30, 1993 AS INSTRUMENT NO. 93-137043, BOTH OF OFFICIAL RECORDS;

ALSO EXCEPTING THERE FROM THAT PORTION OF LAND CONVEYED IN GRANT DEED EXECUTED BY VINEY SONI AND VANDANA SONI, TRUSTEES OF THE SONI REVOCABLE INTER-VIVOS TRUST, DATED MARCH 27, 1984, IN FAVOR OF CITY OF REDLANDS, A MUNICIPAL CORPORATION, RECORDED JUNE 7, 1999 AS INSTRUMENT NO. 99-240498 OF OFFICIAL RECORDS.

APN: 0168-291-02-0-000

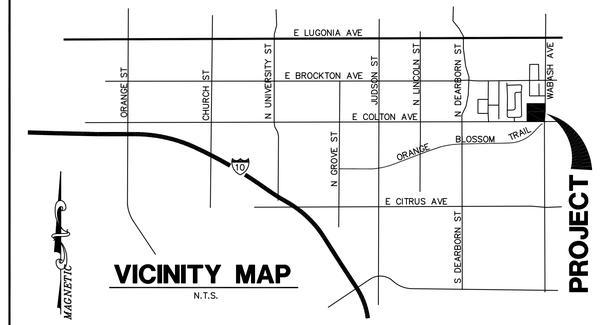
EXHIBIT B

BMP SITE PLAN



BMP LEGEND

- DRAINAGE AREAS **DA 1**
- SURFACE FLOW DIRECTION
- STORM DRAIN FLOW DIRECTION
- UNDERGROUND INFILTRATION PIPE PER DETAIL HEREON
- LANDSCAPE AREA EFFICIENT IRRIGATION
  LANDSCAPE AREA RUNOFF-MINIMIZING DESIGN
- PROPOSED BUILDING
- ASPHALT CONCRETE DRIVE AISLES
- CONCRETE DRIVEWAY APPROACH
- CATCH BASIN WITH INSERT FILTER & STORM DRAIN STENCIL SIGNAGE



VICINITY MAP

N.T.S.

PROJECT DATA:

TOTAL SITE AREA OF PROPOSED DEVELOPMENT: 9.01 AC (392,503 SF)

BUILDING AREA: 122,630 SF
DRIVEWAYS / DRIVE AISLES / PARKING AREAS: 95,896 SF
WALKWAYS / CONC. HARDSCAPE: 95,476 SF

78,501 SF LANDSCAPING PROVIDED (20.0% PERVIOUS AREA)

CURRENT USE: VACANT
PROPOSED USE: RESIDENTIAL

WATERSHED:
SANTA ANA RIVER

LID DCV CALCULATION

AREA 1

AREA – 8.73 AC (380,199 SF)
RUNOFF COEFFICIENT (80% IMPERVIOUS)
C = 0.858 * (0.80)^3 –0.78 * (0.80)^2 + 0.774 * (0.80) + .04 = 0.599
2YR 1 HR STORM – 0.491 IN
P6 = 1.4807 * 0.491 = 0.727 IN
DCV = 380,199 SF * 0.599 * 0.727 IN / 12IN/FT * 1.963 = 27,084 CF

BMP VOLUME CALCULATION

BMP VOLUME
PIPE CROSS SECTIONAL AREA – (50.26) * 2 CF/LF = 100.52 CF/LF
ROCK CROSS SECTIONAL AREA – 79.48 CF/LF ROCK AREA * .35 = 27.82 CF/LF
TOTAL CROSS SECTIONAL AREA – 128.34 CF/LF * 183 LF = 23,486 CF
EFFECTIVE DEPTH – 23,486 CF / 3,660 SF BOTTOM = 6.42'

Vret = (Pdesign/12 * SAinf * Tfill) + (SAres * Dres * Nagg)
Pdesign = 7.98" MEASURED / 2.00 S.F. = 3.99"/HR
SAinf = 3,660 SF
SAres = 3,660 SF
Tfill = 3 HRS
Dres = EFFECTIVE DEPTH = 6.42'
Nagg = 1.0 (EFFECTIVE DEPTH ACCOUNTED FOR ROCK)
Vret = (3.99/12 * 3,660 * 3) + (3,660 * 6.42 * 1)
Vret = 27,148 CF
BMP VOLUME (27,148 CF) > DCV VOLUME (27,084 CF)

EXISTING CN = 38 (AREA WEIGHTED)
PROPOSED CN = 84.8 (AREA WEIGHTED)
V_{HCOC}= VOLUME REDUCTION NEEDED TO MEET HCOC REQUIREMENTS
PRE-RV = PRE-DEVELOPED RUNOFF VOLUME = 2,615 CF
POST-RV = POST DEVELOPED RUNOFF VOLUME = 28,119 CF
V_{HCOC}= (POST-RV * 0.95) – PRE-RV = (28,199 CF * 0.95) – 2,615 CF
= 24,098 CF
BMP VOLUME (27,148 CF) > V_{HCOC} (24,098 CF)

LID DCV CALCULATION

AREA 2

AREA – 0.28 AC (12,304 SF)
RUNOFF COEFFICIENT (80% IMPERVIOUS)
C = 0.858 * (0.80)^3 –0.78 * (0.80)^2 + 0.774 * (0.80) + .04 = 0.599
2YR 1 HR STORM – 0.491 IN
P6 = 1.4807 * 0.594 = 0.727 IN
DCV = 12,304 SF * 0.599 * 0.727 IN / 12IN/FT * 1.963 = 876 CF

BMP VOLUME CALCULATION

BMP VOLUME
PIPE CROSS SECTIONAL AREA – (50.26) CF/LF
ROCK CROSS SECTIONAL AREA – 39.74 CF/LF ROCK AREA * .35 = 13.91 CF/LF
TOTAL CROSS SECTIONAL AREA – 64.17 CF/LF * 20 LF = 1,283 CF
EFFECTIVE DEPTH – 1,283 CF / 200 SF BOTTOM = 6.42'

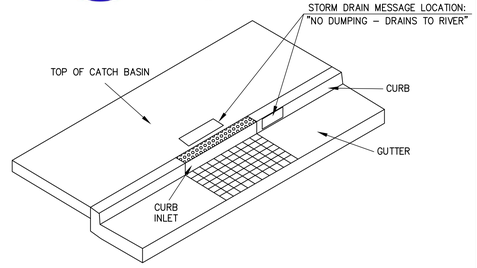
Vret = (Pdesign/12 * SAinf * Tfill) + (SAres * Dres * Nagg)
Pdesign = 7.98" MEASURED / 2.00 S.F. = 3.99"/HR
SAinf = 200 SF
SAres = 200 SF
Tfill = 3 HRS
Dres = EFFECTIVE DEPTH = 6.42'
Nagg = 1.0 (EFFECTIVE DEPTH ACCOUNTED FOR ROCK)
Vret = (3.99/12 * 200 * 3) + (200 * 6.42 * 1)
Vret = 1,484 CF
BMP VOLUME (1,484 CF) > DCV VOLUME (876 CF)

EXISTING CN = 61 (AREA WEIGHTED)
PROPOSED CN = 89.6 (AREA WEIGHTED)
V_{HCOC}= VOLUME REDUCTION NEEDED TO MEET HCOC REQUIREMENTS
PRE-RV = PRE-DEVELOPED RUNOFF VOLUME = 105 CF
POST-RV = POST DEVELOPED RUNOFF VOLUME = 1,218 CF
V_{HCOC}= (POST-RV * 0.95) – PRE-RV = (1,218 CF * 0.95) – 105 CF
= 1,052 CF
BMP VOLUME (1,484 CF) > V_{HCOC} (1,052 CF)

STENCIL SAMPLE*



*THE STENCIL SHALL BE BLUE ON A WHITE BACKGROUND WITH LETTERING 2-1/2" IN HEIGHT AND READING "NO DUMPING –DRAINS TO RIVER". A FISH OR SIMILAR WATER DEPENDENT CREATURE SILHOUETTE MAY BE INCLUDED SUBJECT TO CITY APPROVAL. IN LIEU OF A STENCIL, A CATCH BASIN CURB MARKER, CIRCULAR OR RECTANGULAR, AT LEAST 4" IN HEIGHT OR DIAMETER, MAY BE USED. THE MESSAGE WILL BE THE SAME AND IS SUBJECT TO CITY APPROVAL. A PAINTED CIRCULAR STENCIL SHALL NOT BE BIGGER THAN 8"IN DIAMETER. LEGIBILITY WILL BE CHECKED AND REPAINTED ANNUALLY.



STORM DRAIN STENCIL SIGNAGE - CURB INLET

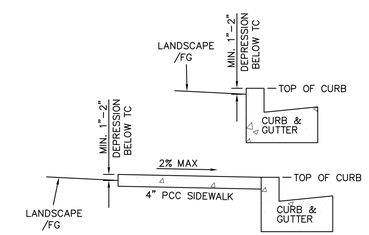
NTS

BMP LOCATIONS

AREA#1 – LATITUDE: 34.063951° / LONGITUDE: –117.140385°
AREA#2 – LATITUDE: 34.062953° / LONGITUDE: –117.140843°

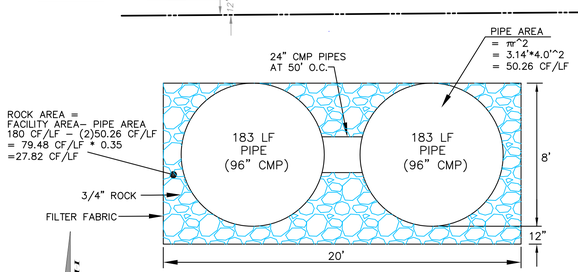
FEASIBILITY CONSTRAINTS

THERE ARE NO FEASIBILITY CONSTRAINTS FOR INFILTRATION



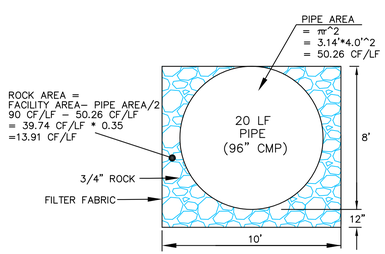
LANDSCAPE DEPRESSION DETAIL

SCALE: 1"=2'



DUAL INFILTRATION BMP CROSS SECTION

SCALE: 1"=4'



INFILTRATION BMP CROSS SECTION

SCALE: 1"=4'

NORTH

GRAPHIC SCALE
0 50
(IN FEET)
1 inch = 50 ft.

PRELIMINARY WQMP SITE PLAN
COLTON AVE + WABASH AVE
REDLANDS, CA

Soni 2012 Irrevocable Trusts
1423 Georgina Avenue Santa Monica
Santa Monica, CA 90402
(949) 922-7075
Contact: Vanita Soni Puri

REGISTERED PROFESSIONAL ENGINEER FRED CORNWELL No. 45591 CIVIL STATE OF CALIFORNIA

FRED CORNWELL R.C.E. 45591 DATE

PREPARED BY:
CA ENGINEERING, INC.
Planning • Engineering • Surveying
13821 NEWPORT AVE., STE 110
TUSTIN, CA 92780
949-724-9480 949-724-9484 FAX

DATE	BY	REVISION

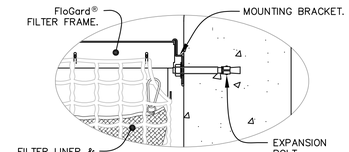
SHEET C1.3
DATE Oct 05 2022
JOB NO. 816-1
Sht. C-2

FloGard®

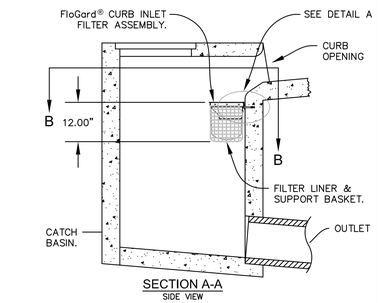
Catch Basin Insert Filter

Curb Inlet Style

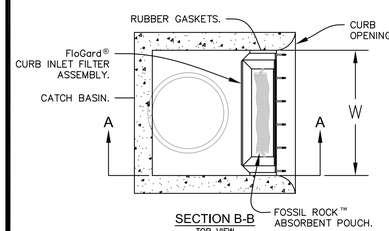
DRAWING NO. FGP-0002



DETAIL A
MOUNTING BRACKET & EXPANSION BOLTS
SEE NOTE 2
NTS



SECTION A-A
SIDE VIEW
NTS



SECTION B-B
TOP VIEW
NTS

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be Fossil Rock, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C, C&R's & Lease Agreements

APPENDICES INCLUDED IN SECTION 6.4 (Other Supporting Documentation):

Appendix I: Kristar FloGard +PLUS Catch Basin Insert Filter Specifications (Pretreatment for Infiltration)

Appendix J: BMP Fact Sheet— INF-7: Underground Infiltration Fact Sheet (from Orange County TGD for Project WQMPs)

Appendix K: BMP Educational Materials

- **Commercial Landscape Maintenance Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Stormwater Management Practices for Commercial Landscape Maintenance Brochure (San Bernardino County Stormwater Program Website)**
- **Sustainable Practices for Landscape Maintenance Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **Construction & Development Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Regulatory Information Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Toxic Household Waste Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **Pet Waste Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **SC-35 Safer Alternative Products**
- **SC-41 Building & Grounds Maintenance**
- **SC-42 Building Repair and Construction**
- **SC-43 Parking / Storage Area Maintenance**
- **SC-44 Drainage System Maintenance**
- **SD-10 Site Design & Landscape Planning**

- **SD-12 Efficient Irrigation**
- **SD-13 Storm Drain Signage**

Appendix L: **NOAA Point Precipitation Frequency Estimate for 2 Year, 1 Hour Storm**

Appendix M: **TGR Geotechnical, Inc.'s Geotechnical Investigation Report, Northwest Corner of E. Colton Avenue and N. Wabash Avenue, Redlands, California 92374, APN 0168-291-02, dated April 8, 2022**

Appendix N: **Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 1); Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 2) (from Orange County TGD for Project WQMPs)**

Appendix O: **Preliminary Hydrology and Hydraulic Report for Madera at Citrus Trail Residential Project, NW Corner of E. Colton Avenue and Wabash Avenue, Redlands, California, 92374, dated July 13, 2022**

Appendix P: **Initial Time of Concentration Nomographs, San Bernardino County Hydrology Manual Figure D-1**

APPENDIX I

Kristar FloGard +PLUS Catch Basin Insert Filter Specifications

(Pretreatment for Infiltration)



KRISTAR

FloGard®+PLUS

Catch Basin Insert Filter

FloGard®+PLUS Catch Basin Insert Filter

GENERAL FILTER CONFIGURATION

FloGard®+PLUS catch basin insert filter shall provide solids filtration through a filter screen or filter liner, and hydrocarbon capture shall be effected using a non-leaching absorbent material contained in a pouch or similar removable restraint. Hydrocarbon absorbent shall not be placed at an exposed location at the entry to the filter that would allow blinding by debris and sediment without provision for self-cleaning in operation.

Filter shall conform to the dimensions of the inlet in which it is applied, allow removal and replacement of all internal components, and allow complete inspection and cleaning in the field.

FLOW CAPACITY

Filter shall provide two internal high-flow bypass locations that in total exceed the inlet peak flow capacity. Filter shall provide filtered flow capacity in excess of the required "first flush" treatment flow. Unit shall not impede flow into or through the catch basin when properly sized and installed.

MATERIALS

Filter support frame shall be constructed of type 304 stainless steel. Filter screen, when used in place of filter liner, shall be type 304 or 316 stainless steel, with an apparent opening size of not less than 4 U.S. mesh. Filter liner, when used in place of filter screen, shall be woven polypropylene geotextile fabric liner with an apparent opening size (AOS) of not less than 40 U.S. mesh as determined by ASTM D 4751. Filter liner shall include a support basket of polypropylene geogrid with stainless steel cable reinforcement.

Filter frame shall be rated at a minimum 25-year service life. All other materials, with the exception of the hydrocarbon absorbent, shall have a rated service life in excess of 2 years.

FloGard®+PLUS TEST RESULTS SUMMARY

Testing Agency	% TSS Removal	% Oil and Grease Removal	% PAH Removal
UCLA	80	70 to 80	
U of Auckland Tonking & Taylor Ltd. (for city of Auckland)	78 to 95		
U of Hawaii (for city of Honolulu)	80		20 to 40

FEATURES

- Easy to install, inspect and maintain
- Can be retrofitted to existing drain catch basins – or used in new projects
- Economical and efficient
- Catches pollutants where they are easiest to catch (at the inlet)
- No standing water – minimizes vector, bacteria and odor problems
- Can be incorporated as part of a "Treatment Train"

BENEFITS

- Lower installation, inspection and maintenance costs
- Versatile installation applications
- Higher return on investment
- Allows for installation on small and confined sites
- Minimizes vector, bacteria and odor problems
- Allows user to target specific pollutants

Innovative stormwater management products

FloGard® +PLUS
Catch Basin Insert Filter



INSTALLATION AND MAINTENANCE
Filter shall be installed and maintained in accordance with manufacturer's general instructions and recommendations.

PERFORMANCE
Filter shall provide 80% removal of total suspended solids (TSS) from treated flow with a particle size distribution consistent with typical urban street deposited sediments. Filter shall capture at least 70% of oil and grease and 40% of total phosphorus (TP) associated with organic debris from treated flow. Unit shall provide for isolation of trapped pollutants, including debris, sediments, and floatable trash and hydrocarbons, from bypass flow such that re-suspension and loss of pollutants is minimized during peak flow events.

FloGard®+PLUS COMPETITIVE FEATURE COMPARISON

Evaluation of FloGard+PLUS Units (Based on flow-comparable units) (Scale 1-10, 10 being best)	**FloGard+PLUS**	**Other Insert Filter Types****
Flow Rate	10	7
Removal Efficiency*	80%	45%
Capacity – Sludge and Oil	7	7
Service Life	10	3
Installation – Ease of Handling / Installation	8	6
Ease of Inspections & Maintenance	7	7
Value	**10**	**2**

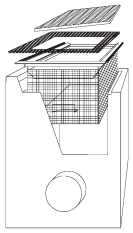
*approximate, based on field sediment removal testing in urban street application **average

Long-Term Cost Comparison (Scale 1-10, 10 being lowest cost, higher number being best)	**FloGard+PLUS**	**Other Insert Filter Types**
Unit cost — initial ($/cfs treated)	10	4
Installation cost ($/cfs treated)	9	6
Adsorbent replacement (annual avg $/cfs treated)	10	2
Unit materials replacement (annual avg $/cfs treated)	10	10
Maintenance cost (annual avg $/cfs treated)	9	6
Total first yr ($/cfs treated)	10	5
Total Annual Avg ($/cfs treated, avg over 20 yrs)*	**10**	**5**

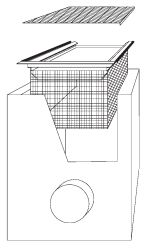
*assumes 3% annual inflation



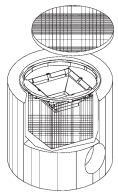
Captured debris from FloGard+PLUS, Dana Point, CA



FloGard+PLUS Combination Inlet



FloGard+PLUS Flat Grate



FloGard+PLUS Round Gated Inlet

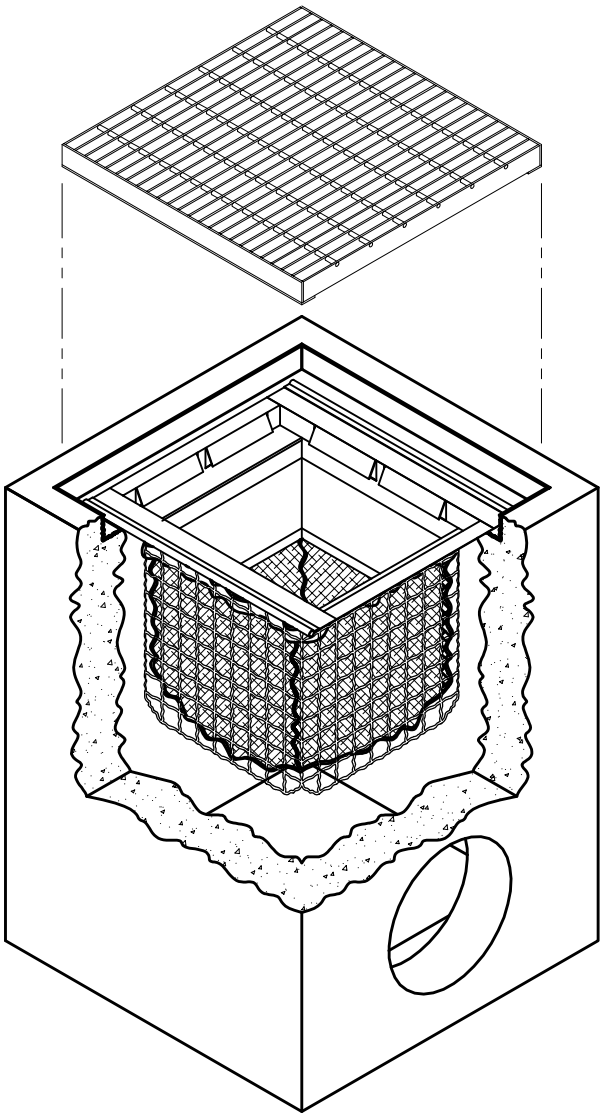
KriStar Enterprises, Inc.
P.O. Box 6419
Santa Rosa, CA 95406-1419

PH: 800-579-8819
FAX: 707-524-8186
www.kristar.com

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FGP-T 11.19.18.04.2M

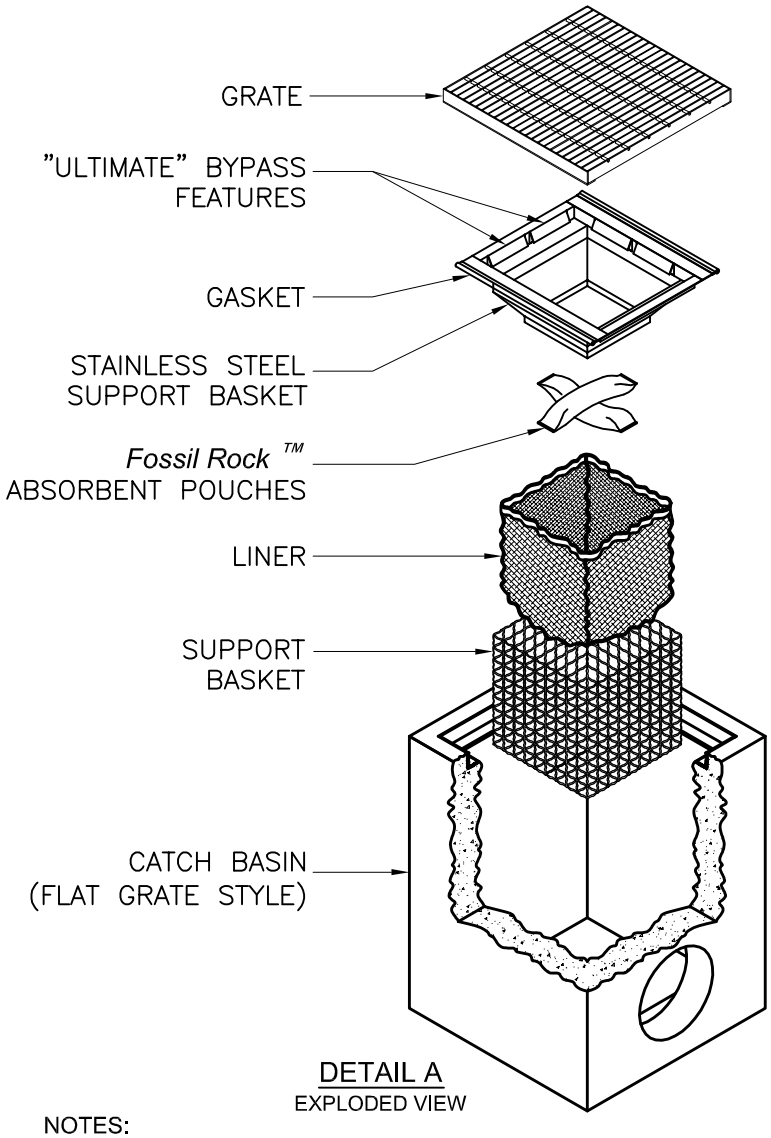
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FGP-0001



FLOGARD+PLUS® FILTER
-INSTALLED INTO CATCH BASIN-

U.S. PATENT # 6,00,023 & 6,877,029



DETAIL A
EXPLODED VIEW

NOTES:

1. FloGard®+Plus (frame mount) high capacity catch basin inserts are available in most sizes and styles (see specifier chart, sheet 2 of 2). Refer to the FloGard®+Plus (wall mount) insert for devices to fit non-standard, or combination style catch basins.
2. Filter insert shall have both an "initial" filtering bypass and "ultimate" high flow bypass feature.
3. Filter support frame shall be constructed from stainless steel Type 304.
4. Allow a minimum of 2.0 feet, of clearance between the bottom of the grate and top of outlet pipe(s), or refer to the FloGard® insert for "shallow" installations.
5. Filter medium shall be *Fossil Rock* ™, installed and maintained in accordance with manufacturer specifications.
6. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
7. Filtered flow r\rate includes a safety factor of two.

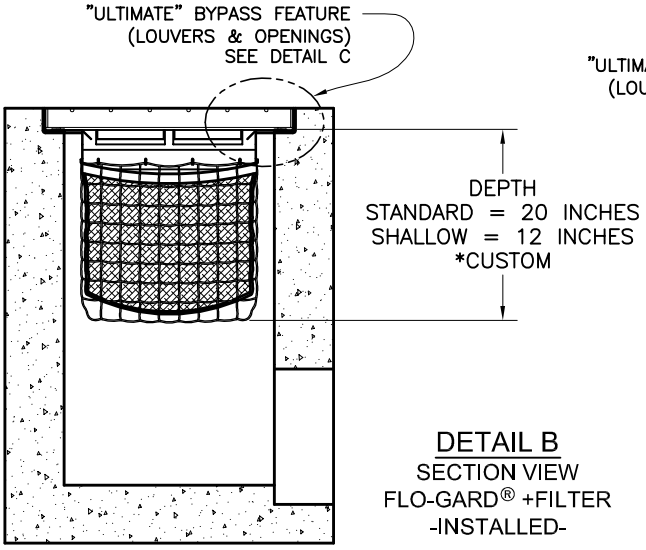
TITLE

FloGard®+PLUS
CATCH BASIN FILTER INSERT
(Frame Mount)
FLAT GRATED INLET

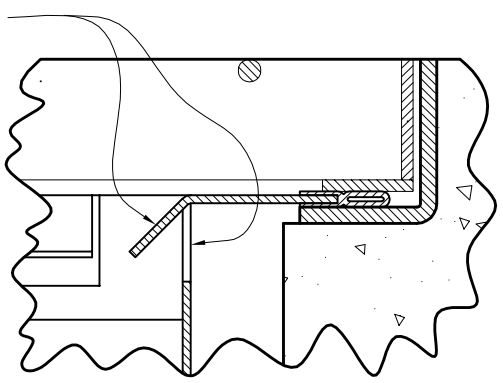
KriStar Enterprises, Inc.
P.O. Box 6419, Santa Rosa, CA 95406
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	SHEET
FGP-0001	A	0001	JPR 09/01/06	1 OF 2

U.S. PATENT # 6,00,023 & 6,877,029



DETAIL B
SECTION VIEW
FLO-GARD® +FILTER
-INSTALLED-



DETAIL C
"ULTIMATE"
BYPASS FEATURES

* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART

MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data in these columes is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO. SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-1530F	15 X 30	15 X 35	6.9	2.3	1.6	FGP-1530F8	1.3	.9
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-1624F	16 X 24	16 X 26	5.0	1.5	1.2	FGP-1624F8	.85	.7
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1820F	16 X 19	18 X 21	5.9	2.1	1.4	FGP-1820F8	1.2	.8
FGP-1824F	16 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	18 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-2142F	21 X 40	24 X 40	9.1	4.3	2.4	FGP-2142F8	2.45	1.35
FGP-2148F	19 X 46	22 X 48	9.8	4.7	2.6	FGP-2148F8	2.7	1.5
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	26 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-28F	28 X 28	32 X 32	6.3	2.2	1.5	FGP-28F8	1.25	.85
FGP-2440F	24 X 36	28 X 40	8.3	4.2	2.3	FGP-2440F8	2.4	1.3
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-SD24F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-SD24F8	1.25	.85
FGP-1836FGO	18 X 36	20 X 40	6.9	2.3	1.6	FGP-1836F8GO	1.3	.9
FGP-2436FGO	20 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8GO	1.95	1.15
FGP-48FGO	18 X 48	20 X 54	6.3	2.2	1.5	FGP-48F8GO	1.25	.85

TITLE

FloGard® +PLUS

CATCH BASIN FILTER INSERT

(Frame Mount)

FLAT GRATED INLET

KriStar Enterprises, Inc.

P.O. Box 6419, Santa Rosa, CA 95406

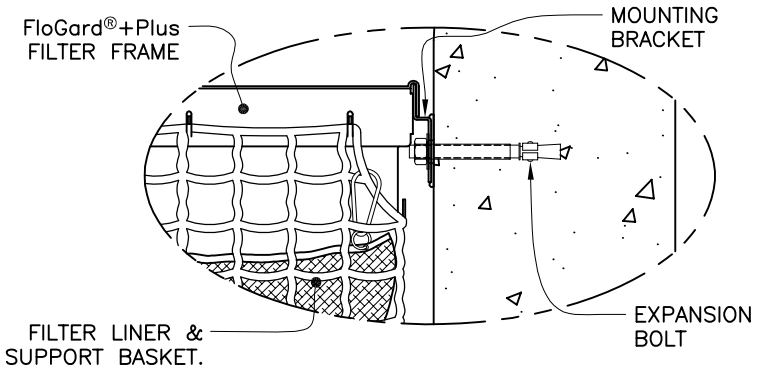
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	SHEET
FGP-0001	A	0001	JPR 09/01/06	SHEET 2 OF 2

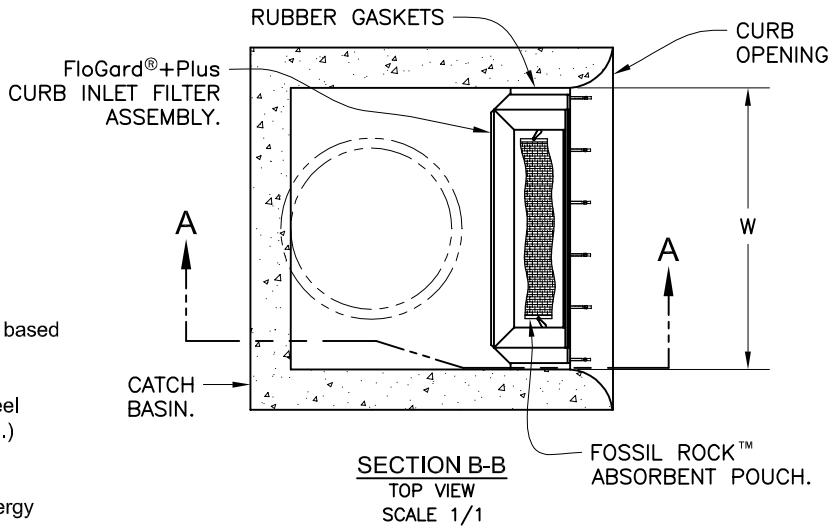
FGP-0002

SPECIFIER CHART

MODEL NO.	Curb Opening Width - W -	Storage Capacity - Cu. Ft. -	Filtered Flow Rate - GPM/CFS -	Bypass Flow Rate - GPM/CFS -
FGP-24CI	2.0' (24")	.95	338 / .75	2,513 / 5.6
FGP-30CI	2.5' (30")	1.20	450 / 1.00	3,008 / 6.7
FGP-36CI	3.0' (36")	1.50	563 / 1.25	3,547 / 7.9
FGP-42CI	3.5' (42")	1.80	675 / 1.50	3,951 / 8.8
FGP-48CI	4.0' (48")	2.10	768 / 1.76	4,445 / 9.9
FGP-5.0CI	5.0' (60")	2.40	900 / 2.00	5,208 / 11.6
FGP-6.0CI	6.0' (72")	3.05	1,126 / 2.51	6,196 / 13.8
FGP-7.0CI	7.0' (84")	3.65	1,350 / 3.01	7,139 / 15.9
FGP-8.0CI	8.0' (96")	4.25	1,576 / 3.51	8,082 / 18.0
FGP-10.0CI	10.0' (120")	4.85	1,800 / 4.01	9,833 / 21.9
FGP-12.0CI	12.0' (144")	6.10	2,252 / 5.02	11,764 / 26.2
FGP-14.0CI	14.0' (168")	7.30	2,700 / 6.02	13,515 / 30.1
FGP-16.0CI	16.0' (192")	8.55	3.152 / 7.02	15,446 / 34.4
FGP-18.0CI	18.0' (216")	9.45	3,490 / 7.78	17,152 / 38.2
FGP-21.0CI	21.0' (252")	10.95	4,050 / 9.02	19,891 / 44.3
FGP-28.0CI	28.0 (336")	14.60	5,400 / 12.03	26,311 / 58.6



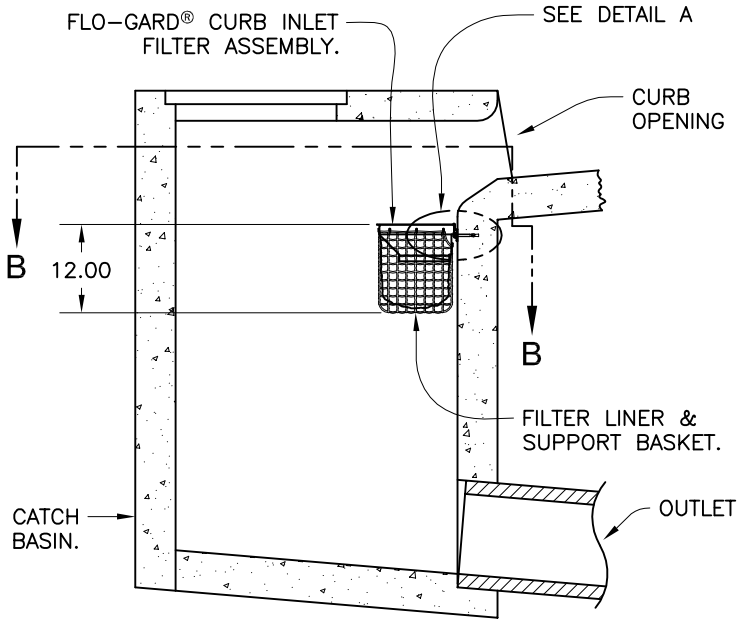
DETAIL A
MOUNTING BRACKET & EXPANSION BOLTS
SEE NOTE 2
SCALE 6/1



SECTION B-B
TOP VIEW
SCALE 1/1

NOTES:

1. FloGard®+PLUS filter inserts shall be installed across the entire width of curb opening. Storage capacity and clean flow rates are based on full width installation.
2. Filter insert shall be attached to the catch basin with stainless steel expansion anchor bolts & washers (3/8" x 2-1/2" minimum length.) See detail A.
3. FloGard®+PLUS filter inserts are designed with a debris trap/energy dissipator for the retention of floatables and collected sediments .
4. Filter support frame shall be constructed from stainless steel Type 304.
5. Filter liner shall be constructed from durable polypropylene, woven, monofilament, geotextile. Filter liner shall not allow the retention of water between storm events.
6. Filter inserts are supplied with "clip-in" filter pouches utilizing FOSSIL ROCK™ filter medium for the collection and retention of petroleum hydrocarbons (oils & greases).
7. FloGard®+PLUS filter inserts and FOSSIL ROCK ™ filter medium pouches must be maintained in accordance with manufacturer recommendations.
8. FloGard +PLUS filter inserts are available in standard lengths of 24", 30",35", 42" & 48" and may be installed in various length combinations (end to end) to fit length of noted catch basin.
9. Clean flow rates are "calculated" based on liner flow rate of 140 gallons per minute per square foot of material, a factor of .50 has been applied to allow for anticipated sediment & debris loading. An additional safety factor of between .25 & .50 may be applied to allow for site specific sediment loading.
10. Storage capacity reflects maximum solids collection prior to impending "initial" filtering bypass. The "ultimate" high-flow bypass will not become impeded due to maximum solids loading.



SECTION A-A
SIDE VIEW
SCALE 1/1

TITLE

FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Curb Inlet Style)

KriStar Enterprises, Inc.
360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	
FGP-0002	D	0059 JPR 12/30/08	JPR 11/3/06	SHEET 1 OF 1

GENERAL SPECIFICATIONS FOR MAINTENANCE OF *FLO-GARD+PLUS*® CATCH BASIN INSERT FILTERS

SCOPE:

Federal, State and Local Clean Water Act regulations and those of insurance carriers require that stormwater filtration systems be maintained and serviced on a recurring basis. The intent of the regulations is to ensure that the systems, on a continuing basis, efficiently remove pollutants from stormwater runoff thereby preventing pollution of the nation's water resources. These specifications apply to the FloGard+Plus® Catch Basin Insert Filter.

RECOMMENDED FREQUENCY OF SERVICE:

Drainage Protection Systems (DPS) recommends that installed Flo-Gard+Plus® Catch Basin Insert Filters be serviced on a recurring basis. Ultimately, the frequency depends on the amount of runoff, pollutant loading and interference from debris (leaves, vegetation, cans, paper, etc.); however, it is recommended that each installation be serviced a minimum of three times per year, with a change of filter medium once per year. DPS technicians are available to do an on-site evaluation, upon request.

RECOMMENDED TIMING OF SERVICE:

DPS guidelines for the timing of service are as follows:

1. For areas with a definite rainy season: Prior to, during and following the rainy season.
2. For areas subject to year-round rainfall: On a recurring basis (at least three times per year).
3. For areas with winter snow and summer rain: Prior to and just after the snow season and during the summer rain season.
4. For installed devices not subject to the elements (washracks, parking garages, etc.): On a recurring basis (no less than three times per years).

SERVICE PROCEDURES:

1. The catch basin grate shall be removed and set to one side. The catch basin shall be visually inspected for defects and possible illegal dumping. If illegal dumping has occurred, the proper authorities and property owner representative shall be notified as soon as practicable.
2. Using an industrial vacuum, the collected materials shall be removed from the liner. (Note: DPS uses a truck-mounted vacuum for servicing Flo-Gard+Plus® catch basin inserts.)
3. When all of the collected materials have been removed, the filter medium pouches shall be removed by unsnapping the tether from the D-ring and set to one side. The filter liner, gaskets, stainless steel frame and mounting brackets, etc. shall be inspected for continued serviceability. Minor damage or defects found shall be corrected on-the-spot and a notation made on the Maintenance Record. More extensive deficiencies that affect the efficiency of the filter (torn liner, etc.), if approved by the customer representative, will be corrected and an invoice submitted to the representative along with the Maintenance Record.
4. The filter medium pouches shall be inspected for defects and continued serviceability and replaced as necessary and the pouch tethers re-attached to the liner's D-ring. See below.
5. The grate shall be replaced.

REPLACEMENT AND DISPOSAL OF EXPOSED FILTER MEDIUM AND COLLECTED DEBRIS

The frequency of filter medium pouch exchange will be in accordance with the existing DPS-Customer Maintenance Contract. DPS recommends that the medium be changed at least once per year. During the appropriate service, or if so determined by the service technician during a non-scheduled service, the filter medium pouches will be replaced with new pouches. Once the exposed pouches and debris have been removed, DPS has possession and must dispose of it in accordance with local, state and federal agency requirements.

DPS also has the capability of servicing all manner of catch basin inserts and catch basins without inserts, underground oil/water separators, stormwater interceptors and other such devices. All DPS personnel are highly qualified technicians and are confined space trained and certified. Call us at (888) 950-8826 for further information and assistance.

APPENDIX J

BMP Fact Sheet—

INF-7: Underground Infiltration Fact Sheet (from Orange County TGD for Project WQMPs)

INF-7: Underground Infiltration

Underground infiltration is a vault or chamber with an open bottom that used to store runoff and percolate into the subsurface. A number of vendors offer proprietary infiltration products that allow for similar or enhanced rates of infiltration and subsurface storage while offering durable prefrabricated structures. There are many varieties of proprietary infiltration BMPs that can be used for roads and parking lots, parks and open spaces, single and multi-family residential, or mixed-use and commercial uses.

Also known as:

- *Infiltration vault*
- *Recharge vault*



Underground Infiltration

Source: http://www.contech-cpi.com

Feasibility Screening Considerations

- Infiltration bains shall pass infeasible screening criteria to be considered for use.
- Underground infiltration galleries pose a potential risk of groundwater contamination; pretreatment should be used.

Opportunity Criteria

- Soils are adequate for infiltration or can be amended to provide an adequate infiltration rate.
- Appropriate for sites with limited surface space.
- Can be placed beneath roads, parking lots, parks, and athletic fields.
- Potential for groundwater contamination can be mitigated through isolation of pollutant sources, pretreatment of inflow, and/or demonstration of adequate treatment capacity of underlying soils.
- Infiltration is into native soil, or depth of engineered fill is ≤ 5 feet from the bottom of the facility to native material and infiltration into fill is approved by a geotechnical professional.
- Tributary area land uses include mixed-use and commercial, sngle-family and multi-family, roads and parking lots, and parks and open spaces. High pollutant land uses should not be tributary to infiltration BMPs.

OC-Specific Design Criteria and Considerations

- ☐ Placement of BMPs should observe geotechnical recommendations with respect to geological hazards (e.g. landslides, liquefaction zones, erosion, etc.) and set-backs (e.g., foundations, utilities, roadways, etc.)
- ☐ Minimum separation to mounded seasonally high groundwater of 10 feet shall be observed.
- ☐ Minimum pretreatment should be provided upstream of the infiltration facility, and water bypassing pretreatment should not be directed to the facility.
- ☐ Underground infiltration should not be used for drainage areas with high sediment production potential unless preceded by full treatment control with a BMP effective for sediment removal.
- ☐ Design infiltration rate should be determined as described in Appendix VII.
- ☐ Inspection ports or similar design features shall be provided to verify continued system performance and identify need for major maintenance.

☐ For infiltration facilities beneath roads and parking areas, structural requirements should meet H-20 load requirements.

Computing Underground Infiltration Device Size

Underground infiltration devices vary by design and by proprietary designs. The sizing method selected for use must be based on the BMP type it most strongly resembles.

- For underground infiltration devices with open pore volume (e.g., vaults, crates, pipe sections, etc), sizing will be most similar to infiltration basins.
- For underground infiltration devices with pore space (e.g., aggregate reservoirs), sizing will be most similar to permeable pavement.

Additional References for Design Guidance

- Los Angeles Unified School District (LAUSD) Stormwater Technical Manual, Chapter 5: http://www.laschools.org/employee/design/fs-studies-and-reports/download/white_paper_report_material/Storm_Water_Technical_Manual_2009-opt-red.pdf?version_id=76975850

APPENDIX K

BMP Educational Materials

- **Commercial Landscape Maintenance Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Stormwater Management Practices for Commercial Landscape Maintenance Brochure (San Bernardino County Stormwater Program Website)**
- **Sustainable Practices for Landscape Maintenance Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **Construction & Development Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Regulatory Information Fact Sheet (San Bernardino County Stormwater Program Website)**
- **Toxic Household Waste Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **Pet Waste Brochure for Homeowners (San Bernardino County Stormwater Program Website)**
- **SC-35 Safer Alternative Products**
- **SC-41 Building & Grounds Maintenance**
- **SC-42 Building Repair and Construction**
- **SC-43 Parking / Storage Area Maintenance**
- **SC-44 Drainage System Maintenance**
- **SD-10 Site Design & Landscape Planning**
- **SD-12 Efficient Irrigation**
- **SD-13 Storm Drain Signage**

SAN BERNARDINO COUNTY
STORMWATER POLLUTION PREVENTION

Commercial landscape maintenance:

Yard waste, sediments and toxic lawn and garden chemicals used in commercial landscape maintenance often make their way into the San Bernardino County storm drain system and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates local waterways, making them unsafe for people and wildlife. Follow these best management practices to prevent pollution, protect public health and avoid fines or legal action.

- **Recycle Yard Waste:** Recycle leaves, grass clippings and other yard waste. Do not blow, sweep, rake or hose yard waste into the street. Let your customers know about grass cycling --the natural recycling of grass by leaving clippings on the lawn when mowing instead of using a grass catcher. Grass clippings will quickly decompose, returning valuable nutrients to the soil. You can get more information at www.ciwmb.ca.gov/Organics.
- **Use Fertilizers, Herbicides & Pesticides Safely:** Fertilizers, herbicides and pesticides are often carried into the storm drain system by sprinkler runoff. Use natural, non-toxic alternatives to traditional garden chemicals. If you must use chemical fertilizers, herbicides, or pesticides spot apply rather than blanketing entire areas, avoid applying near curbs and driveways and never apply before a rain.
- **Recycle Hazardous Waste:** Pesticides, fertilizers, herbicides and motor oil contaminate landfills and should be disposed of through a Hazardous Waste Facility. For information on proper disposal, call (909) 386-8401.
- **Use Water Wisely:** Conserve water and prevent runoff by controlling the amount of water and direction of sprinklers. Sprinklers should be on long enough to allow water to soak into the ground but not so long as to cause runoff. Periodically inspect, fix leaks and realign sprinkler heads.



- **Planting:** Plant native vegetation to reduce the need of water, fertilizers, herbicides and pesticides.
- **Prevent Erosion:** Erosion washes sediments, debris and toxic runoff into the storm drain system, polluting waterways. Prevent erosion and sediment runoff by using ground cover, berms and vegetation down-slope to capture runoff. Avoid excavation or grading during wet weather.



- **Store Materials Safely:** Keep landscaping materials and debris away from the street, gutter and storm drains. On-site stockpiles of materials should be covered with plastic sheeting to protect from rain, wind and runoff.

For more information about how you can prevent stormwater pollution:

www.sbcountystormwater.org

San Bernardino County Stormwater Program
825 East Third Street · Room 127
San Bernardino, CA 94215-0835

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PERMIT# 000



STORMWATER Pollution Prevention

Stormwater Management Practices for Commercial Landscape Maintenance

Yard waste, sediments, and toxic lawn/garden chemicals used in commercial landscape maintenance often make their way into the San Bernardino County storm drain system and do not get treated before reaching the Santa Ana River. This pollutes our drinking water and contaminates local waterways, making them unsafe for people and wildlife. Following these best management practices will prevent pollution, comply with regulations and protect public health.

Recycle Yard Waste

Recycle leaves, grass clippings and other yard waste. Do not blow, sweep, rake or hose yard waste into the street. Try grasscycling - the natural recycling of grass by leaving clippings on the lawn when mowing. Grass clippings will quickly decompose, returning valuable nutrients to the soil. Further information can be obtained at www.ciwmb.ca.gov/Organics.

Use Fertilizers, Herbicides and Pesticides Safely

Fertilizers, herbicides and pesticides are often carried into the storm drain system by sprinkler runoff. Use of natural, non-toxic alternatives to the traditional fertilizers, herbicides and pesticides is highly recommended. If you must use chemical fertilizers, herbicides, or pesticides:



- Spot apply pesticides and herbicides, rather than blanketing entire areas.
- Avoid applying near curbs and driveways, and never apply before a rain.
- Apply fertilizers as needed, when plants can best use it, and when the potential for it being carried away by runoff is low.

Recycle Hazardous Waste

Pesticides, fertilizers, herbicides and motor oil contaminate landfills and should be disposed of through a Hazardous Waste Facility, which accepts these types of materials. For information on proper disposal call, (909) 386-8401.

Use Water Wisely

Conserve water and prevent runoff by controlling the amount of water and direction of sprinklers. Sprinklers should be on long enough to allow water to soak into the ground but not so long as to cause runoff. Periodically inspect, fix leaks and realign sprinkler heads. Plant native vegetation to reduce the need of water, fertilizers, herbicides, and pesticides.

Prevent Erosion

Erosion washes sediments, debris and toxic runoff into the storm drain system, polluting waterways.

- Prevent erosion and sediment runoff by using ground cover, berms and vegetation down-slope to capture runoff.
- Avoid excavation or grading during wet weather.

Store Materials Safely

Keep landscaping materials and debris away from the street, gutter and storm drains. On-site stockpiles of materials must be covered with plastic sheeting to protect from rain, wind and runoff.

San Bernardino County STORMWATER PROGRAM

To report illegal dumping call

(877) WASTE18

or visit our website:

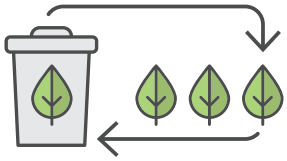
sbcountystormwater.org

DISCHARGE TO THE STORM DRAIN, ACCIDENTAL OR NOT, COULD LEAD TO ENFORCEMENT ACTIONS AND FINES

Sustainable Practices for Landscape Maintenance

Your contributions make a difference in the way you maintain your yard. Learn how to truly be a "green" thumb and prevent stormwater pollution.

Recycle Yard Waste



Yard waste, like grass and leaves, can block the storm drain or carry harmful chemicals into it.

- Recycle yard waste by placing them into your greenwaste container.
- Do not blow, sweep, rake, or hose yard waste into the street or catch basin.
- Try grasscycling by leaving clippings on the lawn when mowing.

For more information, visit www.calrecycle.ca.gov/organics/grasscycling.

Use Safe Products



Fertilizers, herbicides, and pesticides are often carried into the storm drain by sprinkler runoff.

- Use natural and non-toxic alternatives as often as possible.
- Spot-apply, rather than blanketing entire areas.

Apply chemicals directly to the area that needs treatment.

- Read the product label and use only as directed.
- Never apply before a rain.

Use Water Wisely



Conserving water minimizes the amount of urban runoff going into the street.

- Control the amount of water and direction of sprinklers.

The average lawn only needs about an inch of water a week or 10 to 20 minutes of watering.

- Periodically inspect and fix sprinklers for leaks.

Realign sprinkler heads to make sure water is distributed onto the lawn and not onto the sidewalk.

- Plant native vegetation to reduce the need of water.

HOMEOWNERS

Keep these tips in mind when hiring professional landscapers and remind them as necessary.



Leftover pesticides, fertilizers, and herbicides contaminate landfills and should be disposed of through a Household Hazardous Waste Center*.

For more information on proper disposal, call 1 (800) OILYCAT or visit tootoxictotrash.com.

**FREE for San Bernardino County residents.*
Businesses can call for cost inquiries and to schedule an appointment.

To report illegal dumping or toxic spills, call **(877) WASTE18** or visit **tootoxictotrash.com**

To dispose of hazardous waste, call **1 (800) OILYCAT**

sbcountystormwater.org

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

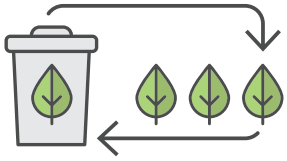
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Rialto • San Bernardino • San Bernardino County • San Bernardino County Flood Control District • Upland • Yucaipa

DESCARGAR DESECHOS HACIA EL DRENAJE DE AGUAS PLUVIALES, ACCIDENTALMENTE O NO, PODRÍA DESENCADENAR ACCIONES POR PARTE DE LAS AUTORIDADES, INCLUYENDO MULTAS

Prácticas Sostenibles para el Mantenimiento de Jardinería

Sus acciones pueden marcar una gran diferencia en la forma en que usted mantenga su jardín. Aprenda cómo implementar prácticas ecológicas y prevenir la contaminación de las aguas pluviales.

Recicle los Residuos de Jardín



Los desechos de jardín, como la hierba y las hojas, pueden bloquear el drenaje pluvial o transportar productos químicos dañinos.

- Recicle los desechos del jardín colocándolos en su contenedor verde de desechos.
- No sople, barra, rastrille ni riegue los desechos del patio en la calle o en la cuneta.
- Intente reciclar el césped dejando los recortes sobre el césped.

Para obtener más información, visite el sitio web en inglés www.calrecycle.ca.gov/organics/grasscycling.

Use Productos Seguros



Los fertilizantes, herbicidas y pesticidas a menudo son arrastrados al drenaje pluvial a través del agua sobrante proveniente de los rociadores.

- Use alternativas naturales y no tóxicas con la mayor frecuencia posible.
- Aplique los productos en las áreas específicas que requiera tratamiento en lugar de cubrir áreas enteras.
- Lea la etiqueta del producto y use solo como se indica.
- Nunca aplique antes de una lluvia.

Use el Agua de Forma Inteligente



La conservación del agua minimiza la cantidad de escorrentía que va a la calle a través del agua sobrante.

- Controle la cantidad de agua y la dirección de los rociadores.

El césped promedio solo necesita aproximadamente una pulgada de agua por semana, incluida la lluvia, o 10 a 20 minutos de riego.

- Inspeccione y repare periódicamente los rociadores para detectar fugas y goteos.

Realinie las cabezas de los rociadores para asegurarse de que el agua se distribuya en el césped y no en la acera.

- Plante vegetación autóctona para reducir la necesidad de agua.

PROPIETARIOS

Tenga en cuenta estos consejos al contratar jardineros profesionales y haga que los mantengan presente como sea necesario.



Los pesticidas, fertilizantes y herbicidas sobrantes contaminan los vertederos y deben desecharse a través de un Centro de Residuos Domésticos Peligrosos*.

Para obtener más información sobre la forma de desechar adecuadamente residuos peligrosos, llame al 1 (800) 645-9228 o visite muytoxicoparabotar.com.

**GRATIS para los residentes del Condado de San Bernardino. Las empresas pueden llamar para consultar los costos y para programar una cita.*

Para reportar desechos ilegales o derrames tóxicos, llame al **(877) 927-8318** o visite **muytoxicoparabotar.com**

Para eliminar residuos peligrosos, llame al **1 (800) 645-9228**

sbcountystormwater.org

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

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Rialto • San Bernardino • San Bernardino County • San Bernardino County Flood Control District • Upland • Yucaipa

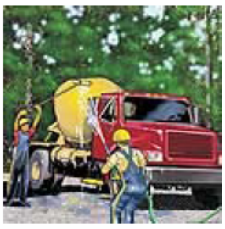
SAN BERNARDINO COUNTY
STORMWATER POLLUTION PREVENTION

Construction & development:

Soil, cement wash, asphalt, oil and other hazardous debris from construction sites often make their way into the San Bernardino County storm drain system, and flow untreated into local waterways. Follow these best management practices to prevent pollution, protect public health and avoid fines or legal action.



- **Store Materials Safely:** Keep construction materials and debris away from the street, gutter and storm drains. Cover exposed stockpiles of soil, sand or gravel and excavated material with plastic sheeting, protected from rain, wind and runoff.
- **Preventing Erosion:** Avoid excavation or grading during wet weather. Plant temporary vegetation or add hydro mulch on slopes where construction is not immediately planned, and permanent vegetation once excavation and grading are complete. Construct diversion dikes to channel runoff to a detention basin and around the construction site. Use gravel approaches where truck traffic is frequent to reduce soil compaction and limit the tracking of sediment into the streets. For more information on erosion control, call (909) 799-7407.



- **Cleaning & Preventing Spills:** Use a drip pan and funnel when draining or pouring fluids. Sweep up dry spills, instead of hosing. Be ready for spills by preparing and using spill containment and cleanup kits that include safety equipment and dry cleanup materials such as kitty litter or sawdust. To report serious spills, call 911.
- **Maintaining Vehicles & Equipment:** Maintain and refuel vehicles and equipment at a single location on-site, away from the street, gutter and storm drains. Perform major equipment repairs and washings off-site. Inspect vehicles and equipment frequently for leaks, and prevent leaks from stored vehicles by draining gas, hydraulic oil, transmission, and brake and radiator fluids.
- **Ordering Materials & Recycling Waste:** Reduce waste by ordering only the amounts of materials needed for the job. Use recycled or recyclable materials whenever possible. You can recycle broken asphalt, concrete, wood, and cleared vegetation. Dispose of hazardous materials through a hazardous waste hauler or other means in accordance with the construction permit. Non-recyclable materials should be taken to a landfill or disposed of as hazardous waste. For recycling and disposal information, call (909) 386-8401.
- **Concrete and mortar application:** Never dispose of cement washout into driveways, streets, gutters or drainage ditches. Wash concrete mixers and equipment only in specified washout areas, where the water flows into lined containment ponds. Cement wash water can be recycled by pumping it back into cement mixers for reuse.

For more information about how you can prevent stormwater pollution:

www.sbcountystormwater.org

SAN BERNARDINO COUNTY STORMWATER PROGRAM

WHERE WATER MEETS COMMUNITY

Regulatory Information

The Federal Water Pollution Control Act prohibits the discharge of any pollutant to navigable waters from a point source unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 passage of the Water Quality Act established NPDES permit requirements for discharges of storm water. The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

Industrial facilities and construction sites are regulated by the Regional Water Quality Control Board and State Water Resources Control Board, through general storm water permits. Most industrial, manufacturing or transportation businesses that store materials, products or equipment outdoors, or conduct vehicle washing or process operations outdoors are required to obtain coverage under the State Water Resources Control Board's General Industrial Activities Stormwater Permit. For more information about this permit, visit *http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/industrial.shtml* or contact your local storm water coordinator.

If your business conducts construction activities, including clearing, grading, stockpiling or excavation that results in soil disturbances of at least one acre, you are subject to the State Water Resources Control Board's General Construction Activities Stormwater Permit. To find out more about this storm water permit for construction, visit *https://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/construction_new.shtml.*
Cities and counties are regulated through permits issued by the Regional Boards. Since 1990 operators of large storm drain systems such as San Bernardino County's have been required to:

- Develop a storm water management program designed to prevent harmful pollutants from being dumped or washed by storm water runoff, into the storm water system, then discharged into local water bodies; and
- Obtain a National Pollutant Discharge Elimination System (NPDES) permit.

The NPDES permit programs in California are administered by the State Water Resources Control Board and by nine regional boards that issue NPDES permits and enforce regulations within their respective region.

San Bernardino County lies within the jurisdiction of the Santa Ana Region. This regional board issues a permit to the San Bernardino County Permittees, which includes the County of San Bernardino, San Bernardino County Flood Control District and incorporated cities of San Bernardino County. Since the program's inception, the County of San Bernardino has served as the principal permittee.

SAN BERNARDINO COUNTY STORMWATER PROGRAM

WHERE WATER MEETS COMMUNITY

Documents & Reports:

The following documents describe the regulations and programs for water quality in San Bernardino County. You can review the latest Basin Plan. National Pollutant Discharge Elimination System (NPDES) Permit and Drainage Area Management Plan (DAMP).

- **Basin Plans:** The document for each region of the State Water Quality Board's jurisdiction, including Santa Ana, is the Water Quality Control Plan, commonly referred to as the Basin Plan. It is the foundation for the regulatory programs of each regional board. The Basin Plan documents the beneficial uses of the region's ground and surface waters, existing water quality conditions, problems, and goals, and actions by the regional board and others that are necessary to achieve and maintain water quality standards.

Water Control Plan for the Santa Ana River Basin

- **Municipal National Pollutant Discharge Elimination System (NPDES) Permits:** The permits of each region outline additional steps for a storm water management program and specify requirements to help protect the beneficial uses of the receiving waters. They require permittees to develop and implement Best Management Practices (BMPs) to control/reduce the discharge of pollutants to waters of the United States to the maximum extent practicable (MEP).

Santa Ana Regional Water Quality Control Board Municipal NPDES Permit Order No. R8-2002-0Q12

- **Report of Waste Discharge:** The Report of Waste Discharge (ROWD) describes the San Bernardino Stormwater Program, implemented by the County and cities to comply with their jointly held stormwater permit. It is the principle policy and guidance document for the NPDES Stormwater Program.

Report of Waste Discharge 2000

- **San Bernardino County Storm Water Program Annual Status Report:** The Annual Status Report is a requirement of the NPDES permit for submittal to the Regional Boards and United States Environmental Protection Agency. The report presents an analysis and assessment of permit compliance activities.

Annual Report - will be posted soon

For more information about how you can prevent stormwater pollution:

www.sbcountystormwater.org

BRING US YOUR TOXIC WASTE

Take toxic household products to your local household hazardous waste collection center.





IT'S EASY!

1 Make sure products are **properly sealed**, **labeled**, and **spill-proof**.*

2 Take them to a **FREE** collection center in:

Big Bear Lake
Chino
Fontana
Ontario
Rancho Cucamonga
Redlands
Rialto
San Bernardino
Upland

TOXIC HOUSEHOLD PRODUCTS INCLUDE:

Automotive Fluids
Batteries
Cooking Oil
Fertilizers & Pesticides
Fluorescent Bulbs
Household Cleaners
Medicine
Motor Oil & Filters
Paint Products
Pool Chemicals

WHY CAN'T I THROW THESE ITEMS IN THE TRASH?

It is illegal and poses health risks to humans, pets, the environment, and our waterways.

For more information, locations and a full list of items, visit

tootoxictotrash.com

** You can bring 15 gallons or 125 pounds in containers no larger than 5 gallons per visit. No business waste accepted. Must be a San Bernardino County resident.*

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY





PICK UP
After Your Pet!



Protect the health of your pet and the environment

For more information about current campaigns visit **sbcountystormwater.org/dog**

facebook.com/sbcountystormwater

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

Big Bear • Chino • Chino Hills • Colton • Fontana • Grand Terrace • Highland • Loma Linda • Montclair • Ontario • Rancho Cucamonga • Redlands • Rialto • San Bernardino • San Bernardino County • San Bernardino County Flood Control District • Upland • Yucaipa

WHY IT MATTERS



PROTECT
YOUR FAMILY AND YOUR PET

- Dog waste can infect children and adults with disease-causing bacteria and parasites.
- Your dog can get infected from the waste of other dogs.

PROTECT
OUR ENVIRONMENT



Leaving dog waste on the streets or on your property can have a negative impact on water quality. Pet waste that's not disposed of properly flows untreated through the storm drain system and directly into our local water bodies. Pet waste is a pollutant that contains nutrients, parasites and bacteria that can affect the quality of our rivers and the ocean and make the water unsafe for swimming, drinking or fishing.

BAG IT AND TRASH IT

It's that simple to protect our health and the environment!



- Keep a supply of bags near your dog leash or tie them to the leash
- Use a poop scooper
- Bring several plastic bags with you
- Reuse plastic grocery bags or purchase special doggie waste bags at pet supplies stores
- Make sure your pet's waste gets into a trash can

Encourage your neighbors and other pet owners to do the right thing and pick up after their pets.










¡RECOJA los desechos de sus mascotas!



Proteja la salud de su mascota y el medio ambiente

Si desea más información, visite
sbcountystormwater.org/dog

facebook.com/sbcountystormwater

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

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POR QUÉ ES IMPORTANTE



PROTEJA
A SU FAMILIA Y A SU MASCOTA

- Los desechos de los perros pueden infectar a niños y adultos con enfermedades causadas por bacterias y parásitos.
- Su perro puede contraer una infección de los desechos de otros perros.

PROTEJA
EL MEDIO AMBIENTE



Dejar desechos de perros en la calle o en su propiedad puede tener un impacto negativo en la calidad del agua. Los desechos de mascotas que no se eliminan de la propiedad fluyen sin tratamiento por el sistema de drenaje de tormentas y llegan directamente a las masas de agua locales. Los desechos de mascotas son agentes contaminantes que contienen nutrientes, parásitos y bacterias que pueden afectar la calidad de nuestros ríos y océanos, y hacer que el agua no sea segura para nadar, beber o pescar.

COLÓQUELA EN UNA BOLSA Y TÍRELA EN LA BASURA

Así de simple es proteger nuestra salud y el medio ambiente.



- Guarde algunas bolsas cerca de la correa de su perro o átelas a la correa;
- Use una cuchara para recojer el desecho;
- Lleve varias bolsas plásticas;
- Reutilice bolsas plásticas de comestibles o compre bolsas especiales para desechos de perros en las tiendas para mascotas;
- Asegúrese de tirar los desechos de su perro en un cesto de basura.

Aliente a sus vecinos y otros dueños de mascotas a hacer lo correcto y levantar los desechos de sus mascotas.






Safer Alternative Products SC-35

Description

Promote the use of less harmful products and products that contain little or no TMDL pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.
- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies

Objectives

- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

CASQA California Stormwater Quality Association

- Procedures
  - Standard operating procedures (SOPs)
  - Purchasing guidelines and procedures
  - Bid packages (services and supplies)
- Materials
  - Preferred or approved product and supplier lists
  - Product and supplier evaluation criteria
  - Training sessions and manuals
  - Fact sheets for employees

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC20 – SC22) and SC41, Building and Grounds Maintenance.

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.

Regulations

This BMP has no regulatory requirements. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Storm water runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major equipment requirements to this BMP.

Limitations

- Alternative products may not be available, suitable, or effective in every case.

Requirements

Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.

- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources listed below.

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Rerefined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps. All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.
- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control (www.dtsc.ca.gov)

California Integrated Waste Management Board (www.ciwmb.ca.gov)

City of Santa Monica (www.santa-monica.org/environment)

City of Palo Alto (www.city.palo-alto.ca.us/cleanbay)

City and County of San Francisco, Department of the Environment (www.ci.sf.ca.us/sfenvironment)

Earth 911 (www.earth911.org/master.asp)

Environmental Finance Center Region IX (www.greenstart.org/efc9)

Flex Your Power (www.flexyourpower.ca.gov)

GreenBiz.com (www.greenbiz.com)

Green Business Program (www.abag.org/bayarea/enviro/gbus/gb.html)

Pacific Industrial and Business Association (www.piba.org)

Sacramento Clean Water Business Partners (www.sacstormwater.org)

USEPA BMP fact sheet – Alternative products (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/poll_2.cfm)

USEPA Region IX Pollution Prevention Program (www.epa.gov/region09/p2)

Western Regional Pollution Prevention Network (www.westp2net.org)

Metals (mercury, copper)

National Electrical Manufacturers Association - Environment, Health and Safety (www.nema.org)

Sustainable Conservation (www.suscon.org)

Auto Recycling Project

Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center (www.birc.org)

California Department of Pesticide Regulation (www.cdpr.ca.gov)

University of California Statewide IPM Program (www.ipm.ucdavis.edu/default.html)

Dioxins

Bay Area Dioxins Project (http://dioxin.abag.ca.gov/)

Building & Grounds Maintenance SC-41



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

CASQA California Stormwater Quality Association

- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Building Repair and Construction SC-42



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Recycle

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

Approach

Pollution Prevention

- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practical.
- Buy recycled products to the maximum extent practical.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.

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- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

Suggested Protocols

Repair & Remodeling

- Follow BMPs identified in Construction BMP Handbook.
- Maintain good housekeeping practices while work is underway.
- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Cover materials of particular concern that must be left outside, particularly during the rainy season.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store materials properly that are normally used in repair and remodeling such as paints and solvents.
- Sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout if when repairing roofs, small particles have accumulated in the gutter. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Properly store and dispose waste materials generated from construction activities. See Construction BMP Handbook.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.

- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is significant risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Training

Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

Limitations

- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more requirements for larger projects. The companion "Construction Best Management Practice Handbook" contains specific guidance and best management practices for larger-scale projects.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.

SC-42 Building Repair and Construction

Requirements

Costs

These BMPs are generally low to modest in cost.

Maintenance

N/A

Supplemental Information

Further Detail of the BMP

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. See Treatment Control Fact Sheet TC-20 Wet Pond/Basin in Section 5 of the New Development and Redevelopment Handbook regarding design criteria. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

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SC-43 Parking/Storage Area Maintenance

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
  - Block the storm drain or contain runoff.
  - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
  - Clean oily spots with absorbent materials.
  - Use a screen or filter fabric over inlet, then wash surfaces.

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

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- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

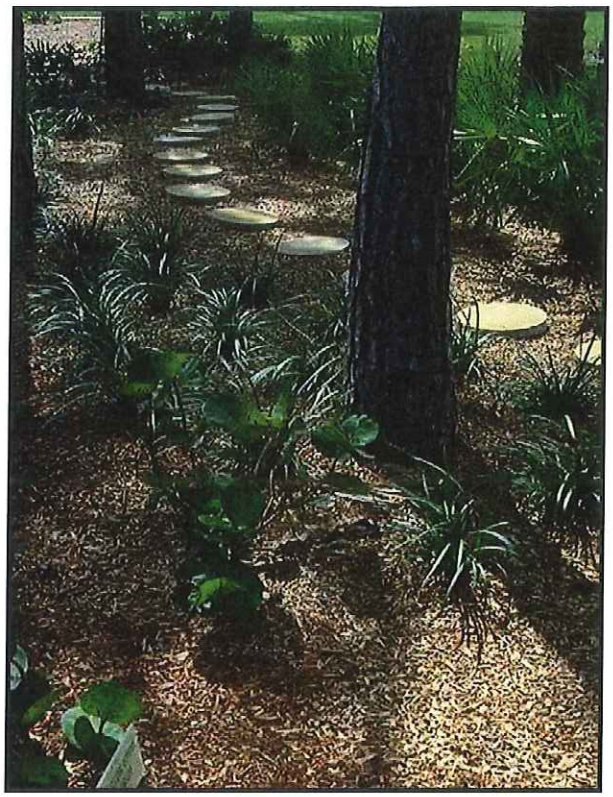
Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Site Design & Landscape Planning SD-10



Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- ✓ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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SD-10 Site Design & Landscape Planning

Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.

- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.

- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.

- Promote natural vegetation by using parking lot islands and other landscaped areas.

- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.

- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

SD-10 Site Design & Landscape Planning

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Efficient Irrigation SD-12



Design Objectives

- ✓ Maximize Infiltration
- ✓ Provide Retention
- ✓ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

APPENDIX L

NOAA Point Precipitation Frequency Estimate for 2 Year, 1 Hour Storm

NOAA Atlas 14, Volume 6, Version 2
Location name: Redlands, California, USA*
Latitude: 34.0629°, Longitude: -117.139°
Elevation: 1616.69 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.104** (0.087-0.127)	**0.137** (0.114-0.167)	**0.183** (0.151-0.223)	**0.222** (0.183-0.273)	**0.279** (0.222-0.355)	**0.326** (0.253-0.423)	**0.376** (0.285-0.501)	**0.430** (0.317-0.590)	**0.509** (0.359-0.729)	**0.575** (0.392-0.852)
10-min	**0.149** (0.124-0.181)	**0.196** (0.163-0.239)	**0.262** (0.217-0.319)	**0.319** (0.262-0.392)	**0.400** (0.318-0.509)	**0.467** (0.363-0.607)	**0.539** (0.408-0.718)	**0.617** (0.454-0.846)	**0.730** (0.515-1.04)	**0.823** (0.561-1.22)
15-min	**0.181** (0.150-0.219)	**0.238** (0.197-0.289)	**0.317** (0.263-0.386)	**0.385** (0.317-0.473)	**0.484** (0.384-0.616)	**0.565** (0.439-0.734)	**0.652** (0.494-0.868)	**0.746** (0.550-1.02)	**0.883** (0.623-1.26)	**0.996** (0.679-1.48)
30-min	**0.265** (0.221-0.322)	**0.349** (0.290-0.424)	**0.465** (0.386-0.567)	**0.566** (0.465-0.696)	**0.711** (0.565-0.904)	**0.830** (0.645-1.08)	**0.957** (0.726-1.28)	**1.10** (0.807-1.50)	**1.30** (0.915-1.86)	**1.46** (0.997-2.17)
60-min	**0.374** (0.311-0.454)	**0.491** (0.408-0.597)	**0.655** (0.543-0.799)	**0.797** (0.655-0.979)	**1.00** (0.795-1.27)	**1.17** (0.908-1.52)	**1.35** (1.02-1.80)	**1.54** (1.14-2.12)	**1.83** (1.29-2.61)	**2.06** (1.40-3.05)
2-hr	**0.535** (0.446-0.650)	**0.692** (0.575-0.842)	**0.908** (0.753-1.11)	**1.09** (0.897-1.34)	**1.35** (1.07-1.72)	**1.56** (1.22-2.03)	**1.79** (1.35-2.38)	**2.03** (1.49-2.78)	**2.37** (1.67-3.39)	**2.64** (1.80-3.92)
3-hr	**0.656** (0.546-0.796)	**0.842** (0.700-1.02)	**1.10** (0.908-1.34)	**1.31** (1.08-1.61)	**1.61** (1.28-2.05)	**1.86** (1.44-2.41)	**2.11** (1.60-2.81)	**2.38** (1.76-3.27)	**2.77** (1.95-3.96)	**3.08** (2.10-4.56)
6-hr	**0.916** (0.762-1.11)	**1.17** (0.970-1.42)	**1.51** (1.25-1.84)	**1.79** (1.47-2.20)	**2.19** (1.74-2.78)	**2.50** (1.94-3.25)	**2.82** (2.14-3.76)	**3.16** (2.33-4.34)	**3.64** (2.57-5.21)	**4.02** (2.74-5.96)
12-hr	**1.24** (1.03-1.50)	**1.58** (1.31-1.92)	**2.03** (1.69-2.48)	**2.41** (1.98-2.96)	**2.93** (2.32-3.72)	**3.33** (2.59-4.33)	**3.74** (2.84-4.99)	**4.17** (3.07-5.72)	**4.76** (3.36-6.81)	**5.22** (3.56-7.74)
24-hr	**1.66** (1.47-1.92)	**2.14** (1.89-2.47)	**2.77** (2.44-3.21)	**3.29** (2.88-3.83)	**3.99** (3.38-4.81)	**4.53** (3.76-5.57)	**5.08** (4.12-6.40)	**5.65** (4.46-7.32)	**6.43** (4.87-8.67)	**7.04** (5.15-9.81)
2-day	**2.03** (1.79-2.33)	**2.65** (2.34-3.06)	**3.47** (3.06-4.02)	**4.15** (3.64-4.84)	**5.09** (4.31-6.13)	**5.82** (4.83-7.15)	**6.56** (5.32-8.26)	**7.34** (5.78-9.49)	**8.40** (6.36-11.3)	**9.23** (6.75-12.9)
3-day	**2.17** (1.92-2.50)	**2.88** (2.54-3.32)	**3.82** (3.37-4.42)	**4.60** (4.03-5.37)	**5.69** (4.82-6.86)	**6.55** (5.43-8.05)	**7.43** (6.02-9.36)	**8.35** (6.59-10.8)	**9.63** (7.29-13.0)	**10.6** (7.79-14.8)
4-day	**2.34** (2.07-2.70)	**3.12** (2.76-3.60)	**4.18** (3.69-4.83)	**5.06** (4.43-5.90)	**6.28** (5.32-7.57)	**7.25** (6.02-8.91)	**8.25** (6.69-10.4)	**9.31** (7.34-12.0)	**10.8** (8.15-14.5)	**11.9** (8.74-16.6)
7-day	**2.70** (2.39-3.11)	**3.64** (3.22-4.21)	**4.92** (4.34-5.69)	**5.98** (5.23-6.97)	**7.46** (6.32-8.98)	**8.62** (7.16-10.6)	**9.83** (7.97-12.4)	**11.1** (8.75-14.4)	**12.9** (9.74-17.3)	**14.3** (10.4-19.9)
10-day	**2.92** (2.59-3.37)	**3.97** (3.51-4.58)	**5.38** (4.75-6.23)	**6.56** (5.74-7.65)	**8.21** (6.95-9.89)	**9.50** (7.88-11.7)	**10.8** (8.79-13.7)	**12.3** (9.66-15.9)	**14.2** (10.8-19.2)	**15.8** (11.5-22.0)
20-day	**3.63** (3.22-4.19)	**4.99** (4.41-5.75)	**6.81** (6.01-7.88)	**8.34** (7.30-9.73)	**10.5** (8.87-12.6)	**12.2** (10.1-15.0)	**13.9** (11.3-17.5)	**15.8** (12.4-20.4)	**18.3** (13.9-24.7)	**20.4** (14.9-28.4)
30-day	**4.32** (3.82-4.97)	**5.92** (5.24-6.84)	**8.10** (7.15-9.37)	**9.92** (8.68-11.6)	**12.5** (10.6-15.0)	**14.5** (12.0-17.8)	**16.6** (13.5-20.9)	**18.8** (14.8-24.4)	**21.9** (16.6-29.5)	**24.4** (17.8-34.0)
45-day	**5.20** (4.61-5.99)	**7.10** (6.28-8.19)	**9.66** (8.52-11.2)	**11.8** (10.3-13.8)	**14.8** (12.6-17.9)	**17.2** (14.3-21.2)	**19.7** (16.0-24.9)	**22.4** (17.6-29.0)	**26.1** (19.7-35.1)	**29.0** (21.2-40.4)
60-day	**6.15** (5.45-7.09)	**8.31** (7.35-9.59)	**11.2** (9.91-13.0)	**13.7** (12.0-16.0)	**17.1** (14.5-20.7)	**19.9** (16.5-24.5)	**22.8** (18.4-28.7)	**25.8** (20.3-33.4)	**30.0** (22.7-40.5)	**33.4** (24.4-46.5)

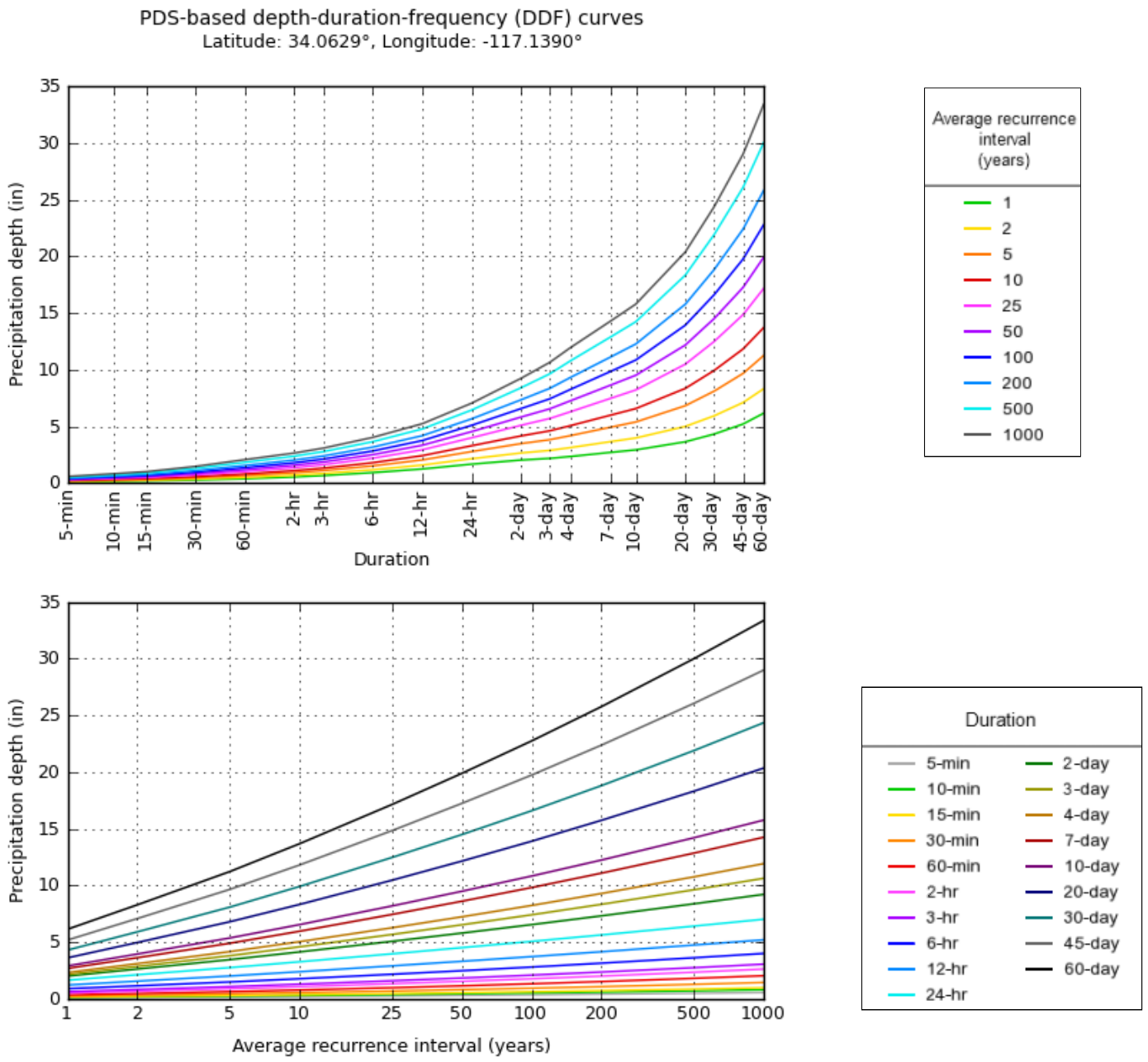
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



NOAA Atlas 14, Volume 6, Version 2

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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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Disclaimer

APPENDIX M

TGR Geotechnical, Inc.’s Geotechnical Investigation Report, Northwest Corner of E. Colton Avenue and N. Wabash Avenue, Redlands, California 92374, APN 0168-291-02, dated April 8, 2022

Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

April 8, 2022 Project No. 22-7455

Vanita Soni Puri
1423 Georgina Ave.,
Santa Monica, CA 90402

Subject: Preliminary Geotechnical Investigation Report, Northwest Corner of E. Colton Avenue and N. Wabash Avenue, Redlands, California 92374, APN 0168-291-02.

Vanita,

In accordance with your request and authorization, TGR Geotechnical, Inc. (TGR) has performed a preliminary geotechnical investigation for the proposed development at the subject site in the city of Redlands, California. The subject site is an approximately 9-acre, undeveloped parcel of land covered in grass and vegetation. It is our understanding that the proposed development will consist of 103 single family homes with associated streets, driveways, parking, and a central common open park space. This report presents the findings of our geotechnical investigation, including site seismicity, settlement potential, infiltration rates and provides geotechnical design recommendations for the proposed improvements. The work was performed in general accordance with our proposal dated March 7, 2022.

Based on our investigation the proposed development is feasible from a geotechnical viewpoint provided the recommendations presented in this report are implemented during design and construction.

If you have any questions regarding this report, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

TGR GEOTECHNICAL, INC.

Robert Aguilar
Staff Engineer

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ATTACHMENTS

Plate 1 – Boring Location Map

Figure 1 – Site Location Map
Figure 2 – Regional Geology Map
Figure 3 – Regional Fault Map
Figure 4 – Seismic Hazard Zone Map

Table 1 – Percolation Test Worksheet

Appendix A – References
Appendix B – Log of Borings
Appendix C – Laboratory Testing Procedures and Results
Appendix D – Site Seismic Design and Deaggregated Parameters
Appendix E – Standard Grading Specifications

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INTRODUCTION

Site Descriptions and Proposed Project Development

The subject site is located on the northwest corner of E. Colton Avenue and N. Wabash Avenue in the city of Redlands, California (Figure 1). The subject site is an approximately 9-acre, undeveloped parcel of land covered in grass and vegetation. It is our understanding that the proposed development will consist of 103 single family homes with associated streets, driveways, parking, and a central common open park space. No grading plans were available at the time of this report. However, it is our understanding that minor cuts and fills will be required to reach design grades.

Scope of Work

The scope of work for this preliminary geotechnical investigation included the following:

- Site reconnaissance to assess current site conditions, mark boring locations and call Dig-Alert for utility clearance.
- Sampling and logging nine (9) borings utilizing a hollow stem drill rig to approximate depths ranging from 3 to 9 feet at the subject site to evaluate subsurface soil conditions. All borings encountered refusal due to cobbles. The borings were backfilled with cuttings and surface tamped.
- Percolation testing of the near surface soils at two (2) locations from depths of 5 to 9 feet below existing grade. The testing procedures followed the County of San Bernardino guidelines.
- Laboratory testing of selected samples to include in-situ moisture and dry density, maximum density and optimum moisture content, shear, consolidation, passing No. 200 sieve, corrosion series and R-value.
- Engineering analysis including infiltration rates, site seismicity, seismic settlement, foundation design and soils engineering/earthwork with respect to the suitability of the proposed development.
- Preparation of this report summarizing current subsurface soil conditions, findings, and presenting our recommendations for the proposed development.

Field Investigation

Field exploration was performed on March 15th, 2022 by members from our firm who logged the borings and obtained representative samples, which were subsequently transported to the laboratory for further review and testing. The approximate locations of the borings are indicated on the enclosed Boring Location Map (Plate 1).

The subsurface conditions were explored by drilling, sampling, and logging nine (9) borings with a truck mounted hollow stem auger drill rig. Borings B-1 through B-9 were advanced to approximate depths ranging from 3 to 9 feet below existing grade. All borings encountered refusal in cobbles and/or boulders. Subsequent to drilling, all borings were backfilled with excavated soil and surface tamped. The log of borings presenting soil conditions and descriptions are presented in Appendix B.

The drill rig was equipped with a sampling apparatus to allow for recovery of driven modified California Ring Sampler (CRS), 3-inch outside diameter, and 2.42-inch inside diameter and SPT samples.

The samples were driven using an automatic 140-pound hammer falling freely from a height of 30 inches. The blow counts for CRS were converted to equivalent SPT blow counts. Soil descriptions were entered on the logs in general accordance with the Unified Soil Classification System (USCS). Driven samples and bulk samples of the earth materials encountered at selected intervals were recovered from the borings. The locations and depths of the soil samples recovered are indicated on the boring logs in Appendix B.

Two (2) percolation test borings, B-5/P-1 and P-2, were advanced to an approximate depth of 9 feet below existing ground surface and percolation testing was performed at depths of approximately 5 to 9 feet below existing grade. Subsequent to percolation testing the borings were backfilled with excavated soils and surface tamped.

Percolation Testing

Upon completion of drilling and sampling Borings B-5/P-1 and P-2 were converted into a field percolation test well. Field percolation testing was performed in general accordance with the with the San Bernardino Technical Guidance for WQMP for sandy soils.

The boreholes were converted to field percolation test wells by placing approximately two inches of gravel at the bottom of the borehole, installing three-inch diameter PVC pipes and backfilling the annular space with gravel. A correction factor was applied to account for the placement of gravel.

Infiltration test rates were determined utilizing the referenced County of San Bernardino guidelines. Results of the infiltration testing are summarized in Table 1 below:

Table 1 – Infiltration Rates

Test Location	Test Depth (feet)	Infiltration Rate (Inches/hour)
B-5/P-1	5-9	10.45
P-2	5-9	7.98

Suitability Assessment Safety Factor

Factor values (v), for Factor Category A, were assigned according to the San Bernardino Technical Guidance Document for WQMP, VII.4.

Table 2 (below) presents assigned factor values and the calculated Suitability Assessment Safety Factor (Σp) in Worksheet H from the San Bernardino Technical Guidance Document for WQMP Appendix VII.

Table 2 – Worksheet H

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w * v
A	Suitability Assessment	Soil assessment methods	0.25	2	0.50
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.25

The above values should be used in conjunction with Factor Category B parameters (to be determined by others) as specified in Worksheet H of the San Bernardino Technical Guidance Document for WQMP Appendix VII to evaluate the combined safety factor that should be applied to the tested infiltration rates.

Laboratory Testing

Laboratory tests were performed on representative samples to verify the field classification of the recovered samples and to evaluate the geotechnical properties of the subsurface soils. The following tests were performed:

- In-situ Moisture Content (ASTM D2216) and Dry Density (ASTM D7263);
- Maximum Dry Density and Optimum Moisture Content (ASTM D1557);
- Direct Shear Strength (ASTM D3080);
- Consolidation (ASTM D2435);
- Expansion Potential (ASTM D4829);
- Passing No. 200 Sieve (ASTM 1140);
- R-value (CAL 301); and
- Corrosion series:
    1. Soluble Sulfate (CAL.417A);
    2. Soluble Chlorides (CAL.422);
    3. Minimum Resistivity (CAL.643); and
    4. pH (CAL 747)

Laboratory tests for geotechnical characteristics were performed in general accordance with the ASTM procedures. The results of the in-situ moisture content and density tests are shown on the borings logs. The results of other laboratory tests are presented in Appendix C.

GEOTECHNICAL FINDINGS

Geology

Regional Geologic Setting

The project site is located in the east central portion of the Redlands 7.5-minute quadrangle, San Bernardino County, California. Per the Geologic Map of the Harrison Mountain/north ½ of Redlands quadrangle, California (Dibblee, 2004), the subject site is underlain by Quaternary alluvium, consisting of gravel and sand of stream channels. Figure 2 presents the Regional Geology Map.

Earth Units

Based on our subsurface investigation, the subject area is generally underlain by approximately 5 feet of light brown silty sand, with some gravel in a dry condition. The silty sand is underlain by sand, gravel and cobbles to an approximate depth of 9 feet below existing grade, the maximum depth explored. Detailed descriptions of the earth units encountered in our borings are presented in the log of the borings. (Appendix B)

Groundwater

Subsurface water was not encountered to a depth of approximately 9 feet below existing grade during the subsurface exploration.

USGS groundwater data from wells nearest to the subject site indicate a historic high groundwater of between 49 feet below existing grade and 1601 feet above NGVD 1929 (USGS 340346117080001 001S002W30C001S).

Seasonal and long-term fluctuations in the groundwater may occur as a result of variations in subsurface conditions, rainfall, run-off conditions and other factors. Therefore, variations from our observations may occur. Static groundwater is not anticipated to impact the proposed development.

Static groundwater is not anticipated to impact the proposed development.

Expansive Soil

Onsite soils have a tested expansion index of 0, correlating to a “very low” expansion potential. The recommendations provided in this report account for the expansion potential of the onsite soils.

Hydro Collapse

Laboratory testing indicates near surface soils undergo approximately 1% to 2% hydro collapse when inundated under load, correlating to a “low” potential for hydro collapse. The recommendations in this report account for the hydro collapse potential of near surface soils.

Cement Type and Corrosion

Based on laboratory testing concrete used should be designed in accordance with the provisions of ACI 318-14, Chapter 19 for Exposure Class S0: Cement with a minimum unconfined compressive strength of 2,500 psi, and for Exposure Class C1 (Moderate) – Concrete exposed to moisture but not a significant source of chlorides, per ACI 318-14 Table 19.3.1.1.

Corrosion tests indicate a mild corrosion potential for ferrous metals exposed to site soils.

TGR does not practice corrosion engineering. If needed, a qualified specialist should review the site conditions and evaluate the corrosion potential of the site soil to the proposed improvements and to provide the appropriate corrosion mitigations for the project.

Seismic Review

Faulting and Seismicity

The subject site, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. The principal source of seismic activity is movement along the northwest-trending regional faults such as the San Andreas, San Jacinto and Elsinore fault zones. These fault systems produce approximately 5 to 35 millimeters per year of slip between the plates.

We consider the most significant geologic hazard to be the potential for moderate to strong seismic shaking that is likely to occur at the subject site. The subject site is located in the highly seismic Southern California region within the influence of several faults that are considered to be Holocene-active or pre-Holocene faults. A Holocene-active fault is defined by the State of California as a fault that has exhibited surface displacement within the Holocene time (about the last 11,700 years). A pre-Holocene fault is defined by the State as a fault whose history of past movement is older than 11,700 years ago and does not meet the criteria for a Holocene-active fault.

These Holocene-active and pre-Holocene faults are capable of producing potentially damaging seismic shaking at the site. It is anticipated that the subject site will periodically experience ground acceleration as the result of small to moderate magnitude earthquakes. Other active faults without surface expression (blind faults) or other potentially active seismic sources that are not currently zoned and may be capable of generating an earthquake are known to be present under in the region.

The subject site is not included within any Earthquake Fault Zones as created by the Alquist-Priolo Earthquake Fault Zoning Act (Hart, 1997). Our review of geologic literature pertaining to the site area indicates that there are no known active or potentially active faults located within or immediately adjacent to the subject property.

The nearest fault to the subject site is the Redlands fault mapped approximately 0.7 miles southeast of the site. Other nearby faults include the Reservoir Canyon fault mapped approximately 1.6 miles to the southeast of the site, the Crafton Hills fault mapped approximately 2.9 miles southeast of the site, the Western Heights fault mapped approximately 3.1 miles southeast of the site, the South Branch San Andreas fault mapped approximately 3.1 miles northeast of the site, the Chicken Hill fault mapped approximately 4.3 miles southeast of the site, the Live Oak Canyon fault mapped approximately 4.4 miles southwest of the site, the Mill Creek fault mapped approximately 5.1 miles northeast of the site and the Loma Linda fault mapped approximately 5.6 miles to the southwest of the site. The Regional Fault Map, Figure 3, shows the location of the subject site in respect to the regional faults.

Secondary Seismic Hazards

Surface Fault Rupture and Ground Shaking

Since no known faults are located within the site, surface fault rupture is not anticipated. However, due to the close proximity of known active and potentially active faults, severe ground shaking should be expected during the life of the proposed structures.

Liquefaction

Liquefaction is a seismic phenomenon in which loose, saturated, fine-grained granular soils behave similarly to a fluid when subjected to high-intensity ground shaking. Liquefaction occurs when these ground conditions exist: 1) Shallow groundwater; 2) Low density, fine, clean sandy soils; and 3) High-intensity ground motion. Effects of liquefaction can include sand boils, settlement, and bearing capacity failures below foundations.

A review of the San Bernardino County General Plan: Geologic Hazard Overlays, Map FH31C indicates that the subject site is not located within an area mapped as having a potential for earthquake induced liquefaction (Figure 4).

Based on the above and depth to groundwater, potential for liquefaction is considered to be negligible.

Seismically Induced Settlement

Ground accelerations generated from a seismic event can produce settlements in sands or in granular earth materials both above and below the groundwater table. This phenomenon is often referred to as seismic settlement and is most common in relatively clean sands, although it can also occur in other soil materials. Based on the nature and density of site soils encountered, seismic settlement is anticipated to be negligible.

Landsliding

Landsliding involves downhill motion of earth materials during or subsequent to earth shaking. Historically, landslides triggered by earthquakes have been a significant cause of damage. Areas that are most susceptible to earthquake induced landslides are areas with steep slopes in poorly cemented or highly fractured bedrock, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits.

A review of the San Bernardino County General Plan: Geologic Hazard Overlays, Map FH31C, this property is not located within a mapped zone of landsliding and adjacent areas are situated on relatively flat topography. Based on the above, the general landslide susceptibility is considered to be negligible.

Lateral Spreading

Seismically induced lateral spreading involves primarily movement of earth materials due to earth shaking. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. The topography in the vicinity of the subject site is relatively flat. Based on the above and absence of liquefaction, the potential for lateral spreading at the subject site is considered very low.

DISCUSSIONS AND CONCLUSIONS

General

Based on our field exploration, laboratory testing and engineering analysis, it is our opinion that the proposed structure and proposed grading will be safe against hazard from landslide, settlement, or slippage and the proposed construction will have no adverse effect on the geologic stability of the adjacent properties provided our recommendations presented in this report are followed.

Conclusions

Based on our findings and analyses, the subject site is likely to be subjected to moderate to severe ground shaking due to the proximity of known active and potentially active faults. This may reasonably be expected during the life of the structure and should be designed accordingly.

The primary conditions affecting the proposed project site development are as follows:

- Potential for caving during excavation.
- The site is underlain by alluvium composed of gravels, cobbles, and boulders in a sandy matrix. As such, oversized materials are anticipated to be encountered during grading operations.

The engineering evaluation performed concerning site preparation and the recommendations presented are based on information provided to us and obtained by us during our office and fieldwork. This report is prepared for the development of 103 single family homes with associated streets, driveways, parking, and a central common open park space. In the event that any significant changes are made to the proposed development, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the recommendations of this report are verified or modified in writing by TGR.

RECOMMENDATIONS

Seismic Design Parameters

When reviewing the 2019 California Building Code the following data should be incorporated into the design.

Parameter	Value
Latitude (degree)	34.0638
Longitude (degree)	-117.1400
Site Class	D – Stiff Soil
Site Coefficient, F_a	1.0
Site Coefficient, F_v	N/A
Mapped Spectral Acceleration at 0.2-sec Period, S_s	1.914 g
Mapped Spectral Acceleration at 1.0-sec Period, S_1	0.789 g
Spectral Acceleration at 0.2-sec Period Adjusted for Site Class, S_{MS}	2.914 g
Spectral Acceleration at 1.0-sec Period Adjusted for Site Class, S_{M1}	N/A
Design Spectral Acceleration at 0.2-sec Period, S_{DS}	1.276 g
Design Spectral Acceleration at 1.0-sec Period, S_{D1}	N/A

Site Specific Response Spectra

The USGS Unified Hazard tool, the USGS RTGM Calculator and the USGS App for Deterministic Spectra Acceleration were utilized to develop site specific ground motion spectra. The analysis was performed utilizing the following attenuation relationships that are part of NGA as required by 2019 CBC code requirements.

- Campbell & Bozorgnia (2014)
- Boore, Stewart, Seyhan & Atkinson (2014)
- Chiou & Youngs (2014)
- Abrahamson, Silva & Kamal (2014)

The results of the Site Specific Response Spectra are incorporated in Table 1 and on Figure 1 in Appendix D. The results include deterministic spectra at 5% damping, maximum rotated component at 0.84 fractile and the probabilistic spectra, maximum rotated component at 5% damping for a return period of 2475 year and subsequently multiplied by risk coefficient to obtain the MCER probabilistic spectral acceleration. The Vs30 utilized was 260 m/s.

The probabilistic response spectrum was determined using the OSHPD generated seismic values and raw output generated from the U.S. Geological Survey Unified Hazard Tool. The spectral response acceleration data generated from the U.S. Geological Survey Unified Hazard Tool was entered into the U.S. Geological Survey Risk-Targeted Ground Motion Calculator tool for each time period. The data is presented on Table 2 in Appendix D.

The deterministic response spectrum was determined using the greatest Deaggregation Contributor from the U.S. Geological Survey Unified Hazard Tool. The largest contributing fault parameters were entered into the Pacific Earthquake Engineering Research Center NGAW2 tool with a user defined sigma + 5% damping. For the deterministic analysis for the subject site, the fault utilized was the San Andreas (San Bernardino S) fault, with a characteristic magnitude M of 7.47 and a fault distance R of 5.81 km. The data is presented on Table 3 in Appendix D.

The above generated spectral accelerations were compared against the minimum code requirements in ASCE7-16 (Chapters 11 and 21) resulting in the final design response spectra which is presented in Table 1 and on Figure 1 in Appendix D.

Based on Table 1 and Figure 1, the recommended Site Specific S_{DS} and S_{D1} are as follows:

S_{DS} = 1.211
S_{D1} = 1.409

Mapped values may be used in lieu of site-specific values to design structures on Site Class D sites with an S1 greater than or equal to 0.2, provided the value of the seismic response coefficient Cs is determined by Eq. (12.8-2) for values of T ≤ 1.5Ts and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for TL ≥ T > 1.5Ts or Eq. (12.8-4) for T > TL.

The structural consultant should review the above parameters and the 2019 California Building Code to evaluate the seismic design.

Conformance to the criteria presented in the above table for seismic design does not constitute any type of guarantee or assurance that significant structural damage or ground failure will not occur during a large earthquake event. The intent of the code is “life safety” and not to completely prevent damage of the structure, since such design may be economically prohibitive.

Foundation Design Recommendations

The proposed residential structures may be supported on continuous and/or spread footings. Bearing capacity recommendations for shallow foundations are presented below. These recommendations assume that the footings will be supported on a minimum of two (2) feet of engineered fill.

For foundations supported on two (2) feet of engineered fill with minimum ninety (90) percent relative compaction at near optimum moisture content, an allowable bearing pressure of 2,500 pounds per square foot may be used in design.

The allowable bearing pressure for shallow foundations supported on minimum ninety (90) percent compacted fill shall be equal to 2,000 pounds per square foot. The recommended minimum footing depth is twelve (12) inches for single story structures and eighteen (18) inches for 2-story structures.

The minimum recommended continuous footing width is fifteen (15) inches for single story structures, eighteen (18) inches for 2-story structures and twenty-four (24) inches for pad footings. A minimum reinforcement of two (2) No. 4 steel bar top and two (2) No. 4 steel bar bottom is required for continuous footings from a geotechnical viewpoint. Foundation design details such as concrete strength, reinforcements, etc should be established by the Structural Engineer.

A one-third (1/3) increase on the aforementioned bearing pressure may be used in design for short-term wind or seismic loads.

The total and differential static settlement is anticipated to be 1 inch and 0.5 inches over 30 feet or less.

Resistance to lateral loads including wind and seismic forces may be provided by frictional resistance between the bottom of concrete and the underlying fill soils and by passive pressure against the sides of the foundations. A coefficient of friction of 0.43 may be used between concrete foundation and underlying soil. The recommended passive pressure of the engineered fill may be taken as an equivalent fluid pressure of 300 pounds per cubic foot (3,000 psf max).

Footings located near property lines where the lateral removal cannot be achieved shall be designed for a reduced bearing capacity of 1,500 pounds per square foot and the passive resistance shall be ignored.

Slab-On-Grade

Slab-on-grade should be a minimum of five (5) inches thick and reinforced with a minimum of No. 4 reinforcing bar on 18-inch centers in two horizontally perpendicular directions. Reinforcing should be properly supported to ensure placement near the vertical midpoint of the slab. "Hooking" of the reinforcement is not considered an acceptable method of positioning the steel. The slab should not be structurally connected to the buildings.

Subgrade material for the slab-on-grade should be compacted to a minimum of ninety (90) percent of the maximum laboratory dry density to a minimum depth of two (2) feet. Prior to placement of concrete, the subgrade soils should be moistened to near optimum moisture content and verified by our field representative.

The actual thickness and reinforcement of the slab shall be designed by the structural engineer per the 2019 California Building Code.

For moisture sensitive flooring, the floor slab should be underlain by an impermeable polyethylene membrane (Stego Wrap, Moistop Plus, or any equivalent meeting the requirements of ASTM D1745) as a capillary break. The membrane shall be a minimum 10-mil thick and overlain and underlain by a minimum of 2-inch thick layer of moistened (not saturated) sand to both protect the membrane and provide proper concrete curing. The polyethylene membrane joints should be lapped not less than 6 inches.

Flatwork

Flatwork should be a minimum of four (4) inches thick should be reinforced with a minimum of No. 3 reinforcing bar on 24-inch centers in two horizontally perpendicular directions. Reinforcing should be properly supported to ensure placement near the vertical midpoint of the slab. "Hooking" of the reinforcement is not considered an acceptable method of positioning the steel. The subgrade material should be compacted to a minimum of ninety (90) percent of the maximum laboratory dry density (ASTM D1557) to a minimum depth of one (1) foot. Prior to placement of concrete, the subgrade soils should be moistened to near percent of optimum moisture content and verified by our field representative. The actual thickness and reinforcement of the slab shall be designed by the structural engineer and should include the anticipated loading condition.

Retaining Wall Recommendations

The following soil parameters may be used for the design of the retaining wall with level backfill and a maximum height of six (6) feet:

Conditions	Parameters
Active (Level)	35 psf/ft
Passive	300 (maximum 3,000 psf)
Friction Coefficient	0.43

- Unrestrained retaining wall, such as a cantilever wall, the active earth pressure shall be used.
- Any import backfill shall be granular non-expansive select fill with a minimum sand equivalent of 30 The import fill should be tested and approved by TGR prior to backfill.
- An allowable coefficient of friction between properly compacted on-site fill soil and concrete of 0.43 may be used with the dead-load forces.
- Passive pressure and frictional resistance could be combined in determining the total lateral resistance. However, one of them shall be reduced by 50 percent.
- The passive pressure in the upper 6 inches of soil not confined by slabs or pavement should be neglected.

Retaining structures should be provided with a drainage system to prevent buildup of hydrostatic pressure behind the walls. Provisions should be made to collect and dispose of excess water away from the wall. Wall drainage may be provided by a perforated pipe encased in gravel or crushed rock and enclosed by geo-synthetic filter fabric. We do not recommend omitting the drains behind walls.

In addition to the above lateral forces due to retained earth, surcharge due to improvements, such as an adjacent structure, should be considered in the design of the retaining wall. A minimum vertical surcharge load of 300 psf should be used in design of walls due to adjacent traffic unless the traffic is kept at least 6 feet from the walls. Loads applied within a 1:1 projection from any surcharging structure on the stem of the wall shall be considered as lateral surcharge.

For uniform lateral surcharge conditions applied to free-to-deflect walls and restrained walls, we recommend utilizing a minimum horizontal load equal to 33 percent and 50 percent of the vertical load, respectively, and should be applied uniformly over the entire height of the wall. This horizontal load should be applied below the 1:1 projection plane. To minimize the surcharge load from an adjacent footing, deepened footings may be considered.

Retaining wall footings should have a minimum embedment of twenty-four (24) inches below the lowest adjacent grade. The retaining walls footings shall be supported on a minimum two (2) feet of compacted engineered fill compacted to a minimum ninety (90) percent relative compaction as per ASTM D1557.

Shrinkage/Subsidence

Removal and recompaction of the near surface soils is estimated to result in shrinkage ranging from 5 to 10 percent. Based on our previous experience with similar projects, additional volume loss can be anticipated due to the presence of oversized materials in the near surface soils. Minor ground subsidence is expected to occur in the soils below the zone of removal, due to settlement and machinery working. The subsidence is estimated to be between one and two tenths of a foot.

Site Development Recommendations

General

During earthwork construction, all site preparation and the general procedures of the contractor should be observed, and the fill selectively tested by a representative of TGR. If unusual or unexpected conditions are exposed in the field, they should be reviewed by this office and if warranted, modified and/or additional recommendations will be offered. During demolition of the existing buildings, large concrete slab and associated site work, voids created from removal of buried elements (footings, pipelines, septic pits, etc.) shall be backfilled with engineered fill to a minimum ninety (90) percent relative compaction per ASTM D1557 under the observation of TGR.

Grading

All grading should conform to the guidelines presented in the California Building Code (2019 edition), except where specifically superseded in the text of this report. Prior to grading, TGR's representative should be present at the pre-construction meeting to provide grading guidelines, if needed, and review any earthwork. Oversize particles may be encountered during grading. All particles greater than 4-inches shall be removed and disposed offsite.

Oversized materials may be crushed to 1" minus and mixed with onsite soil in a controlled manner as recommended by the geotechnical consultant and used as engineered fill.

The footings and slab-on-grade shall be supported on a minimum two (2) feet of engineered fill. A minimum one (1) foot of engineered fill is recommended under flatwork and pavement. Site soils may be reused as engineered fill provided, they are free of oversized particles and the recommendations presented in this report are implemented. Exposed bottoms should be scarified a minimum of 6-inches, moisture conditioned to near optimum moisture and compacted to a minimum ninety (90) percent relative compaction. Subsequently, site fill soils should be re-compacted to a minimum of ninety (90) percent relative compaction at near optimum moisture content. The lateral extent of removals beyond the building/structure/footing limits should be equal to at least 5 feet.

The depth of over-excavation should be reviewed by the Geotechnical Consultant during the actual construction. Any subsurface obstruction buried structural elements, and unsuitable material encountered during grading, should be immediately brought to the attention of the Geotechnical Consultant for proper exposure, removal and processing, as recommended.

Fill Placement

Prior to any fill placement TGR should observe the exposed surface soils. The site soils may be re-used as engineered fill provided, they are free of organic content and particle size greater than 4-inches. All particles greater than 4-inches shall be removed and disposed offsite. Fill shall be moisture conditioned to near optimum moisture and compacted to a minimum relative compaction of ninety (90) percent in accordance with ASTM D1557. Any import soils shall be non-expansive and approved by TGR Geotechnical Inc.

Compaction

Prior to fill placement, the exposed surface should be scarified to a minimum depth of six (6) inches, fill placed in eight (8) inch loose lifts moisture conditioned to near optimum moisture and compacted to a minimum relative compaction of ninety (90) percent in accordance with ASTM D1557.

Trenching

All excavations should conform to CAL-OSHA and local safety codes.

Temporary Excavation and Shoring

Due the dry, granular nature of onsite soils, all cuts shall be properly shored or sloped back to at least 1.H:1V (Horizontal: Vertical) or flatter. Some sloughing may be anticipated due to the granular nature of site soils. The exposed slope face should be kept moist (but not saturated) during construction to reduce local sloughing. No surcharge loads should be permitted within a horizontal distance equal to the height of cut from the toe of excavation unless the cut is properly shored. Excavations that extend below an imaginary plane inclined at 45 degrees below the edge of any nearby adjacent existing site facilities should be properly shored to maintain foundation support at the adjacent structures.

Utility Trench Backfill

All utility trench backfills in structural areas and beneath hardscape features should be brought to near optimum moisture content and compacted to a minimum relative compaction of ninety (90) percent of the laboratory standard. Flooding/jetting is not recommended.

Sand backfill, (unless trench excavation material), should not be allowed in parallel exterior trenches adjacent to and within an area extending below a 1:1 plane projected from the outside bottom edge of the footing. All trench excavations should minimally conform to CAL-OSHA and local safety codes. Soils generated from utility trench excavations may be used provided it is moisture conditioned and compacted to ninety (90) percent minimum relative compaction.

Drainage

Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope or retaining wall. 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/parking or other approved area. Roof gutters and down spouts should be utilized to control roof drainage. Down spouts should outlet a minimum of 5 feet from the proposed structure or into an approved subsurface drainage system. 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.

Preliminary Pavement Design

The Caltrans method of design was utilized to develop the following asphalt pavement section. The section was developed based on a tested “R-Value” for compacted site subgrade soils of 73.

Traffic indices of 4.5, 5 and 6 were assumed for use in the evaluation of the asphalt pavement sections. The traffic indices are subject to approval by controlling authorities and shall be approved by the project civil engineer.

ASPHALT PAVEMENT SECTION			
Traffic Index	Asphalt (Inch)	Aggregate Base (Inch)	Total (Inch)
4.5	3.0	4.0	7.0
5.0	3.0	6.0	9.0
6.0	4.0	6.0	10.0

Aggregate base material for Asphalt Pavement should consist of CAB/CMB complying with the specifications in Section 200-2.2/200-2.4 of the current "Standard Specifications for Public Works Construction" and should be compacted to at least ninety-five (95) percent of the maximum dry density (ASTM D1557). The surface of the base should exhibit a firm and unyielding condition just prior to the placement of asphalt concrete paving. The asphalt concrete shall be compacted to a minimum of ninety-five (95) percent relative compaction.

The pavement subgrade should be constructed in accordance with the recommendations presented in the grading section of this report.

The R-value and the associated pavement section should be confirmed at the completion of site grading.

Geotechnical Review of Plans

All grading and foundation plans should be reviewed and accepted by the geotechnical consultant prior to construction. If significant time elapses since preparation of this report, the geotechnical consultant should verify the current site conditions, and provide any additional recommendations (if necessary) prior to construction.

Geotechnical Observation/Testing During Construction

Per sections 1705.6 and table 1705.6 of the 2019 California Building Code, periodic special inspection shall be performed to:

- Verify materials below shallow foundations are adequate to achieve the design bearing capacity;
- Verify excavations are extended to the proper depth and have reached proper material;
- Verify classification and test compacted materials; and
- Prior to placement of compacted fill, inspect subgrade and verify that the site has been prepared properly.

Per sections 1705.6 and table 1705.6 of the 2019 California Building Code, continuous special inspection shall be performed to:

- Verify use of proper materials, densities and lift thickness during placement and compaction of compacted fill.

The geotechnical consultant should also perform observation and/or testing at the following stages:

- During any grading and fill placement;
- After foundation excavation and prior to placing concrete;
- Prior to placing slab and flatwork concrete;
- During placement of aggregate base and asphalt or Portland cement concrete; and
- When any unusual soil conditions are encountered during any construction operation subsequent to issuance of this report.

Limitations

This report was prepared for a specific client and a specific project, based on the client's needs, directions and requirements at the time.

This report was necessarily based upon data obtained from a limited number of observances, site visits, soil and/or other samples, tests, analyses, histories of occurrences, spaced subsurface exploration and limited information on historical events and observations. Such information is necessarily incomplete. Variations can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time.

This report is not authorized for use by and is not to be relied upon by any party except the client with whom TGR contracted for the work. Use or reliance on this report by any other party is that party's sole risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify TGR from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of TGR.



B-9 APPROXIMATE LOCATION OF EXPLORATORY BORING

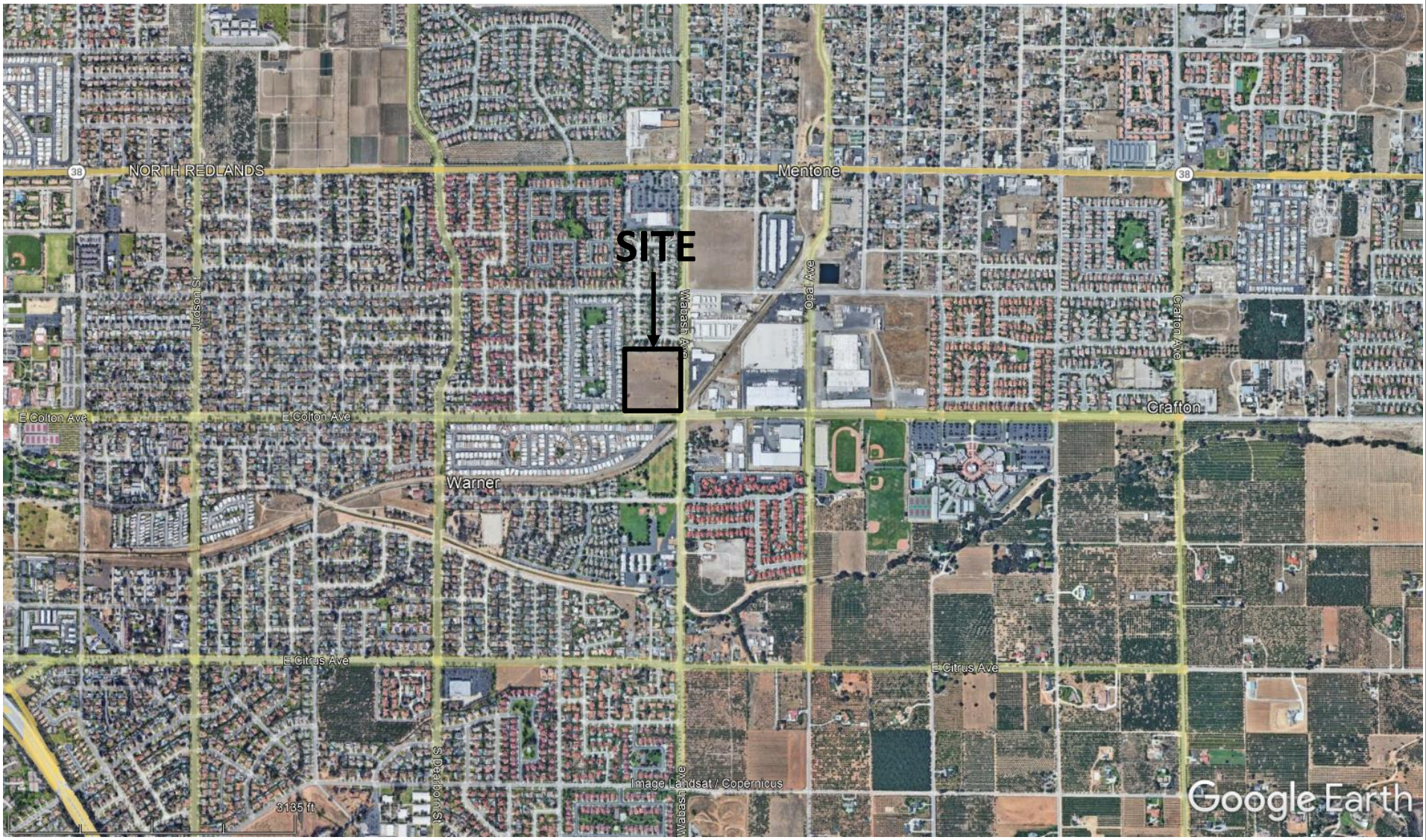
P-2 APPROXIMATE LOCATION OF PERCOLATION BORING

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Environmental
Hydrogeology
Material Testing
Construction Inspection

BORING LOCATION MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

PLATE 1

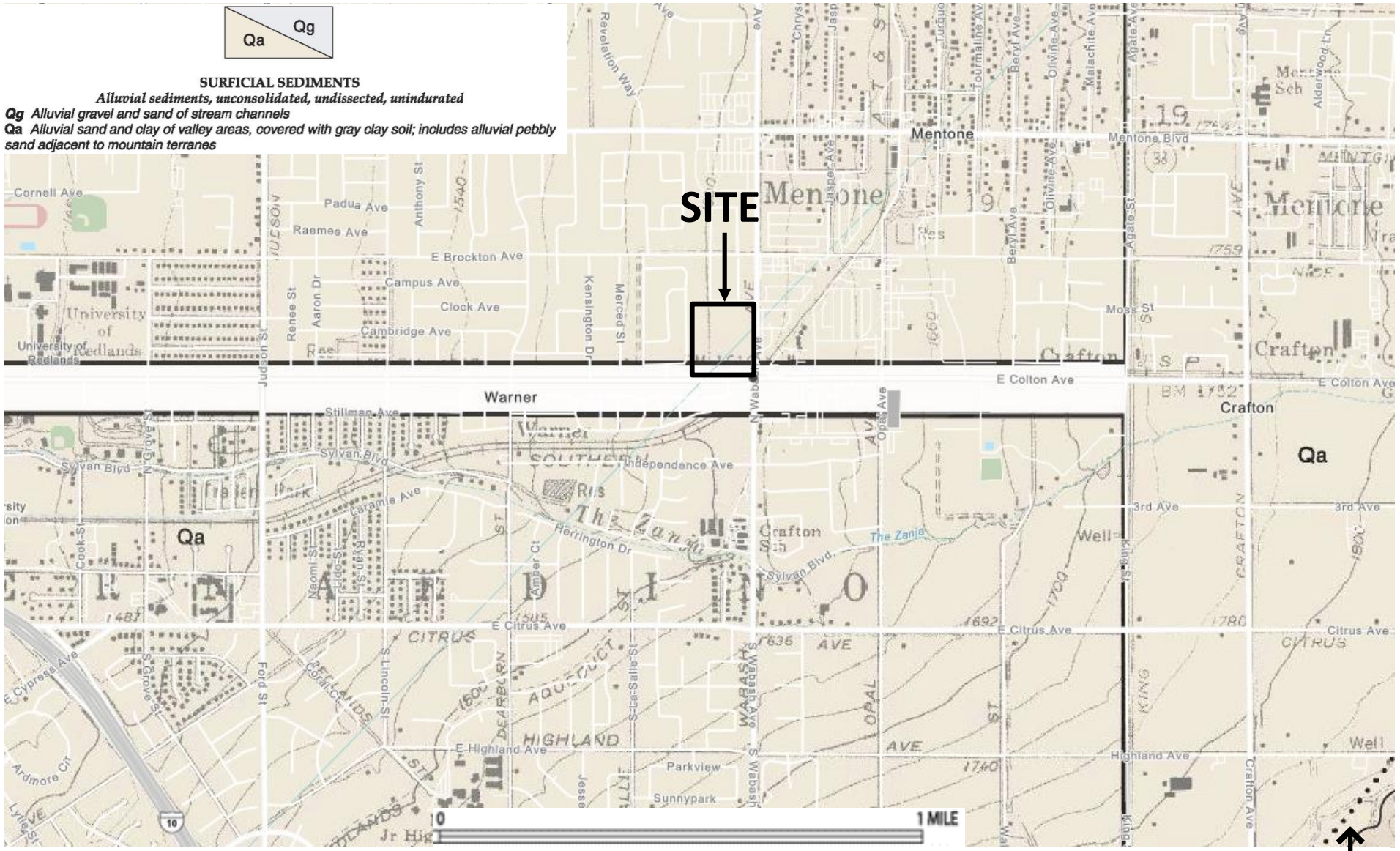


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Environmental
Hydrogeology
Material Testing
Construction Inspection

SITE LOCATION MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 1



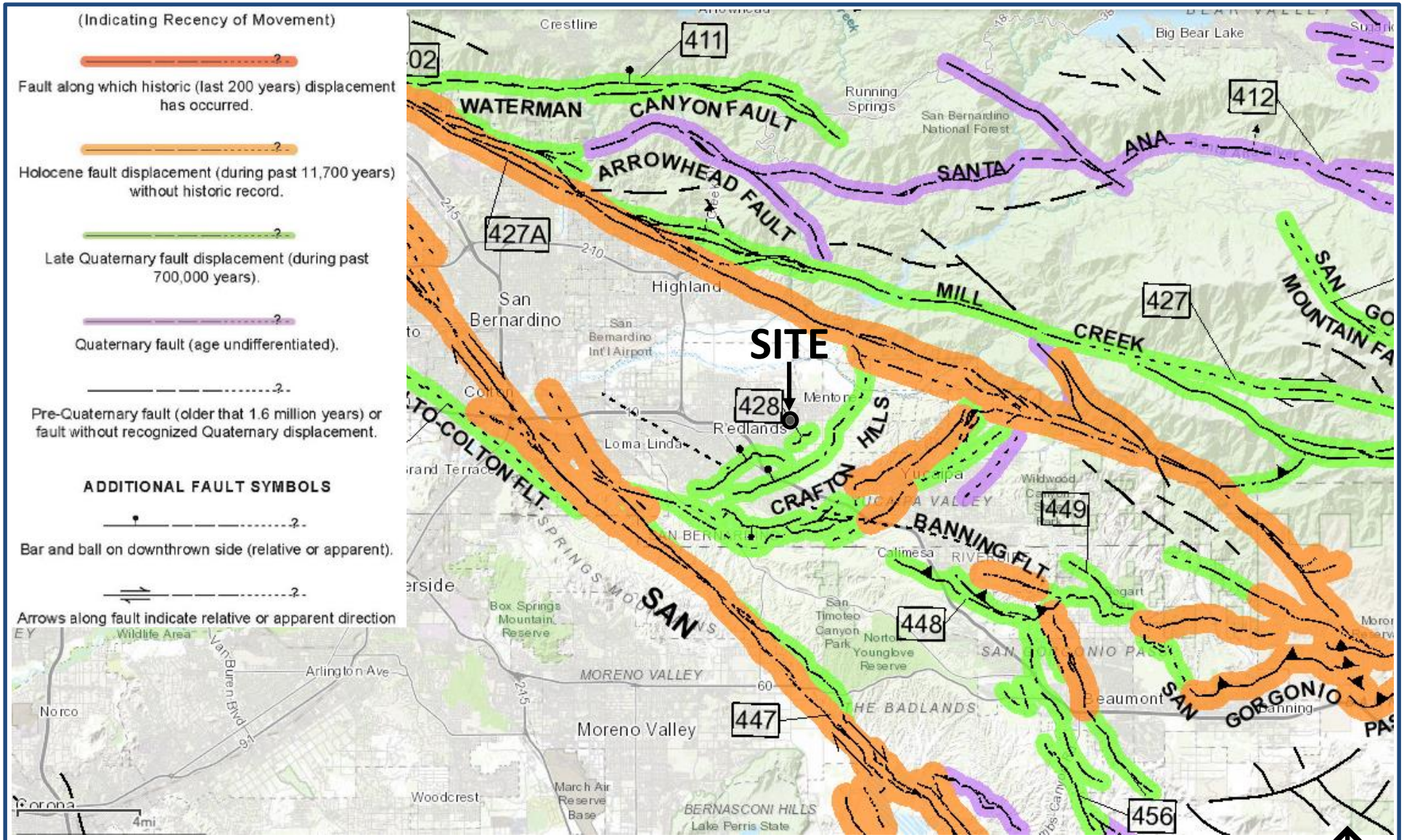
Modified From: Dibblee, T.W., and Minch, J.A., 2004, Geologic map of the Harrison Mountain/north 1/2 of Redlands quadrangles, San Bernardino and Riverside County, California: Dibblee Geological Foundation, DF-126, scale 1:24,000.

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REGIONAL GEOLOGY MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 2



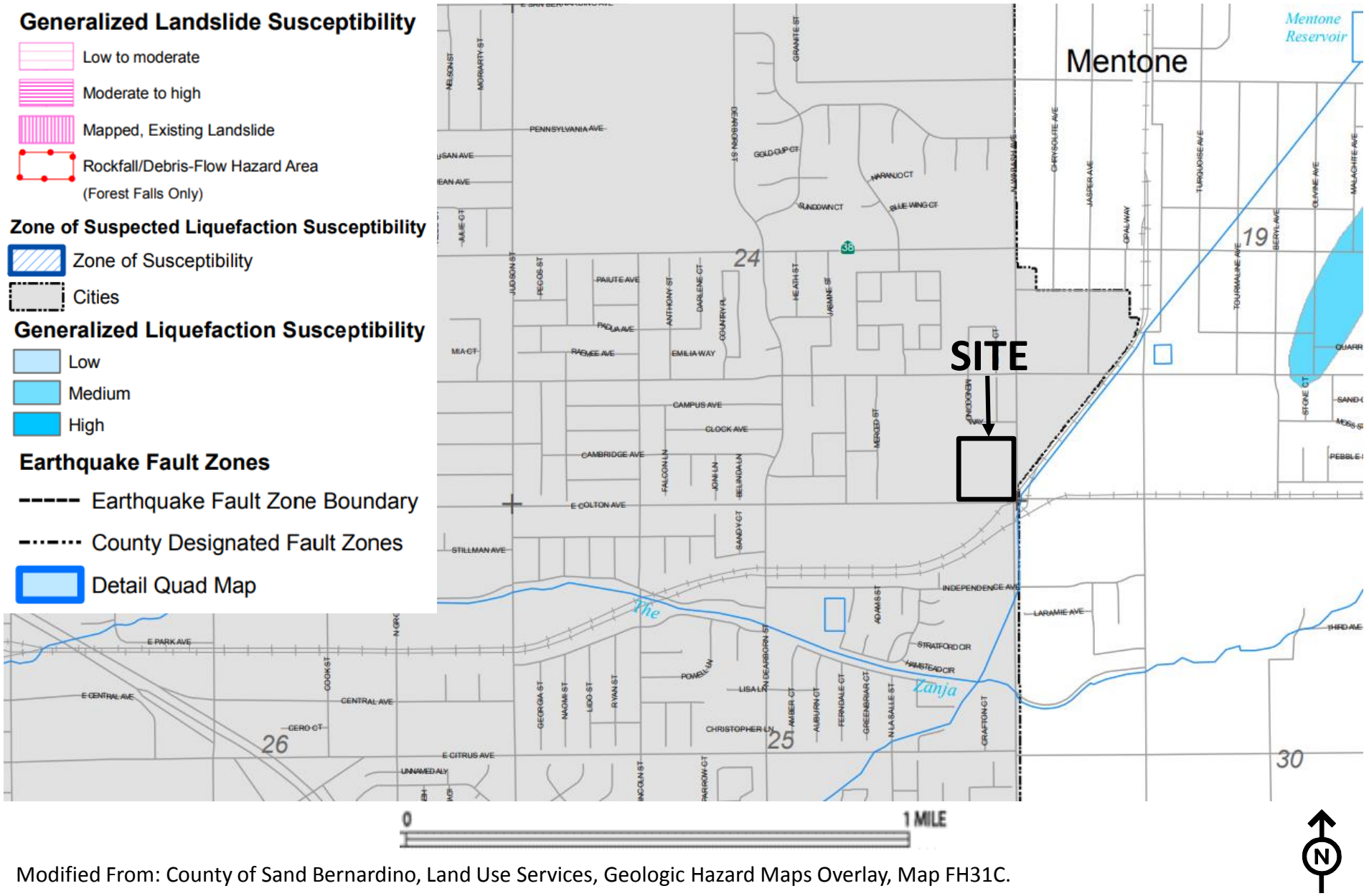
Modified From: Jennings, C. W., 2010, Fault Activity Map of California and Adjacent Areas, California Division of Mines and Geology, Geologic Data Map Series, No. 6, Scale 1:750,000.

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Construction Inspection

REGIONAL FAULT MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 3



Modified From: County of Sand Bernardino, Land Use Services, Geologic Hazard Maps Overlay, Map FH31C.

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Material Testing
Construction Inspection

GEOLOGIC HAZARDS MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 4

Test Hole	Total Depth (in)	Initial Depth (in)	Final Depth (in)	ΔWater Level (in)	Initial Time (min)	Final Time (min)	Δ Time (min)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Gravel Factor	Infiltration Rate (in/hr)
P-1/B-5	108	70.20	96.96	26.76	0.0	5.0	5.0	37.80	11.04	24.42	0.54	13.13
	108	62.76	89.88	27.12	0.0	5.0	5.0	45.24	18.12	31.68	0.54	10.44
	108	63.60	91.44	27.84	0.0	5.0	5.0	44.40	16.56	30.48	0.54	11.11
	108	62.64	89.76	27.12	0.0	5.0	5.0	45.36	18.24	31.80	0.54	10.40
	108	64.08	91.32	27.24	0.0	5.0	5.0	43.92	16.68	30.30	0.54	10.93
	108	63.00	90.00	27.00	0.0	5.0	5.0	45.00	18.00	31.50	0.54	10.45
P-2	108	64.44	92.52	28.08	0.0	5.0	5.0	43.56	15.48	29.52	0.54	11.55
	108	64.56	89.88	25.32	0.0	5.0	5.0	43.44	18.12	30.78	0.54	10.01
	108	63.84	85.20	21.36	0.0	5.0	5.0	44.16	22.80	33.48	0.54	7.80
	108	62.76	84.36	21.6	0.0	5.0	5.0	45.24	23.64	34.44	0.54	7.68
	108	64.20	84.96	20.76	0.0	5.0	5.0	43.80	23.04	33.42	0.54	7.60
	108	63.60	85.44	21.84	0.0	5.0	5.0	44.40	22.56	33.48	0.54	7.98

$$I_t = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

ΔH = Change in height

Δt = Time interval

r = Radius

I_t Infiltration Rate

H_{ave} Average Head Height over the time interval

APPENDIX A
REFERENCES

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APPENDIX A

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APPENDIX B
LOG OF BORINGS

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THE FOLLOWING DESCRIBES THE TERMS AND SYMBOLS USED ON THE LOG OF BORINGS TO SUMMARIZE THE RESULTS OBTAINED IN THE FIELD INVESTIGATION AND SUBSEQUENT LABORATORY TESTING

DENSITY AND CONSISTENCY

The consistency of fine grained soils and the density of coarse grained soils are described on the basis of the Standard Penetration Test as follows:

COARSE GRAINED SOILS		ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (Tsf)	FINE GRAINED SOILS	
Very Loose	< 4	< 0.25	Very Soft	< 2
Loose	4 – 10	0.35 – 0.50	Soft	2 – 4
Medium	10 – 30	0.50 – 1.0	Firm (Medium)	4 – 8
Dense	30 – 50	1.0 – 2.0	Stiff	8 – 15
Very Dense	> 50	2.0 – 4.0	Very Stiff	15 – 30
		> 4.0	Hard	> 30

PARTICLE SIZE DEFINITION (As per ASTM D2487 and D422)

Boulder	⇒ Larger than 12 inches	Coarse Sands	⇒ No. 10 to No. 4 sieve
Cobbles	⇒ 3 to 12 inches	Medium Sands	⇒ No. 40 to No. 10 sieve
Coarse Gravel	⇒ 3/4 to 3 inches	Fine Sands	⇒ No. 200 to 40 sieve
Fine Gravel	⇒ No. 4 to 3/4 inches	Silt	⇒ 5µm to No. 200 sieve
		Clay	⇒ Smaller than 5µm

SOIL CLASSIFICATION

Soils and bedrock are classified and described based on their engineering properties and characteristics using ASTM D2487 and D2488.

Percentage description of minor components:

Trace	1 – 10%	Some	20 – 35%
Little	10 – 20%	And or y	25 – 50%

Stratified soils description:

Parting	0 to 1/16 inch thick	Layer	½ to 12 inches thick
Seam	1/16 to ½ inch thick	Stratum	> 12 inches thick

SOIL CLASSIFICATION CHART

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

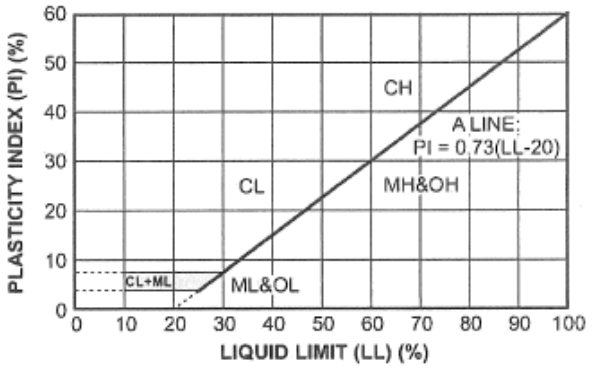
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



PARTICLE SIZE LIMITS

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	
	3"	¾"	NO. 4	NO. 10	NO. 40	NO. 200

TGR Geotechnical Environmental Hydrogeology Material Testing Construction Inspection

LOG OF BORING EXPLANATION

LOG OF EXPLORATORY BORING B-1

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1604**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1604	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, medium dense, very fine to fine grained sand.			
1600	5			■	39		SP	SAND- grey and white, dry, dense, fine to coarse grained, fine to coarse grained gravel, cobbles.	1	117	Consol
1595	10							Total Depth: 8 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1590											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 2

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-2

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1606**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1605								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			EI, Corrosion, R-Value
	5							...Same as above, some cobbles.			
1600					46		SM		2	109	
								Total Depth: 6.5 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
	10										
1595											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 3

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-3

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1611**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								Total Depth: 3 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1605	5										
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 4

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-4

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1603**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1600											
	5			■	46		SP	SAND- light brown, slightly moist, very dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles.	3	117	
								Total Depth: 6.5 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											
	10										
1590											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 5

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-5/P-1

Sheet **1** of **1**

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1607**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1605											
	5			■	50		SP	SAND- light brown, dry, very dense, fine grained sand, fine to coarse grained gravel, some silt.	2	113	-200= 5.7%
1600			■				SP		2		-200= 10.2%
	10							Total Depth: 9 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 6

TGR GEOTECHNICAL, INC.

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

LOG OF EXPLORATORY BORING B-6

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1611**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								...Same as above, cobbles.			
1605	5				53		SPG	Gravelly SAND- grey brown, dry, very dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles.	2	115	Consol
								Total Depth: 7 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 7

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-7

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1605**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1600	5				59		SM	...Same as above, cobbles.	2	103	
								Total Depth: 7 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 8

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-8

Sheet **1** of **1**

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1608**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
1605							SM	NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			Max, Shear
	5				14		SP	SAND- grey brown, dry, medium dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles, some silt.	2	107	Consol
1600								Total Depth: 8 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
	10										
1595											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 9

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-9

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1611**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								Total Depth: 3 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1605	5										
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 10

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING P-2

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1606**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1605								Surface is grass and vegetation. NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
	5										
1600					16		SP	SAND- light brown, dry, medium dense, fine grained sand, fine to coarse grained gravel, cobbles.	2	117	-200= 10.3%
	10							Total Depth: 9 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 11

TGR GEOTECHNICAL, INC.

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

APPENDIX C
LABORATORY TEST RESULTS

TGR GEOTECHNICAL
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3037 S. HARBOR BLVD
SANTA ANA, CA 92704
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www.tgrgeotech.com

APPENDIX C

Laboratory Testing Procedures and Results

In-Situ Moisture and Dry Density Determination (ASTM D2216 and D7263): Moisture content and dry density determinations were performed on relatively undisturbed samples obtained from the test borings. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from "undisturbed" or disturbed samples.

Maximum Density and Optimum Moisture Content (ASTM D1557): The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM Test Method D1557. The results of these tests are presented in the table below:

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-8 @ 0-5 feet	Silty Sand	123.5	7.0

Direct Shear Strength (ASTM D3080): Direct shear test was performed on selected remolded samples, which were soaked for a minimum of 24 hours under a surcharge equal to the applied normal force during testing. After transfer of the sample to the shear box, and reloading the sample, pore pressures set up in the sample due to the transfer were allowed to dissipate for a period of approximately 1-hour prior to application of shearing force. The sample was tested under various normal loads, a motor-driven, strain-controlled, direct-shear testing apparatus at a strain rate of less than 0.001 to 0.5 inches per minute (depending upon the soil type). The test results are presented in the test data and in the table below:

Sample Location	Sample Description	Friction Angle (degrees)	Apparent Cohesion (psf)
B-8 @ 0-5 feet	Silty Sand (Remolded)	33	114

Consolidation Tests (ASTM D2435): Consolidation test were performed on selected, relatively undisturbed ring samples. Samples were placed in a consolidometer and loads were applied in geometric progression. The percent consolidation for each load cycle was recorded as the ratio of the amount of vertical compression to the original 1-inch height. The consolidation pressure curves are presented in the test data.

Expansion Potential (ASTM D4829): The expansion potential of selected materials was evaluated by the Expansion Index Test, ASTM D4829. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch thick by 4-inch diameter specimens are loaded to an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached. The results of these tests are presented in the table below:

Sample Location	Sample Description	Expansion Index	Expansion Potential
B-2 @ 0-5 feet	Silty Sand	0	Very Low

Soluble Sulfate (CAL 417A): The soluble sulfate content of selected sample was determined by standard geochemical methods. The test results are presented in the test data and in the table below:

Sample Location	Sample Description	Water Soluble Sulfate in Soil, (% by Weight)	Sulfate Content (ppm)	Exposure Class*
B-2 @ 0-5 feet	Silty Sand	0.0123	123	S0

* Based on the current version of ACI 318-14 Building Code, Table No. 19.3.1.1; Exposure Categories and Classes.

Corrosivity Tests (CAL 422, CAL 643 and CAL 747): Electrical conductivity, pH, and soluble chloride tests were conducted on representative samples and the results are provided in the test data and in the table below:

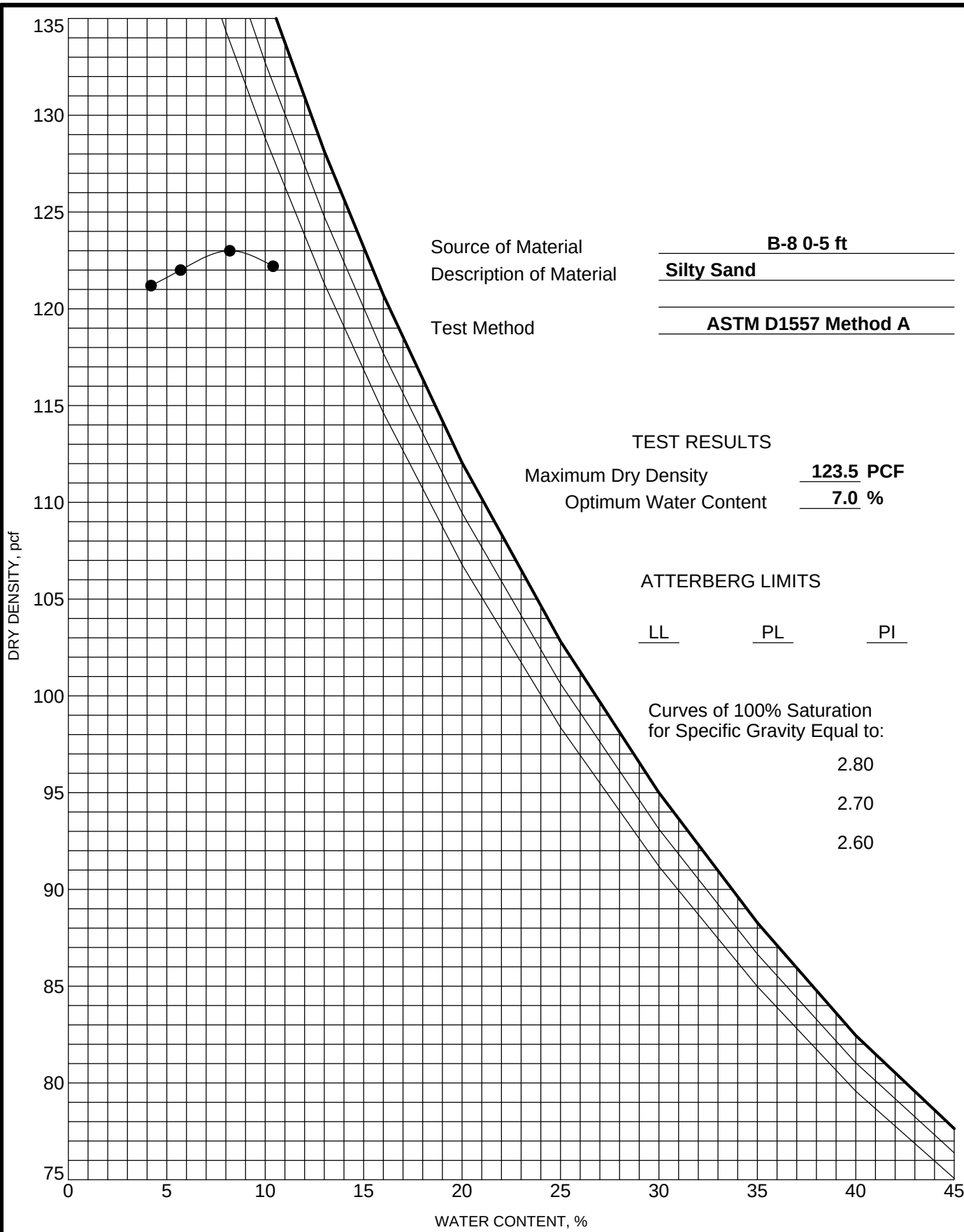
Sample Location	Sample Description	Soluble Chloride (CAL 422) (ppm)	Electrical Resistivity (CAL 643) (ohm-cm)	pH (CAL 747)	Potential Degree of Attack on Steel
B-2 @ 0-5 feet	Silty Sand	65	11,000	7.8	Mild

Passing No. 200 Sieve (ASTM D1140): Typical materials were washed over No. 200 sieve. The test results are presented in the boring logs and in the table below:

Sample Location	% Passing No. 200 Sieve
B-5/P-1 @ 5 feet	5.7
B-5/P-1 @ 8.5-9 feet	10.2
P-2 @ 5 feet	10.3

R-Value: The resistance “R”-Value was determined by the California Materials Method No. 301 for subgrade soils. One sample was prepared, and exudation pressure and “R”-Value determined. The graphically determined “R”-Value at exudation pressure of 300 psi is summarized in the table below:

Sample Location	Sample Description	R-Value
B-2 @ 0-5 feet	Silty Sand	73



Source of Material: **B-8 0-5 ft**

Description of Material: **Silty Sand**

Test Method: **ASTM D1557 Method A**

TEST RESULTS

Maximum Dry Density: **123.5 PCF**

Optimum Water Content: **7.0 %**

ATTERBERG LIMITS

LL PL PI

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

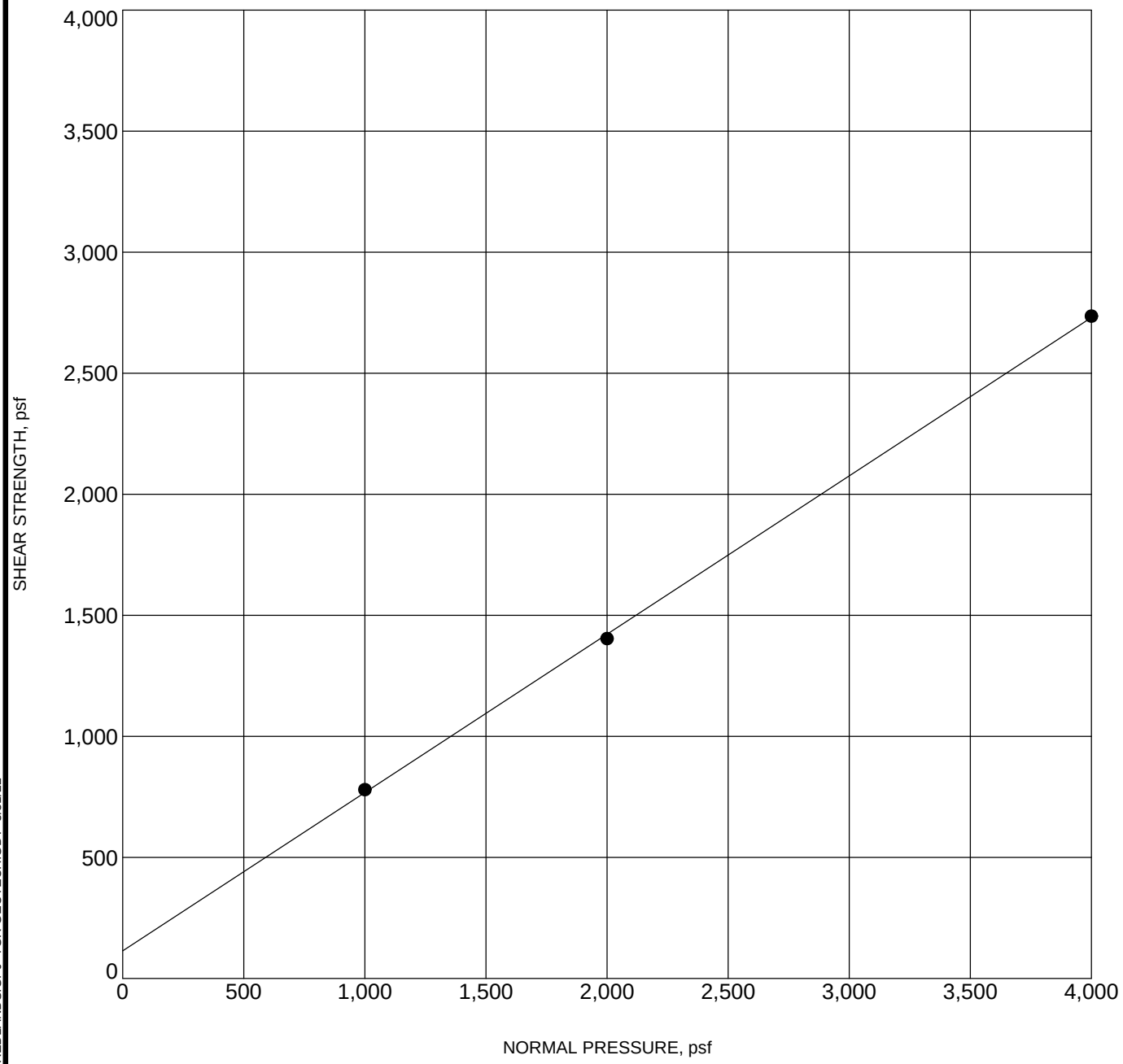
US COMPACTION 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
Santa Ana, CA 92704
Telephone: 714-641-7189
Fax: 714-641-7190

MOISTURE-DENSITY RELATIONSHIP

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands



Specimen Identification		Classification	γ_d	MC%	c	ϕ
● **B-8**	**0-5**	**Silty Sand - Remolded - 90% RC**	**111**	**7**	**114**	**33**

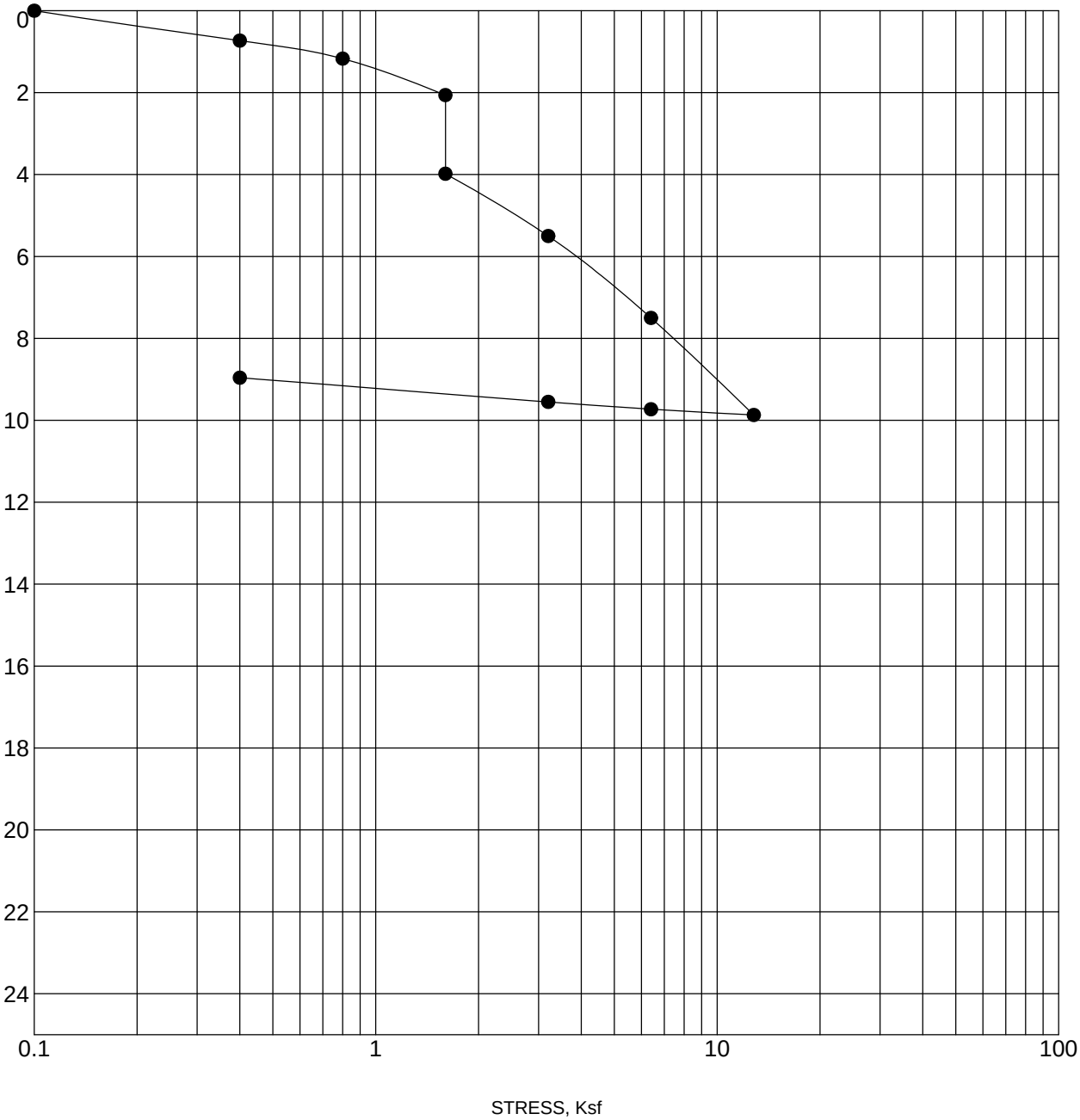
TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
Santa Ana, CA 92704
Telephone: 714-641-7189
Fax: 714-641-7190

DIRECT SHEAR TEST

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands

US DIRECT SHEAR 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22



Specimen Identification		Classification	γ_d	MC%
● **B-1** **5.0**		**Sand**	**117**	**1**

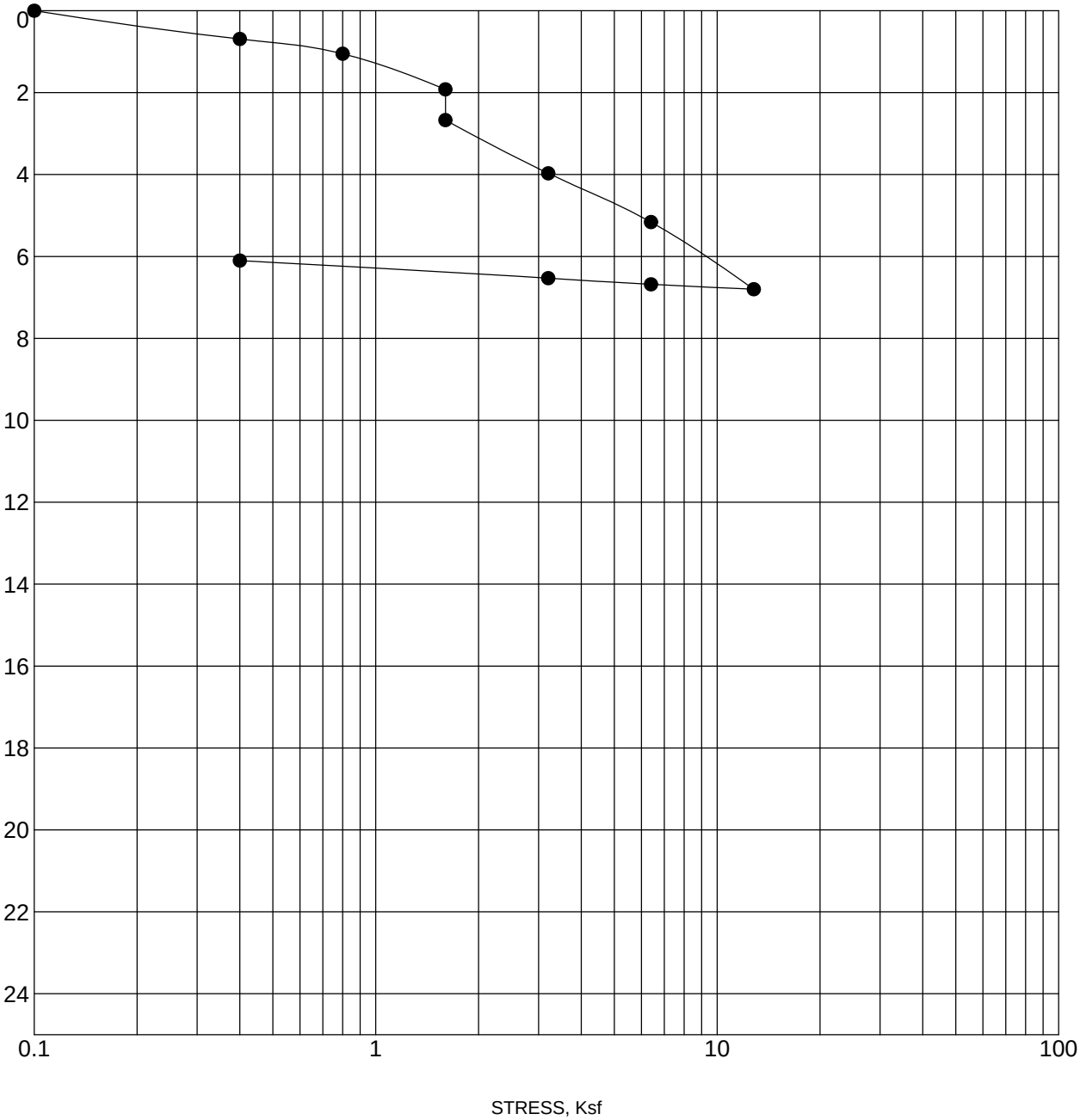
TGR GEOTECHNICAL, INC.
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Telephone: 714-641-7189
Fax: 714-641-7190

CONSOLIDATION TEST

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands

US CONSOL STRAIN 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 4/6/22



Specimen Identification		Classification	γ_d	MC%
● **B-6** **5.0**		**Gravelly Sand**	**115**	**2**

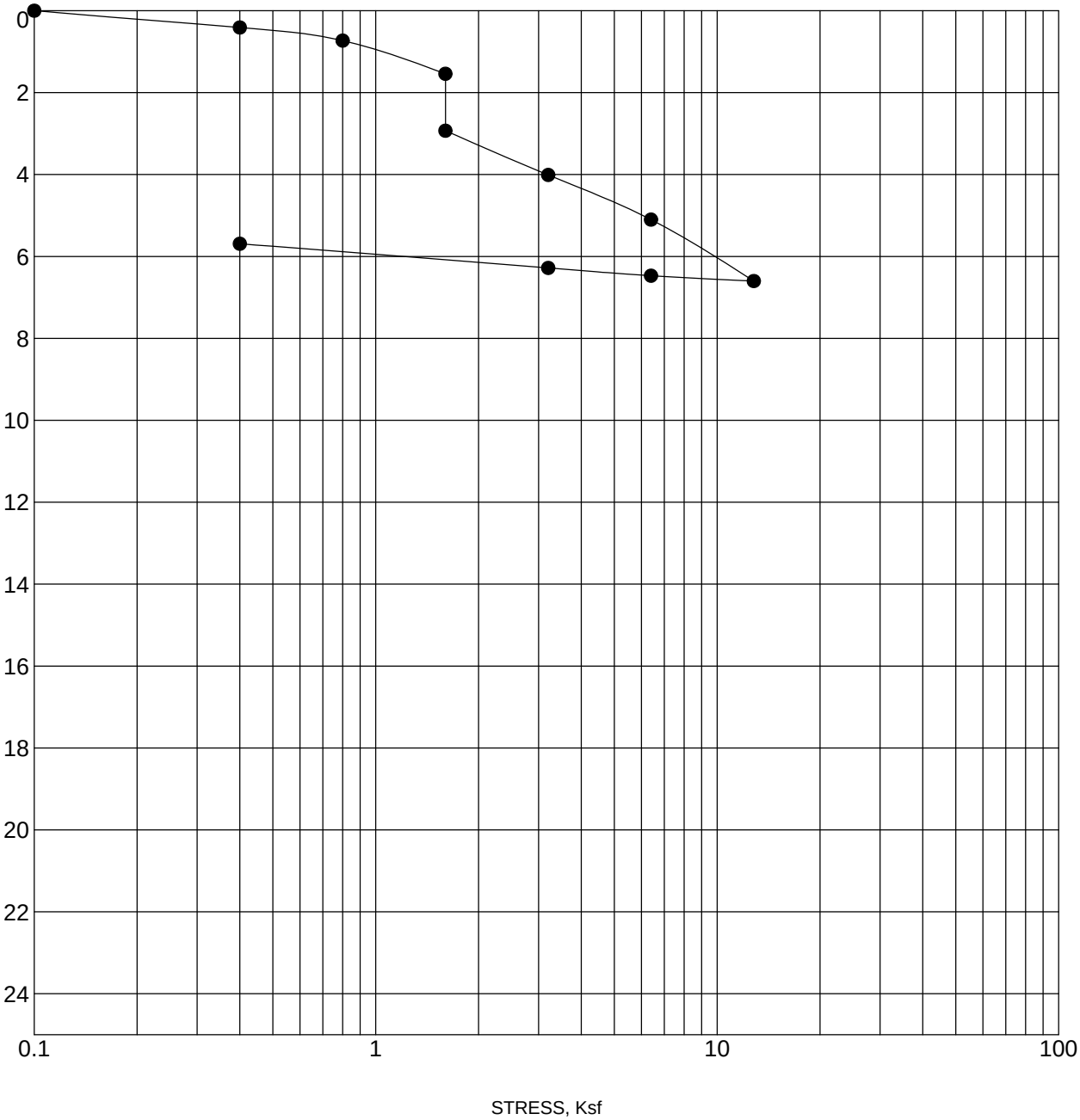
TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
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Telephone: 714-641-7189
Fax: 714-641-7190

CONSOLIDATION TEST

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands

US CONSOL STRAIN 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 4/5/22



Specimen Identification		Classification	γ_d	MC%
● **B-8** **5.0**			**107**	**2**

TGR GEOTECHNICAL, INC.
3037 S. Harbor Blvd
Santa Ana, CA 92704
Telephone: 714-641-7189
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CONSOLIDATION TEST

Project Number: 22-7455

Project Name: Colton Ave. and Wabash Ave., Redlands

US CONSOL STRAIN 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 4/5/22

ANAHEIM TEST LAB, INC

196 Technology Dr., Unit D
Irvine, CA 92618
Phone (949) 336-6544

TO:

TGR GEOTECHNICAL
3037 S. HARBOR BLVD.
SANTA ANA, CA 92704

DATE: 3/31/2022

P.O. NO: VERBAL

LAB NO: C-5800

SPECIFICATION: CTM-643/417/422

MATERIAL: Soil

Project No.: 22-7455
Project: Colton - Redlands
Sample ID: B2 @ 0-5'

ANALYTICAL REPORT

CORROSION SERIES

SUMMARY OF DATA

pH	MIN. RESISTIVITY per CT. 643 ohm-cm	SOLUBLE SULFATES per CT. 417 ppm	SOLUBLE CHLORIDES per CT. 422 ppm
7.8	11,000	123	65

RESPECTFULLY SUBMITTED

WES BRIDGER LAB MANAGER

ANAHEIM TEST LAB, INC

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949) 336-6544

TO:

TGR GEOTECHNICAL
3037 S. HARBOR BLVD.
SANTA ANA, CA. 92704

DATE: 3/24/2022

P.O. NO.: VERBAL

LAB NO.: C-5801

SPECIFICATION: CTM- 301

MATERIAL: Brown, Silty Sand w. trace F. Gravel

Project No.: 22-7455
Project: Colton - Redlands
Sample ID: B2 @ 0-5'

ANALYTICAL REPORT
"R" VALUE

BY EXUDATION	BY EXPANSION
73	N/A

RESPECTFULLY SUBMITTED

WES BRIDGER LAB MANAGER

"R" VALUE CA 301

Client: TGR Geotechnical **ATL No.:** C 5801 **Date:** 3/24/2022

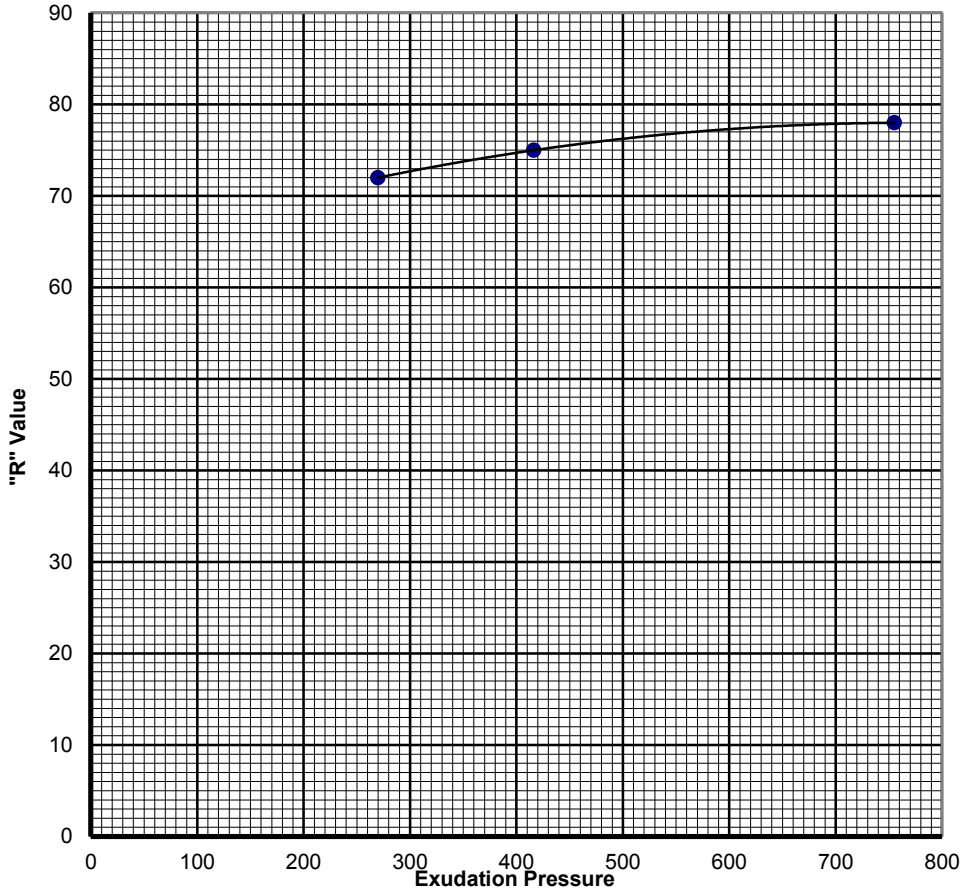
Client Reference No.: 22-7455

Sample: B2 @ 0-5' **Soil Type:** Brown, Silty Sand w. trace F. Gravel

.

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	350	350	350	
Initial Moisture Content	%	1.7	1.7	1.7	
Moisture at Compaction	%	9.3	8.7	9.1	
Briquette Height	in.	2.52	2.44	2.48	
Dry Density	pcf	124.0	125.5	124.8	
EXUDATION PRESSURE	psi	270	755	416	
EXPANSION PRESSURE	psf	26	139	87	
Ph at 1000 pounds	psi	18	15	17	
Ph at 2000 pounds	psi	33	28	30	
Displacement	turns	3.74	3.33	3.62	
"R" Value		72	78	75	
CORRECTED "R" VALUE		72	78	75	

Final "R" Value	
BY EXUDATION: @ 300 psi	**73**
BY EXPANSION: TI = 5.0	**N/A**



APPENDIX D
SITE SEISMICITY AND DEAGGREGATED PARAMETERS

TGR GEOTECHNICAL
DBE & 8(a) firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

TABLE 1

SITE SPECIFIC GROUND MOTION ANALYSIS

22-7455 E. Colton Avenue and N. Wabash Avenue, Redlands

SA Period (sec)	Probabilistic Spectral Acceleration MCER (g)	Deterministic Spectral Acceleration (g)	Is Largest Deterministic Spectral Acceleration <1.5*Fa	Deterministic MCER	Site Specific MCER	2/3 of Site Specific MCER	80% Code Design	Site Specific Design Response Spectrum
	Rotated Maximum	Rotated Maximum 84th Percentile						
0	1.1374	0.7488		0.7488	0.7488	0.4992	0.4083	0.4992
0.1	1.8975	1.1212		1.1212	1.1212	0.7475	0.7055	0.7475
0.2	2.4849	1.5300		1.5300	1.5300	1.0200	1.0208	1.0208
0.3	2.8575	1.8442		1.8442	1.8442	1.2295	1.0208	1.2295
0.5	2.9634	2.0185		2.0185	2.0185	1.3457	1.0208	1.3457
0.75	2.6198	1.8138	No	1.8138	1.8138	1.2092	1.0208	1.2092
1	2.3673	1.6567		1.6567	1.6567	1.1045	1.0520	1.1045
2	1.4688	1.0058		1.0058	1.0058	0.6705	0.5260	0.6705
3	1.0626	0.7045		0.7045	0.7045	0.4697	0.3507	0.4697
4	0.8120	0.5124		0.5124	0.5124	0.3416	0.2630	0.3416
5	0.6435	0.3854		0.3854	0.3854	0.2569	0.2104	0.2569

Code Sds	1.276	Crs =	0.914	Code Ss =	1.914
Code Sd1	1.315	Cr1 =	0.891	Code S1 =	0.789
To	0.21	Code Fa =	1	Sms =	1.914
Ts	1.03	Code Fv =	2.5	Sm1 =	1.9725
TL	8				
Input					

Site Specific S_{DS} = 1.211

Site Specific S_{D1} = 1.409

FIGURE 1
Site Specific Design Response Spectra
22-7455 E. Colton Avenue and N. Wabash Avenue, Redlands

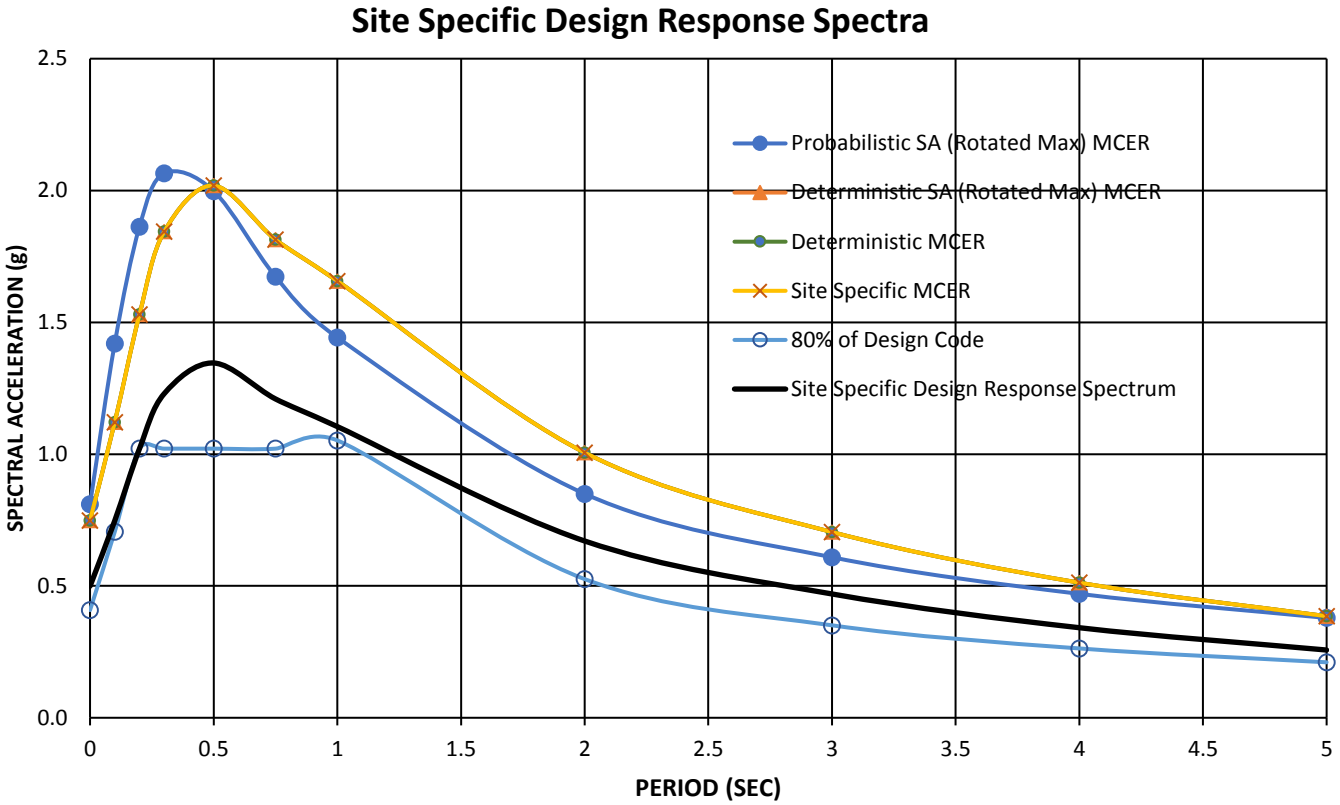


TABLE 2

Probabilistic Response Spectrum ASCE 7-16 Method 2

22-7455 E. Colton Avenue and N. Wabash Avenue, Redlands

Period (g)	UHGM (g)	RTGM (g)	Max Dir Scale factor	Max Dir RTGM (g)
0	1.059	1.034	1.1	1.137
0.1	1.740	1.725	1.1	1.898
0.2	2.276	2.259	1.1	2.485
0.3	2.611	2.540	1.125	2.858
0.5	2.694	2.522	1.175	2.963
0.75	2.326	2.117	1.2375	2.620
1	2.026	1.821	1.3	2.367
2	1.226	1.088	1.35	1.469
3	0.863	0.759	1.4	1.063
4	0.640	0.560	1.45	0.812
5	0.489	0.429	1.5	0.644

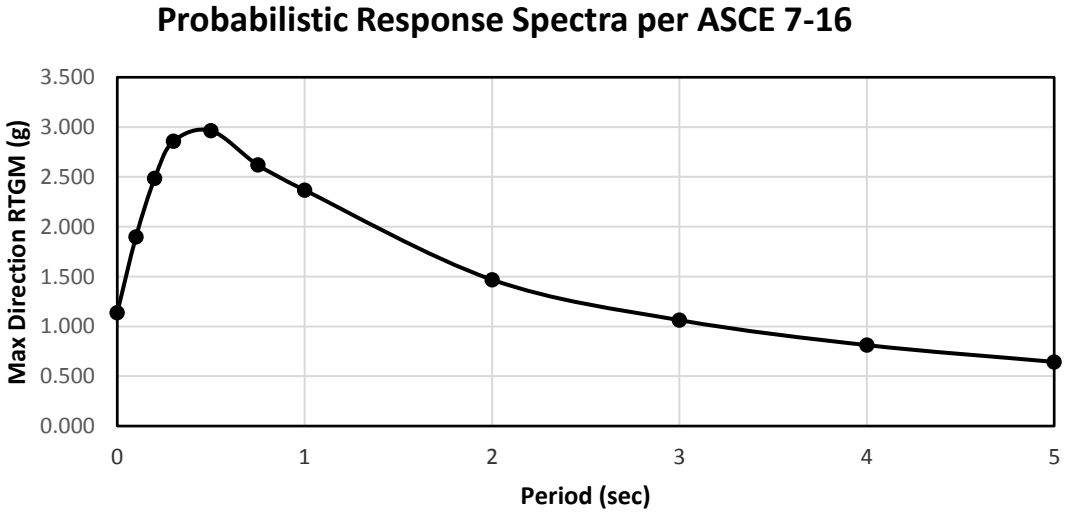
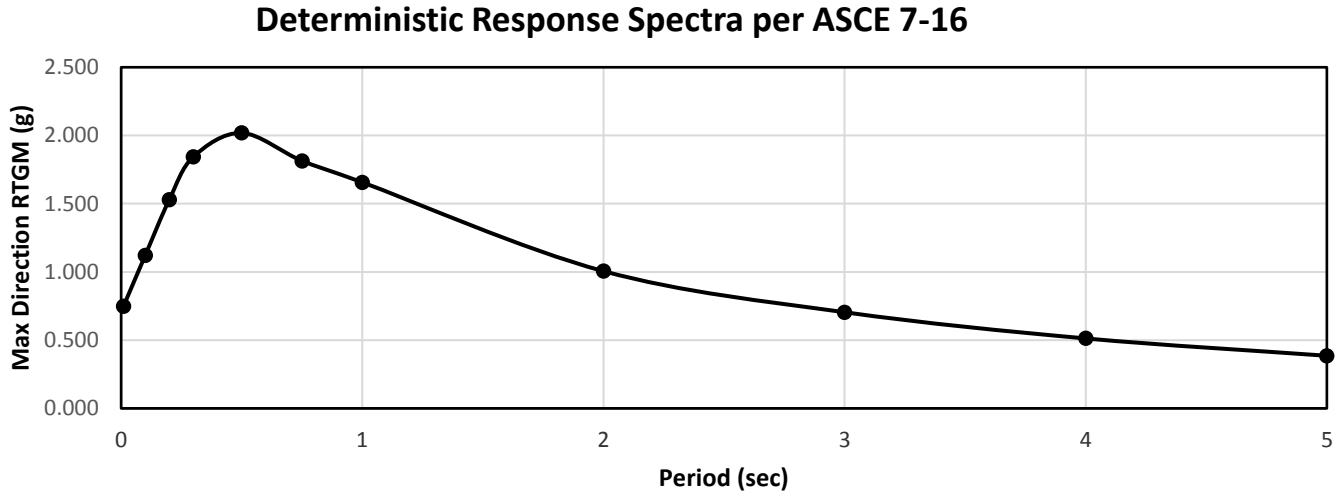


TABLE 3

Deterministic Response Spectrum ASCE 7-16 - San Andreas (San Bernardino S)

22-7455 E. Colton Avenue and N. Wabash Avenue, Redlands

Period (g)	84th-Percentile Spectral Acceleration (g)	Max Dir Scale factor	Max Dir Deterministic SA (g)
0.01	0.681	1.1	0.749
0.1	1.019	1.1	1.121
0.2	1.391	1.1	1.530
0.3	1.639	1.125	1.844
0.5	1.718	1.175	2.019
0.75	1.466	1.2375	1.814
1	1.274	1.3	1.657
2	0.745	1.35	1.006
3	0.503	1.4	0.704
4	0.353	1.45	0.512
5	0.257	1.5	0.385



PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

San Andreas (San Bernardino S) fault

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	Geometric

Weighted average of the natural logarithm of the spectral values

GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1
Damping ratio (%)	5

Modification factors are calculated in Sheet DSF

ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

Input variables | **Errors and warnings**

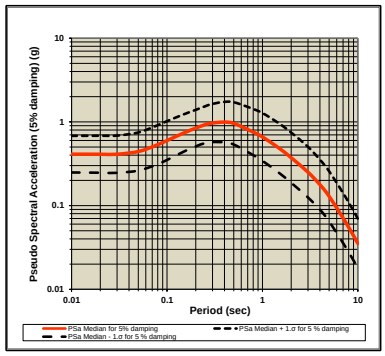
M_w	7.47
R_{RUP} (km)	5.81
R_{JB} (km)	5.81
R_x (km)	5.81
Ry0 (km)	999 *If unknown use 999*
V_{S30} (m/sec)	260
U (BSSA13)	1 *1: Unspecified fault mech.*
F_{RV}	0 *1: reverse fault*
F_{NM}	0 *1: normal fault*
F_{HW}	0 *1: hanging wall side*
Dip (deg)	90
Z_{TOR} (km)	999 *If unknown use 999*
Z_{HYP} (km)	7.48 *If unknown use 999*
$Z_{1.0}$ (km)	999 *If unknown use 999*
$Z_{2.5}$ (km)	999 *If unknown use 999*
W (km)	11.52 *If unknown use 999*
Vs30Flag	measured *Choose options for V_{s30} from the list*
F_{AS}	no *Aftershock effect is not applicable.*
Region	California *Choose region from the list*

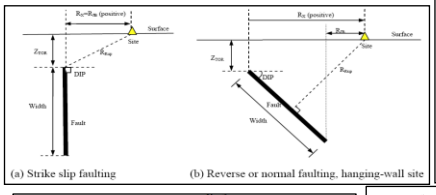
Calculated Variables/Flags

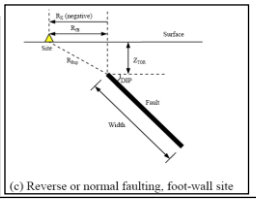
ΔDPP	0 *Always 0 for median calcs.*
PGA_r (g)	0.347
Z_{BOT} (km) (CB14)	15 *Enter for default W calcs*
SS	1 *auto calculated*
$V_{s30Flag}$	1 *measured*
F_{AS}	0 *Aftershock effect is not applicable.*
Region	0 *California*
Option for Sa value	1 *Weighted average of the natural logarithm of the spectral values*

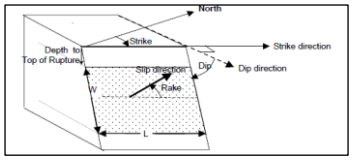
RotD50 Horizontal Component of PGA, PGV and *IMs*

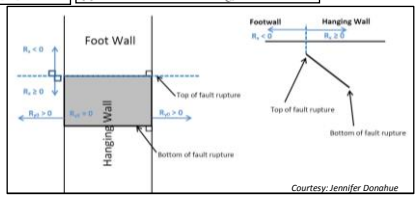
GMP	T (s)	Baseline: 5% Damping: PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	User defined: 5% Damping: PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.4113299	0.6807387	0.248542	0.001021	0.41133	0.6807387	0.248542	0.001021
	0.02	0.4106372	0.6825476	0.247049	0.004077	0.410637	0.6825476	0.247049	0.004077
	0.03	0.4109585	0.6858812	0.246233	0.009181	0.410548	0.6851953	0.245987	0.009172
	0.05	0.4420571	0.7465188	0.261768	0.027434	0.442057	0.7465188	0.261768	0.027434
	0.075	0.5175297	0.8840625	0.302962	0.072264	0.518565	0.8858306	0.303567	0.072409
	0.1	0.5962087	1.015328	0.349754	0.148001	0.597997	1.019377	0.350803	0.148445
	0.15	0.735682	1.2287286	0.440478	0.410903	0.737153	1.2311861	0.441359	0.411725
	0.2	0.8403639	1.3881876	0.508729	0.834437	0.842045	1.390964	0.509747	0.836106
	0.25	0.9204193	1.5271272	0.554749	1.428013	0.924101	1.5332357	0.556968	1.433725
	0.3	0.9690804	1.6377524	0.573418	2.165054	0.970049	1.6393901	0.573991	2.167219
	0.4	0.9912308	1.7296257	0.568064	3.936961	0.993213	1.733085	0.5692	3.944835
	0.5	0.9592081	1.7162152	0.53611	5.952771	0.960167	1.7179314	0.536646	5.958724
	0.75	0.7823989	1.4657097	0.417646	10.92489	0.782399	1.4657097	0.417646	10.92489
	1	0.6608729	1.2757199	0.342358	16.4053	0.660212	1.2744442	0.342016	16.3889
	1.5	0.4828805	0.9530981	0.244648	26.97047	0.483363	0.9540512	0.244893	26.99744
	2	0.3740868	0.7465504	0.18745	37.14486	0.373339	0.7450573	0.187075	37.07057
	3	0.2510145	0.5037736	0.125073	56.07997	0.250764	0.5032698	0.124948	56.02389
	4	0.1779982	0.3537962	0.089553	70.69715	0.17782	0.3534424	0.089463	70.62645
	5	0.1293917	0.2577257	0.064961	80.29949	0.129004	0.2569525	0.064766	80.0586
	7.5	0.062502	0.1241545	0.031465	87.27359	0.062377	0.1239062	0.031402	87.09905
	10	0.0354445	0.0697478	0.018012	87.98629	0.035303	0.0694688	0.01794	87.63435
PGA (g)	0	0.4089755	0.6763637	0.247294	0.001015	0.41133	0.6807387	0.248542	0.001021
PGV (cm/s)	-1	68.706356	121.29546	38.91789	0.170555	NA	NA	NA	NA











Courtesy: Jennifer Donahue

Definition of Parameters

Damping ratio = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
PSA = Pseudo-absolute acceleration response spectrum (g)
PGA = Peak ground acceleration (g)
PGV = Peak ground velocity (cm/s)
S_d = Relative displacement response spectrum (cm)
M_w = Moment magnitude
R_{RUP} = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
R_{JB} = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
R_X = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
R_{Y0} = The horizontal distance off the end of the rupture measured parallel to strike (km)
V_{S30} = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
U = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
F_{RV} = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
F_{NM} = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
F_{HW} = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
Dip = Average dip of rupture plane (degrees)
Z_{TOR} = Depth to top of coseismic rupture (km)
Z_{HYP} = Hypocentral depth from the earthquake
$Z_{1.0}$ = Depth to Vs=1 km/sec
$Z_{2.5}$ = Depth to Vs=2.5 km/sec
W = Fault rupture width (km)
$V_{s30flag}$ = 1 for measured, 0 for inferred Vs30
F_{AS} = 0 for mainshock; 1 for aftershock
Region = Specific regions considered in the models, Click on Region to see codes
ΔDPP = Directivity term, direct point parameter; uses 0 for median predictions
PGA_r (g) = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
Z_{BOT} (km) = The depth to the bottom of the seismogenic crust
Z_{BOR} (km) = The depth to the bottom of the rupture plane
SS = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTS	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	11.52			15.000		
$Z_{1.0}$ (km)	999.000	0.475			0.485	
$\delta Z_{1.0}$ (km)	0.000		0.000			
$Z_{2.5}$ (V_{S30}=1100)(km)	999.000			0.398		
$Z_{2.5}$ (V_{S30})(km)	999.000			2.070		
Z_{HYP} (km)	7.48			10.227		
Z_{TOR} (km)	999.00			0.000	0.000	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

PACIFIC EARTHQUAKE ENGINEERING RESEARCH CENTER

WEIGHTED AVERAGE of 2014 NGA WEST-2 GMPEs

Last updated: 04 14 15

by Emel Seyhan, PhD, PEER & UCLA -- email: emel.seyhan@gmail.com, peer_center@berkeley.edu

San Jacinto (San Jacinto Valley) fault

This excel file will be updated as necessary on the PEER website to fix any typos or other errors. Please check the website frequently for new versions at: http://peer.berkeley.edu/ngawest2/databases/

Legend	Pre-defined option	Main input variable	Calculated variable	Input var. flag	Internal variable

GMPE averaging	**Geometric**

Weighted average of the natural logarithm of the spectral values

GMPEs	ASK14	BSSA14	CB14	CY14	I14
Weight	0.25	0.25	0.25	0.25	0

# of std. dev.	1
Damping ratio (%)	5

Modification factors are calculated in Sheet DSF

ASK14 Abrahamson & Silva & Kamai 2014 NGA West-2 Model
BSSA14 Boore & Stewart & Seyhan & Atkinson 2014 NGA West-2 Model
CB14 Campbell & Bozorgnia 2014 NGA West-2 Model
CY14 Chiou & Youngs 2014 NGA West-2 Model
I14 Idriss 2014 NGA West-2 Model

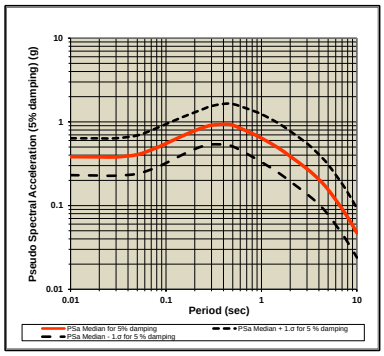
RotD50 Horizontal Component of PGA, PGV and *IMs*

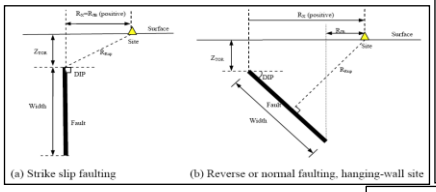
Input variables	Errors and warnings
M_w	
8.01	
R_{RUP} (km)	
9.81	
R_{JB} (km)	
9.81	
R_x (km)	
9.81	
Ry0 (km)	*If unknown use 999*
999	
V_{S30} (m/sec)	
260	
U (BSSA13)	*1: Unspecified fault mech.*
1	
F_{RV}	*1: reverse fault*
0	
F_{NM}	*1: normal fault*
0	
F_{HW}	*1: hanging wall side*
0	
Dip (deg)	
90	
Z_{TOR} (km)	*If unknown use 999*
999	
Z_{HYP} (km)	*If unknown use 999*
10.27	
$Z_{1.0}$ (km)	*If unknown use 999*
999	
$Z_{2.5}$ (km)	*If unknown use 999*
999	
W (km)	*If unknown use 999*
15.81	
Vs30Flag	
measured	*Choose options for V_{s30} from the list*
F_{AS}	
no	*Aftershock effect is not applicable.*
Region	
California	*Choose region from the list*

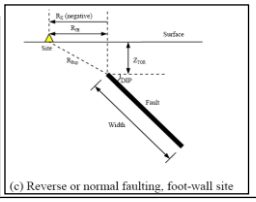
Calculated Variables/Flags

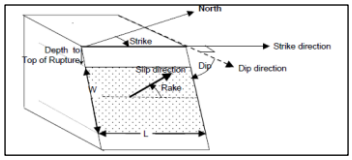
ΔDPP	*Always 0 for median calcs.*
0	
PGA_r (g)	
0.318	
Z_{BOT} (km) (CB14)	*Enter for default W calcs*
15	
SS	
1	*auto calculated*
$V_{s30Flag}$	
1	*measured*
F_{AS}	
0	*Aftershock effect is not applicable.*
Region	
0	*California*
Option for Sa value	
1	*Weighted average of the natural logarithm of the spectral values*

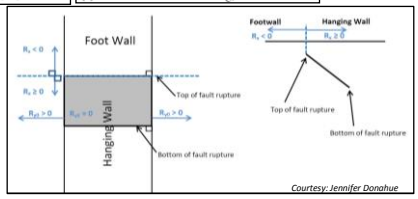
GMP	T (s)	Baseline: 5% Damping: PSa Median for 5% damping	PSa Median + 1.σ for 5% damping	PSa Median - 1.σ for 5% damping	S_d Median for 5% damping	User defined: 5% Damping: PSa Median for 5% damping	PSa Median + 1.σ for 5 % damping	PSa Median - 1.σ for 5 % damping	Sd Median for 5 % damping
PSa (g), S_d (cm)	0.01	0.3835155	0.6366977	0.231011	0.000952	0.383515	0.6366977	0.231011	0.000952
	0.02	0.3813894	0.6359577	0.228723	0.003787	0.381389	0.6359577	0.228723	0.003787
	0.03	0.3809259	0.6378317	0.227497	0.00851	0.380545	0.6371939	0.227269	0.008502
	0.05	0.4063868	0.6883907	0.239908	0.02522	0.406387	0.6883907	0.239908	0.02522
	0.075	0.4756873	0.8148786	0.277684	0.066422	0.477114	0.8173232	0.278517	0.066621
	0.1	0.5492158	0.9389254	0.321259	0.136336	0.550863	0.9417422	0.322223	0.136745
	0.15	0.6806703	1.1405579	0.406215	0.380177	0.682712	1.1439796	0.407434	0.381317
	0.2	0.7829452	1.297868	0.472315	0.777424	0.784511	1.3004638	0.47326	0.778978
	0.25	0.8592518	1.4306566	0.516066	1.333113	0.86183	1.4349486	0.517615	1.337112
	0.3	0.9100874	1.543215	0.53671	2.033255	0.911908	1.5463014	0.537784	2.037322
	0.4	0.9345762	1.6349049	0.534241	3.711941	0.936445	1.6381747	0.535309	3.719365
	0.5	0.9116648	1.6344062	0.508523	5.657721	0.912576	1.6360407	0.509031	5.663379
	0.75	0.7493947	1.4054866	0.399571	10.46404	0.749395	1.4054866	0.399571	10.46404
	1	0.6401862	1.2366468	0.331411	15.89178	0.639546	1.2354102	0.33108	15.87589
	1.5	0.4887143	0.964879	0.247535	27.29631	0.489203	0.9658439	0.247783	27.32361
	2	0.3883103	0.7749882	0.194564	38.55717	0.387534	0.7734382	0.194175	38.48006
	3	0.2755349	0.5529874	0.13729	61.55814	0.275259	0.5524344	0.137152	61.49658
	4	0.205369	0.4081994	0.103323	81.56825	0.205164	0.4077912	0.10322	81.48668
	5	0.1553114	0.3093533	0.077974	96.38508	0.155001	0.3087346	0.077818	96.19231
	7.5	0.0819255	0.1627376	0.041243	114.3953	0.081598	0.1620866	0.041078	113.9377
	10	0.0473547	0.0931848	0.024065	117.5518	0.047165	0.092812	0.023968	117.0816
PGA (g)	0	0.3813813	0.632705	0.229889	0.000947	0.383515	0.6366977	0.231011	0.000952
PGV (cm/s)	-1	68.879089	121.68825	38.98757	0.170983	NA	NA	NA	NA











Courtesy: Jennifer Donahue

Definition of Parameters

Damping ratio = Viscous damping ratio (%) See Sanaz et al. (2012) PEER Report
PSA = Pseudo-absolute acceleration response spectrum (g)
PGA = Peak ground acceleration (g)
PGV = Peak ground velocity (cm/s)
S_d = Relative displacement response spectrum (cm)
M_w = Moment magnitude
R_{RUP} = Closest distance to coseismic rupture (km), used in ASK13, CB13 and CY13. See Figures a, b and c for illustation
R_{JB} = Closest distance to surface projection of coseismic rupture (km). See Figures a, b and c for illustation
R_x = Horizontal distance from top of rupture measured perpendicular to fault strike (km). See Figures a, b and c for illustation
R_{y0} = The horizontal distance off the end of the rupture measured parallel to strike (km)
V_{S30} = The average shear-wave velocity (m/s) over a subsurface depth of 30 m
U = Unspecified-mechanism factor: 1 for unspecified; 0 otherwise
F_{RV} = Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust
F_{NM} = Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique, thrust and normal-oblique; 1 for normal
F_{HW} = Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise
Dip = Average dip of rupture plane (degrees)
Z_{TOR} = Depth to top of coseismic rupture (km)
Z_{HYP} = Hypocentral depth from the earthquake
$Z_{1.0}$ = Depth to Vs=1 km/sec
$Z_{2.5}$ = Depth to Vs=2.5 km/sec
W = Fault rupture width (km)
$V_{s30flag}$ = 1 for measured, 0 for inferred Vs30
F_{AS} = 0 for mainshock; 1 for aftershock
Region = Specific regions considered in the models, Click on Region to see codes
ΔDPP = Directivity term, direct point parameter; uses 0 for median predictions
PGA_r (g) = Peak ground acceleration on rock (g), this specific cell is updated in the cell for BSSA14 and CB14, for others it is taken account for in the macros
Z_{BOT} (km) = The depth to the bottom of the seismogenic crust
Z_{BOR} (km) = The depth to the bottom of the rupture plane
SS = 1 for strike slip, automatically updated in the cell

Input variables with defaults (If entered 999 as input):

Red colored value: The value is used in the code when input is unknown

DEFAULTS	USER defined	ASK14	BSSA14	CB14	CY14	I14
W (km)	15.81			15.000		
$Z_{1.0}$ (km)	999.000	0.475			0.485	
$\delta Z_{1.0}$ (km)	0.000		0.000			
$Z_{2.5}$ (V_{S30}=1100)(km)	999.000			0.398		
$Z_{2.5}$ (V_{S30})(km)	999.000			2.070		
Z_{HYP} (km)	10.27			10.227		
Z_{TOR} (km)	999.00			0.000	0.000	
Z_{BOR} (km)	-			15.000		

ACKNOWLEDGEMENTS

Nick Gregor, Bechtel
Silvia Mazzoni, Consultant

All NGA West-2 participants are acknowledged for their constructive comments and feedback.

E. Colton Avenue and N. Wabash Avenue, Redlands

Latitude, Longitude: 34.0638, -117.1400



Date	3/22/2022, 12:45:04 PM
Design Code Reference Document	ASCE7-16
Risk Category	III
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.914	MCE_R ground motion. (for 0.2 second period)
S_1	0.789	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.914	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.276	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.819	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.901	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	2.587	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.831	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.914	Factored deterministic acceleration value. (0.2 second)
S1RT	1.018	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	1.143	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.789	Factored deterministic acceleration value. (1.0 second)
PGAd	0.819	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.914	Mapped value of the risk coefficient at short periods
C_{R1}	0.891	Mapped value of the risk coefficient at a period of 1 s

DISCLAIMER

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U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Dynamic: Conterminous U.S. 2014 (upd…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.0638

Time Horizon

Return period in years

2475

Longitude

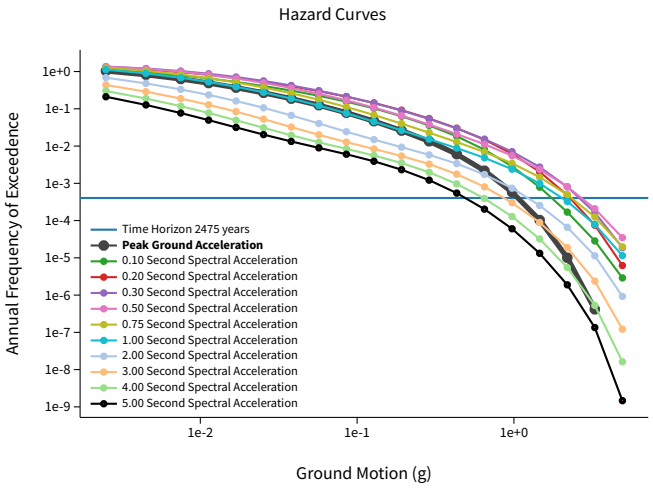
Decimal degrees, negative values for western longitudes

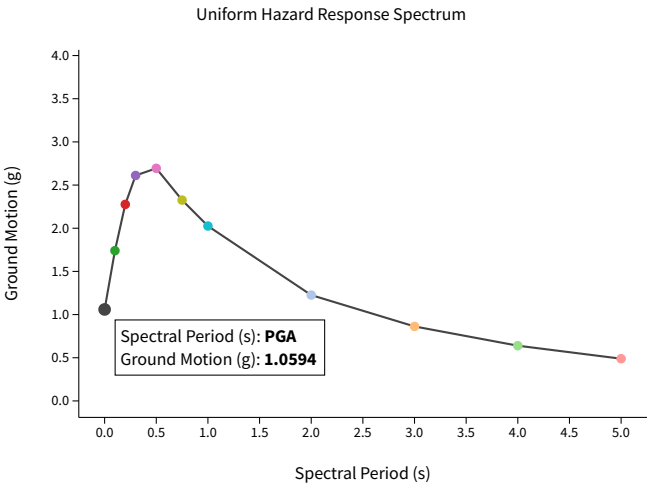
-117.14

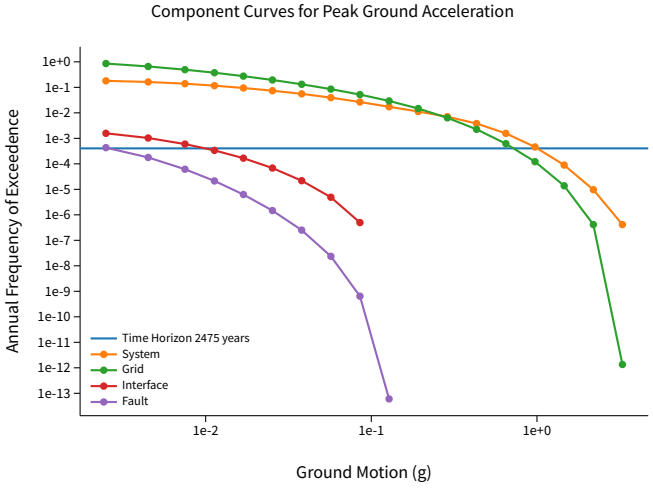
Site Class

259 m/s (Site class D)

Hazard Curve





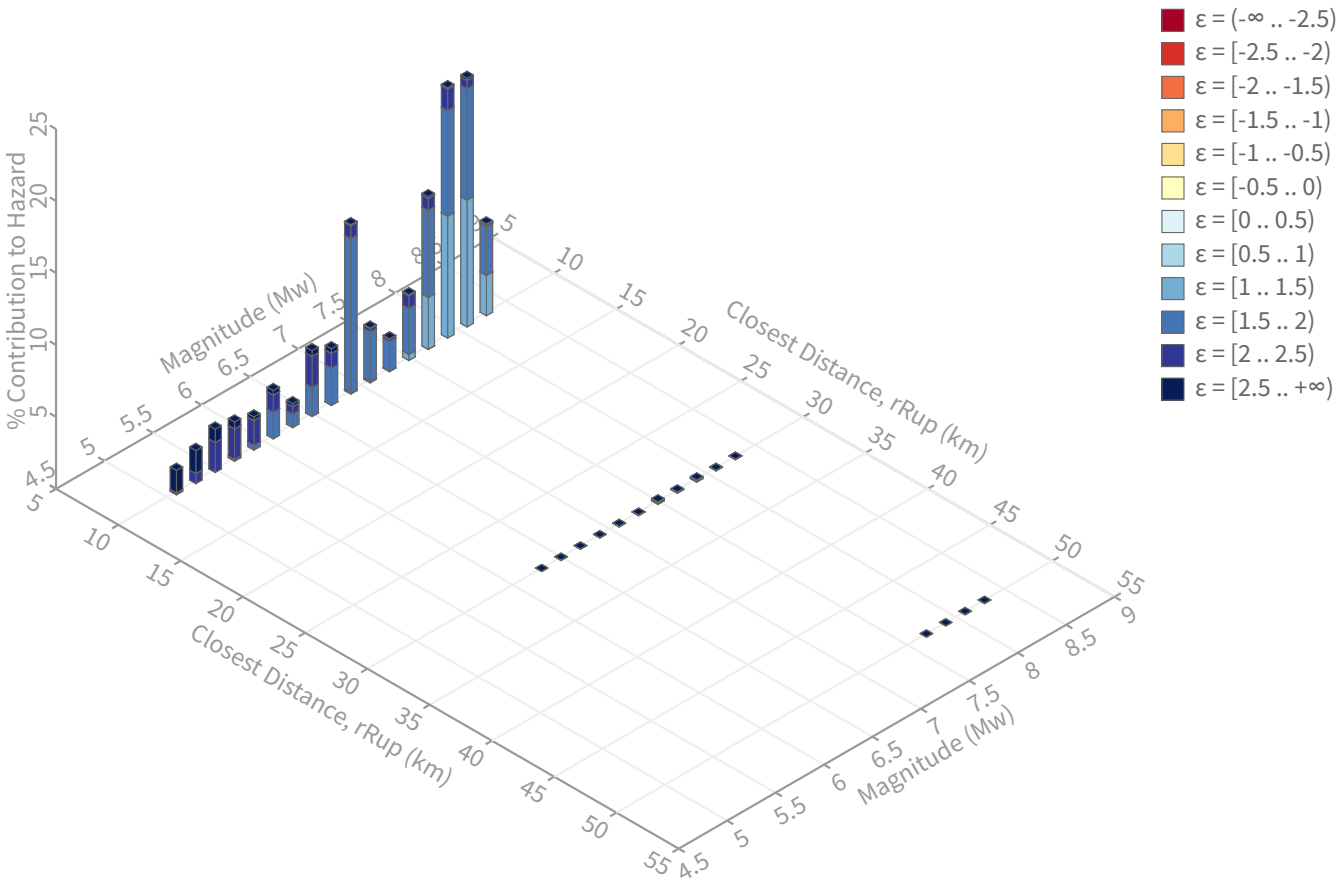


View Raw Data

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 1.0593831 g

Recovered targets

Return period: 3321.3976 yrs
Exceedance rate: 0.00030107808 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.03 %

Mean (over all sources)

m: 7.27
r: 7.32 km
ε₀: 1.8 σ

Mode (largest m-r bin)

m: 7.91
r: 7.19 km
ε₀: 1.6 σ
Contribution: 17.39 %

Mode (largest m-r-ε₀ bin)

m: 6.84
r: 5.81 km
ε₀: 1.81 σ
Contribution: 10.71 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							41.52
San Andreas (San Bernardino S) [1]		5.81	7.46	1.67	117.117°W	34.111°N	22.38	26.23
San Jacinto (San Jacinto Valley) rev [0]		9.81	8.02	1.78	117.215°W	34.002°N	225.08	7.41
San Andreas (North Branch Mill Creek) [1]		7.08	7.94	1.40	117.111°W	34.123°N	21.83	3.54
San Andreas (San Bernardino S) [2]		6.03	6.79	1.89	117.099°W	34.104°N	39.89	1.39
UC33brAvg_FM32	System							41.39
San Andreas (San Bernardino S) [1]		5.81	7.47	1.66	117.117°W	34.111°N	22.38	26.35
San Jacinto (San Jacinto Valley) rev [0]		9.81	8.01	1.78	117.215°W	34.002°N	225.08	7.39
San Andreas (North Branch Mill Creek) [1]		7.08	7.95	1.40	117.111°W	34.123°N	21.83	3.64
San Andreas (San Bernardino S) [2]		6.03	6.81	1.88	117.099°W	34.104°N	39.89	1.23
UC33brAvg_FM31 (opt)	Grid							8.54
PointSourceFinite: -117.140, 34.122		8.07	5.70	2.26	117.140°W	34.122°N	0.00	1.70
PointSourceFinite: -117.140, 34.122		8.07	5.70	2.26	117.140°W	34.122°N	0.00	1.70
PointSourceFinite: -117.140, 34.113		7.45	5.65	2.20	117.140°W	34.113°N	0.00	1.32
PointSourceFinite: -117.140, 34.113		7.45	5.65	2.20	117.140°W	34.113°N	0.00	1.32
UC33brAvg_FM32 (opt)	Grid							8.54
PointSourceFinite: -117.140, 34.122		8.07	5.70	2.26	117.140°W	34.122°N	0.00	1.70
PointSourceFinite: -117.140, 34.122		8.07	5.70	2.26	117.140°W	34.122°N	0.00	1.70
PointSourceFinite: -117.140, 34.113		7.45	5.65	2.20	117.140°W	34.113°N	0.00	1.32
PointSourceFinite: -117.140, 34.113		7.45	5.65	2.20	117.140°W	34.113°N	0.00	1.32

APPENDIX E
STANDARD GRADING GUIDELINES

TGR GEOTECHNICAL
DBE & 8(a) firm
3037 S. HARBOR BLVD
SANTA ANA, CA 92704
P 714.641.7189 F 714.641.7190
www.tgrgeotech.com

STANDARD GRADING SPECIFICATIONS

These specifications present the usual and minimum requirements for grading operations performed under the observation and testing of TGR Geotechnical, Inc.

No deviation from these specifications will be allowed, except where specifically superseded in the Preliminary Geotechnical Investigation report, or in other written communication signed by the Soils Engineer or Engineering Geologist.

1.0 GENERAL

- The Soils Engineer and Engineering Geologist are the Owner's or Builder's representatives on the project. For the purpose of these specifications, observation and testing by the Soils Engineer includes that observation and testing performed by any person or persons employed by, and responsible to, the licensed Geotechnical Engineer or Geologist signing the grading report.

- All clearing, site preparation or earthwork performed on the project shall be conducted by the Contractor under the observation of the Geotechnical Engineer.

- It is the Contractor's responsibility to prepare the ground surface to receive the fills to the satisfaction of the Geotechnical Engineer and to place, spread, mix, water and compact the fill in accordance with the specifications of the Geotechnical Engineer. The Contractor shall also remove all material considered unsatisfactory by the Geotechnical Engineer.

- It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment will be shut down to permit completion of Compaction. Sufficient watering apparatus will also be provided by the Contractor, with due consideration for the fill material, rate of placement and time of year.

- A final report will be issued by the Geotechnical Engineer and Engineering Geologist attesting to the Contractor's conformance with these specifications.

2.0 SITE PREPARATION

- All vegetation and deleterious material such as rubbish shall be disposed of off-site. The removal must be concluded prior to placing fill.

- The Civil Engineer shall locate all houses, sheds, sewage disposal systems, large trees or structures on the site, or on the grading plan to the best of his knowledge prior to preparing the ground surface.

- Soil, alluvium or rock materials determined by the Geotechnical Engineer as being unsuitable for placement in compacted fills shall be removed and wasted from the site. Any material incorporated as part of a compacted fill must be approved by the Geotechnical Engineer.

- After the ground surface to receive fill has been cleared, it shall be scarified, disced or bladed by the Contractor until it is uniform and free from ruts, hollows, hummocks or other uneven features which may prevent uniform compaction.

  The scarified ground surface shall then be brought to optimum moisture content, mixed as required, and compacted as specified. If the scarified zone is greater than twelve inches in depth, the excess shall be removed and placed in lifts restricted to six inches. Prior to placing fill, the ground surface to receive fill shall be inspected, tested and approved by the Geotechnical Engineer.

- Any underground structures such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipe lines or others not located prior to grading are to be removed or treated in a manner prescribed by the Geotechnical Engineer.

3.0 COMPACTED FILLS

- Any material imported or excavated on the property may be utilized in the fill, provided each material has been determined to be suitable by the Geotechnical Engineer. Roots, tree branches and other matter missed during clearing shall be removed from the fill as directed by the Geotechnical Engineer.
- Rock fragments less than six inches in diameter may be utilized in the fill, provided:

- They are not placed in concentrated pockets.
- There is a sufficient percentage of fine-grained material to surround the rocks.
- The distribution of the rocks is observed by the Geotechnical Engineer.

- Rocks greater than six inches in diameter shall be taken off-site, or placed in accordance with the recommendations of the Geotechnical Engineer in areas designated as suitable for rock disposal. Details for rock disposal such as location, moisture control, percentage of the rock placed, etc., will be referred to in the "Conclusions and Recommendations" section of the Geotechnical Report, if applicable.

  If rocks greater than six inches in diameter were not anticipated in the Preliminary Geotechnical report, rock disposal recommendations may not have been made in the "Conclusions and Recommendations" section. In this case, the Contractor shall notify the Geotechnical Engineer if rocks greater than six inches in diameter are encountered. The Geotechnical Engineer will then prepare a rock disposal recommendation or request that such rocks be taken off-site.

- Material that is spongy, subject to decay, or otherwise considered unsuitable shall not be used in the compacted fill.

- Representative samples of materials to be utilized as compacted fill shall be analyzed in the laboratory by the Geotechnical Engineer to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material shall be conducted by the Geotechnical Engineer as soon as possible.

- Material used in the compacting process shall be evenly spread, watered or dried, processed and compacted in thin lifts not to exceed six inches in thickness to obtain a uniformly dense layer. The fill shall be placed and compacted on a horizontal plane, unless otherwise approved by the Geotechnical Engineer.

- If the moisture content or relative compaction varies from that required by the Geotechnical Engineer, the Contractor shall rework the fill until it is approved by the Geotechnical Engineer.

- Each layer shall be compacted to 90 percent of the maximum dry density in compliance with the testing method specified by the controlling governmental agency; (in general, ASTM D1557 will be used.)

  If compaction to a lesser percentage is authorized by the controlling governmental agency because of a specific land use of expansive soil conditions, the area to receive fill compacted to less than 90 percent shall either be delineated on the grading plan or appropriate reference made to the area in the grading report.

- All fill shall be keyed and benched through all topsoil, colluvium, alluvium or creep material, into sound bedrock or firm material where the slope receiving fill exceeds a ratio of five horizontal to one vertical, in accordance with the recommendations of the Geotechnical Engineer.

- The key for side hill fills shall be a minimum of 15 feet within bedrock or firm materials, unless otherwise specified in the Preliminary report. (See details)

- Drainage terraces and subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency, or with the recommendation of the Geotechnical Engineer and Engineer Geologist.

- The Contractor will be required to obtain a minimum relative compaction of 90 percent out to the finish slope face of fill slopes, buttresses and stabilization fills. This may be achieved by either overbuilding the slope and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure which produces the required compaction.

The Contractor shall prepare a written detailed description of the method or methods he will employ to obtain the required slope compaction. Such documents shall be submitted to the Geotechnical Engineer for review and comments prior to the start of grading.

If a method other than overbuilding and cutting back to the compacted core is to be employed, slope tests will be made by the Geotechnical Engineer during construction of the slopes to determine if the required compaction is being achieved. Where failing tests occur or other field problems arise, the contractor will be notified by the Geotechnical Engineer.

If the method of achieving the required slope compaction selected by the Contractor fails to produce the necessary results, the Contractor shall rework or rebuild such slopes until the required degree of compaction is obtained, at no additional cost to the Owner or Geotechnical Engineer.

- All fill slopes should be planted or protected from erosion by methods specified in the preliminary report or by means approved by the governing authorities.

- Fill-over-cut slopes shall be properly keyed through topsoil, colluvium or creep material into rock or firm materials; and the transition shall be stripped of all soil prior to placing fill. (See detail)

4.0 CUT SLOPES

- The Engineering Geologist shall inspect all cut slopes excavated in rock, lithified or formation material at vertical intervals not exceeding ten feet.

- If any conditions not anticipated in the preliminary report such as perched water, seepage, lenticular or confined strata of a potentially adverse nature, unfavorably inclined bedding, joints or fault planes are encountered during grading, these

conditions shall be analyzed by the Engineering Geologist and Geotechnical Engineer; and recommendations shall be made to treat these problems.

- Cut slopes that face in the same direction as the prevailing drainage shall be protected from slope wash by a non-erosive interceptor swale placed at the top of the slope.

- Unless otherwise specified in the soils and geological report, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

- Drainage terraces shall be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Geotechnical Engineer or Engineering Geologist.

5.0 GRADING CONTROL

- Inspection of the fill placement shall be provided by the Geotechnical Engineer during the progress of grading.

- In general, density tests should be made at intervals not exceeding two feet of fill height or every 500 cubic yards of fill placed. This criteria will vary depending on soil conditions and the size of the job. In any event, an adequate number of field density tests shall be made to verify that the required compaction of being achieved.
- Density tests should be made on the surface material to receive fill as required by the Geotechnical Engineer.

- All cleanout, processed ground to receive fill, key excavations, subdrains and rock disposal must be inspected and approved by the Geotechnical Engineer (and often by the governing authorities) prior to placing any fill. It shall be the Contractor's responsibility to notify the Geotechnical Engineer and governing authorities when such areas are ready for inspection.

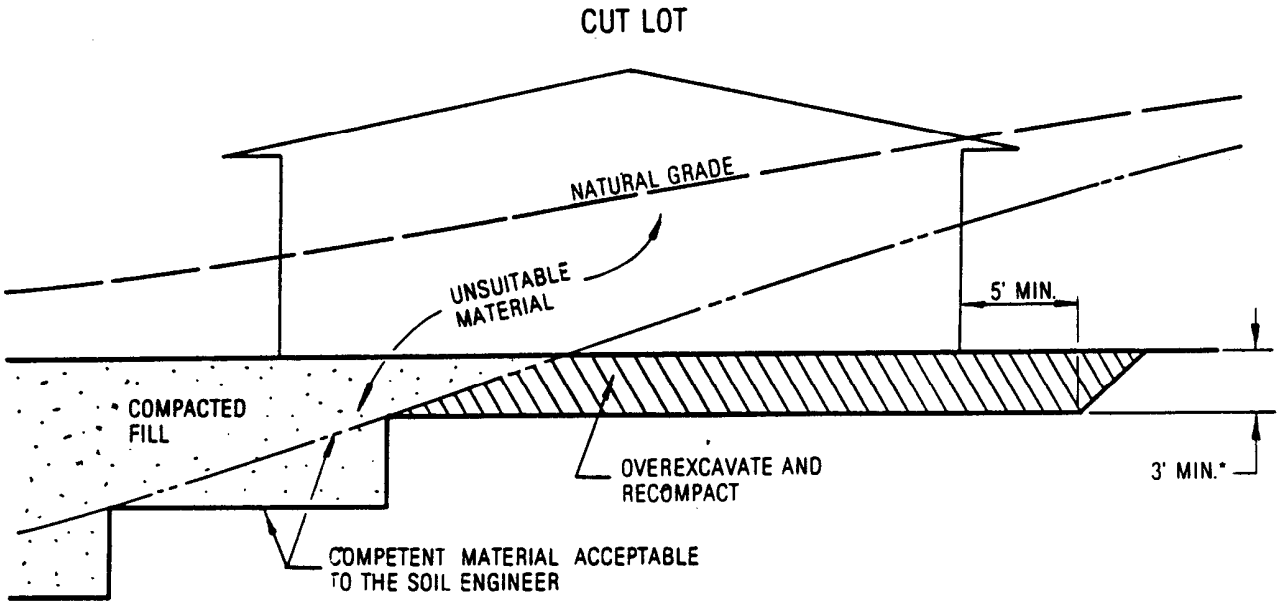
6.0 CONSTRUCTION CONSIDERATIONS

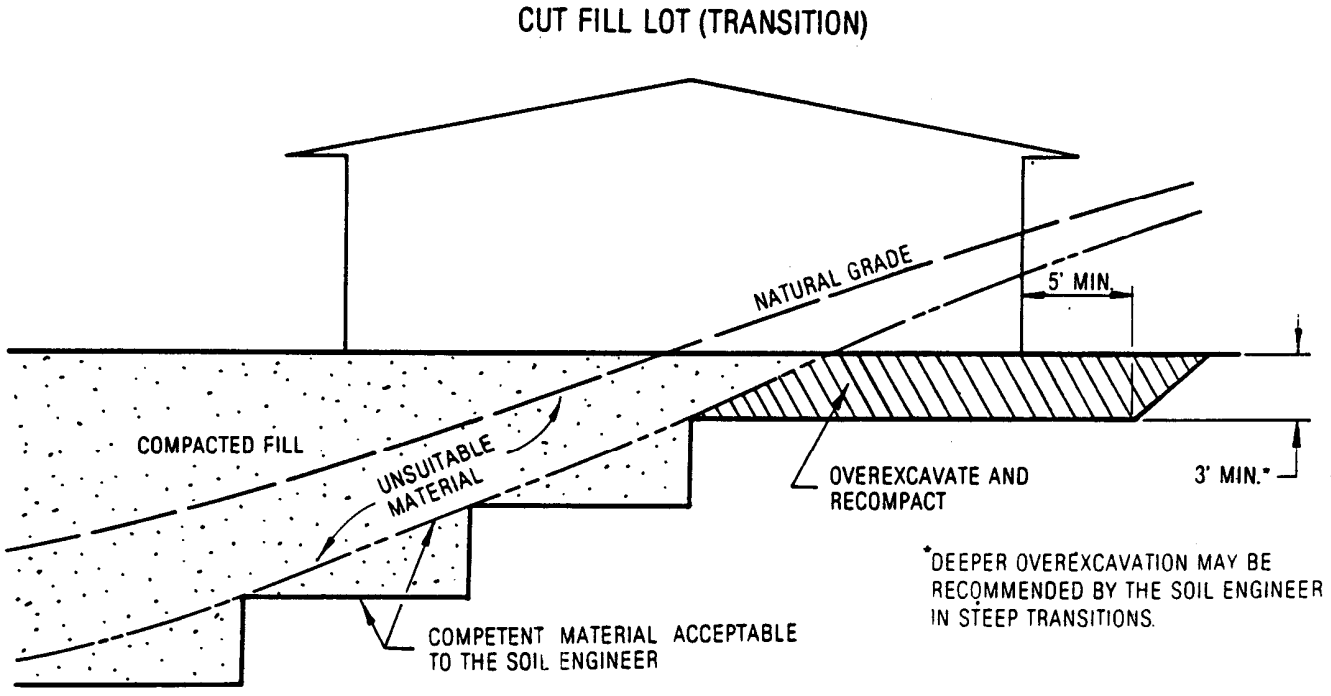
- Erosion control measures, when necessary, shall be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls.

- Upon completion of grading and termination of observations by the Geotechnical Engineer, no further filling or excavating, including that necessary for footings, foundations, large tree wells, retaining walls, or other features shall be performed without the approval of the Geotechnical Engineer or Engineering Geologist.

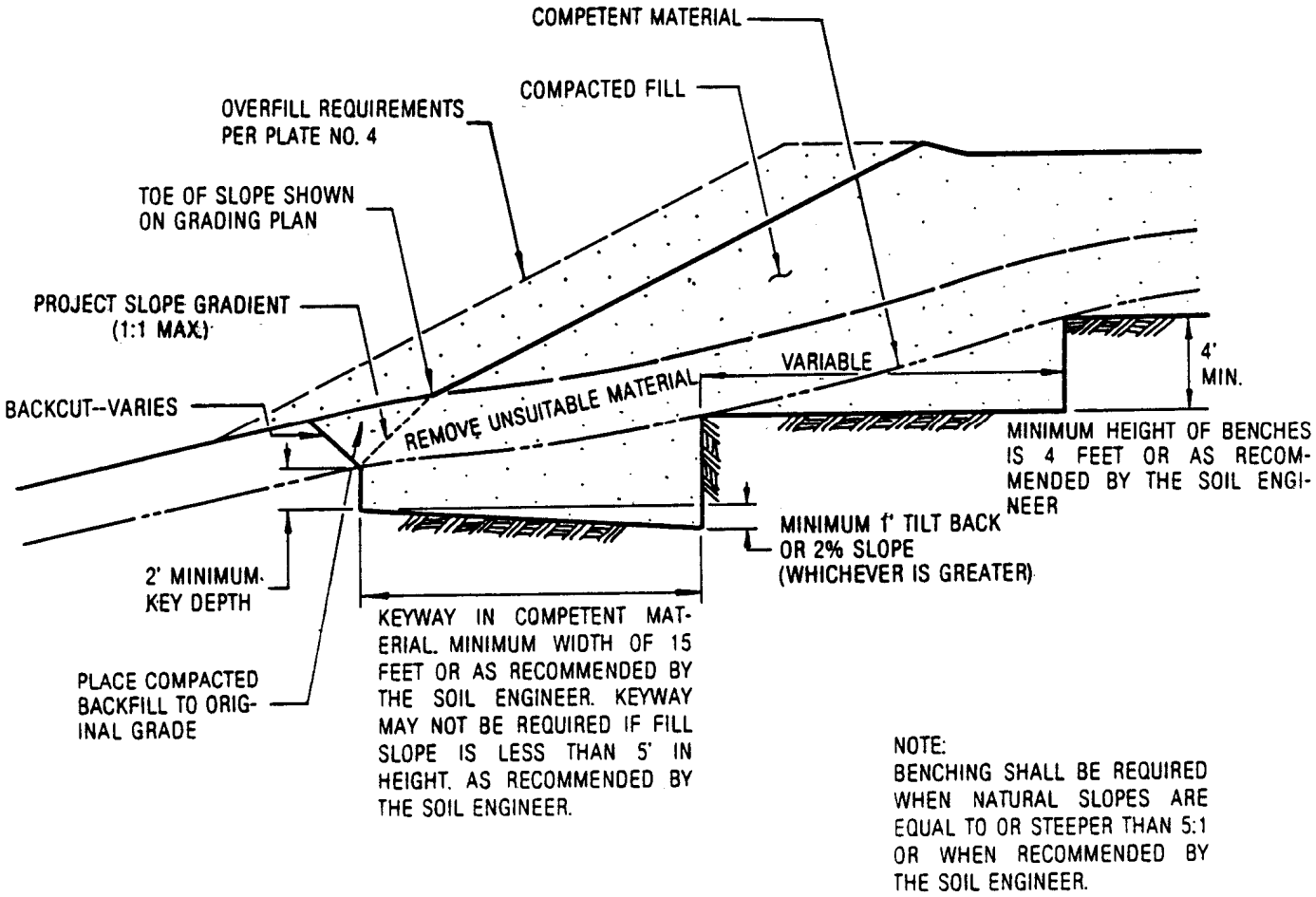
- Care shall be taken by the Contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of a permanent nature on or adjacent to the property.

TYPICAL OVEREXCAVATION OF DAYLIGHT LINE



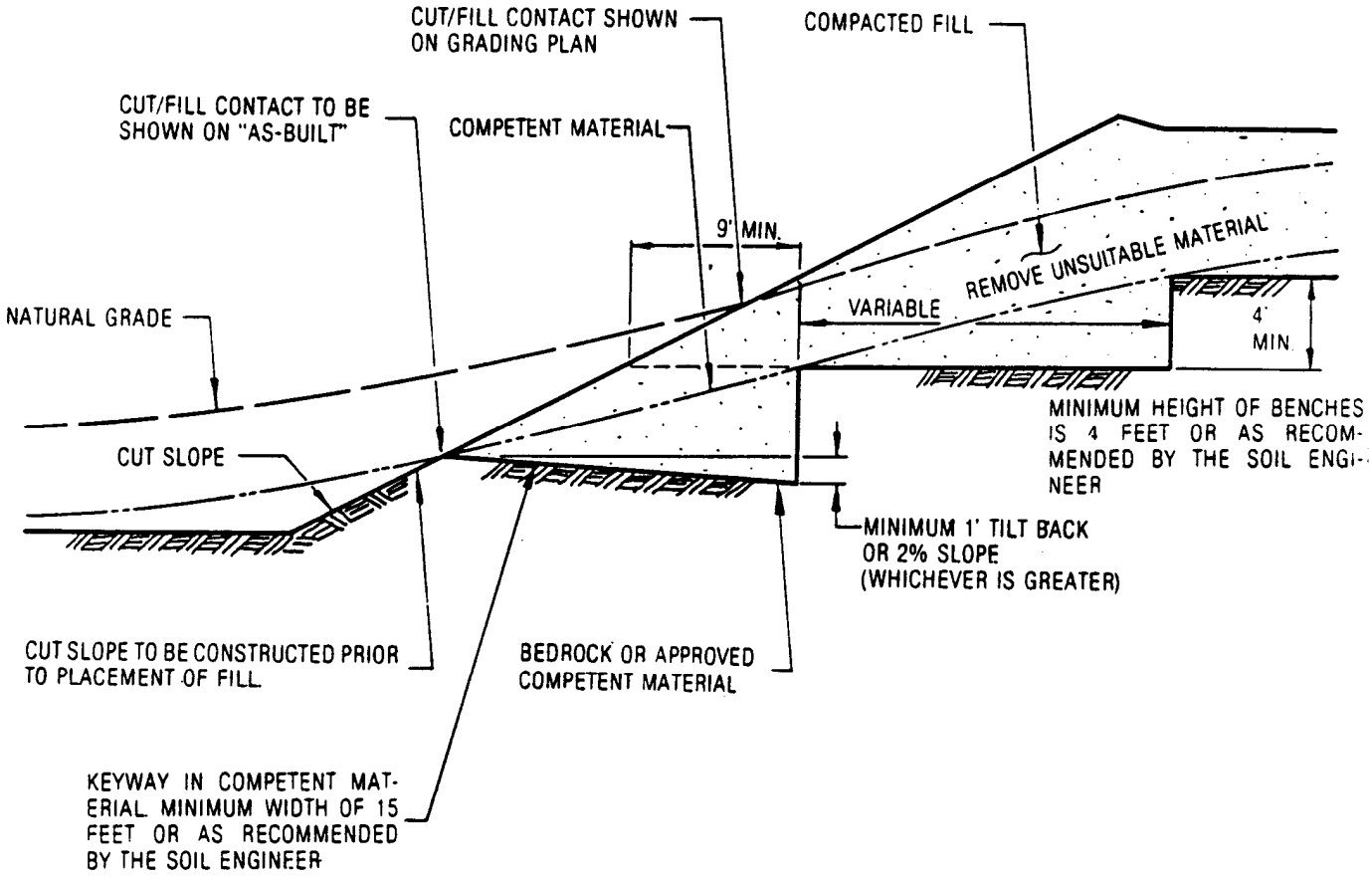


TYPICAL FILL OVER NATURAL SLOPE

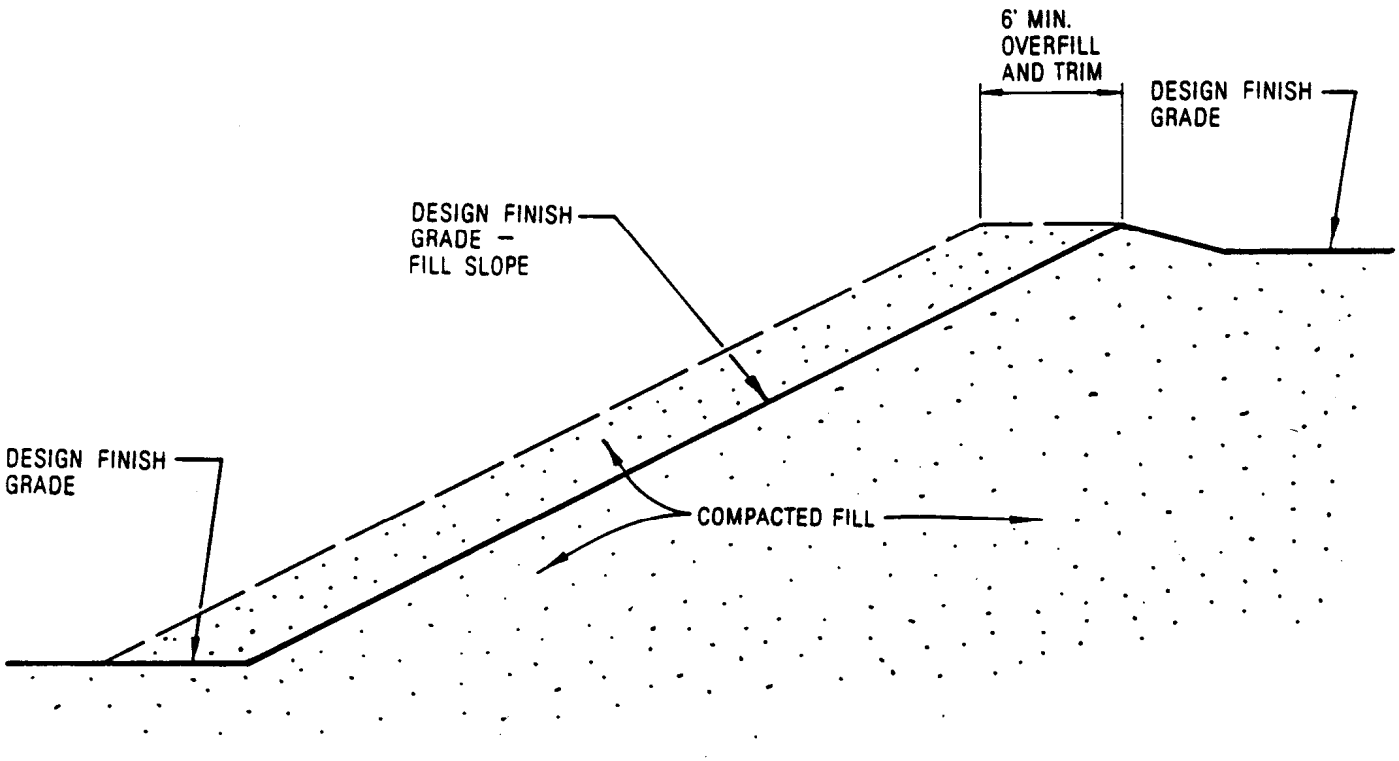


NOTE:
BENCHING SHALL BE REQUIRED WHEN NATURAL SLOPES ARE EQUAL TO OR STEEPER THAN 5:1 OR WHEN RECOMMENDED BY THE SOIL ENGINEER.

TYPICAL FILL-OVER-CUT SLOPE



TYPICAL FILL SLOPE CONSTRUCTION



NOTES:

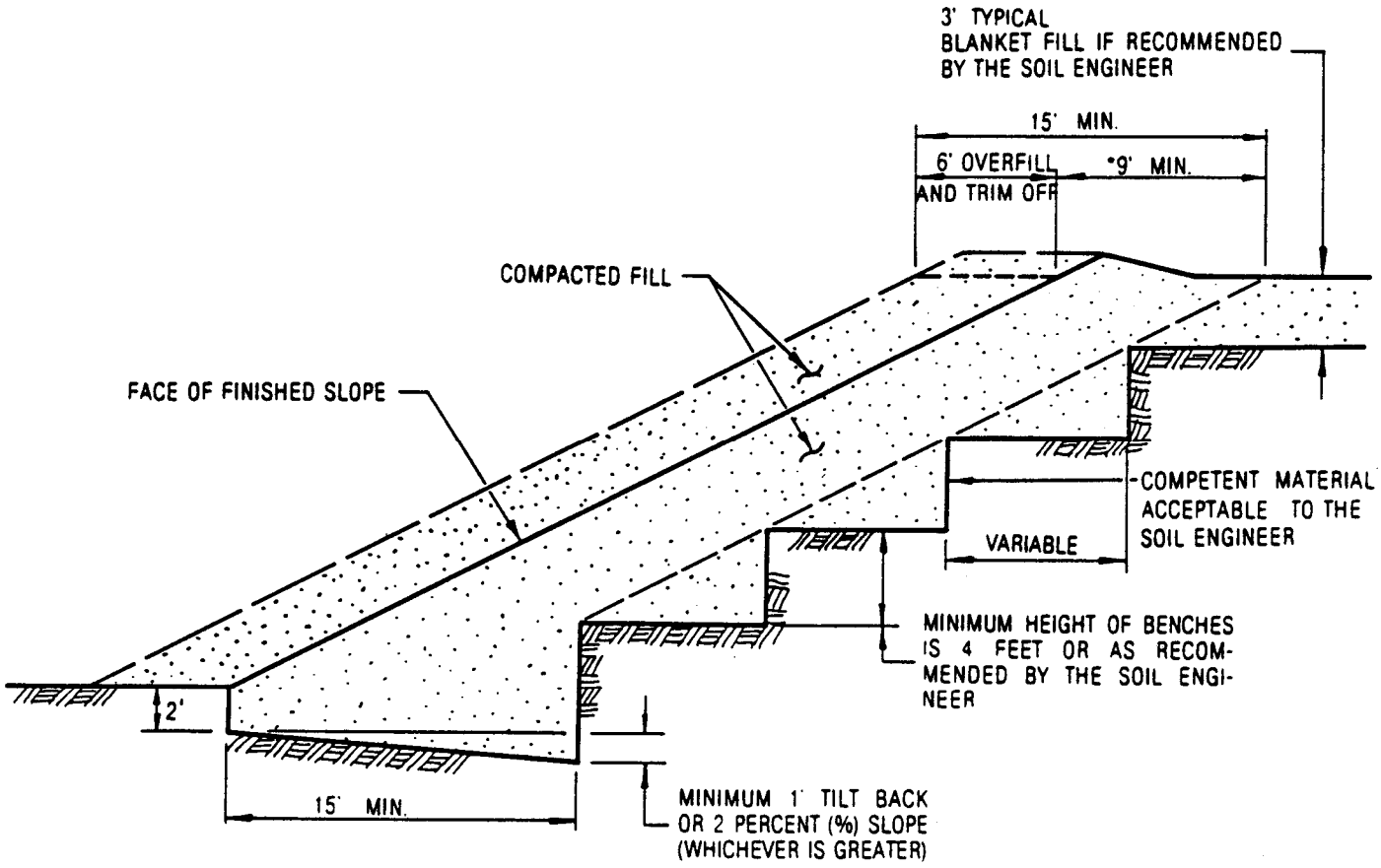
1. ALL FILL SLOPES, INCLUDING BUTTRESS AND STABILIZATION FILLS, SHALL BE OVERFILLED A MINIMUM OF SIX FEET HORIZONTALLY WITH COMPACTED FILL AND TRIMMED TO THE DESIGN FINISH GRADE.

   EXCEPTIONS:

   A. FILL SLOPE OVER CUT SLOPE.
   B. FILL SLOPE ADJACENT TO EXISTING IMPROVEMENTS.

2. THE EXCEPTIONS ABOVE WHICH DO NOT HAVE THE 6 FOOT SLOPE OVERFILL AND TRIM SHALL BE COMPACTED AS STATED IN THE PROJECT SPECIFICATIONS.

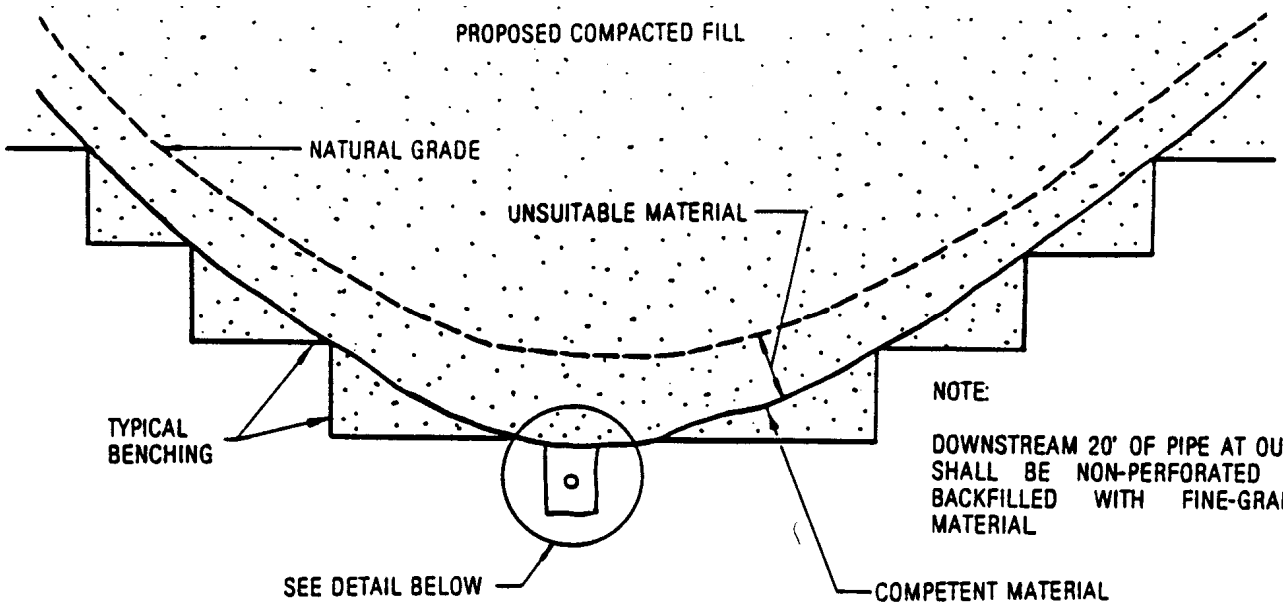
TYPICAL STABILIZATION FILL



NOTE:
SEE PLATE 6 FOR TYPICAL SUBDRAIN DETAILS FOR STABILIZATION FILLS. IF RECOMMENDED BY THE SOIL ENGINEER.

*GREATER THAN 9' IF RECOMMENDED BY THE SOIL ENGINEER: 15' WHERE NO 6' OVERFILL

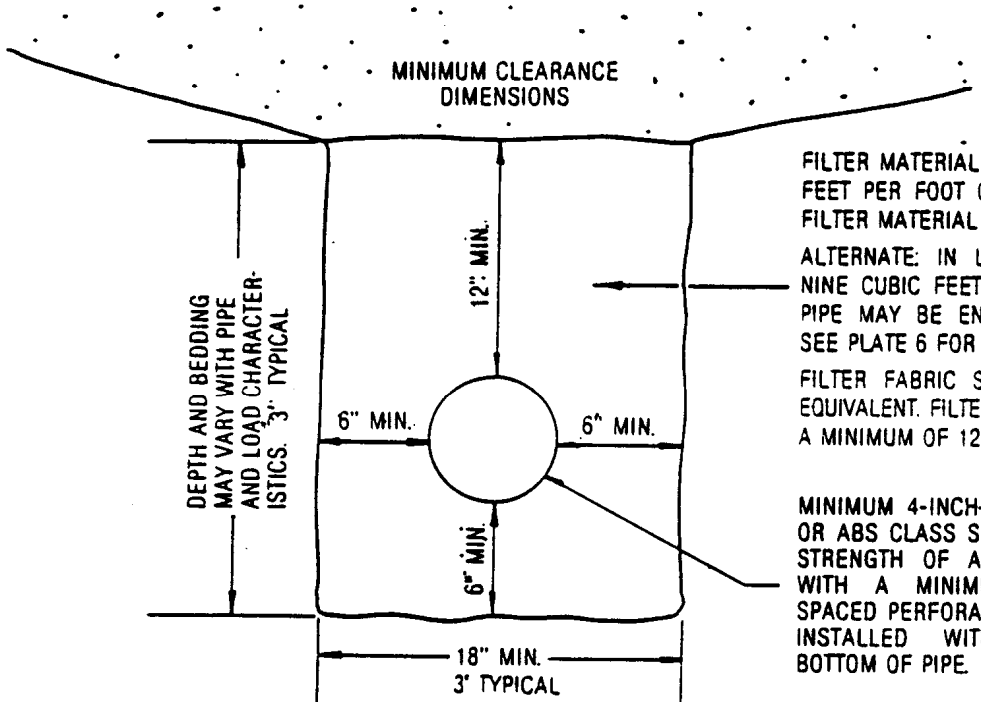
TYPICAL CANYON SUBDRAIN



NOTE:

DOWNSTREAM 20' OF PIPE AT OUTLET SHALL BE NON-PERFORATED AND BACKFILLED WITH FINE-GRAINED MATERIAL

NOTES:
PIPE SHALL BE A MINIMUM OF 4 INCHES DIAMETER AND RUNS OF 500 FEET OR MORE USE 6-INCH DIAMETER PIPE, OR AS RECOMMENDED BY THE SOIL ENGINEER



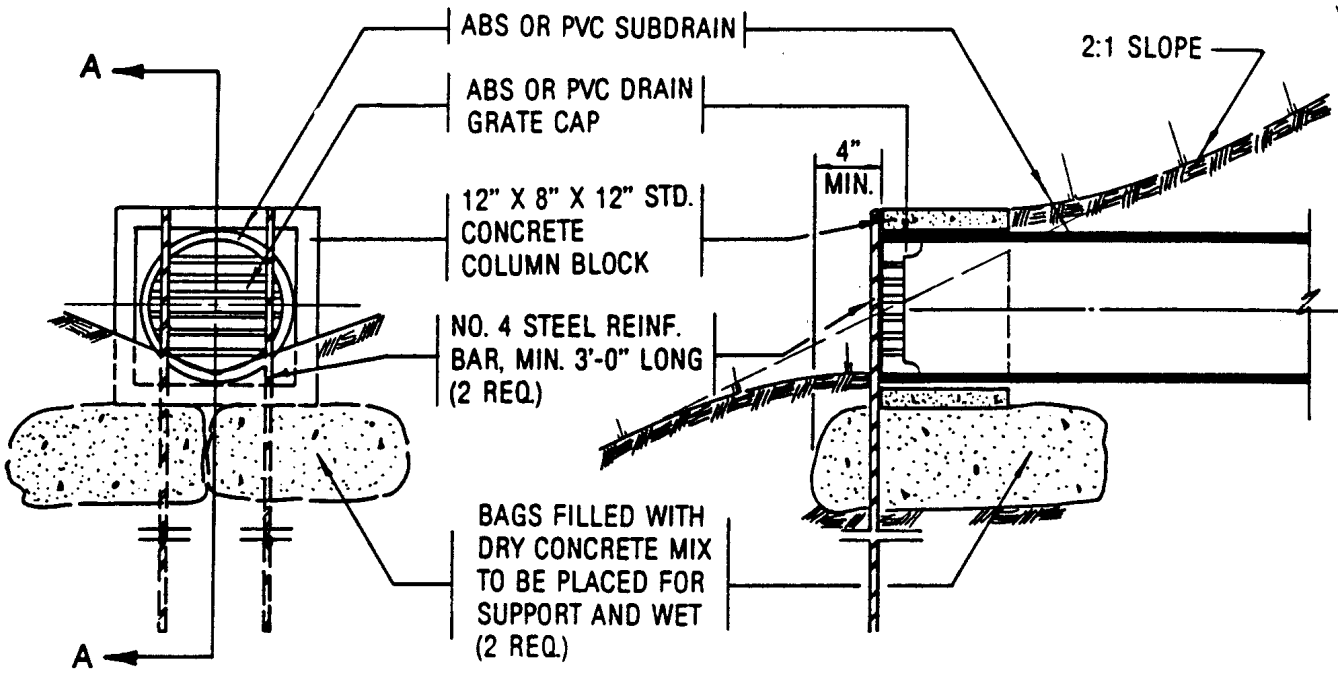
FILTER MATERIAL – MINIMUM OF NINE CUBIC FEET PER FOOT OF PIPE. SEE PLATE 6 FOR FILTER MATERIAL SPECIFICATION.

ALTERNATE: IN LIEU OF FILTER MATERIAL NINE CUBIC FEET OF GRAVEL PER FOOT OF PIPE MAY BE ENCASED IN FILTER FABRIC. SEE PLATE 6 FOR GRAVEL SPECIFICATIONS.

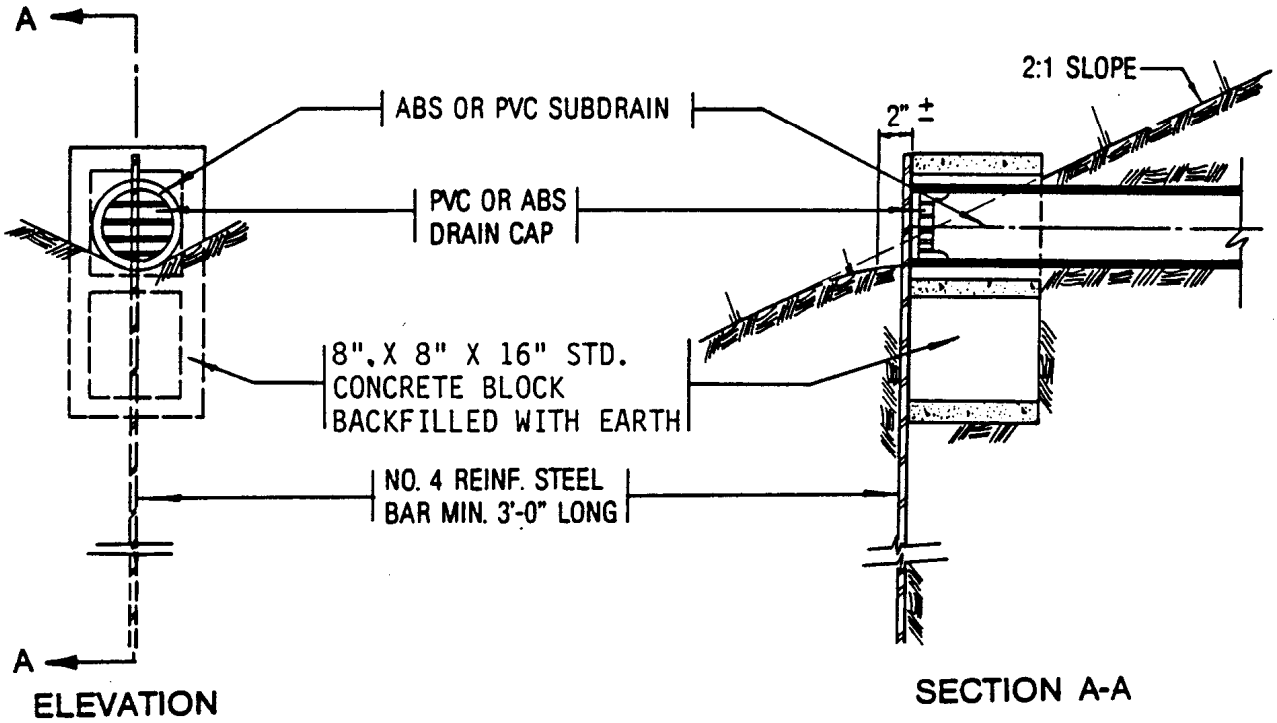
FILTER FABRIC SHALL BE MIRAFI 140 OR EQUIVALENT. FILTER FABRIC SHALL BE LAPPED A MINIMUM OF 12 INCHES ON ALL JOINTS.

MINIMUM 4-INCH-DIAMETER, PVC SCH. 40 OR ABS CLASS SDR-35 WITH A CRUSHING STRENGTH OF AT LEAST 1000 POUNDS, WITH A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE, INSTALLED WITH PERFORATIONS ON BOTTOM OF PIPE.

SUBDRAIN OUTLET MARKER

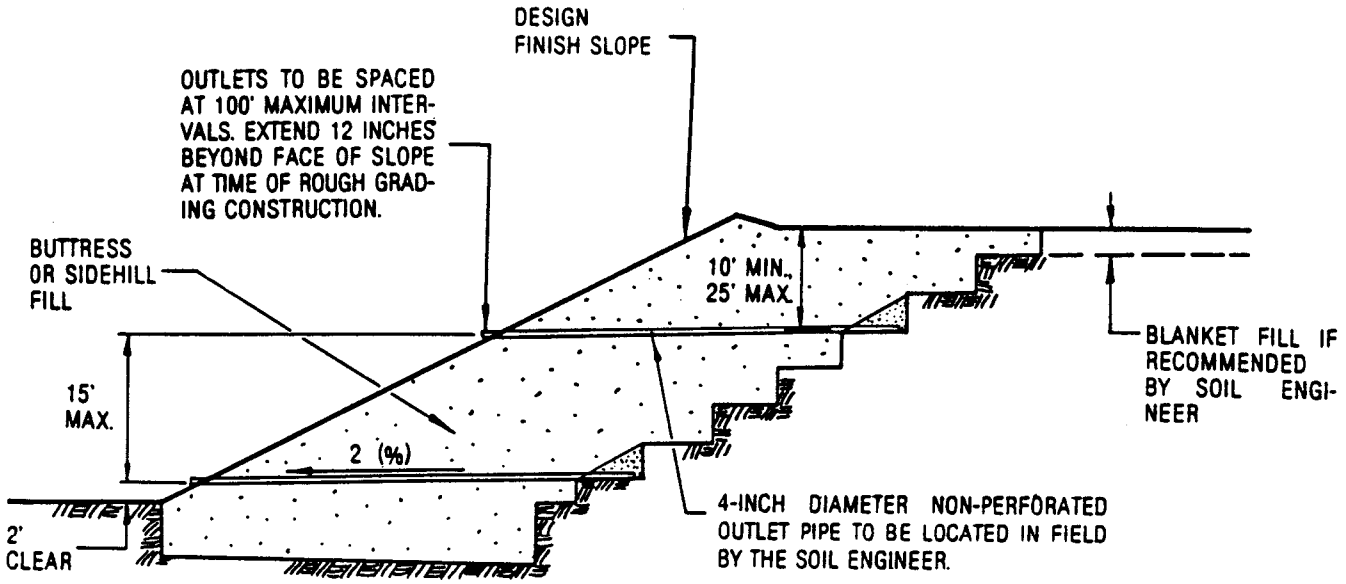


SUBDRAIN OUTLET MARKER FOR 6" AND 8" PIPES



SUBDRAIN OUTLET MARKER – 4" PIPE

TYPICAL STABILIZATION AND BUTTRESS FILL SUBDRAIN



FILTER MATERIAL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT: (CONFORMS TO MA STD. PLAN 323)

SIEVE SIZE	PERCENTAGE PASSING
1"	100
3/4"	90-100
3/8"	40-100
NO. 4	25-40
NO. 8	18-33
NO. 30	5-15
NO. 50	0-7
NO. 200	0-3

"GRAVEL" TO MEET FOLLOWING SPECIFICATION OR APPROVED EQUIVALENT:

SIEVE SIZE	MAXIMUM PERCENTAGE PASSING
1½"	100
NO. 4	50
NO. 200	8

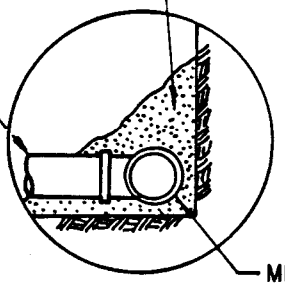
SAND EQUIVALENT = MINIMUM OF 50

FILTER MATERIAL – MINIMUM OF FIVE CUBIC FEET PER FOOT OF PIPE. SEE ABOVE FOR FILTER MATERIAL SPECIFICATION.

ALTERNATIVE: IN LIEU OF FILTER MATERIAL, FIVE CUBIC FEET OF GRAVEL PER FOOT OF PIPE MAY BE ENCASED IN FILTER FABRIC. SEE ABOVE FOR GRAVEL SPECIFICATION.

FILTER FABRIC SHALL BE MIRAFI 140 OR EQUIVALENT. FILTER FABRIC SHALL BE LAPPED A MINIMUM OF 12 INCHES ON ALL JOINTS.

OUTLET PIPE TO BE CONNECTED TO SUBDRAIN PIPE WITH TEE OR ELBOW



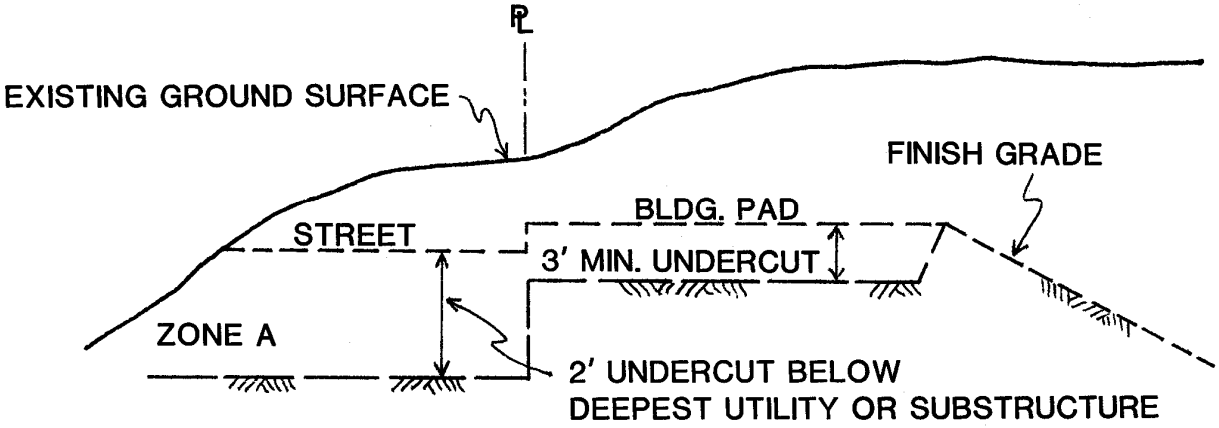
MINIMUM 4-INCH DIAMETER PVC SCH 40 OR ABS CLASS SDR 35 WITH A CRUSHING STRENGTH OF AT LEASE 1,000 POUNDS, WITH A MINIMUM OF 8 UNIFORMLY SPACED PERFORATIONS PER FOOT OF PIPE INSTALLED WITH PERFORATIONS ON BOTTOM OF PIPE. PROVIDE CAP AT UPSTREAM END OF PIPE. SLOPE AT 2 PERCENT TO OUTLET PIPE.

NOTES:

1. TRENCH FOR OUTLET PIPES TO BE BACKFILLED WITH ON-SITE SOIL.

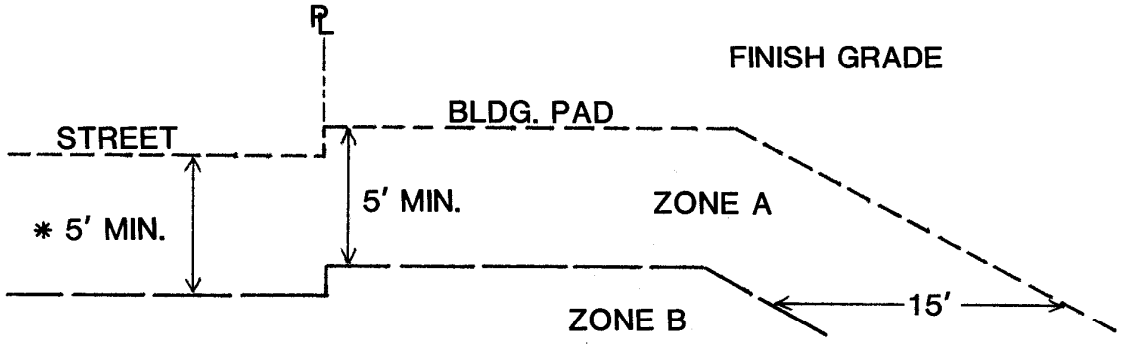
TYPICAL CUT AND FILL GRADING DETAILS

TYPICAL GRADING WITHIN PROPOSED DEEP BEDROCK CUT AREAS



NO SCALE

TYPICAL GRADING WITHIN PROPOSED FILL AREAS



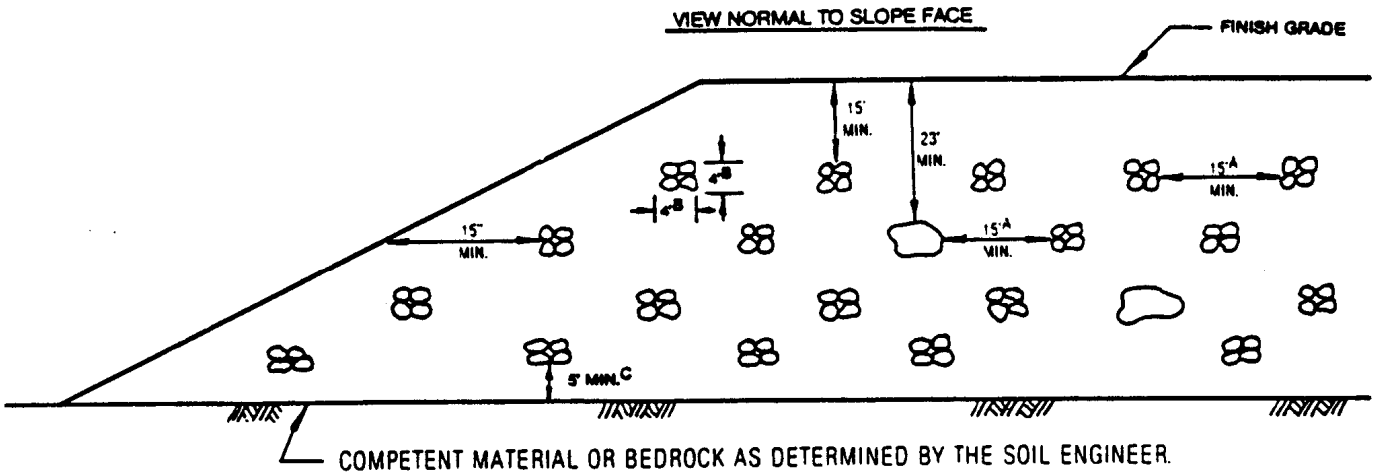
LEGEND

ZONE A ....."SOIL" FILL PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS PRESENTED IN SECTION 11.2.3 OF THIS REPORT

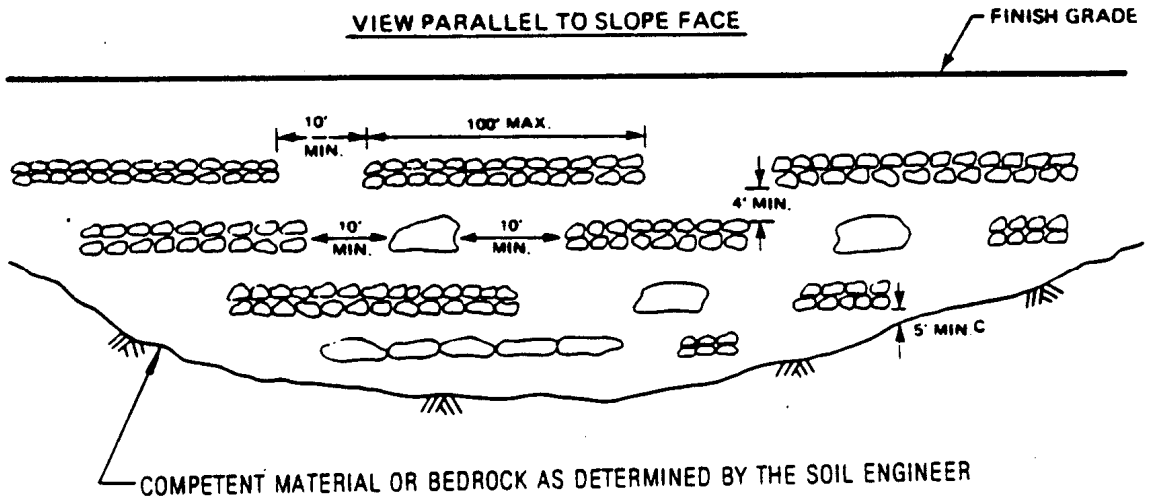
ZONE B ....."SOIL-ROCK" AND/OR "ROCK" FILL PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS PRESENTED IN SECTION 11.2.3 OF THIS REPORT

* 5′ OR 1′ BELOW DEEPEST UTILITY, WHICHEVER IS GREATER

TYPICAL OVERSIZE ROCK DISPOSAL – "SOIL-ROCK" FILL



NOTE:
ORIENTATION OF WINDROWS MAY VARY BUT SHALL BE AS RECOMMENDED BY SOIL ENGINEER.



NOTES:

A. ONE EQUIPMENT WIDTH OR A MINIMUM OF 15 FEET.
B. HEIGHT AND WIDTH MAY VARY DEPENDING ON ROCK SIZE AND TYPE OF EQUIPMENT.
C. IF APPROVED BY THE SOIL ENGINEER, WINDROWS MAY BE PLACED DIRECTLY ON COMPETENT MATERIALS OR BEDROCK PROVIDING ADEQUATE SPACE IS AVAILABLE FOR COMPACTION.
D. VOIDS IN WINDROW TO BE FILLED BY FLOODING GRANULAR SOIL INTO PLACE. GRANULAR SOIL SHALL MEAN ANY SOIL WHICH HAS A UNIFIED SOIL CLASSIFICATION SYSTEM (UBC 29-1) DESIGNATION OF SM, SP, SW, GM, GP, OR GW.
E. AFTER FILL BETWEEN WINDROWS IS PLACED AND COMPACTED WITH THE LIFT OF FILL COVERING WINDROW, WINDROW SHALL BE PROOF-ROLLED WITH D-9 DOZER OR EQUIVALENT.
F. OVERSIZED ROCK IS DEFINED AS LARGER THAN 12" IN SIZE.

APPENDIX N

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet

(DA 1);

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet

(DA 2)

(from Orange County TGD for Project WQMPs)

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 1)

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	.25
		Predominant soil texture	0.25	1	.25
		Site soil variability	0.25	1	.50
		Depth to groundwater / impervious layer	0.25	1	.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.25
B	Design	Tributary area size	0.25	2	.50
		Level of pretreatment/ expected sediment loads	0.25	1	.25
		Redundancy	0.25	1	.25
		Compaction during construction	0.25	1	.25
		Design Safety Factor, $S_B = \Sigma p$			1.25
Combined Safety Factor, $S_{Total} = S_A \times S_B$					1.5625 (Use 2.0 per Note below)
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias) (Most conservative test result)					7.98
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					3.99

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

VII.4. Considerations for Infiltration Rate Factor of Safety

Given the known potential for infiltration BMPs to fail over time, an appropriate factor of safety applied to infiltration testing results must be mandatory. The infiltration rate will decline between maintenance cycles as the BMP surface becomes occluded and particulates accumulate in the infiltrative layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design infiltration rates. The design infiltration rate discussed here is the infiltration rate of the underlying soil, below the elevation to which soil amendments would not be provided.

The factor of safety that should be applied to measured infiltration rates is a function of:

- Suitability of underlying soils for infiltration
- The infiltration system design.

These factors are discussed in the following sections.

The *measured infiltration rate* calculated for the purpose of infiltration infeasibility screening (**TGD Section 2.4.2.4**) shall be based on a factor of safety of 2.0 applied to the rates obtained from the infiltration test results. No adjustments from this value are permitted. The factor of safety used to compute the *design infiltration rate* shall not be less than 2.0, but may be higher at the discretion of the design engineer and acceptance of the plan reviewer, per the considerations described in the following sections.

It is recognized that there are competing objectives in the selection of a factor of safety. There is an initial economic incentive to select a lower factor of safety to yield smaller BMP designs. A low factor of safety also allows a broader range of systems to be considered "feasible" in marginal conditions. However, there are both economic and environmental incentives for the use of an appropriate factor of safety to prevent premature failure and substandard performance. The use of an artificially low factor of safety to demonstrate feasibility in the design process is shortsighted in that it does not consider the long term feasibility of the system.

The best way to balance these competing factors is through a commitment to thorough site investigation, use of effective pretreatment controls, good construction practices, the commitment to restore the infiltration rates of soils that are damaged by prior uses or construction practices, and the commitment to effective maintenance practices. However, these commitments do not mitigate the need to apply a factor of safety to account for uncertainty and long term deterioration that cannot be technically mitigated. Therefore, a factor of safety of no less than 2.0 shall be used to compute the design infiltration rate.

VII.4.1. Site Suitability Considerations

Suitability assessment related considerations include (**Table VII.3**):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate average properties for resulting in a higher level of uncertainty associated with initial estimates.
- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table VII.3: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods (see explanation below)	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Texture Class	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<5 ft below facility bottom	5-10 ft below facility bottom	>10 below facility bottom

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88) which measure infiltration rates over an area less than 10 sq-ft, may include lateral

flow, and do not attempt to account for heterogeneity of soil. The amount of area each test represents should be estimated depending on the observed heterogeneity of the soil.

Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. The excavation should be to the depth of the proposed infiltration surface and ideally be at least 50 to 100 square feet.

In all cases, testing should be conducted in the area of the proposed BMP where, based on review of available geotechnical data, soils appear least likely to support infiltration.

VII.4.2. Design Related Considerations

Design related considerations include (**Table VII.4**):

- Size of area tributary to facility – all things being equal, risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.
- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.
- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remains functional when other parts fail and/or bypass should be rewarded for the built-in redundancy with less restrictive correction and safety factors. For example, if bypass flows would be at least partially treated in another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example.
- Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of infiltration facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table VII.4: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pretreatment/ expected influent sediment loads	Pretreatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pretreatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pretreatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

VII.4.3. Determining Factor of Safety

A factor of safety shall be used. To assist in selecting the appropriate design infiltration rate, the measured short term infiltration rate should be adjusted using a weighted average of several safety factors using the worksheet shown in **Worksheet H** below. The design infiltration rate would be determined as follows:

1. For each consideration shown in **Table VII.3** and **Table VII.4** above, determine whether the consideration is a high, medium, or low concern.
2. For all high concerns, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
3. Multiply each of the factors by the corresponding weight to get a product.
4. Sum the products within each factor category to obtain a safety factor for each.
5. Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then 2 shall be used as the safety factor.
6. Divide the measured short term infiltration rate by the combined safety factor to obtain the adjusted design infiltration rate for use in sizing the infiltration facility.

The design infiltration rate shall be used to size BMPs and to evaluate their expected long term performance. This rate shall not be less than 2, but may be higher at the discretion of the design engineer.

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 2)

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	.25
		Predominant soil texture	0.25	1	.25
		Site soil variability	0.25	1	.50
		Depth to groundwater / impervious layer	0.25	1	.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.25
B	Design	Tributary area size	0.25	1	.25
		Level of pretreatment/ expected sediment loads	0.25	1	.25
		Redundancy	0.25	1	.25
		Compaction during construction	0.25	1	.25
		Design Safety Factor, $S_B = \Sigma p$			1.00
Combined Safety Factor, $S_{Total} = S_A \times S_B$					1.25 (Use 2.0 per Note below)
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias) (Most conservative test result)					7.98
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					3.99

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

VII.4. Considerations for Infiltration Rate Factor of Safety

Given the known potential for infiltration BMPs to fail over time, an appropriate factor of safety applied to infiltration testing results must be mandatory. The infiltration rate will decline between maintenance cycles as the BMP surface becomes occluded and particulates accumulate in the infiltrative layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design infiltration rates. The design infiltration rate discussed here is the infiltration rate of the underlying soil, below the elevation to which soil amendments would not be provided.

The factor of safety that should be applied to measured infiltration rates is a function of:

- Suitability of underlying soils for infiltration
- The infiltration system design.

These factors are discussed in the following sections.

The *measured infiltration rate* calculated for the purpose of infiltration infeasibility screening (**TGD Section 2.4.2.4**) shall be based on a factor of safety of 2.0 applied to the rates obtained from the infiltration test results. No adjustments from this value are permitted. The factor of safety used to compute the *design infiltration rate* shall not be less than 2.0, but may be higher at the discretion of the design engineer and acceptance of the plan reviewer, per the considerations described in the following sections.

It is recognized that there are competing objectives in the selection of a factor of safety. There is an initial economic incentive to select a lower factor of safety to yield smaller BMP designs. A low factor of safety also allows a broader range of systems to be considered "feasible" in marginal conditions. However, there are both economic and environmental incentives for the use of an appropriate factor of safety to prevent premature failure and substandard performance. The use of an artificially low factor of safety to demonstrate feasibility in the design process is shortsighted in that it does not consider the long term feasibility of the system.

The best way to balance these competing factors is through a commitment to thorough site investigation, use of effective pretreatment controls, good construction practices, the commitment to restore the infiltration rates of soils that are damaged by prior uses or construction practices, and the commitment to effective maintenance practices. However, these commitments do not mitigate the need to apply a factor of safety to account for uncertainty and long term deterioration that cannot be technically mitigated. Therefore, a factor of safety of no less than 2.0 shall be used to compute the design infiltration rate.

VII.4.1. Site Suitability Considerations

Suitability assessment related considerations include (**Table VII.3**):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate average properties for resulting in a higher level of uncertainty associated with initial estimates.
- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table VII.3: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods (see explanation below)	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Texture Class	Silty and clayey soils with significant fines	Loamy soils	Granular to slightly loamy soils
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
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flow, and do not attempt to account for heterogeneity of soil. The amount of area each test represents should be estimated depending on the observed heterogeneity of the soil.

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In all cases, testing should be conducted in the area of the proposed BMP where, based on review of available geotechnical data, soils appear least likely to support infiltration.

VII.4.2. Design Related Considerations

Design related considerations include (**Table VII.4**):

- Size of area tributary to facility – all things being equal, risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.
- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.
- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remains functional when other parts fail and/or bypass should be rewarded for the built-in redundancy with less restrictive correction and safety factors. For example, if bypass flows would be at least partially treated in another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example.
- Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of infiltration facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table VII.4: Design Related Considerations for Infiltration Facility Safety Factors

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Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

VII.4.3. Determining Factor of Safety

A factor of safety shall be used. To assist in selecting the appropriate design infiltration rate, the measured short term infiltration rate should be adjusted using a weighted average of several safety factors using the worksheet shown in **Worksheet H** below. The design infiltration rate would be determined as follows:

1. For each consideration shown in **Table VII.3** and **Table VII.4** above, determine whether the consideration is a high, medium, or low concern.
2. For all high concerns, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
3. Multiply each of the factors by the corresponding weight to get a product.
4. Sum the products within each factor category to obtain a safety factor for each.
5. Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then 2 shall be used as the safety factor.
6. Divide the measured short term infiltration rate by the combined safety factor to obtain the adjusted design infiltration rate for use in sizing the infiltration facility.

The design infiltration rate shall be used to size BMPs and to evaluate their expected long term performance. This rate shall not be less than 2, but may be higher at the discretion of the design engineer.

APPENDIX O

Preliminary Hydrology and Hydraulic Report for Madera at Citrus Trail Residential Project, NW Corner of E. Colton Avenue and Wabash Avenue, Redlands, California, 92374,

dated July 13, 2022

CA ENGINEERING, INC.

Planning • Engineering • Surveying

PRELIMINARY HYDROLOGY AND HYDRAULIC REPORT

FOR

Madera at Citrus Trail Residential Project

NW Corner of E. Colton Avenue and Wabash Avenue Redlands, California 92374

Date: July 13, 2022

PLANS PREPARED UNDER THE SUPERVISION OF:

Fred Cornwell, P.E. - R.C.E 45591 Date

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1.0 INTRODUCTION

The purpose of this report is to present the hydrology analysis and drainage calculations for a proposed residential project located in the City of Redlands, California. The site proposes to construct 103 residential detached townhouses on approximately 9.0 net acres.

2.0 EXISTING DRAINAGE CONDITIONS

The subject site is located on the northwest corner of E. Colton Avenue and N. Wabash Avenue in the city of Redlands, California. The subject site is an approximately 9-acre, undeveloped parcel of land covered in grass and vegetation.

The on-site drainage primarily drains from the east to the west and slightly from the north to the south. The site is relatively flat with approximately a 2-3 percent fall from east to west across the entire site. From north to south the fall is even less significant with approximately 2 feet of fall across the 633 foot wide site, or about 0.3%.

The site is bounded to the south and east by Colton Ave. and Wabash Ave. respectively. To the north there is a single family residential development and to the west there is a mobile home park.

The property to the west is developed with a wall that blocks the natural drainage and directs it to the south into a concrete drainage channel and then into a parkway culvert that outlets into Colton Ave.

The rational method was used to evaluate the existing site conditions and runoff peak flow rates to determine the amount of flows that will need to be conveyed through our parcel, and to determine flows that can be released to comply with the Technical Guidance Document (TGD). Hydrologic Conditions of Concern (HCOC's) will also need to be satisfied due to existing conditions downstream. We prepared an existing hydrology map with the associated calculations.

3.0 BASIS OF DESIGN CRITERIA

The site will be designed to capture and infiltrate the Design Capture Volume (DCV) per the County's WQMP manual. The storm events with greater runoff will be collected into the infiltration chambers and then conveyed to Colton Ave. via a proposed storm drain system. The runoff will be allowed to "bubble" out of the constructed catch basin on Colton Ave. The storm flows will be increased for the larger storms due to the increased impervious surfaces created by the proposed development. These increases will be discussed later in this report.

4.0 PROPOSED DRAINAGE CONDITIONS

The proposed drainage for the easterly portion of the site will drain via area drains and access driveways that convey the runoff to two proposed streets that run from the east to the west. The runoff will be collected into catch basins at the westerly ends of the streets that will deposit the runoff into an infiltration facility located just westerly of the proposed park.

The majority of the westerly portion of the site will drain to a street that runs from north to the south. The street will collect the runoff and convey the flows to a storm drain system that will also connect to said infiltration facility.

The remaining small portion of the site located at the southwest corner will surface flow to a drainage

channel that will convey the flows to an existing concrete V-gutter that is connected to Colton Ave. via a parkway culvert. This channel will have an inlet that will collect the low flows and direct them to a smaller infiltration facility located at the southwest corner of the development.

The infiltration facilities consists of a 96" perforated CMP pipes with gravel as a base that will allow infiltration into the soils below.

The infiltration facilities are sized to detain the Design Capture Volume (DCV) per county LID requirements. The detention pipe will also satisfy Hydrologic Condition of Concern (HCOC) requirements which states that the proposed 2 year storm flows must be within 105% of the existing 2 year storm flows.

The larger facility's storm flows, greater than the DCV, will be directed into a storm drain system that runs southerly into Colton Ave. and then westerly on Colton Ave to a proposed catch basin westerly of the proposed development. This catch basin will allow the storm flows to bubble out of the catch basin into Colton Ave. once the hydraulic grade line (HGL) rises above the street elevation. We will utilize the 100 year storm event's flow to analyze this system to assure the site is protected from possible flooding.

The emergency overflow for the site will be satisfied by the onsite north to south street capacity, and a drainage channel that connects the south westerly access to the existing concrete V gutter.

5.0 HYDROLOGICAL AND SOIL DATA

References used in this report were the following:

- San Bernardino County Flood Control District, Hydrology Manual, dated August 1986.
- NOAA Atlas 14, Volume 6, Version 2, Point Precipitation Frequency Estimates.

Based on the Stormwater Facility Mapping tool for San Bernardino County, the hydrological soils group designation the site consists of soil groups "A" & "B". The soil group designation is presented in the mapping tool image found in Section 14.0.

- Slope of Intensity Duration Curve = 0.6

The point precipitation frequency estimates for the project site are presented in Section 14.0.

6.0 HYDROLOGY RESULTS

The results of the 2, 5, 10, 25, and 100-year storm events for both the existing and proposed conditions are shown on the hydrology maps in this report (Exhibits A & B).

7.0 WATER QUALITY

To satisfy San Bernardino County water quality requirements, the site will utilize two 96" storm drain infiltration facilities, as catch basin inlet filters as BMP's. More information on the water quality is shown on the WQMP Site Plan (Exhibit D).

8.0 FLOOD PLAIN DESIGNATION

The site falls within a Zone "X" or Zone "D" designation under the FEMA Map 06071C8709J, dated September 2, 2016. Zone X (Shaded) represents areas determined to be outside the 0.2% annual chance, Zone "D" Areas in which flood hazards are undetermined, but possible. The FEMA food map is included

in Exhibit C.

9.0 METHODOLOGY

The San Bernardino County Rational Method described in the San Bernardino County Hydrology Manual were utilized to determine the storm flows. The Computer Software Programs used were Advanced Engineering Software (AES) Rational Tabling Version 15.0 for the Rational Method and the CH1 module v1.8 for the basin routing.

This report analyzes the 2, 5, 10, 25 & 100 year storms for the rational method and the 2 & 5 year storms basin routing.

The infiltration facility's top of pipe elevation will be set at the exit elevation for the proposed bubble up catch basin which will allow the facility to capture all of the DCV and allow it to infiltrate before the storm flows will begin to exit onto Colton Ave. A hydraulic calculation that estimates the HGL necessary to push the 100 year on-site flows out of the catch basin is located in Appendix "D". The HGL at the storage facility will be compared to the on-site low points to assure the site will be protected from flooding.

10.0 HYDRAULICS

ON-SITE DRAINAGE SYSTEM

The on-site drainage system consists of storm drain facilities collecting the storm flows and conveying them to a infiltration facility. The infiltration facility will allow the DCV to infiltrate per the County's requirements. Once the storm flows fill the infiltration facility, the excess flows will be conveyed to a bubble up catch basin located on Colton Ave. via a 48" storm drain.

EMERGENCY OVERFLOW

The site drains from the east to the west and then to the south to Colton Ave. If the drainage system fails, the flows must be conveyed to Colton Ave. without flooding the proposed buildings. There are four critical points that will be analyzed.

Point 1:

This point is the high point located on the street that runs north to south. The cross section is 32' wide from curb to curb and will act as a weir. To calculate the depth of flow over this section we will use the weir equation in King's handbook (5-540) and the following values:

$H=(Q/CL)^{0.67}$

Q = 3.733 cfs (Areas A1 & A2 as shown on the proposed hydrology map)
C= 2.7
L=32'

$H=(3.83/2.7*32)^{0.67} = 0.12'$

Since the street is crowned an average capacity depth can be calculated by the area below the top of curb divided by the width of the street. The area below the top of curb is 8.13 cf (See Exhibit "X") and the street width is 32' which yields 8.13cf/32'= 0.25' which is twice the depth of the flows going over the street section.

Point 2:
After the flows crest the high point they are conveyed southerly along said street. The street will transition from a crowned section to a tilted section which will put all the flows to the westerly curb. To calculate the depth of flows we will utilize FlowMaster v 5.15 and the 100 year flows going to the on-site infiltration facility (Node 3) as shown on the hydrology map.

Q100= 30.73 cfs
Per the FlowMaster output the depth of flow will be 0.03' below the 8" low curb – see street output Appendix "D"

Point 3:
Once the flow reaches the access driveway for Units 1-3, it will be directed westerly down said access to a concrete channel. We have performed the same calculation as for Point 2.

Q100= 30.73 cfs
Per the FlowMaster output the depth of flow will be 0.13' below the 8" low curb – see access output Appendix "D"

Point 4:
The flow will enter a 4' wide 2.2' deep concrete channel at the end of the access driveway.

Q100= 31.85 cfs(addition of area A5)
Per the FlowMaster output the depth of flow will be 1.0' below the rim of the concrete channel – see 4' conc channel output Appendix "D"

11.0 RESULTS

HYDROLOGY AND HYDRAULICS STUDY

To determine the pre and post construction flows for the proposed development, we will utilize the existing and proposed hydrology maps (EXHIBITS A & B) and associated calculations (Appendies A & B). We have also routed the proposed flows through the proposed basins (Appendix C) with the storage being the volumes of the pipes and the outflow being the infiltration of the facilities. All the storm events will be reduced by the total infiltration imparted by the proposed infiltration facilities being 0.388 cfs (See "Storage Volume & Outfall Calculations Appendix XD). The results are as follows:

FLOW TABLE

STORM EVENT	EXISTING FLOWS (CFS)	PROPOSED FLOWS (CFS)	OUTFLOW FORM BASIN (CFS)	INCREASE FLOW (CFS) (BASIN – (EXISTING+0.388))
2 YEAR STORM	0.00	8.21	0.00	0.00
5 YEAR STORM	0.00	13.94	0.00	0.00
10 YEAR STORM	2.66	18.19	18.19	15.14
25 YEAR STORM	4.96	22.86	22.86	17.51
100 YEAR STORM	11.65	31.85	31.85	19.81

WATER QUALITY

Per the County of San Bernardino water quality requirements, the proposed project will treat the project's DCV (Design Capture Volume).

The site will sheet flow into a drainage system that will convey them into a 96" storage infiltration facility for each drainage area. The facilities are sized per the County's WQMP guidelines for infiltration – see the calculations on the WQMP Site plan (Exhibit D). The property is also subject to Hydraulic Conditions of Concern and the development must mitigate the 2 year proposed storm runoff to be within 105% of the 2 year existing storm event.

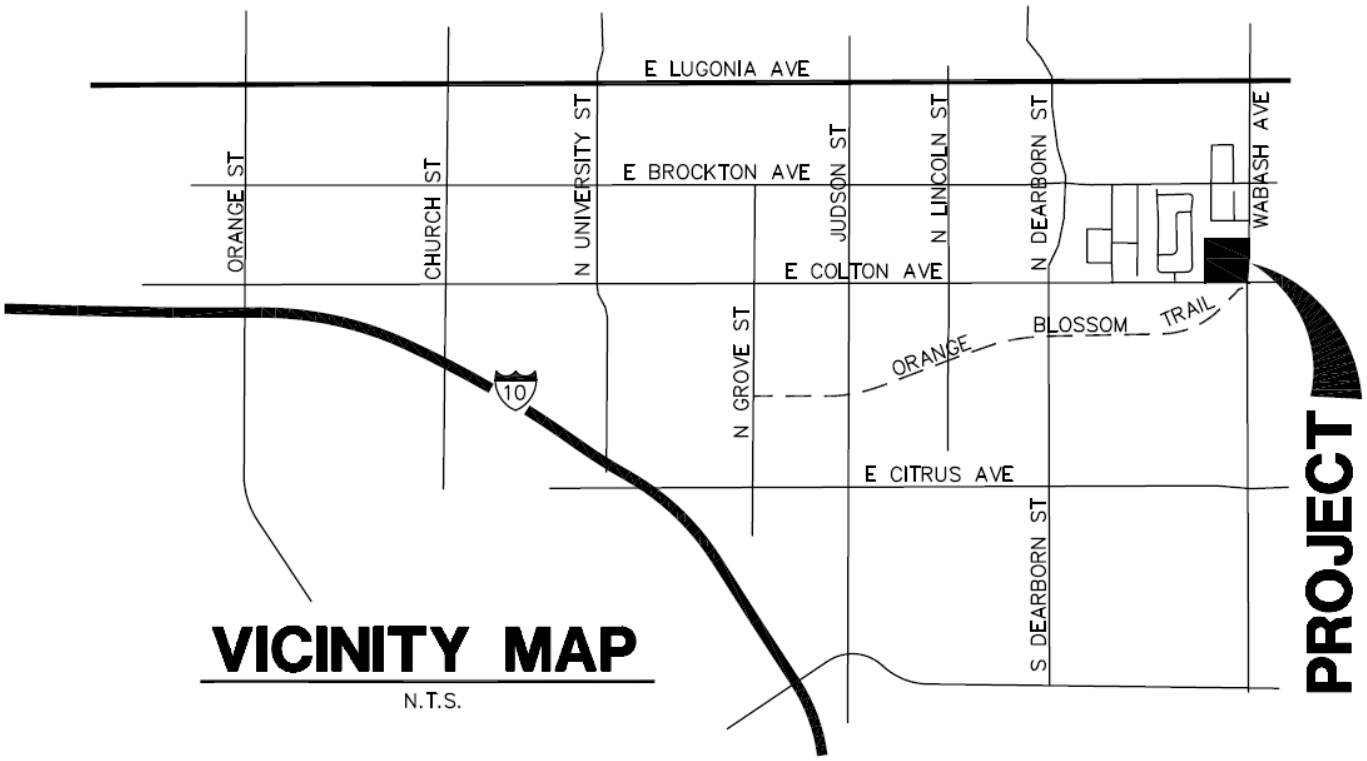
We have modeled the 2 year storm event utilizing (AES) small area hydrograph module CH1 – v1.8 for the Hydrograph Routing to determine what effect the 2 year event will have on the proposed facilities. The basin routing (see Appendix C) shows that the proposed facilities will reduce the 2 year storm flows, thus satisfying the County's criteria for HCOC's.

12.0 CONCLUSION

In the Results (Section 11.0), it is shown that the proposed flows will be increased for storm events greater than the 5 year storm. When the storm flows are greater than the 5 year storm the infiltration facilities fill completely before the peak flow is experienced, therefore, the facilities will minimally reduce the greater flows.

In the Hydraulics (Section 10.0), it is shown that the proposed site will mitigate the 2 & 5 year storms on site and the proposed drainage facilities are adequate to convey the storm flows to Colton Ave. It is also shown the emergency overflow for the site is adequate if the drainage facilities fail.

13.0 VICINITY MAP



14.0 SOIL AND RAINFALL DATA TABLES



WQMP Project Report

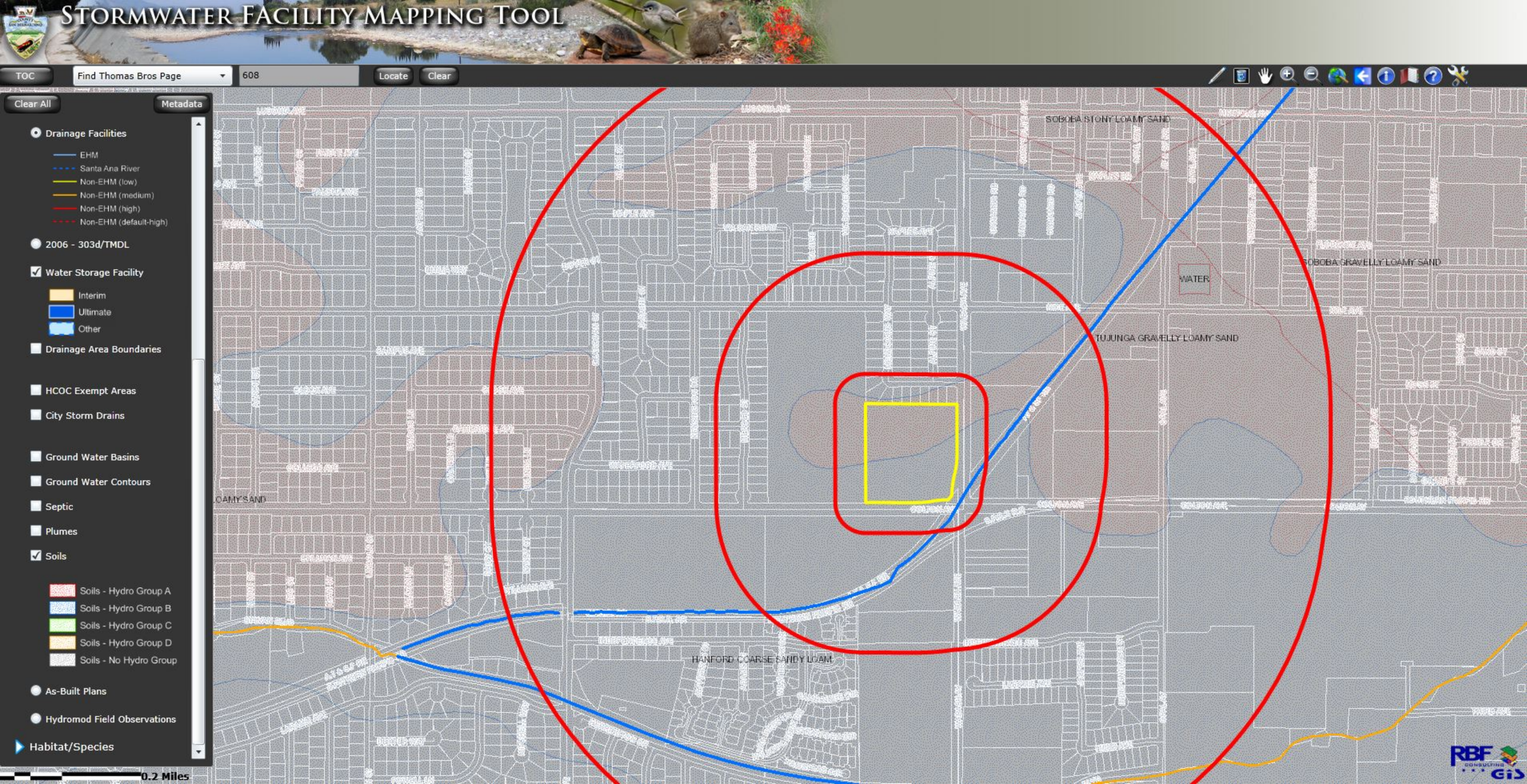
County of San Bernardino Stormwater Program

Santa Ana River Watershed Geodatabase

Tuesday, June 21, 2022

Note: The information provided in this report and on the Stormwater Geodatabase for the County of San Bernardino Stormwater Program is intended to provide basic guidance in the preparation of the applicant's Water Quality Management Plan (WQMP) and should not be relied upon without independent verification.

Project Site Parcel Number(s):	016829102
Project Site Acreage:	9
HCOC Exempt Area:	No
Closest Receiving Waters: (Applicant to verify based on local drainage facilities and topography.)	**System Number** - 0-000-00 **Facility Name** - **Owner** - SBCFCD
Closest channel segment's susceptibility to Hydromodification:	EHM
Highest downstream hydromodification susceptibility:	High
Is this drainage segment subject to TMDLs?	No
Are there downstream drainage segments subject to TMDLs?	No
Is this drainage segment a 303d listed stream?	No
Are there 303d listed streams downstream?	Yes
Are there unlined downstream waterbodies?	No
Project Site Onsite Soil Group(s):	A, B
Environmentally Sensitive Areas within 200':	None
Groundwater Depth (FT):	-171
Parcels with potential septic tanks within 1000':	No
Known Groundwater Contamination Plumes within 1000':	No
Studies and Reports Related to Project Site:	CSDP 4 CALC SHEET FOR HYDRO CSDP 4 Hydrological Design Criteria SBVMWD High Groundwater / Pressure Zone Area


STORMWATER FACILITY MAPPING TOOL
TOC
Find Thomas Bros Page
608
Locate
Clear
Clear All
Metadata
Drainage Facilities
EHM
Santa Ana River
Non-EHM (low)
Non-EHM (medium)
Non-EHM (high)
Non-EHM (default-high)
2006 - 303d/TMDL
Water Storage Facility
Interim
Ultimate
Other
Drainage Area Boundaries
HCOC Exempt Areas
City Storm Drains
Ground Water Basins
Ground Water Contours
Septic
Plumes
Soils
Soils - Hydro Group A
Soils - Hydro Group B
Soils - Hydro Group C
Soils - Hydro Group D
Soils - No Hydro Group
As-Built Plans
Hydromod Field Observations
Habitat/Species
0.2 Miles
SOBOBA STONY LOAMY SAND
WATER
SOBOBA GRAVELLY LOAMY SAND
TUJUNGA GRAVELLY LOAMY SAND
HANFORD COARSE SANDY LOAM
RBF CONSULTING GIS

NOAA Atlas 14, Volume 6, Version 2
Location name: Redlands, California, USA*
Latitude: 34.0629°, Longitude: -117.139°
Elevation: 1616.69 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.104** (0.087-0.127)	**0.137** (0.114-0.167)	**0.183** (0.151-0.223)	**0.222** (0.183-0.273)	**0.279** (0.222-0.355)	**0.326** (0.253-0.423)	**0.376** (0.285-0.501)	**0.430** (0.317-0.590)	**0.509** (0.359-0.729)	**0.575** (0.392-0.852)
10-min	**0.149** (0.124-0.181)	**0.196** (0.163-0.239)	**0.262** (0.217-0.319)	**0.319** (0.262-0.392)	**0.400** (0.318-0.509)	**0.467** (0.363-0.607)	**0.539** (0.408-0.718)	**0.617** (0.454-0.846)	**0.730** (0.515-1.04)	**0.823** (0.561-1.22)
15-min	**0.181** (0.150-0.219)	**0.238** (0.197-0.289)	**0.317** (0.263-0.386)	**0.385** (0.317-0.473)	**0.484** (0.384-0.616)	**0.565** (0.439-0.734)	**0.652** (0.494-0.868)	**0.746** (0.550-1.02)	**0.883** (0.623-1.26)	**0.996** (0.679-1.48)
30-min	**0.265** (0.221-0.322)	**0.349** (0.290-0.424)	**0.465** (0.386-0.567)	**0.566** (0.465-0.696)	**0.711** (0.565-0.904)	**0.830** (0.645-1.08)	**0.957** (0.726-1.28)	**1.10** (0.807-1.50)	**1.30** (0.915-1.86)	**1.46** (0.997-2.17)
60-min	**0.374** (0.311-0.454)	**0.491** (0.408-0.597)	**0.655** (0.543-0.799)	**0.797** (0.655-0.979)	**1.00** (0.795-1.27)	**1.17** (0.908-1.52)	**1.35** (1.02-1.80)	**1.54** (1.14-2.12)	**1.83** (1.29-2.61)	**2.06** (1.40-3.05)
2-hr	**0.535** (0.446-0.650)	**0.692** (0.575-0.842)	**0.908** (0.753-1.11)	**1.09** (0.897-1.34)	**1.35** (1.07-1.72)	**1.56** (1.22-2.03)	**1.79** (1.35-2.38)	**2.03** (1.49-2.78)	**2.37** (1.67-3.39)	**2.64** (1.80-3.92)
3-hr	**0.656** (0.546-0.796)	**0.842** (0.700-1.02)	**1.10** (0.908-1.34)	**1.31** (1.08-1.61)	**1.61** (1.28-2.05)	**1.86** (1.44-2.41)	**2.11** (1.60-2.81)	**2.38** (1.76-3.27)	**2.77** (1.95-3.96)	**3.08** (2.10-4.56)
6-hr	**0.916** (0.762-1.11)	**1.17** (0.970-1.42)	**1.51** (1.25-1.84)	**1.79** (1.47-2.20)	**2.19** (1.74-2.78)	**2.50** (1.94-3.25)	**2.82** (2.14-3.76)	**3.16** (2.33-4.34)	**3.64** (2.57-5.21)	**4.02** (2.74-5.96)
12-hr	**1.24** (1.03-1.50)	**1.58** (1.31-1.92)	**2.03** (1.69-2.48)	**2.41** (1.98-2.96)	**2.93** (2.32-3.72)	**3.33** (2.59-4.33)	**3.74** (2.84-4.99)	**4.17** (3.07-5.72)	**4.76** (3.36-6.81)	**5.22** (3.56-7.74)
24-hr	**1.66** (1.47-1.92)	**2.14** (1.89-2.47)	**2.77** (2.44-3.21)	**3.29** (2.88-3.83)	**3.99** (3.38-4.81)	**4.53** (3.76-5.57)	**5.08** (4.12-6.40)	**5.65** (4.46-7.32)	**6.43** (4.87-8.67)	**7.04** (5.15-9.81)
2-day	**2.03** (1.79-2.33)	**2.65** (2.34-3.06)	**3.47** (3.06-4.02)	**4.15** (3.64-4.84)	**5.09** (4.31-6.13)	**5.82** (4.83-7.15)	**6.56** (5.32-8.26)	**7.34** (5.78-9.49)	**8.40** (6.36-11.3)	**9.23** (6.75-12.9)
3-day	**2.17** (1.92-2.50)	**2.88** (2.54-3.32)	**3.82** (3.37-4.42)	**4.60** (4.03-5.37)	**5.69** (4.82-6.86)	**6.55** (5.43-8.05)	**7.43** (6.02-9.36)	**8.35** (6.59-10.8)	**9.63** (7.29-13.0)	**10.6** (7.79-14.8)
4-day	**2.34** (2.07-2.70)	**3.12** (2.76-3.60)	**4.18** (3.69-4.83)	**5.06** (4.43-5.90)	**6.28** (5.32-7.57)	**7.25** (6.02-8.91)	**8.25** (6.69-10.4)	**9.31** (7.34-12.0)	**10.8** (8.15-14.5)	**11.9** (8.74-16.6)
7-day	**2.70** (2.39-3.11)	**3.64** (3.22-4.21)	**4.92** (4.34-5.69)	**5.98** (5.23-6.97)	**7.46** (6.32-8.98)	**8.62** (7.16-10.6)	**9.83** (7.97-12.4)	**11.1** (8.75-14.4)	**12.9** (9.74-17.3)	**14.3** (10.4-19.9)
10-day	**2.92** (2.59-3.37)	**3.97** (3.51-4.58)	**5.38** (4.75-6.23)	**6.56** (5.74-7.65)	**8.21** (6.95-9.89)	**9.50** (7.88-11.7)	**10.8** (8.79-13.7)	**12.3** (9.66-15.9)	**14.2** (10.8-19.2)	**15.8** (11.5-22.0)
20-day	**3.63** (3.22-4.19)	**4.99** (4.41-5.75)	**6.81** (6.01-7.88)	**8.34** (7.30-9.73)	**10.5** (8.87-12.6)	**12.2** (10.1-15.0)	**13.9** (11.3-17.5)	**15.8** (12.4-20.4)	**18.3** (13.9-24.7)	**20.4** (14.9-28.4)
30-day	**4.32** (3.82-4.97)	**5.92** (5.24-6.84)	**8.10** (7.15-9.37)	**9.92** (8.68-11.6)	**12.5** (10.6-15.0)	**14.5** (12.0-17.8)	**16.6** (13.5-20.9)	**18.8** (14.8-24.4)	**21.9** (16.6-29.5)	**24.4** (17.8-34.0)
45-day	**5.20** (4.61-5.99)	**7.10** (6.28-8.19)	**9.66** (8.52-11.2)	**11.8** (10.3-13.8)	**14.8** (12.6-17.9)	**17.2** (14.3-21.2)	**19.7** (16.0-24.9)	**22.4** (17.6-29.0)	**26.1** (19.7-35.1)	**29.0** (21.2-40.4)
60-day	**6.15** (5.45-7.09)	**8.31** (7.35-9.59)	**11.2** (9.91-13.0)	**13.7** (12.0-16.0)	**17.1** (14.5-20.7)	**19.9** (16.5-24.5)	**22.8** (18.4-28.7)	**25.8** (20.3-33.4)	**30.0** (22.7-40.5)	**33.4** (24.4-46.5)

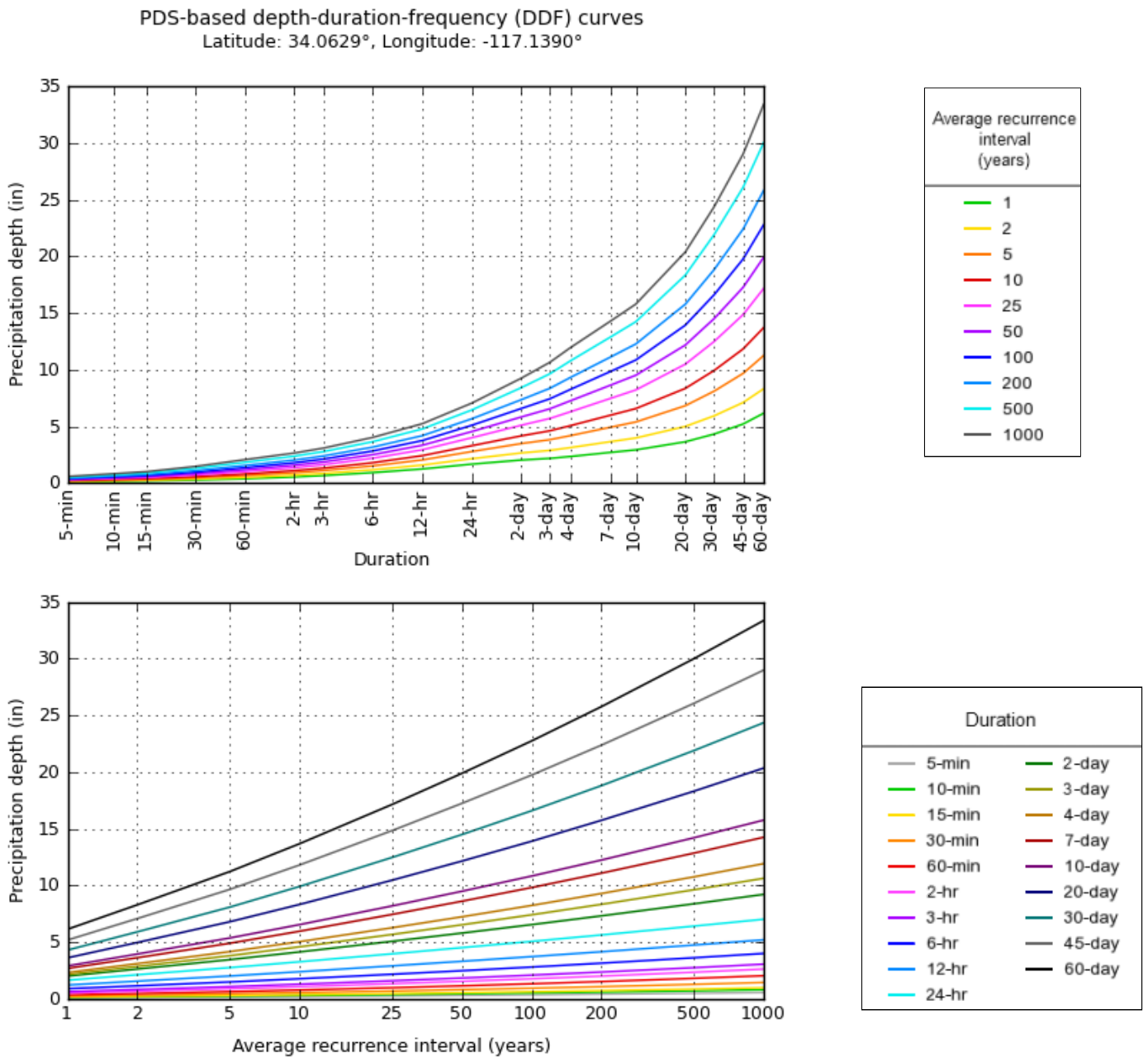
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Wed Jul 20 00:10:24 2022

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Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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APPENDICES

APPENDIX A: EXISTING RATIONAL METHOD, 2, 5, 10, 25 & 100 YEAR STORM FREQUENCY OUTPUT FILES.

```
 ************************************************************************
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                            Analysis prepared by:

                                 CA Engineering
                              13821 Newport Ave., Ste 110
                                   Tustin, Ca. 92780


  ************************** DESCRIPTION OF STUDY **************************
 * EXISTING CONDITION                                                     *
 * 2 YR STORM                                                             *
 *                                                                        *
  ************************************************************************

   FILE NAME: 816-1EX.DAT
   TIME/DATE OF STUDY: 13:14 07/12/2022
 ========================================================================
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                      --*TIME-OF-CONCENTRATION MODEL*--

   USER SPECIFIED STORM EVENT(YEAR) =    2.00
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
   *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
   10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
   100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
   COMPUTED RAINFALL INTENSITY DATA:
   STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) = 0.4105
   SLOPE OF INTENSITY DURATION CURVE = 0.6000

   *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
      WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.    (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
   *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

 ************************************************************************
   FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
 ------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   761.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1602.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   29.669
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.626
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL GOOD COVER
  "GRASS"                     A        4.30      1.19     1.000    21   29.67
  NATURAL GOOD COVER
  "GRASS"                     B        1.20      0.90     1.000    41   29.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.13
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA RUNOFF(CFS) =      0.00
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      0.00
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        5.5  TC(MIN.) =     29.67
  EFFECTIVE AREA(ACRES) =      5.50  AREA-AVERAGED Fm(INCH/HR)=  1.13
  AREA-AVERAGED Fp(INCH/HR) =  1.13  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       0.00
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDITION                                                    *
* 5 YR STORM                                                            *
*                                                                       *
 ************************************************************************

  FILE NAME: 816-1EX.DAT
  TIME/DATE OF STUDY: 13:25 07/12/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    5.00   1-HOUR INTENSITY(INCH/HOUR) = 0.6465
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   761.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1602.40
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   29.669
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  0.987
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL GOOD COVER
  "GRASS"                    A        4.30      1.19     1.000    21   29.67
  NATURAL GOOD COVER
  "GRASS"                    B        1.20      0.90     1.000    41   29.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.13
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA RUNOFF(CFS) =      0.00
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      0.00

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
----------------------------------------------------------------------------
  ** WARNING: Computed Flowrate is less than 0.1 cfs,
               Routing Algorithm is UNAVAILABLE.
```

```
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                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDITION                                                    *
* 10 YR STORM                                                           *
*                                                                       *
 ************************************************************************

  FILE NAME: 816-1EX.DAT
  TIME/DATE OF STUDY: 13:24 07/12/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) = 0.8050
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   761.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1602.40
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   29.669
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.228
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL GOOD COVER
  "GRASS"                     A        4.30      0.94     1.000    38   29.67
  NATURAL GOOD COVER
  "GRASS"                     B        1.20      0.69     1.000    61   29.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.88
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      1.72
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      1.72

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1602.40  DOWNSTREAM(FEET) =   1600.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00   CHANNEL SLOPE =  0.0070
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.72
  FLOW VELOCITY(FEET/SEC) =   1.39 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.95   Tc(MIN.) =   33.62
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1091.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.140
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL GOOD COVER
  "GRASS"                     A        0.20      0.94     1.000    38
  NATURAL GOOD COVER
  "GRASS"                     B        3.30      0.69     1.000    61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.70
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    3.50      SUBAREA RUNOFF(CFS) =    1.38
  EFFECTIVE AREA(ACRES) =      9.00   AREA-AVERAGED Fm(INCH/HR) =  0.81
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =        9.0       PEAK FLOW RATE(CFS) =       2.66
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        9.0  TC(MIN.) =     33.62
  EFFECTIVE AREA(ACRES) =      9.00  AREA-AVERAGED Fm(INCH/HR)=  0.81
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       2.66
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

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                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDITION                                                    *
* 25 YR STORM                                                           *
*                                                                       *
 ************************************************************************

  FILE NAME: 816-1EX.DAT
  TIME/DATE OF STUDY: 13:22 07/12/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   25.00   1-HOUR INTENSITY(INCH/HOUR) = 0.9972
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   761.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1602.40
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   29.669
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.522
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL GOOD COVER
  "GRASS"                     A        4.30      0.94     1.000    38   29.67
  NATURAL GOOD COVER
  "GRASS"                     B        1.20      0.69     1.000    61   29.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.88
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      3.17
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      3.17

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1602.40  DOWNSTREAM(FEET) =   1600.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00   CHANNEL SLOPE =  0.0070
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.17
  FLOW VELOCITY(FEET/SEC) =   1.59 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   3.47   Tc(MIN.) =   33.14
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1091.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.14
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.424
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL GOOD COVER
  "GRASS"                     A        0.20      0.94     1.000    38
  NATURAL GOOD COVER
  "GRASS"                     B        3.30      0.69     1.000    61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.70
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    3.50      SUBAREA RUNOFF(CFS) =    2.28
  EFFECTIVE AREA(ACRES) =      9.00   AREA-AVERAGED Fm(INCH/HR) =  0.81
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =        9.0       PEAK FLOW RATE(CFS) =       4.96
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        9.0  TC(MIN.) =     33.14
  EFFECTIVE AREA(ACRES) =      9.00  AREA-AVERAGED Fm(INCH/HR)=  0.81
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =       4.96
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
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                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* EXISTING CONDITION                                                    *
* 100 YR STORM                                                          *
*                                                                       *
 ************************************************************************

  FILE NAME: 816-1EX.DAT
  TIME/DATE OF STUDY: 13:20 07/12/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) = 1.3500
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   761.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1602.40
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   29.669
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.060
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL GOOD COVER
  "GRASS"                     A        4.30      0.66     1.000    58   29.67
  NATURAL GOOD COVER
  "GRASS"                     B        1.20      0.36     1.000    80   29.67
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.59
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      7.26
  TOTAL AREA(ACRES) =      5.50   PEAK FLOW RATE(CFS) =      7.26

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  52
----------------------------------------------------------------------------
  >>>>>COMPUTE NATURAL VALLEY CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1602.40  DOWNSTREAM(FEET) =   1600.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00   CHANNEL SLOPE =  0.0070
  CHANNEL FLOW THRU SUBAREA(CFS) =       7.26
  FLOW VELOCITY(FEET/SEC) =   1.93 (PER LACFCD/RCFC&WCD HYDROLOGY MANUAL)
  TRAVEL TIME(MIN.) =   2.86   Tc(MIN.) =   32.52
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1091.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   32.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.949
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL GOOD COVER
  "GRASS"                     A        0.20      0.66     1.000    58
  NATURAL GOOD COVER
  "GRASS"                     B        3.30      0.36     1.000    80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.38
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA AREA(ACRES) =    3.50      SUBAREA RUNOFF(CFS) =    4.94
  EFFECTIVE AREA(ACRES) =      9.00   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.51  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =        9.0       PEAK FLOW RATE(CFS) =      11.65
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        9.0  TC(MIN.) =     32.52
  EFFECTIVE AREA(ACRES) =      9.00  AREA-AVERAGED Fm(INCH/HR)=  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.51  AREA-AVERAGED Ap = 1.000
  PEAK FLOW RATE(CFS)   =      11.65
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX B: PROPOSED RATIONAL METHOD, 2, 5, 10, 25 & 100 YEAR STORM FREQUENCY OUTPUT FILES.

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
         (c) Copyright 1983-2008 Advanced Engineering Software (aes)
             Ver. 15.0  Release Date: 04/01/2008  License ID 1420

                           Analysis prepared by:

                                CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


  ************************* DESCRIPTION OF STUDY *************************
 * PROPOSED CONDITION                                                    *
 * 2 YR STORM                                                            *
 *                                                                       *
  ************************************************************************

   FILE NAME: 816-1PR.DAT
   TIME/DATE OF STUDY: 08:47 07/13/2022
 ========================================================================
   USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
 ========================================================================
                      --*TIME-OF-CONCENTRATION MODEL*--

   USER SPECIFIED STORM EVENT(YEAR) =    2.00
   SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
   SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
   *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
   10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
   100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
   COMPUTED RAINFALL INTENSITY DATA:
   STORM EVENT =    2.00   1-HOUR INTENSITY(INCH/HOUR) = 0.4105
   SLOPE OF INTENSITY DURATION CURVE = 0.6000

   *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

   *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
      HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
      WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
 NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
 ===  =====  =========  =================  ======  ===== ====== ===== =======
   1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

   GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
     1. Relative Flow-Depth =  0.00 FEET
        as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
     2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
   *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
    OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
   *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

 ************************************************************************
   FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   485.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1603.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.017
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.373
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        2.11      1.33     0.200    17    8.02
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.17      0.94     0.200    36    8.02
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      2.28
  TOTAL AREA(ACRES) =      2.28   PEAK FLOW RATE(CFS) =      2.28

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    44.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.75
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.28
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    8.17
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.17
  RAINFALL INTENSITY(INCH/HR) =   1.36
  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  1.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.28
  TOTAL STREAM AREA(ACRES) =       2.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.28

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   363.00
  ELEVATION DATA: UPSTREAM(FEET) =   1604.30  DOWNSTREAM(FEET) =   1602.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.895
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.210
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"       A        1.55      1.33     0.200    17    9.90
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.33
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA RUNOFF(CFS) =      1.35
 TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      1.35

****************************************************************************
 FLOW PROCESS FROM NODE      5.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
 FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.69
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.35
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   10.01
 LONGEST FLOWPATH FROM NODE      4.00 TO NODE      3.00 =     395.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.01
 RAINFALL INTENSITY(INCH/HR) =   1.20
 AREA-AVERAGED Fm(INCH/HR) =  0.27
 AREA-AVERAGED Fp(INCH/HR) =  1.33
 AREA-AVERAGED Ap =  0.20
 EFFECTIVE STREAM AREA(ACRES) =       1.55
 TOTAL STREAM AREA(ACRES) =       1.55
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.35

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        2.28    8.17    1.358  1.30( 0.26) 0.20       2.3       1.00
     2        1.35   10.01    1.202  1.33( 0.27) 0.20       1.5       4.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        3.54    8.17    1.358  1.31( 0.26) 0.20       3.5       1.00
     2        3.35   10.01    1.202  1.31( 0.26) 0.20       3.8       4.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =       3.54    Tc(MIN.) =     8.17
  EFFECTIVE AREA(ACRES) =       3.55   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  1.31  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.20  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.37
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.54
  PIPE TRAVEL TIME(MIN.) =   1.05    Tc(MIN.) =    9.23
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   496.00
  ELEVATION DATA: UPSTREAM(FEET) =   1615.00  DOWNSTREAM(FEET) =   1603.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.250
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.350
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.14      1.33     0.200    17    8.25
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        2.70      0.94     0.200    36    8.25
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      2.96
  TOTAL AREA(ACRES) =      2.84   PEAK FLOW RATE(CFS) =      2.96

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.30  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =    26.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.03
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.96
```

```
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    8.34
  LONGEST FLOWPATH FROM NODE      6.00 TO NODE      8.00 =     522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.34
  RAINFALL INTENSITY(INCH/HR) =   1.34
  AREA-AVERAGED Fm(INCH/HR) =  0.19
  AREA-AVERAGED Fp(INCH/HR) =  0.96
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.84
  TOTAL STREAM AREA(ACRES) =       2.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.96

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   444.00
  ELEVATION DATA: UPSTREAM(FEET) =   1603.50  DOWNSTREAM(FEET) =   1601.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.727
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.153
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.78      1.33     0.200    17   10.73
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        1.22      0.94     0.200    36   10.73
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.09
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      1.68
  TOTAL AREA(ACRES) =      2.00   PEAK FLOW RATE(CFS) =      1.68

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.80  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.19
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.68
  PIPE TRAVEL TIME(MIN.) =   0.86    Tc(MIN.) =   11.59
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.59
  RAINFALL INTENSITY(INCH/HR) =   1.10
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  1.09
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.00
  TOTAL STREAM AREA(ACRES) =       2.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.68

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.96    8.34    1.342  0.96( 0.19) 0.20       2.8       6.00
      2        1.68   11.59    1.101  1.09( 0.22) 0.20       2.0       9.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        4.50    8.34    1.342  1.01( 0.20) 0.20       4.3       6.00
      2        4.02   11.59    1.101  1.02( 0.20) 0.20       4.8       9.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.50    Tc(MIN.) =     8.34
  EFFECTIVE AREA(ACRES) =       4.28   AREA-AVERAGED Fm(INCH/HR) =  0.20
  AREA-AVERAGED Fp(INCH/HR) =  1.01  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        4.8
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.00  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.69
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.50
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.42
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        4.50    8.42    1.334  1.01( 0.20) 0.20       4.3       6.00
      2        4.02   11.67    1.096  1.02( 0.20) 0.20       4.8       9.00
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
```

```
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1        3.54    9.23    1.262  1.31( 0.26) 0.20       3.5       1.00
    2        3.35   11.11    1.129  1.31( 0.26) 0.20       3.8       4.00
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

  ** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1        7.92    8.42    1.334  1.14( 0.23) 0.20       7.5       6.00
    2        7.92    9.23    1.262  1.14( 0.23) 0.20       8.0       1.00
    3        7.46   11.11    1.129  1.15( 0.23) 0.20       8.6       4.00
    4        7.28   11.67    1.096  1.15( 0.23) 0.20       8.7       9.00
   TOTAL AREA(ACRES) =         8.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        7.92  Tc(MIN.) =    8.416
  EFFECTIVE AREA(ACRES) =      7.51  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  1.14  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        8.7
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   205.00
  ELEVATION DATA: UPSTREAM(FEET) =   1601.30  DOWNSTREAM(FEET) =   1600.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.750
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.401
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.28      1.33     0.200    17    7.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.33
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.29
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      0.29
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.3  TC(MIN.) =      7.75
  EFFECTIVE AREA(ACRES) =      0.28  AREA-AVERAGED Fm(INCH/HR)=  0.27
  AREA-AVERAGED Fp(INCH/HR) =  1.33  AREA-AVERAGED Ap = 0.200
  PEAK FLOW RATE(CFS)   =       0.29
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
        (c) Copyright 1983-2008 Advanced Engineering Software (aes)
            Ver. 15.0  Release Date: 04/01/2008  License ID 1420

                        Analysis prepared by:

                            CA Engineering
                       13821 Newport Ave., Ste 110
                            Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED CONDITION                                                    *
* 5 YR STORM                                                            *
*                                                                       *
 ************************************************************************

  FILE NAME: 816-1PR.DAT
  TIME/DATE OF STUDY: 08:48 07/13/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    5.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =    5.00   1-HOUR INTENSITY(INCH/HOUR) = 0.6465
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   485.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1603.80
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.017
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.163
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        2.11      1.33     0.200    17    8.02
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.17      0.94     0.200    36    8.02
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      3.91
  TOTAL AREA(ACRES) =      2.28   PEAK FLOW RATE(CFS) =      3.91

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    44.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.44
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.91
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    8.15
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.15
  RAINFALL INTENSITY(INCH/HR) =   2.14
  AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  1.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.28
  TOTAL STREAM AREA(ACRES) =       2.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.91

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   363.00
  ELEVATION DATA: UPSTREAM(FEET) =   1604.30  DOWNSTREAM(FEET) =   1602.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.895
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.906
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        1.55      1.33     0.200    17    9.90
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.33
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      2.29
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      2.29

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.37
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.29
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.99
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      3.00 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.99
  RAINFALL INTENSITY(INCH/HR) =   1.90
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  1.33
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.55
  TOTAL STREAM AREA(ACRES) =       1.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.29

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        3.91    8.15    2.142  1.30( 0.26) 0.20       2.3       1.00
      2        2.29    9.99    1.895  1.33( 0.27) 0.20       1.5       4.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.05    8.15    2.142  1.31( 0.26) 0.20       3.5       1.00
      2        5.68    9.99    1.895  1.31( 0.26) 0.20       3.8       4.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.05    Tc(MIN.) =     8.15
  EFFECTIVE AREA(ACRES) =       3.54   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  1.31  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.20  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.69
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.05
  PIPE TRAVEL TIME(MIN.) =   0.93    Tc(MIN.) =    9.08
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   496.00
  ELEVATION DATA: UPSTREAM(FEET) =   1615.00  DOWNSTREAM(FEET) =   1603.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.250
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.126
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.14      1.33     0.200    17    8.25
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        2.70      0.94     0.200    36    8.25
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      4.94
  TOTAL AREA(ACRES) =      2.84   PEAK FLOW RATE(CFS) =      4.94

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.30  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =    26.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.75
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.94
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.33
  LONGEST FLOWPATH FROM NODE      6.00 TO NODE      8.00 =     522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    8.33
  RAINFALL INTENSITY(INCH/HR) =   2.11
  AREA-AVERAGED Fm(INCH/HR) =  0.19
  AREA-AVERAGED Fp(INCH/HR) =  0.96
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.84
  TOTAL STREAM AREA(ACRES) =       2.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.94

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   444.00
  ELEVATION DATA: UPSTREAM(FEET) =   1603.50  DOWNSTREAM(FEET) =   1601.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.727
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  1.816
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.78      1.33     0.200    17   10.73
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        1.22      0.94     0.200    36   10.73
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.09
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      2.88
  TOTAL AREA(ACRES) =      2.00   PEAK FLOW RATE(CFS) =      2.88

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.80  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.65
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.88
  PIPE TRAVEL TIME(MIN.) =   0.75    Tc(MIN.) =   11.48
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.48
  RAINFALL INTENSITY(INCH/HR) =   1.74
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  1.09
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.00
  TOTAL STREAM AREA(ACRES) =       2.00
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.88

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        4.94    8.33    2.115  0.96( 0.19) 0.20       2.8       6.00
     2        2.88   11.48    1.744  1.09( 0.22) 0.20       2.0       9.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        7.54    8.33    2.115  1.01( 0.20) 0.20       4.3       6.00
     2        6.87   11.48    1.744  1.02( 0.20) 0.20       4.8       9.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       7.54    Tc(MIN.) =     8.33
 EFFECTIVE AREA(ACRES) =       4.29   AREA-AVERAGED Fm(INCH/HR) =  0.20
 AREA-AVERAGED Fp(INCH/HR) =  1.01  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =        4.8
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      8.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1597.00  DOWNSTREAM(FEET) =  1596.00
 FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.80
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       7.54
 PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.40
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        7.54    8.40    2.104  1.01( 0.20) 0.20       4.3       6.00
     2        6.87   11.55    1.737  1.02( 0.20) 0.20       4.8       9.00
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        6.05    9.08    2.007  1.31( 0.26) 0.20       3.5       1.00
     2        5.68   10.94    1.795  1.31( 0.26) 0.20       3.8       4.00
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       13.44    8.40    2.104  1.14( 0.23) 0.20       7.6       6.00
```

```
      2       13.45    9.08    2.007  1.14( 0.23) 0.20       8.0       1.00
      3       12.68   10.94    1.795  1.15( 0.23) 0.20       8.6       4.00
      4       12.33   11.55    1.737  1.15( 0.23) 0.20       8.7       9.00
    TOTAL AREA(ACRES) =         8.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       13.45  Tc(MIN.) =    9.082
  EFFECTIVE AREA(ACRES) =      7.95  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  1.15  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        8.7
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   205.00
  ELEVATION DATA: UPSTREAM(FEET) =   1601.30  DOWNSTREAM(FEET) =   1600.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.750
  *   5 YEAR RAINFALL INTENSITY(INCH/HR) =  2.208
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.28      1.33     0.200    17    7.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  1.33
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      0.49
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.3  TC(MIN.) =      7.75
  EFFECTIVE AREA(ACRES) =      0.28  AREA-AVERAGED Fm(INCH/HR)=  0.27
  AREA-AVERAGED Fp(INCH/HR) =  1.33  AREA-AVERAGED Ap = 0.200
  PEAK FLOW RATE(CFS)   =       0.49
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED CONDITION                                                    *
* 10 YR STORM                                                           *
*                                                                       *
 ************************************************************************

  FILE NAME: 816-1PR.DAT
  TIME/DATE OF STUDY: 08:49 07/13/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) = 0.8050
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   485.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1603.80
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.017
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.693
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        2.11      0.98     0.200    32    8.02
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.17      0.75     0.200    56    8.02
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      5.13
  TOTAL AREA(ACRES) =      2.28   PEAK FLOW RATE(CFS) =      5.13

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    44.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.76
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.13
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    8.14
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.14
  RAINFALL INTENSITY(INCH/HR) =   2.67
  AREA-AVERAGED Fm(INCH/HR) =  0.19
  AREA-AVERAGED Fp(INCH/HR) =  0.96
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.28
  TOTAL STREAM AREA(ACRES) =       2.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.13

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   363.00
  ELEVATION DATA: UPSTREAM(FEET) =   1604.30  DOWNSTREAM(FEET) =   1602.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.895
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.374
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        1.55      0.98     0.200    32    9.90
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      3.04
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      3.04

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.72
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.04
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.99
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      3.00 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.99
  RAINFALL INTENSITY(INCH/HR) =   2.36
  AREA-AVERAGED Fm(INCH/HR) =  0.20
  AREA-AVERAGED Fp(INCH/HR) =  0.97
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.55
  TOTAL STREAM AREA(ACRES) =       1.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.04

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        5.13    8.14    2.668  0.96( 0.19) 0.20       2.3       1.00
      2        3.04    9.99    2.360  0.97( 0.20) 0.20       1.5       4.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        7.96    8.14    2.668  0.96( 0.19) 0.20       3.5       1.00
      2        7.53    9.99    2.360  0.96( 0.19) 0.20       3.8       4.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.96    Tc(MIN.) =     8.14
  EFFECTIVE AREA(ACRES) =       3.54   AREA-AVERAGED Fm(INCH/HR) =  0.19
  AREA-AVERAGED Fp(INCH/HR) =  0.96  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.20  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.89
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.96
  PIPE TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =    9.01
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   496.00
  ELEVATION DATA: UPSTREAM(FEET) =   1615.00  DOWNSTREAM(FEET) =   1603.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.250
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.647
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.14      0.98     0.200    32    8.25
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        2.70      0.75     0.200    56    8.25
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      6.38
  TOTAL AREA(ACRES) =      2.84   PEAK FLOW RATE(CFS) =      6.38

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.30  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =    26.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  12.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.95
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.38
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.32
  LONGEST FLOWPATH FROM NODE      6.00 TO NODE      8.00 =     522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    8.32
  RAINFALL INTENSITY(INCH/HR) =   2.63
  AREA-AVERAGED Fm(INCH/HR) =  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.76
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.84
  TOTAL STREAM AREA(ACRES) =       2.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.38

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   444.00
  ELEVATION DATA: UPSTREAM(FEET) =   1603.50  DOWNSTREAM(FEET) =   1601.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.727
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.261
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.78      0.98     0.200    32   10.73
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        1.22      0.75     0.200    56   10.73
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.84
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      3.77
  TOTAL AREA(ACRES) =      2.00   PEAK FLOW RATE(CFS) =      3.77

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.80  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.83
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.77
  PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =   11.45
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.45
  RAINFALL INTENSITY(INCH/HR) =   2.18
  AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.84
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.00
  TOTAL STREAM AREA(ACRES) =       2.00
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.77

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.38    8.32    2.633  0.76( 0.15) 0.20       2.8       6.00
      2        3.77   11.45    2.175  0.84( 0.17) 0.20       2.0       9.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.74    8.32    2.633  0.79( 0.16) 0.20       4.3       6.00
      2        8.97   11.45    2.175  0.79( 0.16) 0.20       4.8       9.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.74    Tc(MIN.) =     8.32
  EFFECTIVE AREA(ACRES) =       4.29   AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.79  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        4.8
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.00  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  12.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.10
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.74
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.39
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.74    8.39    2.621  0.79( 0.16) 0.20       4.3       6.00
      2        8.97   11.51    2.167  0.79( 0.16) 0.20       4.8       9.00
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        7.96    9.01    2.511  0.96( 0.19) 0.20       3.5       1.00
      2        7.53   10.89    2.241  0.96( 0.19) 0.20       3.8       4.00
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       17.51    8.39    2.621  0.86( 0.17) 0.20       7.6       6.00
```

```
      2       17.55    9.01    2.511  0.87( 0.17) 0.20       7.9       1.00
      3       16.66   10.89    2.241  0.87( 0.17) 0.20       8.6       4.00
      4       16.24   11.51    2.167  0.87( 0.17) 0.20       8.7       9.00
    TOTAL AREA(ACRES) =         8.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       17.55  Tc(MIN.) =    9.010
  EFFECTIVE AREA(ACRES) =      7.95  AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        8.7
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   205.00
  ELEVATION DATA: UPSTREAM(FEET) =   1601.30  DOWNSTREAM(FEET) =   1600.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.750
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.748
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.28      0.98     0.200    32    7.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.64
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      0.64
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.3  TC(MIN.) =      7.75
  EFFECTIVE AREA(ACRES) =      0.28  AREA-AVERAGED Fm(INCH/HR)=  0.20
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap = 0.200
  PEAK FLOW RATE(CFS)   =       0.64
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED CONDITION                                                    *
* 25 YR STORM                                                           *
*                                                                       *
 ************************************************************************

  FILE NAME: 816-1PR.DAT
  TIME/DATE OF STUDY: 08:49 07/13/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   25.00   1-HOUR INTENSITY(INCH/HOUR) = 0.9972
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   485.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1603.80
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.017
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.336
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        2.11      0.98     0.200    32    8.02
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.17      0.75     0.200    56    8.02
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      6.45
  TOTAL AREA(ACRES) =      2.28   PEAK FLOW RATE(CFS) =      6.45

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    44.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.16
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.45
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    8.14
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.14
  RAINFALL INTENSITY(INCH/HR) =   3.31
  AREA-AVERAGED Fm(INCH/HR) =  0.19
  AREA-AVERAGED Fp(INCH/HR) =  0.96
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.28
  TOTAL STREAM AREA(ACRES) =       2.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.45

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   363.00
  ELEVATION DATA: UPSTREAM(FEET) =   1604.30  DOWNSTREAM(FEET) =   1602.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.895
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.940
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        1.55      0.98     0.200    32    9.90
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      3.83
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      3.83

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.93
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.83
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.99
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      3.00 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.99
  RAINFALL INTENSITY(INCH/HR) =   2.92
  AREA-AVERAGED Fm(INCH/HR) =  0.20
  AREA-AVERAGED Fp(INCH/HR) =  0.97
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.55
  TOTAL STREAM AREA(ACRES) =       1.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.83

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        6.45    8.14    3.307  0.96( 0.19) 0.20       2.3       1.00
      2        3.83    9.99    2.924  0.97( 0.20) 0.20       1.5       4.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       10.01    8.14    3.307  0.96( 0.19) 0.20       3.5       1.00
      2        9.49    9.99    2.924  0.96( 0.19) 0.20       3.8       4.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.01    Tc(MIN.) =     8.14
  EFFECTIVE AREA(ACRES) =       3.54   AREA-AVERAGED Fm(INCH/HR) =  0.19
  AREA-AVERAGED Fp(INCH/HR) =  0.96  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.20  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.99
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.01
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =    8.97
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   496.00
  ELEVATION DATA: UPSTREAM(FEET) =   1615.00  DOWNSTREAM(FEET) =   1603.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.250
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.279
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.14      0.98     0.200    32    8.25
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        2.70      0.75     0.200    56    8.25
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      7.99
  TOTAL AREA(ACRES) =      2.84   PEAK FLOW RATE(CFS) =      7.99

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.30  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =    26.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.49
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.99
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.32
  LONGEST FLOWPATH FROM NODE      6.00 TO NODE      8.00 =     522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    8.32
  RAINFALL INTENSITY(INCH/HR) =   3.26
  AREA-AVERAGED Fm(INCH/HR) =  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.76
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.84
  TOTAL STREAM AREA(ACRES) =       2.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.99

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   444.00
  ELEVATION DATA: UPSTREAM(FEET) =   1603.50  DOWNSTREAM(FEET) =   1601.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.727
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.801
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.78      0.98     0.200    32   10.73
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        1.22      0.75     0.200    56   10.73
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.84
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      4.74
  TOTAL AREA(ACRES) =      2.00   PEAK FLOW RATE(CFS) =      4.74

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.80  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.14
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.74
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =   11.39
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.39
  RAINFALL INTENSITY(INCH/HR) =   2.70
  AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.84
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.00
  TOTAL STREAM AREA(ACRES) =       2.00
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.74

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        7.99    8.32    3.264  0.76( 0.15) 0.20       2.8       6.00
     2        4.74   11.39    2.702  0.84( 0.17) 0.20       2.0       9.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       12.22    8.32    3.264  0.79( 0.16) 0.20       4.3       6.00
     2       11.29   11.39    2.702  0.79( 0.16) 0.20       4.8       9.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      12.22    Tc(MIN.) =     8.32
 EFFECTIVE AREA(ACRES) =       4.30   AREA-AVERAGED Fm(INCH/HR) =  0.16
 AREA-AVERAGED Fp(INCH/HR) =  0.79  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =        4.8
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      8.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1597.00  DOWNSTREAM(FEET) =  1596.00
 FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.93
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.22
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    8.38
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       12.22    8.38    3.249  0.79( 0.16) 0.20       4.3       6.00
     2       11.29   11.46    2.693  0.79( 0.16) 0.20       4.8       9.00
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       10.01    8.97    3.118  0.96( 0.19) 0.20       3.5       1.00
     2        9.49   10.83    2.786  0.96( 0.19) 0.20       3.8       4.00
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       21.99    8.38    3.249  0.86( 0.17) 0.20       7.6       6.00
```

```
      2       22.05    8.97    3.118  0.87( 0.17) 0.20       7.9       1.00
      3       20.97   10.83    2.786  0.87( 0.17) 0.20       8.6       4.00
      4       20.44   11.46    2.693  0.87( 0.17) 0.20       8.7       9.00
    TOTAL AREA(ACRES) =         8.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       22.05  Tc(MIN.) =    8.973
  EFFECTIVE AREA(ACRES) =      7.95  AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        8.7
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   205.00
  ELEVATION DATA: UPSTREAM(FEET) =   1601.30  DOWNSTREAM(FEET) =   1600.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.750
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.405
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.28      0.98     0.200    32    7.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.81
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      0.81
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.3  TC(MIN.) =      7.75
  EFFECTIVE AREA(ACRES) =      0.28  AREA-AVERAGED Fm(INCH/HR)=  0.20
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap = 0.200
  PEAK FLOW RATE(CFS)   =       0.81
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
         (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                        Analysis prepared by:

                            CA Engineering
                       13821 Newport Ave., Ste 110
                            Tustin, Ca. 92780


 ************************* DESCRIPTION OF STUDY *************************
* PROPOSED CONDITION                                                    *
* 100 YR STORM                                                          *
*                                                                       *
 ************************************************************************

  FILE NAME: 816-1PR.DAT
  TIME/DATE OF STUDY: 08:50 07/13/2022
========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.797
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.350
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) = 1.3500
  SLOPE OF INTENSITY DURATION CURVE = 0.6000

  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   485.00
  ELEVATION DATA: UPSTREAM(FEET) =   1616.10  DOWNSTREAM(FEET) =   1603.80
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.017
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.517
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        2.11      0.74     0.200    52    8.02
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.17      0.42     0.200    76    8.02
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      8.97
  TOTAL AREA(ACRES) =      2.28   PEAK FLOW RATE(CFS) =      8.97

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    44.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.58
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.97
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    8.13
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.13
  RAINFALL INTENSITY(INCH/HR) =   4.48
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.72
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.28
  TOTAL STREAM AREA(ACRES) =       2.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       8.97

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   363.00
  ELEVATION DATA: UPSTREAM(FEET) =   1604.30  DOWNSTREAM(FEET) =   1602.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.895
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.981
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        1.55      0.74     0.200    52    9.90
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      5.35
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      5.35

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.50  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.59
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.35
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.98
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      3.00 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.98
  RAINFALL INTENSITY(INCH/HR) =   3.96
  AREA-AVERAGED Fm(INCH/HR) =  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.55
  TOTAL STREAM AREA(ACRES) =       1.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.35

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        8.97    8.13    4.479  0.72( 0.14) 0.20       2.3       1.00
      2        5.35    9.98    3.961  0.74( 0.15) 0.20       1.5       4.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       13.92    8.13    4.479  0.73( 0.15) 0.20       3.5       1.00
      2       13.25    9.98    3.961  0.73( 0.15) 0.20       3.8       4.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.92    Tc(MIN.) =     8.13
  EFFECTIVE AREA(ACRES) =       3.54   AREA-AVERAGED Fm(INCH/HR) =  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.73  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     529.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1596.20  DOWNSTREAM(FEET) =  1596.00
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.32
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.92
  PIPE TRAVEL TIME(MIN.) =   0.75    Tc(MIN.) =    8.88
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   496.00
  ELEVATION DATA: UPSTREAM(FEET) =   1615.00  DOWNSTREAM(FEET) =   1603.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.250
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.440
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.14      0.74     0.200    52    8.25
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        2.70      0.42     0.200    76    8.25
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.44
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =     11.12
  TOTAL AREA(ACRES) =      2.84   PEAK FLOW RATE(CFS) =     11.12

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.30  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =    26.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.08
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.12
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    8.31
  LONGEST FLOWPATH FROM NODE      6.00 TO NODE      8.00 =     522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    8.31
  RAINFALL INTENSITY(INCH/HR) =   4.42
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.44
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.84
  TOTAL STREAM AREA(ACRES) =       2.84
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      11.12

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE     10.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   444.00
  ELEVATION DATA: UPSTREAM(FEET) =   1603.50  DOWNSTREAM(FEET) =   1601.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.727
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.793
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.78      0.74     0.200    52   10.73
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        1.22      0.42     0.200    76   10.73
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.55
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      6.63
  TOTAL AREA(ACRES) =      2.00   PEAK FLOW RATE(CFS) =      6.63

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1597.80  DOWNSTREAM(FEET) =  1597.00
  FLOW LENGTH(FEET) =   165.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.35
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.63
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =   11.36
  LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.36
  RAINFALL INTENSITY(INCH/HR) =   3.66
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.55
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       2.00
  TOTAL STREAM AREA(ACRES) =       2.00
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.63

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       11.12    8.31    4.420  0.44( 0.09) 0.20       2.8       6.00
     2        6.63   11.36    3.664  0.55( 0.11) 0.20       2.0       9.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       17.00    8.31    4.420  0.48( 0.10) 0.20       4.3       6.00
     2       15.81   11.36    3.664  0.48( 0.10) 0.20       4.8       9.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      17.00    Tc(MIN.) =     8.31
 EFFECTIVE AREA(ACRES) =       4.30   AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.48  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =        4.8
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      8.00 =     609.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      8.00 TO NODE      3.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1597.00  DOWNSTREAM(FEET) =  1596.00
 FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.83
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      17.00
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    8.37
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE      3.00 TO NODE      3.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       17.00    8.37    4.402  0.48( 0.10) 0.20       4.3       6.00
     2       15.81   11.42    3.653  0.48( 0.10) 0.20       4.8       9.00
 LONGEST FLOWPATH FROM NODE      9.00 TO NODE      3.00 =     646.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       13.92    8.88    4.247  0.73( 0.15) 0.20       3.5       1.00
     2       13.25   10.76    3.786  0.73( 0.15) 0.20       3.8       4.00
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       30.61    8.37    4.402  0.59( 0.12) 0.20       7.6       6.00
```

```
      2       30.73    8.88    4.247  0.59( 0.12) 0.20       7.9       1.00
      3       29.32   10.76    3.786  0.59( 0.12) 0.20       8.6       4.00
      4       28.57   11.42    3.653  0.59( 0.12) 0.20       8.7       9.00
    TOTAL AREA(ACRES) =         8.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       30.73  Tc(MIN.) =    8.882
  EFFECTIVE AREA(ACRES) =      7.94  AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.59  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        8.7
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     679.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   205.00
  ELEVATION DATA: UPSTREAM(FEET) =   1601.30  DOWNSTREAM(FEET) =   1600.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.750
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.609
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        0.28      0.74     0.200    52    7.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      1.12
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      1.12
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.3  TC(MIN.) =      7.75
  EFFECTIVE AREA(ACRES) =      0.28  AREA-AVERAGED Fm(INCH/HR)=  0.15
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap = 0.200
  PEAK FLOW RATE(CFS)   =       1.12
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX C: PROPOSED HYDROGRAPH METHOD & BASIN ROUTING, 2, 5, & 10 YEAR STORM FREQUENCY OUTPUT FILES FOR ON-SITE FACILITIES.

```
 **************************************************************************
                       SMALL AREA UNIT HYDROGRAPH MODEL
 ==========================================================================
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                            Analysis prepared by:

                                 CA Engineering
                              13821 Newport Ave., Ste 110
                                   Tustin, Ca. 92780


 **************************************************************************
 --------------------------------------------------------------------------

  Problem Descriptions:

   2 YR BASIN ROUTING

 --------------------------------------------------------------------------


     RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
     TOTAL CATCHMENT AREA(ACRES) =    8.98
     SOIL-LOSS RATE, Fm,(INCH/HR) =  0.230
     LOW LOSS FRACTION = 0.820
     TIME OF CONCENTRATION(MIN.) =  8.42
     SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
     USER SPECIFIED RAINFALL VALUES ARE USED
     RETURN FREQUENCY(YEARS) =   2
        5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.14
       30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.35
        1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.49
        3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.84
        6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.17
       24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.14

 --------------------------------------------------------------------------

     TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.38
     TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.23

 **************************************************************************
   TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
  (HOURS)    (AF)      (CFS)
 --------------------------------------------------------------------------
   0.00      0.0000      0.00  Q         .         .         .         .
   0.14      0.0003      0.06  Q         .         .         .         .
   0.28      0.0010      0.06  Q         .         .         .         .
   0.42      0.0016      0.06  Q         .         .         .         .
   0.56      0.0023      0.06  Q         .         .         .         .
   0.70      0.0030      0.06  Q         .         .         .         .
   0.84      0.0036      0.06  Q         .         .         .         .
```

0.98	0.0043	0.06	Q	.	.	.	.
1.12	0.0050	0.06	Q	.	.	.	.
1.26	0.0057	0.06	Q	.	.	.	.
1.41	0.0064	0.06	Q	.	.	.	.
1.55	0.0071	0.06	Q	.	.	.	.
1.69	0.0077	0.06	Q	.	.	.	.
1.83	0.0084	0.06	Q	.	.	.	.
1.97	0.0091	0.06	Q	.	.	.	.
2.11	0.0099	0.06	Q	.	.	.	.
2.25	0.0106	0.06	Q	.	.	.	.
2.39	0.0113	0.06	Q	.	.	.	.
2.53	0.0120	0.06	Q	.	.	.	.
2.67	0.0127	0.06	Q	.	.	.	.
2.81	0.0134	0.06	Q	.	.	.	.
2.95	0.0142	0.06	Q	.	.	.	.
3.09	0.0149	0.06	Q	.	.	.	.
3.23	0.0156	0.06	Q	.	.	.	.
3.37	0.0164	0.06	Q	.	.	.	.
3.51	0.0171	0.06	Q	.	.	.	.
3.65	0.0179	0.06	Q	.	.	.	.
3.79	0.0186	0.07	Q	.	.	.	.
3.93	0.0194	0.07	Q	.	.	.	.
4.07	0.0202	0.07	Q	.	.	.	.
4.21	0.0209	0.07	Q	.	.	.	.
4.35	0.0217	0.07	Q	.	.	.	.
4.49	0.0225	0.07	Q	.	.	.	.
4.63	0.0233	0.07	Q	.	.	.	.
4.77	0.0241	0.07	Q	.	.	.	.
4.91	0.0249	0.07	Q	.	.	.	.
5.05	0.0257	0.07	Q	.	.	.	.
5.19	0.0265	0.07	Q	.	.	.	.
5.33	0.0273	0.07	Q	.	.	.	.
5.47	0.0281	0.07	Q	.	.	.	.
5.62	0.0290	0.07	Q	.	.	.	.
5.76	0.0298	0.07	Q	.	.	.	.
5.90	0.0306	0.07	Q	.	.	.	.
6.04	0.0315	0.07	Q	.	.	.	.
6.18	0.0323	0.07	Q	.	.	.	.
6.32	0.0332	0.07	Q	.	.	.	.
6.46	0.0341	0.08	Q	.	.	.	.
6.60	0.0349	0.08	Q	.	.	.	.
6.74	0.0358	0.08	Q	.	.	.	.
6.88	0.0367	0.08	Q	.	.	.	.
7.02	0.0376	0.08	Q	.	.	.	.
7.16	0.0385	0.08	Q	.	.	.	.
7.30	0.0394	0.08	Q	.	.	.	.
7.44	0.0403	0.08	Q	.	.	.	.
7.58	0.0413	0.08	Q	.	.	.	.
7.72	0.0422	0.08	Q	.	.	.	.
7.86	0.0432	0.08	Q	.	.	.	.
8.00	0.0441	0.08	Q	.	.	.	.
8.14	0.0451	0.08	Q	.	.	.	.
8.28	0.0461	0.08	Q	.	.	.	.
8.42	0.0470	0.09	Q	.	.	.	.
8.56	0.0480	0.09	Q	.	.	.	.
8.70	0.0490	0.09	Q	.	.	.	.
8.84	0.0501	0.09	Q	.	.	.	.
8.98	0.0511	0.09	Q	.	.	.	.
9.12	0.0521	0.09	Q	.	.	.	.
9.26	0.0532	0.09	Q	.	.	.	.
9.40	0.0542	0.09	Q	.	.	.	.
9.54	0.0553	0.09	Q	.	.	.	.
9.68	0.0564	0.09	Q	.	.	.	.

```
 9.83      0.0575      0.10  Q          .          .          .          .
 9.97      0.0586      0.10  Q          .          .          .          .
10.11      0.0598      0.10  Q          .          .          .          .
10.25      0.0609      0.10  Q          .          .          .          .
10.39      0.0621      0.10  Q          .          .          .          .
10.53      0.0632      0.10  Q          .          .          .          .
10.67      0.0644      0.10  Q          .          .          .          .
10.81      0.0656      0.11  Q          .          .          .          .
10.95      0.0669      0.11  Q          .          .          .          .
11.09      0.0681      0.11  Q          .          .          .          .
11.23      0.0694      0.11  Q          .          .          .          .
11.37      0.0707      0.11  Q          .          .          .          .
11.51      0.0720      0.11  Q          .          .          .          .
11.65      0.0733      0.12  Q          .          .          .          .
11.79      0.0747      0.12  Q          .          .          .          .
11.93      0.0761      0.12  Q          .          .          .          .
12.07      0.0775      0.12  Q          .          .          .          .
12.21      0.0790      0.14  Q          .          .          .          .
12.35      0.0806      0.14  Q          .          .          .          .
12.49      0.0822      0.14  Q          .          .          .          .
12.63      0.0839      0.14  Q          .          .          .          .
12.77      0.0856      0.15  Q          .          .          .          .
12.91      0.0873      0.15  Q          .          .          .          .
13.05      0.0891      0.16  Q          .          .          .          .
13.19      0.0909      0.16  Q          .          .          .          .
13.33      0.0928      0.16  Q          .          .          .          .
13.47      0.0947      0.17  Q          .          .          .          .
13.61      0.0967      0.17  Q          .          .          .          .
13.75      0.0987      0.18  Q          .          .          .          .
13.90      0.1008      0.18  Q          .          .          .          .
14.04      0.1029      0.19  Q          .          .          .          .
14.18      0.1052      0.20  Q          .          .          .          .
14.32      0.1076      0.21  Q          .          .          .          .
14.46      0.1101      0.22  Q          .          .          .          .
14.60      0.1127      0.23  Q          .          .          .          .
14.74      0.1155      0.24  Q          .          .          .          .
14.88      0.1184      0.25  .Q         .          .          .          .
15.02      0.1214      0.27  .Q         .          .          .          .
15.16      0.1247      0.29  .Q         .          .          .          .
15.30      0.1282      0.32  .Q         .          .          .          .
15.44      0.1321      0.34  .Q         .          .          .          .
15.58      0.1364      0.40  .Q         .          .          .          .
15.72      0.1423      0.61  . Q        .          .          .          .
15.86      0.1554      1.65  .     Q    .          .          .          .
16.00      0.1803      2.65  .          Q          .          .          .
16.14      0.2450      8.50  .          .          .          .  Q       .
16.28      0.3003      1.05  .   Q      .          .          .          .
16.42      0.3085      0.37  .Q         .          .          .          .
16.56      0.3124      0.30  .Q         .          .          .          .
16.70      0.3157      0.26  .Q         .          .          .          .
16.84      0.3186      0.24  Q          .          .          .          .
16.98      0.3212      0.22  Q          .          .          .          .
17.12      0.3236      0.20  Q          .          .          .          .
17.26      0.3258      0.18  Q          .          .          .          .
17.40      0.3278      0.17  Q          .          .          .          .
17.54      0.3297      0.16  Q          .          .          .          .
17.68      0.3315      0.15  Q          .          .          .          .
17.82      0.3333      0.15  Q          .          .          .          .
17.96      0.3349      0.14  Q          .          .          .          .
18.11      0.3365      0.13  Q          .          .          .          .
18.25      0.3380      0.12  Q          .          .          .          .
18.39      0.3393      0.12  Q          .          .          .          .
18.53      0.3407      0.11  Q          .          .          .          .
```

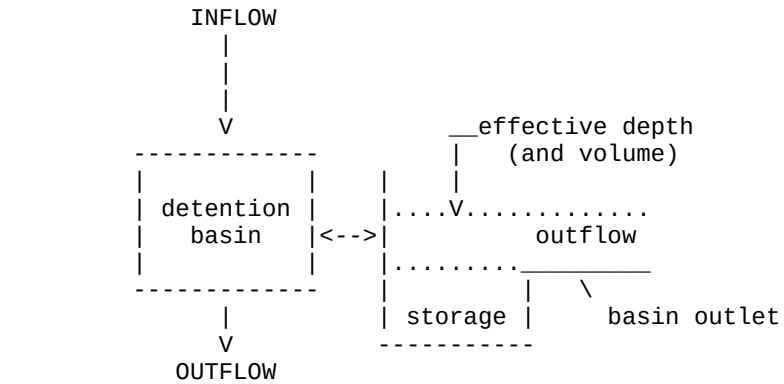
18.67	0.3419	0.11	Q	.	.	.	.
18.81	0.3432	0.10	Q	.	.	.	.
18.95	0.3443	0.10	Q	.	.	.	.
19.09	0.3455	0.10	Q	.	.	.	.
19.23	0.3466	0.10	Q	.	.	.	.
19.37	0.3477	0.09	Q	.	.	.	.
19.51	0.3488	0.09	Q	.	.	.	.
19.65	0.3499	0.09	Q	.	.	.	.
19.79	0.3509	0.09	Q	.	.	.	.
19.93	0.3519	0.09	Q	.	.	.	.
20.07	0.3529	0.08	Q	.	.	.	.
20.21	0.3539	0.08	Q	.	.	.	.
20.35	0.3548	0.08	Q	.	.	.	.
20.49	0.3557	0.08	Q	.	.	.	.
20.63	0.3566	0.08	Q	.	.	.	.
20.77	0.3575	0.08	Q	.	.	.	.
20.91	0.3584	0.08	Q	.	.	.	.
21.05	0.3593	0.07	Q	.	.	.	.
21.19	0.3601	0.07	Q	.	.	.	.
21.33	0.3610	0.07	Q	.	.	.	.
21.47	0.3618	0.07	Q	.	.	.	.
21.61	0.3626	0.07	Q	.	.	.	.
21.75	0.3634	0.07	Q	.	.	.	.
21.89	0.3642	0.07	Q	.	.	.	.
22.03	0.3650	0.07	Q	.	.	.	.
22.17	0.3658	0.07	Q	.	.	.	.
22.32	0.3665	0.07	Q	.	.	.	.
22.46	0.3673	0.06	Q	.	.	.	.
22.60	0.3680	0.06	Q	.	.	.	.
22.74	0.3688	0.06	Q	.	.	.	.
22.88	0.3695	0.06	Q	.	.	.	.
23.02	0.3702	0.06	Q	.	.	.	.
23.16	0.3709	0.06	Q	.	.	.	.
23.30	0.3716	0.06	Q	.	.	.	.
23.44	0.3723	0.06	Q	.	.	.	.
23.58	0.3730	0.06	Q	.	.	.	.
23.72	0.3737	0.06	Q	.	.	.	.
23.86	0.3744	0.06	Q	.	.	.	.
24.00	0.3750	0.06	Q	.	.	.	.
24.14	0.3757	0.06	Q	.	.	.	.
24.28	0.3760	0.00	Q	.	.	.	.

Problem Descriptions:

==========

FLOW-THROUGH DETENTION BASIN MODEL

SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
CONSTANT HYDROGRAPH TIME UNIT(MINUTES) = 8.420
DEAD STORAGE(AF) = 0.00
SPECIFIED DEAD STORAGE(AF) FILLED = 0.00
ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN = 0.00



DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES = 10

*BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	**	BASIN-DEPTH (FEET)	STORAGE (ACRE-FEET)	OUTFLOW (CFS)	*
0.000	0.000	0.000	**	1.000	0.035	0.388	*
2.000	0.095	0.388	**	3.000	0.166	0.388	*
4.000	0.242	0.388	**	5.000	0.326	0.388	*
6.000	0.406	0.388	**	7.000	0.478	0.388	*
8.000	0.535	0.388	**	9.000	0.541	0.388	*

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00	0.00000	0.00000
2	1.00	0.03270	0.03720
3	2.00	0.09248	0.09698
4	3.00	0.16374	0.16824
5	4.00	0.24005	0.24455
6	5.00	0.32341	0.32791
7	6.00	0.40347	0.40797
8	7.00	0.47607	0.48057
9	8.00	0.53254	0.53704
10	9.00	0.53921	0.54371

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)

DETENTION BASIN ROUTING RESULTS:
NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	EFFECTIVE DEPTH(FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.002	0.000	0.00	0.00	0.00	0.000
0.142	0.000	0.06	0.02	0.00	0.001
0.283	0.000	0.06	0.03	0.01	0.001
0.423	0.000	0.06	0.05	0.02	0.002
0.563	0.000	0.06	0.06	0.02	0.002
0.704	0.000	0.06	0.07	0.03	0.002
0.844	0.000	0.06	0.08	0.03	0.003
0.984	0.000	0.06	0.09	0.03	0.003
1.125	0.000	0.06	0.10	0.04	0.003
1.265	0.000	0.06	0.10	0.04	0.004
1.405	0.000	0.06	0.11	0.04	0.004
1.546	0.000	0.06	0.11	0.04	0.004
1.686	0.000	0.06	0.12	0.05	0.004

1.826	0.000	0.06	0.12	0.05	0.004
1.967	0.000	0.06	0.13	0.05	0.004
2.107	0.000	0.06	0.13	0.05	0.005
2.247	0.000	0.06	0.13	0.05	0.005
2.388	0.000	0.06	0.14	0.05	0.005
2.528	0.000	0.06	0.14	0.05	0.005
2.668	0.000	0.06	0.14	0.05	0.005
2.809	0.000	0.06	0.14	0.06	0.005
2.949	0.000	0.06	0.15	0.06	0.005
3.089	0.000	0.06	0.15	0.06	0.005
3.230	0.000	0.06	0.15	0.06	0.005
3.370	0.000	0.06	0.15	0.06	0.005
3.510	0.000	0.06	0.15	0.06	0.005
3.651	0.000	0.06	0.16	0.06	0.005
3.791	0.000	0.07	0.16	0.06	0.006
3.931	0.000	0.07	0.16	0.06	0.006
4.072	0.000	0.07	0.16	0.06	0.006
4.212	0.000	0.07	0.16	0.06	0.006
4.352	0.000	0.07	0.16	0.06	0.006
4.493	0.000	0.07	0.16	0.06	0.006
4.633	0.000	0.07	0.17	0.06	0.006
4.773	0.000	0.07	0.17	0.06	0.006
4.914	0.000	0.07	0.17	0.07	0.006
5.054	0.000	0.07	0.17	0.07	0.006
5.194	0.000	0.07	0.17	0.07	0.006
5.335	0.000	0.07	0.17	0.07	0.006
5.475	0.000	0.07	0.17	0.07	0.006
5.615	0.000	0.07	0.18	0.07	0.006
5.756	0.000	0.07	0.18	0.07	0.006
5.896	0.000	0.07	0.18	0.07	0.006
6.036	0.000	0.07	0.18	0.07	0.006
6.177	0.000	0.07	0.18	0.07	0.006
6.317	0.000	0.07	0.18	0.07	0.006
6.457	0.000	0.08	0.18	0.07	0.006
6.598	0.000	0.08	0.18	0.07	0.006
6.738	0.000	0.08	0.19	0.07	0.007
6.878	0.000	0.08	0.19	0.07	0.007
7.019	0.000	0.08	0.19	0.07	0.007
7.159	0.000	0.08	0.19	0.07	0.007
7.299	0.000	0.08	0.19	0.07	0.007
7.440	0.000	0.08	0.19	0.07	0.007
7.580	0.000	0.08	0.20	0.08	0.007
7.720	0.000	0.08	0.20	0.08	0.007
7.861	0.000	0.08	0.20	0.08	0.007
8.001	0.000	0.08	0.20	0.08	0.007
8.141	0.000	0.08	0.20	0.08	0.007
8.282	0.000	0.08	0.20	0.08	0.007
8.422	0.000	0.09	0.21	0.08	0.007
8.562	0.000	0.09	0.21	0.08	0.007
8.703	0.000	0.09	0.21	0.08	0.007
8.843	0.000	0.09	0.21	0.08	0.007
8.983	0.000	0.09	0.21	0.08	0.007
9.124	0.000	0.09	0.22	0.08	0.008
9.264	0.000	0.09	0.22	0.08	0.008
9.404	0.000	0.09	0.22	0.09	0.008
9.545	0.000	0.09	0.22	0.09	0.008
9.685	0.000	0.09	0.23	0.09	0.008
9.825	0.000	0.10	0.23	0.09	0.008
9.966	0.000	0.10	0.23	0.09	0.008
10.106	0.000	0.10	0.23	0.09	0.008
10.246	0.000	0.10	0.24	0.09	0.008
10.387	0.000	0.10	0.24	0.09	0.008
10.527	0.000	0.10	0.24	0.09	0.008

10.667	0.000	0.10	0.25	0.09	0.009
10.808	0.000	0.11	0.25	0.10	0.009
10.948	0.000	0.11	0.25	0.10	0.009
11.088	0.000	0.11	0.26	0.10	0.009
11.229	0.000	0.11	0.26	0.10	0.009
11.369	0.000	0.11	0.26	0.10	0.009
11.509	0.000	0.11	0.27	0.10	0.009
11.650	0.000	0.12	0.27	0.10	0.009
11.790	0.000	0.12	0.27	0.11	0.010
11.930	0.000	0.12	0.28	0.11	0.010
12.071	0.000	0.12	0.28	0.11	0.010
12.211	0.000	0.14	0.29	0.11	0.010
12.351	0.000	0.14	0.30	0.11	0.010
12.492	0.000	0.14	0.31	0.12	0.011
12.632	0.000	0.14	0.32	0.12	0.011
12.772	0.000	0.15	0.32	0.12	0.011
12.913	0.000	0.15	0.33	0.13	0.012
13.053	0.000	0.16	0.34	0.13	0.012
13.193	0.000	0.16	0.35	0.13	0.012
13.334	0.000	0.16	0.36	0.14	0.012
13.474	0.000	0.17	0.37	0.14	0.013
13.614	0.000	0.17	0.38	0.14	0.013
13.755	0.000	0.18	0.39	0.15	0.013
13.895	0.000	0.18	0.40	0.15	0.014
14.035	0.000	0.19	0.41	0.16	0.014
14.176	0.000	0.20	0.42	0.16	0.015
14.316	0.000	0.21	0.44	0.17	0.015
14.456	0.000	0.22	0.45	0.17	0.016
14.597	0.000	0.23	0.47	0.18	0.016
14.737	0.000	0.24	0.49	0.19	0.017
14.877	0.000	0.25	0.51	0.19	0.018
15.018	0.000	0.27	0.53	0.20	0.019
15.158	0.000	0.29	0.56	0.21	0.019
15.298	0.000	0.32	0.59	0.22	0.021
15.439	0.000	0.34	0.63	0.24	0.022
15.579	0.000	0.40	0.68	0.25	0.024
15.719	0.000	0.61	0.78	0.28	0.027
15.860	0.000	1.65	1.13	0.35	0.042
16.000	0.000	2.65	1.57	0.39	0.069
16.140	0.000	8.50	2.96	0.39	0.163
16.281	0.000	1.05	**3.06**	**0.39**	0.170
16.421	0.000	0.37	3.06	0.39	0.170
16.561	0.000	0.30	3.04	0.39	0.169
16.702	0.000	0.26	3.02	0.39	0.168
16.842	0.000	0.24	3.00	0.39	0.166
16.982	0.000	0.22	2.97	0.39	0.164
17.123	0.000	0.20	2.94	0.39	0.162
17.263	0.000	0.18	2.91	0.39	0.159
17.403	0.000	0.17	2.87	0.39	0.157
17.544	0.000	0.16	2.84	0.39	0.154
17.684	0.000	0.15	2.80	0.39	0.152
17.824	0.000	0.15	2.76	0.39	0.149
17.965	0.000	0.14	2.72	0.39	0.146
18.105	0.000	0.13	2.68	0.39	0.143
18.245	0.000	0.12	2.63	0.39	0.140
18.386	0.000	0.12	2.59	0.39	0.137
18.526	0.000	0.11	2.54	0.39	0.133
18.666	0.000	0.11	2.50	0.39	0.130
18.807	0.000	0.10	2.45	0.39	0.127
18.947	0.000	0.10	2.40	0.39	0.124
19.087	0.000	0.10	2.36	0.39	0.120
19.228	0.000	0.10	2.31	0.39	0.117
19.368	0.000	0.09	2.26	0.39	0.113

19.508	0.000	0.09	2.21	0.39	0.110
19.649	0.000	0.09	2.16	0.39	0.106
19.789	0.000	0.09	2.12	0.39	0.103
19.929	0.000	0.09	2.07	0.39	0.099
20.070	0.000	0.08	2.02	0.39	0.096
20.210	0.000	0.08	1.96	0.39	0.092
20.350	0.000	0.08	1.90	0.39	0.089
20.491	0.000	0.08	1.84	0.39	0.085
20.631	0.000	0.08	1.78	0.39	0.082
20.771	0.000	0.08	1.72	0.39	0.078
20.912	0.000	0.08	1.66	0.39	0.074
21.052	0.000	0.07	1.60	0.39	0.071
21.192	0.000	0.07	1.54	0.39	0.067
21.333	0.000	0.07	1.48	0.39	0.063
21.473	0.000	0.07	1.42	0.39	0.060
21.613	0.000	0.07	1.35	0.39	0.056
21.754	0.000	0.07	1.29	0.39	0.052
21.894	0.000	0.07	1.23	0.39	0.049
22.034	0.000	0.07	1.17	0.39	0.045
22.175	0.000	0.07	1.11	0.39	0.041
22.315	0.000	0.07	1.04	0.39	0.038
22.455	0.000	0.06	0.97	0.38	0.034
22.596	0.000	0.06	0.87	0.36	0.030
22.736	0.000	0.06	0.78	0.32	0.027
22.876	0.000	0.06	0.71	0.29	0.025
23.017	0.000	0.06	0.64	0.26	0.022
23.157	0.000	0.06	0.58	0.24	0.020
23.297	0.000	0.06	0.53	0.22	0.019
23.438	0.000	0.06	0.49	0.20	0.017
23.578	0.000	0.06	0.45	0.18	0.016
23.718	0.000	0.06	0.41	0.17	0.014
23.859	0.000	0.06	0.38	0.15	0.013
23.999	0.000	0.06	0.35	0.14	0.012
24.139	0.000	0.06	0.33	0.13	0.011
24.280	0.000	0.00	0.29	0.12	0.010

```
**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
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             Ver. 15.0  Release Date: 04/01/2008  License ID 1420

                          Analysis prepared by:

                              CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:

  5 YR BASIN ROUTING

--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 1.05
    TOTAL CATCHMENT AREA(ACRES) =    8.98
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.200
    LOW LOSS FRACTION = 0.740
    TIME OF CONCENTRATION(MIN.) =  9.08
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   5
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.18
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.47
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.65
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  1.10
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.51
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.77

--------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.79
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.29

**************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.11      0.0006      0.12  Q         .         .         .         .
  0.26      0.0021      0.12  Q         .         .         .         .
  0.41      0.0037      0.13  Q         .         .         .         .
  0.56      0.0052      0.13  Q         .         .         .         .
  0.72      0.0068      0.13  Q         .         .         .         .
  0.87      0.0084      0.13  Q         .         .         .         .
  1.02      0.0100      0.13  Q         .         .         .         .
  1.17      0.0116      0.13  Q         .         .         .         .
  1.32      0.0132      0.13  Q         .         .         .         .
  1.47      0.0148      0.13  Q         .         .         .         .
  1.62      0.0165      0.13  Q         .         .         .         .
  1.77      0.0181      0.13  Q         .         .         .         .
  1.93      0.0198      0.13  Q         .         .         .         .
  2.08      0.0214      0.13  Q         .         .         .         .
  2.23      0.0231      0.13  Q         .         .         .         .
```

2.38	0.0248	0.13	Q	.	.	.	.
2.53	0.0265	0.14	Q	.	.	.	.
2.68	0.0282	0.14	Q	.	.	.	.
2.83	0.0299	0.14	Q	.	.	.	.
2.99	0.0316	0.14	Q	.	.	.	.
3.14	0.0334	0.14	Q	.	.	.	.
3.29	0.0351	0.14	Q	.	.	.	.
3.44	0.0369	0.14	Q	.	.	.	.
3.59	0.0386	0.14	Q	.	.	.	.
3.74	0.0404	0.14	Q	.	.	.	.
3.89	0.0422	0.14	Q	.	.	.	.
4.04	0.0440	0.15	Q	.	.	.	.
4.20	0.0458	0.15	Q	.	.	.	.
4.35	0.0477	0.15	Q	.	.	.	.
4.50	0.0495	0.15	Q	.	.	.	.
4.65	0.0514	0.15	Q	.	.	.	.
4.80	0.0532	0.15	Q	.	.	.	.
4.95	0.0551	0.15	Q	.	.	.	.
5.10	0.0570	0.15	Q	.	.	.	.
5.26	0.0590	0.15	Q	.	.	.	.
5.41	0.0609	0.15	Q	.	.	.	.
5.56	0.0628	0.16	Q	.	.	.	.
5.71	0.0648	0.16	Q	.	.	.	.
5.86	0.0668	0.16	Q	.	.	.	.
6.01	0.0688	0.16	Q	.	.	.	.
6.16	0.0708	0.16	Q	.	.	.	.
6.31	0.0728	0.16	Q	.	.	.	.
6.47	0.0749	0.16	Q	.	.	.	.
6.62	0.0769	0.17	Q	.	.	.	.
6.77	0.0790	0.17	Q	.	.	.	.
6.92	0.0811	0.17	Q	.	.	.	.
7.07	0.0832	0.17	Q	.	.	.	.
7.22	0.0854	0.17	Q	.	.	.	.
7.37	0.0876	0.17	Q	.	.	.	.
7.53	0.0897	0.18	Q	.	.	.	.
7.68	0.0919	0.18	Q	.	.	.	.
7.83	0.0942	0.18	Q	.	.	.	.
7.98	0.0964	0.18	Q	.	.	.	.
8.13	0.0987	0.18	Q	.	.	.	.
8.28	0.1010	0.19	Q	.	.	.	.
8.43	0.1033	0.19	Q	.	.	.	.
8.58	0.1057	0.19	Q	.	.	.	.
8.74	0.1081	0.19	Q	.	.	.	.
8.89	0.1105	0.19	Q	.	.	.	.
9.04	0.1129	0.20	Q	.	.	.	.
9.19	0.1154	0.20	Q	.	.	.	.
9.34	0.1179	0.20	Q	.	.	.	.
9.49	0.1204	0.20	Q	.	.	.	.
9.64	0.1229	0.21	Q	.	.	.	.
9.80	0.1255	0.21	Q	.	.	.	.
9.95	0.1282	0.21	Q	.	.	.	.
10.10	0.1308	0.21	Q	.	.	.	.
10.25	0.1335	0.22	Q	.	.	.	.
10.40	0.1363	0.22	Q	.	.	.	.
10.55	0.1390	0.22	Q	.	.	.	.
10.70	0.1419	0.23	Q	.	.	.	.
10.85	0.1447	0.23	Q	.	.	.	.
11.01	0.1477	0.24	Q	.	.	.	.
11.16	0.1506	0.24	Q	.	.	.	.
11.31	0.1536	0.24	Q	.	.	.	.
11.46	0.1567	0.25	Q	.	.	.	.
11.61	0.1598	0.25	Q	.	.	.	.
11.76	0.1630	0.26	Q	.	.	.	.

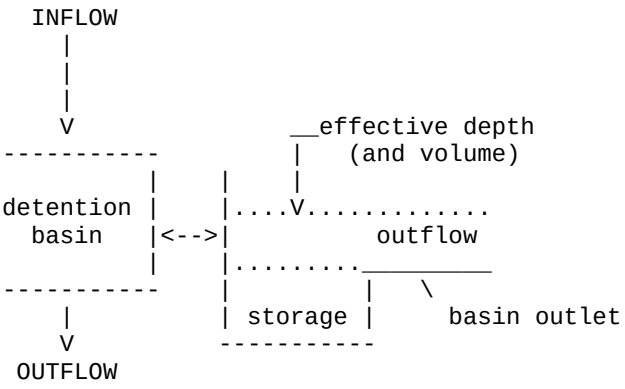
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11.91      0.1663      0.26  Q          .          .          .          .
12.07      0.1696      0.27  Q          .          .          .          .
12.22      0.1730      0.29  Q          .          .          .          .
12.37      0.1766      0.29  Q          .          .          .          .
12.52      0.1803      0.30  Q          .          .          .          .
12.67      0.1841      0.30  Q          .          .          .          .
12.82      0.1880      0.31  Q          .          .          .          .
12.97      0.1919      0.32  Q          .          .          .          .
13.12      0.1960      0.33  Q          .          .          .          .
13.28      0.2002      0.34  Q          .          .          .          .
13.43      0.2045      0.35  Q          .          .          .          .
13.58      0.2089      0.36  Q          .          .          .          .
13.73      0.2135      0.37  Q          .          .          .          .
13.88      0.2183      0.38  Q          .          .          .          .
14.03      0.2232      0.40  Q          .          .          .          .
14.18      0.2284      0.43  Q          .          .          .          .
14.34      0.2339      0.45  Q          .          .          .          .
14.49      0.2396      0.47  Q          .          .          .          .
14.64      0.2457      0.50  .Q         .          .          .          .
14.79      0.2520      0.52  .Q         .          .          .          .
14.94      0.2588      0.57  .Q         .          .          .          .
15.09      0.2661      0.59  .Q         .          .          .          .
15.24      0.2740      0.67  .Q         .          .          .          .
15.39      0.2834      0.84  .Q         .          .          .          .
15.55      0.2978      1.47  . Q        .          .          .          .
15.70      0.3184      1.83  .  Q       .          .          .          .
15.85      0.3508      3.36  .     Q    .          .          .          .
16.00      0.4023      4.87  .        Q.          .          .          .
16.15      0.5182     13.67  .          .          .      Q   .          .
16.30      0.6187      2.40  .   Q      .          .          .          .
16.45      0.6409      1.14  . Q        .          .          .          .
16.61      0.6520      0.63  .Q         .          .          .          .
16.76      0.6593      0.54  .Q         .          .          .          .
16.91      0.6657      0.48  Q          .          .          .          .
17.06      0.6714      0.44  Q          .          .          .          .
17.21      0.6766      0.39  Q          .          .          .          .
17.36      0.6814      0.37  Q          .          .          .          .
17.51      0.6858      0.34  Q          .          .          .          .
17.66      0.6900      0.33  Q          .          .          .          .
17.82      0.6940      0.31  Q          .          .          .          .
17.97      0.6978      0.29  Q          .          .          .          .
18.12      0.7013      0.28  Q          .          .          .          .
18.27      0.7047      0.26  Q          .          .          .          .
18.42      0.7079      0.25  Q          .          .          .          .
18.57      0.7110      0.24  Q          .          .          .          .
18.72      0.7139      0.23  Q          .          .          .          .
18.88      0.7168      0.23  Q          .          .          .          .
19.03      0.7196      0.22  Q          .          .          .          .
19.18      0.7223      0.21  Q          .          .          .          .
19.33      0.7249      0.21  Q          .          .          .          .
19.48      0.7275      0.20  Q          .          .          .          .
19.63      0.7300      0.20  Q          .          .          .          .
19.78      0.7324      0.19  Q          .          .          .          .
19.93      0.7348      0.19  Q          .          .          .          .
20.09      0.7371      0.18  Q          .          .          .          .
20.24      0.7394      0.18  Q          .          .          .          .
20.39      0.7416      0.18  Q          .          .          .          .
20.54      0.7438      0.17  Q          .          .          .          .
20.69      0.7459      0.17  Q          .          .          .          .
20.84      0.7480      0.17  Q          .          .          .          .
20.99      0.7501      0.16  Q          .          .          .          .
21.15      0.7521      0.16  Q          .          .          .          .
21.30      0.7541      0.16  Q          .          .          .          .
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 21.45      0.7561      0.16  Q         .         .         .         .
 21.60      0.7580      0.15  Q         .         .         .         .
 21.75      0.7599      0.15  Q         .         .         .         .
 21.90      0.7618      0.15  Q         .         .         .         .
 22.05      0.7637      0.15  Q         .         .         .         .
 22.20      0.7655      0.14  Q         .         .         .         .
 22.36      0.7673      0.14  Q         .         .         .         .
 22.51      0.7690      0.14  Q         .         .         .         .
 22.66      0.7708      0.14  Q         .         .         .         .
 22.81      0.7725      0.14  Q         .         .         .         .
 22.96      0.7742      0.14  Q         .         .         .         .
 23.11      0.7759      0.13  Q         .         .         .         .
 23.26      0.7776      0.13  Q         .         .         .         .
 23.42      0.7792      0.13  Q         .         .         .         .
 23.57      0.7808      0.13  Q         .         .         .         .
 23.72      0.7824      0.13  Q         .         .         .         .
 23.87      0.7840      0.13  Q         .         .         .         .
 24.02      0.7856      0.12  Q         .         .         .         .
 24.17      0.7864      0.00  Q         .         .         .         .
-------------------------------------------------------------------------
```

Problem Descriptions:

```
=========================================================================
     FLOW-THROUGH DETENTION BASIN MODEL

     SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
     CONSTANT HYDROGRAPH TIME UNIT(MINUTES) =    9.080
     DEAD STORAGE(AF) =       0.00
     SPECIFIED DEAD STORAGE(AF) FILLED =       0.00
     ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN =    0.00
```




```
     DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
     TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES =  10
     *BASIN-DEPTH  STORAGE    OUTFLOW  **BASIN-DEPTH  STORAGE    OUTFLOW  *
     *   (FEET)  (ACRE-FEET)   (CFS)   **   (FEET)  (ACRE-FEET)   (CFS)   *
     *      0.000      0.000      0.000**      1.000      0.035      0.388*
     *      2.000      0.095      0.388**      3.000      0.166      0.388*
     *      4.000      0.242      0.388**      5.000      0.326      0.388*
     *      6.000      0.406      0.388**      7.000      0.478      0.388*
     *      8.000      0.535      0.388**      9.000      0.541      0.388*
```

BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:

INTERVAL NUMBER	DEPTH (FEET)	{S-O*DT/2} (ACRE-FEET)	{S+O*DT/2} (ACRE-FEET)
1	0.00	0.00000	0.00000
2	1.00	0.03252	0.03738
3	2.00	0.09230	0.09716
4	3.00	0.16356	0.16842
5	4.00	0.23987	0.24473
6	5.00	0.32323	0.32809
7	6.00	0.40329	0.40815
8	7.00	0.47589	0.48075
9	8.00	0.53236	0.53722
10	9.00	0.53903	0.54389

WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)

DETENTION BASIN ROUTING RESULTS:

NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	EFFECTIVE DEPTH(FT)	OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
0.110	0.000	0.12	0.04	0.01	0.001
0.261	0.000	0.12	0.08	0.02	0.003
0.413	0.000	0.13	0.11	0.04	0.004
0.564	0.000	0.13	0.14	0.05	0.005
0.715	0.000	0.13	0.16	0.06	0.006
0.867	0.000	0.13	0.18	0.07	0.006
1.018	0.000	0.13	0.20	0.07	0.007
1.169	0.000	0.13	0.22	0.08	0.008
1.321	0.000	0.13	0.23	0.09	0.008
1.472	0.000	0.13	0.25	0.09	0.009
1.623	0.000	0.13	0.26	0.10	0.009
1.775	0.000	0.13	0.27	0.10	0.009
1.926	0.000	0.13	0.28	0.11	0.010
2.077	0.000	0.13	0.29	0.11	0.010
2.229	0.000	0.13	0.29	0.11	0.010
2.380	0.000	0.13	0.30	0.12	0.011
2.531	0.000	0.14	0.31	0.12	0.011
2.683	0.000	0.14	0.31	0.12	0.011
2.834	0.000	0.14	0.32	0.12	0.011
2.985	0.000	0.14	0.32	0.12	0.011
3.137	0.000	0.14	0.33	0.13	0.011
3.288	0.000	0.14	0.33	0.13	0.012
3.439	0.000	0.14	0.34	0.13	0.012
3.591	0.000	0.14	0.34	0.13	0.012
3.742	0.000	0.14	0.34	0.13	0.012
3.893	0.000	0.14	0.35	0.13	0.012
4.045	0.000	0.15	0.35	0.14	0.012
4.196	0.000	0.15	0.35	0.14	0.012
4.347	0.000	0.15	0.36	0.14	0.012
4.499	0.000	0.15	0.36	0.14	0.013
4.650	0.000	0.15	0.36	0.14	0.013
4.801	0.000	0.15	0.37	0.14	0.013
4.953	0.000	0.15	0.37	0.14	0.013
5.104	0.000	0.15	0.37	0.14	0.013
5.255	0.000	0.15	0.38	0.15	0.013
5.407	0.000	0.15	0.38	0.15	0.013
5.558	0.000	0.16	0.38	0.15	0.013
5.709	0.000	0.16	0.39	0.15	0.013
5.861	0.000	0.16	0.39	0.15	0.014

6.012	0.000	0.16	0.39	0.15	0.014
6.163	0.000	0.16	0.40	0.15	0.014
6.315	0.000	0.16	0.40	0.15	0.014
6.466	0.000	0.16	0.40	0.16	0.014
6.617	0.000	0.17	0.40	0.16	0.014
6.769	0.000	0.17	0.41	0.16	0.014
6.920	0.000	0.17	0.41	0.16	0.014
7.071	0.000	0.17	0.42	0.16	0.015
7.223	0.000	0.17	0.42	0.16	0.015
7.374	0.000	0.17	0.42	0.16	0.015
7.525	0.000	0.18	0.43	0.16	0.015
7.677	0.000	0.18	0.43	0.17	0.015
7.828	0.000	0.18	0.43	0.17	0.015
7.979	0.000	0.18	0.44	0.17	0.015
8.131	0.000	0.18	0.44	0.17	0.015
8.282	0.000	0.19	0.45	0.17	0.016
8.433	0.000	0.19	0.45	0.17	0.016
8.585	0.000	0.19	0.46	0.18	0.016
8.736	0.000	0.19	0.46	0.18	0.016
8.887	0.000	0.19	0.47	0.18	0.016
9.039	0.000	0.20	0.47	0.18	0.016
9.190	0.000	0.20	0.48	0.18	0.017
9.341	0.000	0.20	0.48	0.19	0.017
9.493	0.000	0.20	0.49	0.19	0.017
9.644	0.000	0.21	0.49	0.19	0.017
9.795	0.000	0.21	0.50	0.19	0.017
9.947	0.000	0.21	0.50	0.19	0.018
10.098	0.000	0.21	0.51	0.20	0.018
10.249	0.000	0.22	0.52	0.20	0.018
10.401	0.000	0.22	0.52	0.20	0.018
10.552	0.000	0.22	0.53	0.20	0.019
10.703	0.000	0.23	0.54	0.21	0.019
10.855	0.000	0.23	0.55	0.21	0.019
11.006	0.000	0.24	0.55	0.21	0.019
11.157	0.000	0.24	0.56	0.22	0.020
11.309	0.000	0.24	0.57	0.22	0.020
11.460	0.000	0.25	0.58	0.22	0.020
11.611	0.000	0.25	0.59	0.23	0.021
11.763	0.000	0.26	0.60	0.23	0.021
11.914	0.000	0.26	0.61	0.23	0.021
12.065	0.000	0.27	0.62	0.24	0.022
12.217	0.000	0.29	0.63	0.24	0.022
12.368	0.000	0.29	0.65	0.25	0.023
12.519	0.000	0.30	0.66	0.25	0.023
12.671	0.000	0.30	0.68	0.26	0.024
12.822	0.000	0.31	0.70	0.27	0.024
12.973	0.000	0.32	0.71	0.27	0.025
13.125	0.000	0.33	0.73	0.28	0.026
13.276	0.000	0.34	0.75	0.29	0.026
13.427	0.000	0.35	0.77	0.29	0.027
13.579	0.000	0.36	0.79	0.30	0.028
13.730	0.000	0.37	0.81	0.31	0.028
13.881	0.000	0.38	0.84	0.32	0.029
14.033	0.000	0.40	0.86	0.33	0.030
14.184	0.000	0.43	0.89	0.34	0.031
14.335	0.000	0.45	0.93	0.35	0.032
14.487	0.000	0.47	0.96	0.37	0.034
14.638	0.000	0.50	1.00	0.38	0.035
14.789	0.000	0.52	1.03	0.39	0.037
14.941	0.000	0.57	1.07	0.39	0.039
15.092	0.000	0.59	1.11	0.39	0.042
15.243	0.000	0.67	1.17	0.39	0.045
15.395	0.000	0.84	1.26	0.39	0.051

15.546	0.000	1.47	1.49	0.39	0.064
15.697	0.000	1.83	1.79	0.39	0.082
15.849	0.000	3.36	2.35	0.39	0.119
16.000	0.000	4.87	3.12	0.39	0.175
16.151	0.000	13.67	5.20	0.39	0.342
16.303	0.000	2.40	5.51	0.39	0.367
16.454	0.000	1.14	5.63	0.39	0.376
16.605	0.000	0.63	5.67	0.39	0.379
16.757	0.000	0.54	5.69	0.39	0.381
16.908	0.000	0.48	5.71	0.39	0.382
17.059	0.000	0.44	5.72	0.39	0.383
17.211	0.000	0.39	**5.72**	**0.39**	0.383
17.362	0.000	0.37	5.71	0.39	0.383
17.513	0.000	0.34	5.71	0.39	0.382
17.665	0.000	0.33	5.70	0.39	0.381
17.816	0.000	0.31	5.68	0.39	0.380
17.967	0.000	0.29	5.67	0.39	0.379
18.119	0.000	0.28	5.65	0.39	0.378
18.270	0.000	0.26	5.63	0.39	0.376
18.421	0.000	0.25	5.61	0.39	0.375
18.573	0.000	0.24	5.59	0.39	0.373
18.724	0.000	0.23	5.56	0.39	0.371
18.875	0.000	0.23	5.54	0.39	0.369
19.027	0.000	0.22	5.51	0.39	0.367
19.178	0.000	0.21	5.48	0.39	0.364
19.329	0.000	0.21	5.46	0.39	0.362
19.481	0.000	0.20	5.43	0.39	0.360
19.632	0.000	0.20	5.40	0.39	0.357
19.783	0.000	0.19	5.37	0.39	0.355
19.935	0.000	0.19	5.34	0.39	0.353
20.086	0.000	0.18	5.30	0.39	0.350
20.237	0.000	0.18	5.27	0.39	0.347
20.389	0.000	0.18	5.24	0.39	0.345
20.540	0.000	0.17	5.20	0.39	0.342
20.691	0.000	0.17	5.17	0.39	0.339
20.843	0.000	0.17	5.14	0.39	0.337
20.994	0.000	0.16	5.10	0.39	0.334
21.145	0.000	0.16	5.07	0.39	0.331
21.297	0.000	0.16	5.03	0.39	0.328
21.448	0.000	0.16	4.99	0.39	0.325
21.599	0.000	0.15	4.96	0.39	0.322
21.751	0.000	0.15	4.92	0.39	0.319
21.902	0.000	0.15	4.89	0.39	0.316
22.053	0.000	0.15	4.85	0.39	0.313
22.205	0.000	0.14	4.81	0.39	0.310
22.356	0.000	0.14	4.78	0.39	0.307
22.507	0.000	0.14	4.74	0.39	0.304
22.659	0.000	0.14	4.70	0.39	0.301
22.810	0.000	0.14	4.66	0.39	0.298
22.961	0.000	0.14	4.63	0.39	0.295
23.113	0.000	0.13	4.59	0.39	0.291
23.264	0.000	0.13	4.55	0.39	0.288
23.415	0.000	0.13	4.51	0.39	0.285
23.567	0.000	0.13	4.47	0.39	0.282
23.718	0.000	0.13	4.43	0.39	0.278
23.869	0.000	0.13	4.39	0.39	0.275
24.021	0.000	0.12	4.36	0.39	0.272
24.172	0.000	0.00	4.30	0.39	0.267

```
**************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==========================================================================
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                          Analysis prepared by:

                               CA Engineering
                          13821 Newport Ave., Ste 110
                               Tustin, Ca. 92780


**************************************************************************
--------------------------------------------------------------------------

 Problem Descriptions:

  10 YR BASIN ROUTING

--------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 1.05
    TOTAL CATCHMENT AREA(ACRES) =    8.98
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.170
    LOW LOSS FRACTION = 0.390
    TIME OF CONCENTRATION(MIN.) =  9.01
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =  10
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.22
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.57
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.80
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  1.31
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.79
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  3.29

--------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.68
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.79

**************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
--------------------------------------------------------------------------
  0.08      0.0000      0.00  Q         .         .         .         .
  0.23      0.0022      0.35  Q         .         .         .         .
  0.38      0.0065      0.35  Q         .         .         .         .
  0.53      0.0108      0.35  Q         .         .         .         .
  0.68      0.0152      0.35  Q         .         .         .         .
  0.83      0.0196      0.36  Q         .         .         .         .
  0.98      0.0240      0.36  Q         .         .         .         .
  1.13      0.0285      0.36  Q         .         .         .         .
  1.28      0.0329      0.36  Q         .         .         .         .
  1.43      0.0374      0.36  Q         .         .         .         .
  1.58      0.0419      0.36  Q         .         .         .         .
  1.73      0.0465      0.37  Q         .         .         .         .
  1.88      0.0511      0.37  Q         .         .         .         .
  2.03      0.0557      0.37  Q         .         .         .         .
  2.18      0.0603      0.37  Q         .         .         .         .
```

2.33	0.0649	0.38	Q	.	.	.	.
2.48	0.0696	0.38	Q	.	.	.	.
2.64	0.0743	0.38	Q	.	.	.	.
2.79	0.0791	0.38	Q	.	.	.	.
2.94	0.0839	0.39	Q	.	.	.	.
3.09	0.0887	0.39	Q	.	.	.	.
3.24	0.0935	0.39	Q	.	.	.	.
3.39	0.0984	0.39	Q	.	.	.	.
3.54	0.1033	0.40	Q	.	.	.	.
3.69	0.1082	0.40	Q	.	.	.	.
3.84	0.1132	0.40	Q	.	.	.	.
3.99	0.1182	0.40	Q	.	.	.	.
4.14	0.1232	0.41	Q	.	.	.	.
4.29	0.1283	0.41	Q	.	.	.	.
4.44	0.1334	0.41	Q	.	.	.	.
4.59	0.1385	0.42	Q	.	.	.	.
4.74	0.1437	0.42	Q	.	.	.	.
4.89	0.1489	0.42	Q	.	.	.	.
5.04	0.1542	0.43	Q	.	.	.	.
5.19	0.1595	0.43	Q	.	.	.	.
5.34	0.1648	0.43	Q	.	.	.	.
5.49	0.1702	0.43	Q	.	.	.	.
5.64	0.1756	0.44	Q	.	.	.	.
5.79	0.1811	0.44	Q	.	.	.	.
5.94	0.1866	0.45	Q	.	.	.	.
6.09	0.1921	0.45	Q	.	.	.	.
6.24	0.1977	0.45	Q	.	.	.	.
6.39	0.2034	0.46	Q	.	.	.	.
6.54	0.2091	0.46	Q	.	.	.	.
6.69	0.2149	0.46	Q	.	.	.	.
6.84	0.2207	0.47	Q	.	.	.	.
6.99	0.2265	0.47	Q	.	.	.	.
7.14	0.2324	0.48	Q	.	.	.	.
7.29	0.2384	0.48	Q	.	.	.	.
7.44	0.2444	0.49	Q	.	.	.	.
7.59	0.2505	0.49	Q	.	.	.	.
7.74	0.2566	0.50	Q	.	.	.	.
7.89	0.2628	0.50	.Q	.	.	.	.
8.04	0.2691	0.51	.Q	.	.	.	.
8.19	0.2754	0.51	.Q	.	.	.	.
8.34	0.2819	0.52	.Q	.	.	.	.
8.49	0.2883	0.52	.Q	.	.	.	.
8.64	0.2949	0.53	.Q	.	.	.	.
8.79	0.3015	0.54	.Q	.	.	.	.
8.94	0.3082	0.54	.Q	.	.	.	.
9.09	0.3150	0.55	.Q	.	.	.	.
9.24	0.3218	0.56	.Q	.	.	.	.
9.39	0.3287	0.56	.Q	.	.	.	.
9.54	0.3358	0.57	.Q	.	.	.	.
9.69	0.3429	0.58	.Q	.	.	.	.
9.84	0.3501	0.59	.Q	.	.	.	.
9.99	0.3574	0.59	.Q	.	.	.	.
10.14	0.3648	0.60	.Q	.	.	.	.
10.29	0.3723	0.61	.Q	.	.	.	.
10.44	0.3800	0.62	.Q	.	.	.	.
10.59	0.3877	0.63	.Q	.	.	.	.
10.74	0.3956	0.64	.Q	.	.	.	.
10.89	0.4035	0.65	.Q	.	.	.	.
11.04	0.4116	0.66	.Q	.	.	.	.
11.19	0.4199	0.67	.Q	.	.	.	.
11.34	0.4283	0.68	.Q	.	.	.	.
11.49	0.4368	0.69	.Q	.	.	.	.
11.65	0.4455	0.71	.Q	.	.	.	.

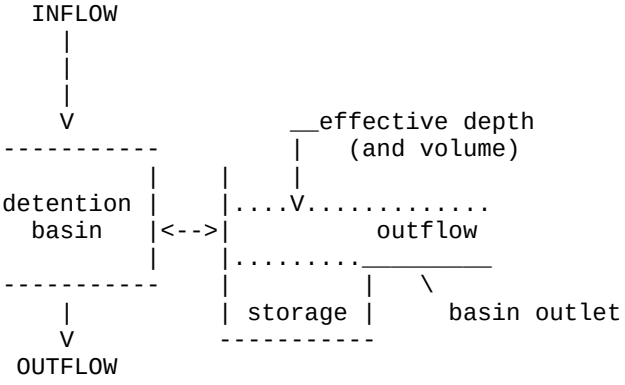
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11.80      0.4544      0.72  .Q        .         .         .         .
11.95      0.4634      0.74  .Q        .         .         .         .
12.10      0.4726      0.75  .Q        .         .         .         .
12.25      0.4822      0.79  .Q        .         .         .         .
12.40      0.4920      0.80  .Q        .         .         .         .
12.55      0.5021      0.82  .Q        .         .         .         .
12.70      0.5124      0.84  .Q        .         .         .         .
12.85      0.5230      0.87  .Q        .         .         .         .
13.00      0.5338      0.88  .Q        .         .         .         .
13.15      0.5450      0.91  .Q        .         .         .         .
13.30      0.5564      0.93  .Q        .         .         .         .
13.45      0.5682      0.97  .Q        .         .         .         .
13.60      0.5803      0.99  .Q        .         .         .         .
13.75      0.5929      1.03  . Q       .         .         .         .
13.90      0.6059      1.06  . Q       .         .         .         .
14.05      0.6194      1.12  . Q       .         .         .         .
14.20      0.6334      1.15  . Q       .         .         .         .
14.35      0.6482      1.22  . Q       .         .         .         .
14.50      0.6636      1.26  . Q       .         .         .         .
14.65      0.6798      1.35  . Q       .         .         .         .
14.80      0.6969      1.41  . Q       .         .         .         .
14.95      0.7152      1.54  .  Q      .         .         .         .
15.10      0.7348      1.62  .  Q      .         .         .         .
15.25      0.7561      1.81  .  Q      .         .         .         .
15.40      0.7794      1.94  .  Q      .         .         .         .
15.55      0.8070      2.50  .   Q     .         .         .         .
15.70      0.8406      2.93  .    Q    .         .         .         .
15.85      0.8887      4.82  .        Q.         .         .         .
16.00      0.9600      6.67  .          .  Q      .         .         .
16.15      1.1091     17.36  .          .         .         .   Q     .
16.30      1.2395      3.65  .      Q   .         .         .         .
16.45      1.2759      2.23  .   Q      .         .         .         .
16.60      1.3004      1.71  .  Q       .         .         .         .
16.75      1.3201      1.47  . Q        .         .         .         .
16.90      1.3373      1.31  . Q        .         .         .         .
17.05      1.3528      1.18  . Q        .         .         .         .
17.20      1.3668      1.09  . Q        .         .         .         .
17.35      1.3799      1.01  . Q        .         .         .         .
17.50      1.3920      0.95  .Q         .         .         .         .
17.65      1.4035      0.90  .Q         .         .         .         .
17.80      1.4143      0.85  .Q         .         .         .         .
17.95      1.4246      0.81  .Q         .         .         .         .
18.10      1.4345      0.78  .Q         .         .         .         .
18.25      1.4438      0.73  .Q         .         .         .         .
18.40      1.4527      0.70  .Q         .         .         .         .
18.55      1.4612      0.68  .Q         .         .         .         .
18.70      1.4695      0.65  .Q         .         .         .         .
18.85      1.4775      0.63  .Q         .         .         .         .
19.00      1.4852      0.61  .Q         .         .         .         .
19.15      1.4927      0.60  .Q         .         .         .         .
19.30      1.5000      0.58  .Q         .         .         .         .
19.45      1.5072      0.57  .Q         .         .         .         .
19.60      1.5141      0.55  .Q         .         .         .         .
19.75      1.5209      0.54  .Q         .         .         .         .
19.90      1.5275      0.53  .Q         .         .         .         .
20.05      1.5340      0.52  .Q         .         .         .         .
20.20      1.5403      0.51  .Q         .         .         .         .
20.35      1.5465      0.49  Q          .         .         .         .
20.51      1.5526      0.49  Q          .         .         .         .
20.66      1.5586      0.48  Q          .         .         .         .
20.81      1.5644      0.47  Q          .         .         .         .
20.96      1.5702      0.46  Q          .         .         .         .
21.11      1.5758      0.45  Q          .         .         .         .
```

```
 21.26      1.5814      0.44  Q         .         .         .         .
 21.41      1.5868      0.44  Q         .         .         .         .
 21.56      1.5922      0.43  Q         .         .         .         .
 21.71      1.5975      0.42  Q         .         .         .         .
 21.86      1.6027      0.42  Q         .         .         .         .
 22.01      1.6079      0.41  Q         .         .         .         .
 22.16      1.6130      0.41  Q         .         .         .         .
 22.31      1.6180      0.40  Q         .         .         .         .
 22.46      1.6229      0.39  Q         .         .         .         .
 22.61      1.6278      0.39  Q         .         .         .         .
 22.76      1.6326      0.38  Q         .         .         .         .
 22.91      1.6373      0.38  Q         .         .         .         .
 23.06      1.6420      0.38  Q         .         .         .         .
 23.21      1.6466      0.37  Q         .         .         .         .
 23.36      1.6512      0.37  Q         .         .         .         .
 23.51      1.6557      0.36  Q         .         .         .         .
 23.66      1.6602      0.36  Q         .         .         .         .
 23.81      1.6646      0.35  Q         .         .         .         .
 23.96      1.6690      0.35  Q         .         .         .         .
 24.11      1.6733      0.35  Q         .         .         .         .
 24.26      1.6754      0.00  Q         .         .         .         .
-------------------------------------------------------------------------
```

Problem Descriptions:

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=========================================================================
     FLOW-THROUGH DETENTION BASIN MODEL

     SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
     CONSTANT HYDROGRAPH TIME UNIT(MINUTES) =    9.010
     DEAD STORAGE(AF) =       0.00
     SPECIFIED DEAD STORAGE(AF) FILLED =       0.00
     ASSUMED INITIAL DEPTH(FEET) IN STORAGE BASIN =    0.00
```




```
     DEPTH-VS.-STORAGE AND DEPTH-VS.-DISCHARGE INFORMATION:
     TOTAL NUMBER OF BASIN DEPTH INFORMATION ENTRIES =  10
     *BASIN-DEPTH  STORAGE    OUTFLOW  **BASIN-DEPTH  STORAGE    OUTFLOW  *
     *   (FEET)  (ACRE-FEET)   (CFS)   **   (FEET)  (ACRE-FEET)   (CFS)   *
     *      0.000      0.000      0.000**      1.000      0.035      0.388*
     *      2.000      0.095      0.388**      3.000      0.166      0.388*
     *      4.000      0.242      0.388**      5.000      0.326      0.388*
```

```
     *      6.000      0.406      0.388**      7.000      0.478      0.388*
     *      8.000      0.535      0.388**      9.000      0.541      0.388*
-------------------------------------------------------------------------------
     BASIN STORAGE, OUTFLOW AND DEPTH ROUTING VALUES:
      INTERVAL   DEPTH   {S-O*DT/2}   {S+O*DT/2}
       NUMBER   (FEET)   (ACRE-FEET)  (ACRE-FEET)
           1     0.00       0.00000      0.00000
           2     1.00       0.03254      0.03736
           3     2.00       0.09232      0.09714
           4     3.00       0.16358      0.16840
           5     4.00       0.23989      0.24471
           6     5.00       0.32325      0.32807
           7     6.00       0.40331      0.40813
           8     7.00       0.47591      0.48073
           9     8.00       0.53238      0.53720
          10     9.00       0.53905      0.54387
     WHERE S=STORAGE(AF);O=OUTFLOW(AF/MIN.);DT=UNIT INTERVAL(MIN.)
-------------------------------------------------------------------------------
     DETENTION BASIN ROUTING RESULTS:
     NOTE: COMPUTED BASIN DEPTH, OUTFLOW, AND STORAGE QUANTITIES
           OCCUR AT THE GIVEN TIME. BASIN INFLOW VALUES REPRESENT THE
           AVERAGE INFLOW DURING THE RECENT HYDROGRAPH UNIT INTERVAL.

        TIME  DEAD-STORAGE  INFLOW  EFFECTIVE  OUTFLOW  EFFECTIVE
       (HRS)   FILLED(AF)    (CFS)  DEPTH(FT)   (CFS)   VOLUME(AF)
-------------------------------------------------------------------------------
       0.082        0.000     0.00      0.00     0.00      0.000
       0.232        0.000     0.35      0.12     0.02      0.004
       0.383        0.000     0.35      0.22     0.06      0.008
       0.533        0.000     0.35      0.31     0.10      0.011
       0.683        0.000     0.35      0.38     0.13      0.013
       0.833        0.000     0.36      0.45     0.16      0.016
       0.983        0.000     0.36      0.51     0.19      0.018
       1.133        0.000     0.36      0.57     0.21      0.020
       1.284        0.000     0.36      0.61     0.23      0.021
       1.434        0.000     0.36      0.65     0.25      0.023
       1.584        0.000     0.36      0.69     0.26      0.024
       1.734        0.000     0.37      0.72     0.27      0.025
       1.884        0.000     0.37      0.75     0.29      0.026
       2.034        0.000     0.37      0.78     0.30      0.027
       2.185        0.000     0.37      0.80     0.31      0.028
       2.335        0.000     0.38      0.83     0.32      0.029
       2.485        0.000     0.38      0.84     0.32      0.030
       2.635        0.000     0.38      0.86     0.33      0.030
       2.785        0.000     0.38      0.88     0.34      0.031
       2.935        0.000     0.39      0.89     0.34      0.031
       3.086        0.000     0.39      0.91     0.35      0.032
       3.236        0.000     0.39      0.92     0.35      0.032
       3.386        0.000     0.39      0.93     0.36      0.033
       3.536        0.000     0.40      0.94     0.36      0.033
       3.686        0.000     0.40      0.95     0.37      0.033
       3.836        0.000     0.40      0.96     0.37      0.034
       3.987        0.000     0.40      0.97     0.38      0.034
       4.137        0.000     0.41      0.98     0.38      0.034
       4.287        0.000     0.41      0.99     0.38      0.035
       4.437        0.000     0.41      1.00     0.39      0.035
       4.587        0.000     0.42      1.01     0.39      0.035
       4.737        0.000     0.42      1.01     0.39      0.036
       4.888        0.000     0.42      1.02     0.39      0.036
       5.038        0.000     0.43      1.03     0.39      0.037
       5.188        0.000     0.43      1.04     0.39      0.037
       5.338        0.000     0.43      1.05     0.39      0.038
       5.488        0.000     0.43      1.06     0.39      0.038
```

5.638	0.000	0.44	1.07	0.39	0.039
5.789	0.000	0.44	1.08	0.39	0.040
5.939	0.000	0.45	1.09	0.39	0.040
6.089	0.000	0.45	1.10	0.39	0.041
6.239	0.000	0.45	1.12	0.39	0.042
6.389	0.000	0.46	1.13	0.39	0.043
6.539	0.000	0.46	1.15	0.39	0.044
6.690	0.000	0.46	1.16	0.39	0.045
6.840	0.000	0.47	1.18	0.39	0.046
6.990	0.000	0.47	1.20	0.39	0.047
7.140	0.000	0.48	1.22	0.39	0.048
7.290	0.000	0.48	1.24	0.39	0.049
7.440	0.000	0.49	1.26	0.39	0.050
7.591	0.000	0.49	1.28	0.39	0.052
7.741	0.000	0.50	1.30	0.39	0.053
7.891	0.000	0.50	1.32	0.39	0.054
8.041	0.000	0.51	1.35	0.39	0.056
8.191	0.000	0.51	1.38	0.39	0.057
8.342	0.000	0.52	1.40	0.39	0.059
8.492	0.000	0.52	1.43	0.39	0.061
8.642	0.000	0.53	1.46	0.39	0.062
8.792	0.000	0.54	1.49	0.39	0.064
8.942	0.000	0.54	1.52	0.39	0.066
9.092	0.000	0.55	1.56	0.39	0.068
9.242	0.000	0.56	1.59	0.39	0.070
9.393	0.000	0.56	1.63	0.39	0.072
9.543	0.000	0.57	1.67	0.39	0.075
9.693	0.000	0.58	1.70	0.39	0.077
9.843	0.000	0.59	1.75	0.39	0.080
9.993	0.000	0.59	1.79	0.39	0.082
10.143	0.000	0.60	1.83	0.39	0.085
10.294	0.000	0.61	1.88	0.39	0.087
10.444	0.000	0.62	1.93	0.39	0.090
10.594	0.000	0.63	1.98	0.39	0.093
10.744	0.000	0.64	2.02	0.39	0.096
10.894	0.000	0.65	2.07	0.39	0.100
11.044	0.000	0.66	2.12	0.39	0.103
11.195	0.000	0.67	2.16	0.39	0.106
11.345	0.000	0.68	2.22	0.39	0.110
11.495	0.000	0.69	2.27	0.39	0.114
11.645	0.000	0.71	2.33	0.39	0.118
11.795	0.000	0.72	2.38	0.39	0.122
11.945	0.000	0.74	2.44	0.39	0.126
12.096	0.000	0.75	2.51	0.39	0.131
12.246	0.000	0.79	2.58	0.39	0.136
12.396	0.000	0.80	2.65	0.39	0.141
12.546	0.000	0.82	2.72	0.39	0.146
12.696	0.000	0.84	2.80	0.39	0.152
12.846	0.000	0.87	2.89	0.39	0.158
12.997	0.000	0.88	2.97	0.39	0.164
13.147	0.000	0.91	3.06	0.39	0.170
13.297	0.000	0.93	3.15	0.39	0.177
13.447	0.000	0.97	3.24	0.39	0.184
13.597	0.000	0.99	3.34	0.39	0.192
13.747	0.000	1.03	3.44	0.39	0.200
13.898	0.000	1.06	3.55	0.39	0.208
14.048	0.000	1.12	3.67	0.39	0.217
14.198	0.000	1.15	3.80	0.39	0.227
14.348	0.000	1.22	3.93	0.39	0.237
14.498	0.000	1.26	4.07	0.39	0.248
14.648	0.000	1.35	4.21	0.39	0.260
14.799	0.000	1.41	4.36	0.39	0.273
14.949	0.000	1.54	4.53	0.39	0.287

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15.099        0.000     1.62      4.72     0.39      0.302
15.249        0.000     1.81      4.93     0.39      0.320
15.399        0.000     1.94      5.17     0.39      0.339
15.549        0.000     2.50      5.49     0.39      0.365
15.700        0.000     2.93      5.89     0.39      0.397
15.850        0.000     4.82      6.63     0.39      0.452
16.000        0.000     6.67      7.91     0.39      0.530
16.150     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
16.150        0.000    17.36     38.82     0.39      0.740
16.300     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
16.300        0.000     3.65     44.89     0.39      0.781
16.451     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
16.451        0.000     2.23     48.31     0.39      0.804
16.601     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
16.601        0.000     1.71     50.77     0.39      0.820
16.751     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
16.751        0.000     1.47     52.78     0.39      0.833
16.901     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
16.901        0.000     1.31     54.49     0.39      0.845
17.051     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
17.051        0.000     1.18     55.97     0.39      0.855
17.201     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
17.201        0.000     1.09     57.27     0.39      0.863
17.351     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
17.351        0.000     1.01     58.43     0.39      0.871
17.502     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
17.502        0.000     0.95     59.47     0.39      0.878
17.652     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
17.652        0.000     0.90     60.42     0.39      0.884
17.802     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
17.802        0.000     0.85     61.28     0.39      0.890
17.952     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
17.952        0.000     0.81     62.07     0.39      0.895
18.102     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
18.102        0.000     0.78     62.79     0.39      0.900
18.253     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
18.253        0.000     0.73     63.43     0.39      0.904
18.403     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
18.403        0.000     0.70     64.01     0.39      0.908
18.553     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
18.553        0.000     0.68     64.54     0.39      0.912
18.703     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
18.703        0.000     0.65     65.04     0.39      0.915
18.853     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
18.853        0.000     0.63     65.49     0.39      0.918
19.003     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
19.003        0.000     0.61     65.91     0.39      0.921
19.153     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
19.153        0.000     0.60     66.30     0.39      0.924
19.304     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
19.304        0.000     0.58     66.66     0.39      0.926
19.454     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
19.454        0.000     0.57     66.99     0.39      0.928
19.604     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
19.604        0.000     0.55     67.30     0.39      0.930
19.754     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
19.754        0.000     0.54     67.58     0.39      0.932
19.904     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
19.904        0.000     0.53     67.84     0.39      0.934
20.055     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
20.055        0.000     0.52     68.08     0.39      0.936
20.205     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
20.205        0.000     0.51     68.30     0.39      0.937
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 20.355     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 20.355        0.000     0.49     68.49     0.39      0.938
 20.505     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 20.505        0.000     0.49     68.68     0.39      0.939
 20.655     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 20.655        0.000     0.48     68.84     0.39      0.941
 20.805     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 20.805        0.000     0.47     68.99     0.39      0.942
 20.955     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 20.955        0.000     0.46     69.12     0.39      0.942
 21.106     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 21.106        0.000     0.45     69.24     0.39      0.943
 21.256     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 21.256        0.000     0.44     69.34     0.39      0.944
 21.406     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 21.406        0.000     0.44     69.44     0.39      0.945
 21.556     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 21.556        0.000     0.43     69.51     0.39      0.945
 21.706     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 21.706        0.000     0.42     69.58     0.39      0.946
 21.857     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 21.857        0.000     0.42     69.63     0.39      0.946
 22.007     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 22.007        0.000     0.41     69.68     0.39      0.946
 22.157     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 22.157        0.000     0.41     69.71     0.39      0.946
 22.307     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 22.307        0.000     0.40     69.73     0.39      0.947
 22.457     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 22.457        0.000     0.39     69.75     0.39      0.947
 22.607     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 22.607        0.000     0.39     69.75     0.39      0.947
 22.757     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 22.757        0.000     0.38     69.74     0.39      0.947
 22.908     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 22.908        0.000     0.38     69.73     0.39      0.947
 23.058     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 23.058        0.000     0.38     69.70     0.39      0.946
 23.208     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 23.208        0.000     0.37     69.67     0.39      0.946
 23.358     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 23.358        0.000     0.37     69.63     0.39      0.946
 23.508     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 23.508        0.000     0.36     69.58     0.39      0.946
 23.659     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 23.659        0.000     0.36     69.53     0.39      0.945
 23.809     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 23.809        0.000     0.35     69.46     0.39      0.945
 23.959     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 23.959        0.000     0.35     69.39     0.39      0.944
 24.109     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 24.109        0.000     0.35     69.32     0.39      0.944
 24.259     * BASIN CAPACITY EXCEEDED:  BASIN DATA IS EXTRAPOLATED *
 24.259        0.000     0.00     68.59     0.39      0.939
-------------------------------------------------------------------------
```

<u>APPENDIX D</u>: PIPE, STREET & CONC.CHANNEL HYDRAULIC CALCULATIONS - STORAGE VOLUME & OUTFALL CALCULATIONS, Ybar CALCULATIONS & WQMP WORKSHEET H

PIPE FLOW HYDRAULIC CALCULATIONS

HGL Calculator

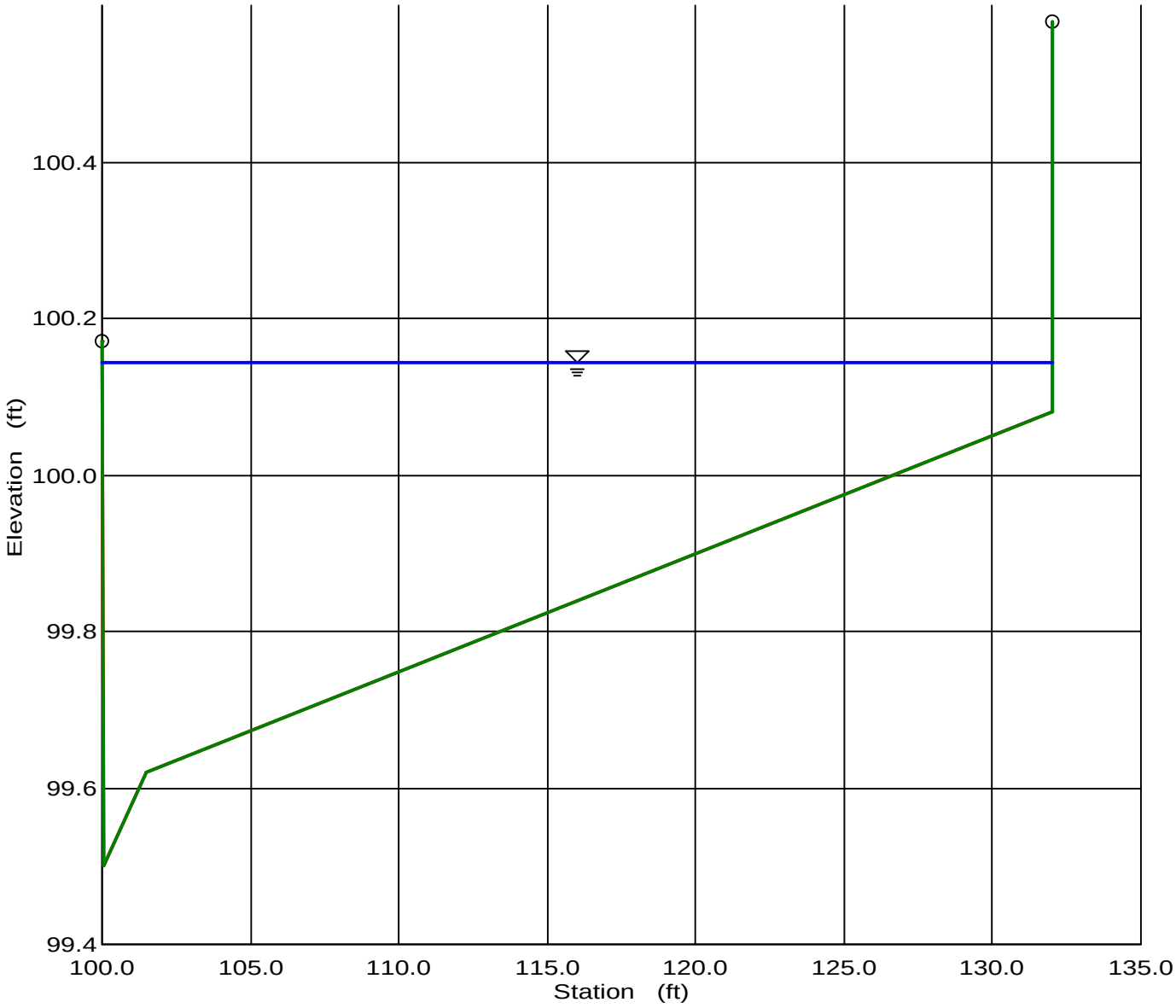
Pipe Diameter (D)	48	in
Flow (Q)	56	cfs
Manning's (n)	0.013	
Area (A)	12.56637061	$ft.^2$
Wetted Perimeter (P)	12.56637061	ft.
Hydraulic Slope (S_f)	0.00152	
Starting HGL	1600.50	
Length of Pipe	515.18	
Ending HGL	1601.28	
Head (h)	0.78	

STREET FLOWS FLOWMASTER CALCULATIONS

STREET Cross Section
Cross Section for Irregular Channel

Project Description	
Project File	c:\program files\haestad\fmw\816-1.fm2
Worksheet	STREET
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data		
Wtd. Mannings Coefficient	0.015	
Channel Slope	0.005000	ft/ft
Water Surface Elevation	100.14	ft
Discharge	30.73	cfs



STREET WORKSHEET
Worksheet for Irregular Channel

Project Description	
Project File	c:\program files\haestad\fmw\816-1.fm2
Worksheet	STREET
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data		
Channel Slope	0.005000	ft/ft
Elevation range: 99.50 ft to 100.58 ft.		
Discharge	30.73	cfs

Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
100.00	100.17	100.00	132.05	0.015
100.05	99.50			
101.50	99.62			
132.00	100.08			
132.05	100.58			

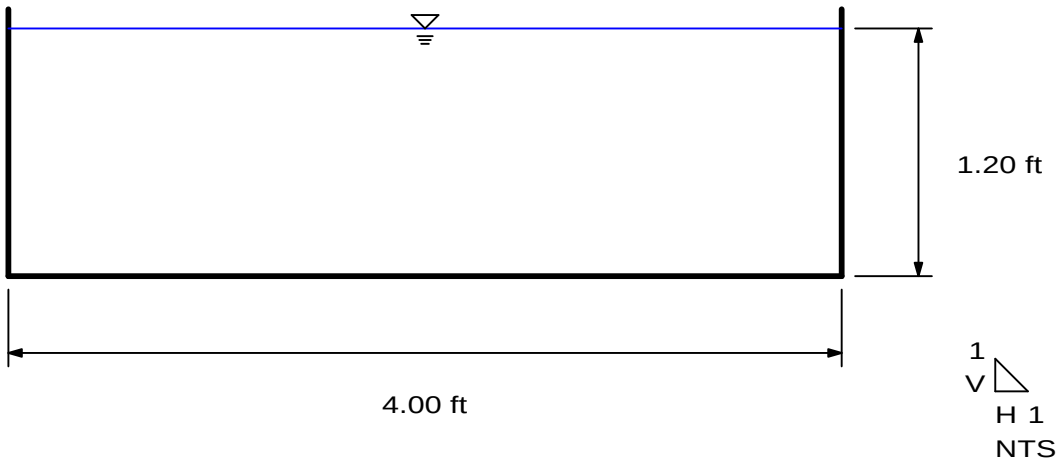
Results		
Wtd. Mannings Coefficient	0.015	
Water Surface Elevation	100.14	ft
Flow Area	9.79	ft²
Wetted Perimeter	32.67	ft
Top Width	32.00	ft
Height	0.64	ft
Critical Depth	100.14	ft
Critical Slope	0.005000	ft/ft
Velocity	3.14	ft/s
Velocity Head	0.15	ft
Specific Energy	100.30	ft
Froude Number	1.00	
Flow is subcritical.		

CONC. CHANNEL FLOWMASTER CALCULATIONS

4' CONC CHANNEL
Cross Section for Rectangular Channel

Project Description	
Project File	c:\program files\haestad\fmw\816-1.fm2
Worksheet	4' BOX
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.005000	ft/ft
Depth	1.20	ft
Bottom Width	4.00	ft
Discharge	31.85	cfs



CONC CHANNEL
Worksheet for Rectangular Channel

Project Description	
Project File	c:\program files\haestad\fmw\816-1.fm2
Worksheet	4' BOX
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.005000	ft/ft
Bottom Width	4.00	ft
Discharge	31.85	cfs

Results		
Depth	1.20	ft
Flow Area	4.78	ft²
Wetted Perimeter	6.39	ft
Top Width	4.00	ft
Critical Depth	1.25	ft
Critical Slope	0.004370	ft/ft
Velocity	6.66	ft/s
Velocity Head	0.69	ft
Specific Energy	1.88	ft
Froude Number	1.07	
Flow is supercritical.		

AREA 1 STORAGE PIPE CALCULATIONS

VOLUME = 200 LF - DUAL 96" DIA. PIPE INF. FACILITY
INFILTRATION
INFILTRATION RATE - 3.99 "/HR (WQMP Worksheet H)
FACILITY AREA - 4,000 SF
TOTAL INF. = 3.99"/HR*(1/3600 SEC/HR*1/12FT/IN)*4,000SF=0.369CFS

OUTLET		STORAGE			
HEAD (h)	OUTLET FLOW (cfs)	CF/LF	CF	AF	TOTAL
1	0.369	7.25	1450	0.03329	0.03329
2	0.369	12.40	2480	0.05693	0.09022
3	0.369	14.78	2956	0.06786	0.15808
4	0.369	15.83	3166	0.07268	0.23076
5	0.369	17.29	3458	0.07938	0.31014
6	0.369	16.61	3321	0.07625	0.38639
7	0.369	15.06	3012	0.06915	0.45554
8	0.369	11.71	2343	0.05378	0.50932
9	0.369	7.00	1400	0.03214	0.54146

AREA 2 STORAGE PIPE CALCULATIONS

VOLUME = 20 LF - 96" DIA. PIPE INF. FACILITY
INFILTRATION
INFILTRATION RATE - 3.99 "/HR (WQMP Worksheet H)
FACILITY AREA - 200 SF
TOTAL INF. = 3.99"/HR*(1/3600 SEC/HR*1/12FT/IN)200SF=0.018CFS

OUTLET		STORAGE			
HEAD (h)	OUTLET FLOW (cfs)	CF/LF	CF	AF	TOTAL
1	0.018	3.63	73	0.00167	0.00167
2	0.018	6.20	124	0.00285	0.00451
3	0.018	7.39	148	0.00339	0.00791
4	0.018	7.92	158	0.00364	0.01154
5	0.018	8.65	173	0.00397	0.01551
6	0.018	8.30	166	0.00381	0.01933
7	0.018	7.53	151	0.00346	0.02278
8	0.018	5.86	117	0.00269	0.02547
9	0.018	3.50	70	0.00161	0.02708

TOTAL BOTH SITES

HEAD (h)	OUTLET (CFS)	STORAGE TOTAL
1	0.388	0.03495
2	0.388	0.09473
3	0.388	0.16599
4	0.388	0.24230
5	0.388	0.32566
6	0.388	0.40572
7	0.388	0.47832
8	0.388	0.53479
9	0.388	0.56854

ON -SITE YBAR CALCULATIONS

DEFINITIONS:

CN - CURVE NUMBER OF HYDRAULIC SOIL COVER
S - ESTIMATE OF TOTAL SOIL CAPACITY
Ia - INITIAL ABSTRACTION
Yj - 24-HR STORM RUNOFF YIELD FRACTION
Ybar - CATCHMENT LOW LOSS FRACTION

2 YEAR STORM						
		P24 =	2.14	in.		
SUBAREA	**ACRES**	**CN**	**S**	**Ia**	**Yj**	**Yj*Aj**
A1	2.28	73	3.70	0.74	0.18	0.41
A2	1.55	73	3.70	0.74	0.18	0.28
A3	2.84	73	3.70	0.74	0.18	0.51
A4	2	73	3.70	0.74	0.18	0.36
A5	0.28	73	3.70	0.74	0.18	0.05
TOTAL	**8.95**					
				Y=(∑Yj*Aj)/A	Y=	0.18
				Ybar=1-Y	**Ybar=**	**0.82**

ON-SITE 5 YEAR STORM						
		P24 =	2.77	in.		
SUBAREA	**ACRES**	**CN**	**S**	**Ia**	**Yj**	**Yj*Aj**
A1	2.28	73	3.70	0.74	0.26	0.59
A2	1.55	73	3.70	0.74	0.26	0.40
A3	2.84	73	3.70	0.74	0.26	0.74
A4	2	73	3.70	0.74	0.26	0.52
A5	0.28	73	3.70	0.74	0.26	0.07
TOTAL	**8.95**					
				Y=(∑Yj*Aj)/A	Y=	0.26
				Ybar=1-Y	**Ybar=**	**0.74**

ON-SITE 10 YEAR STORM						
P24 = 3.29 in.						
SUBAREA	**ACRES**	**CN**	**S**	**Ia**	**Yj**	**Yj*Aj**
A1	2.28	87	1.49	0.30	0.61	1.38
A2	1.55	87	1.49	0.30	0.61	0.94
A3	2.84	87	1.49	0.30	0.61	1.72
A4	2	87	1.49	0.30	0.61	1.21
A5	0.28	87	1.49	0.30	0.61	0.17
TOTAL	**8.95**					

Y=(∑Yj*Aj)/A Y= 0.61

Ybar=1-Y **Ybar= 0.39**

CN=87 is Weighted Average for 20% Landscape and 80% Impervious Area

ON-SITE 25 YEAR STORM						
P24 = 3.99 in.						
SUBAREA	**ACRES**	**CN**	**S**	**Ia**	**Yj**	**Yj*Aj**
A1	2.28	87	1.49	0.30	0.66	1.50
A2	1.55	87	1.49	0.30	0.66	1.02
A3	2.84	87	1.49	0.30	0.66	1.87
A4	2	87	1.49	0.30	0.66	1.32
A5	0.28	87	1.49	0.30	0.66	0.18
TOTAL	**8.95**					

Y=(∑Yj*Aj)/A Y= 0.66

Ybar=1-Y **Ybar= 0.34**

CN=87 is Weighted Average for 20% Landscape and 80% Impervious Area

ON-SITE 100 YEAR STORM						
P24 = 5.08 in.						
SUBAREA	**ACRES**	**CN**	**S**	**Ia**	**Yj**	**Yj*Aj**
A1	2.28	97	0.31	0.06	0.93	2.12
A2	1.55	97	0.31	0.06	0.93	1.44
A3	2.84	97	0.31	0.06	0.93	2.64
A4	2	97	0.31	0.06	0.93	1.86
A5	0.28	97	0.31	0.06	0.93	0.26
TOTAL	**8.95**					

Y=(∑Yj*Aj)/A Y= 0.93

Ybar=1-Y **Ybar= 0.07**

WORKSHEET H

Worksheet H: Factor of Safety and Design Infiltration Rate Worksheet (DA 1 & 2)

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	2	.25
		Predominant soil texture	0.25	1	.25
		Site soil variability	0.25	1	.50
		Depth to groundwater / impervious layer	0.25	1	.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.25
B	Design	Tributary area size	0.25	2	.50
		Level of pretreatment/ expected sediment loads	0.25	1	.25
		Redundancy	0.25	1	.25
		Compaction during construction	0.25	1	.25
		Design Safety Factor, $S_B = \Sigma p$			1.25
Combined Safety Factor, $S_{Total} = S_A \times S_B$					1.5625 (Use 2.0 per Note below)
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias) (Most conservative test result)					7.98
Design Infiltration Rate, in/hr, $K_{DESIGN} = K_{Observed} / S_{Total}$					3.99

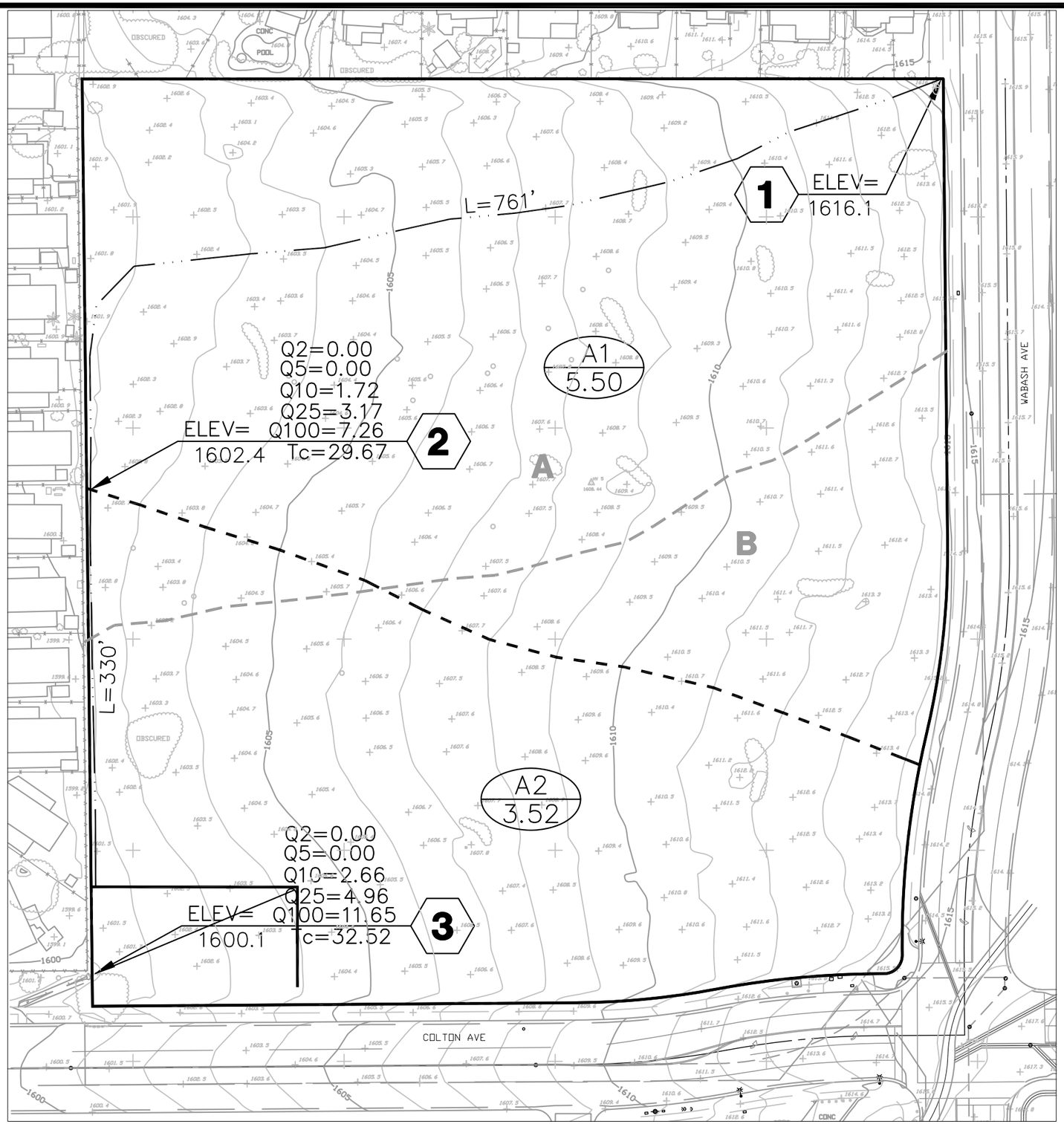
Supporting Data

Briefly describe infiltration test and provide reference to test forms:

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

EXHIBITS

EXHIBIT A: EXISTING CONDITION HYDROLOGY MAPS



LEGEND:

DISCHARGE AT NODE (Q_{100} cfs)

NODE #

SOIL TYPE

Q=13.41 EL= / Tc=11.37 527.8 (4)

B

TIME OF CONCENTRATION

F.S. ELEVATION AT NODE(ft)

DRAINAGE BOUNDARY

SUBAREA BOUNDARY

SOIL TYPE BOUNDARY

L=205'

FLOWPATH

A2 / 1.83

SUBAREA DESIGNATION

TRIBUTARY AREA (AC.)

NORTH

CA

0 80

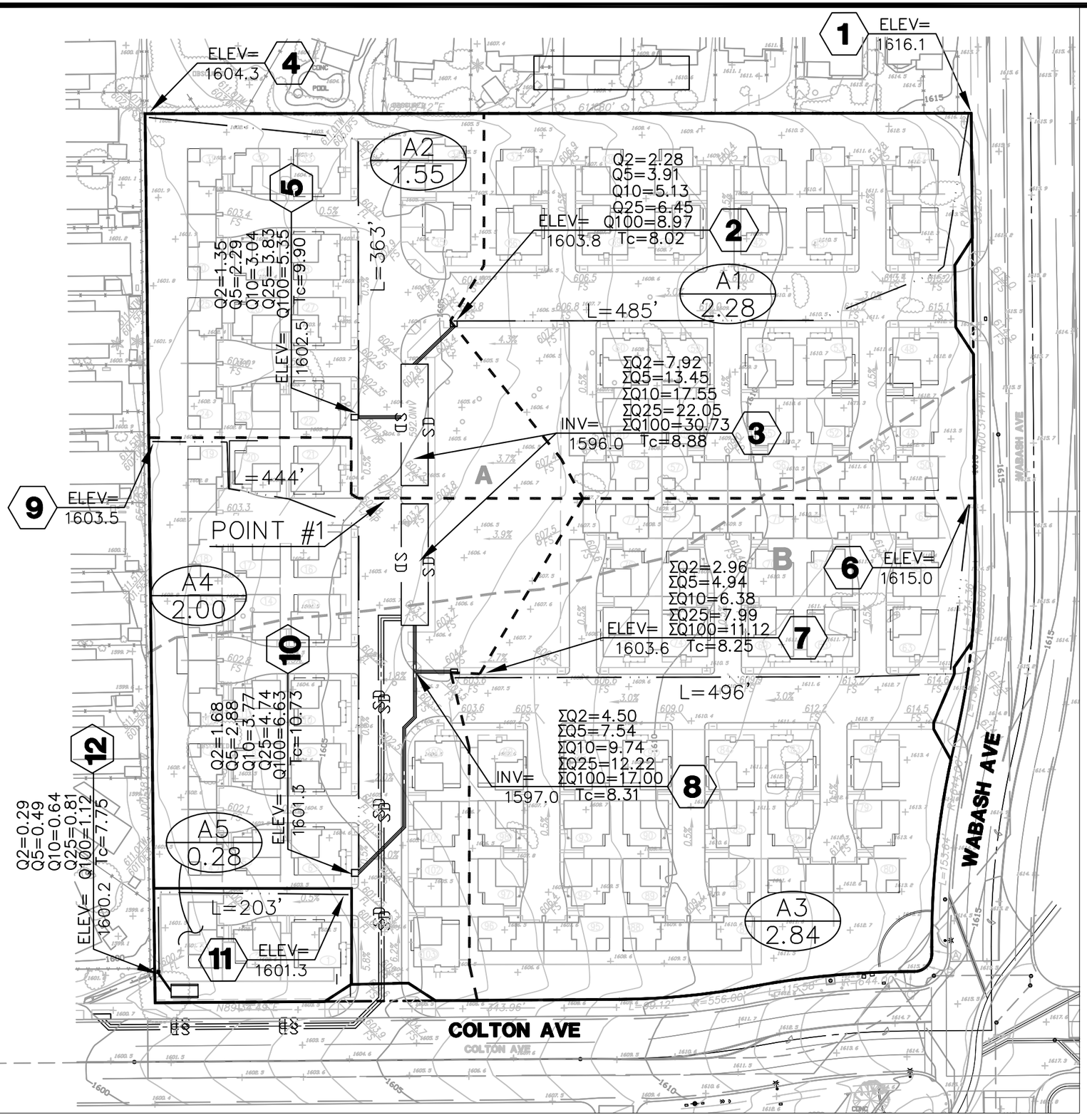
SCALE: 1"=80'

CITY OF REDLANDS

HYDROLOGY MAP (EXISTING CONDITION)

COLTON & WABASH, REDLANDS

EXHIBIT B: PROPOSED CONDITION HYDROLOGY MAP



CITY OF REDLANDS

HYDROLOGY MAP (PROPOSED CONDITION)

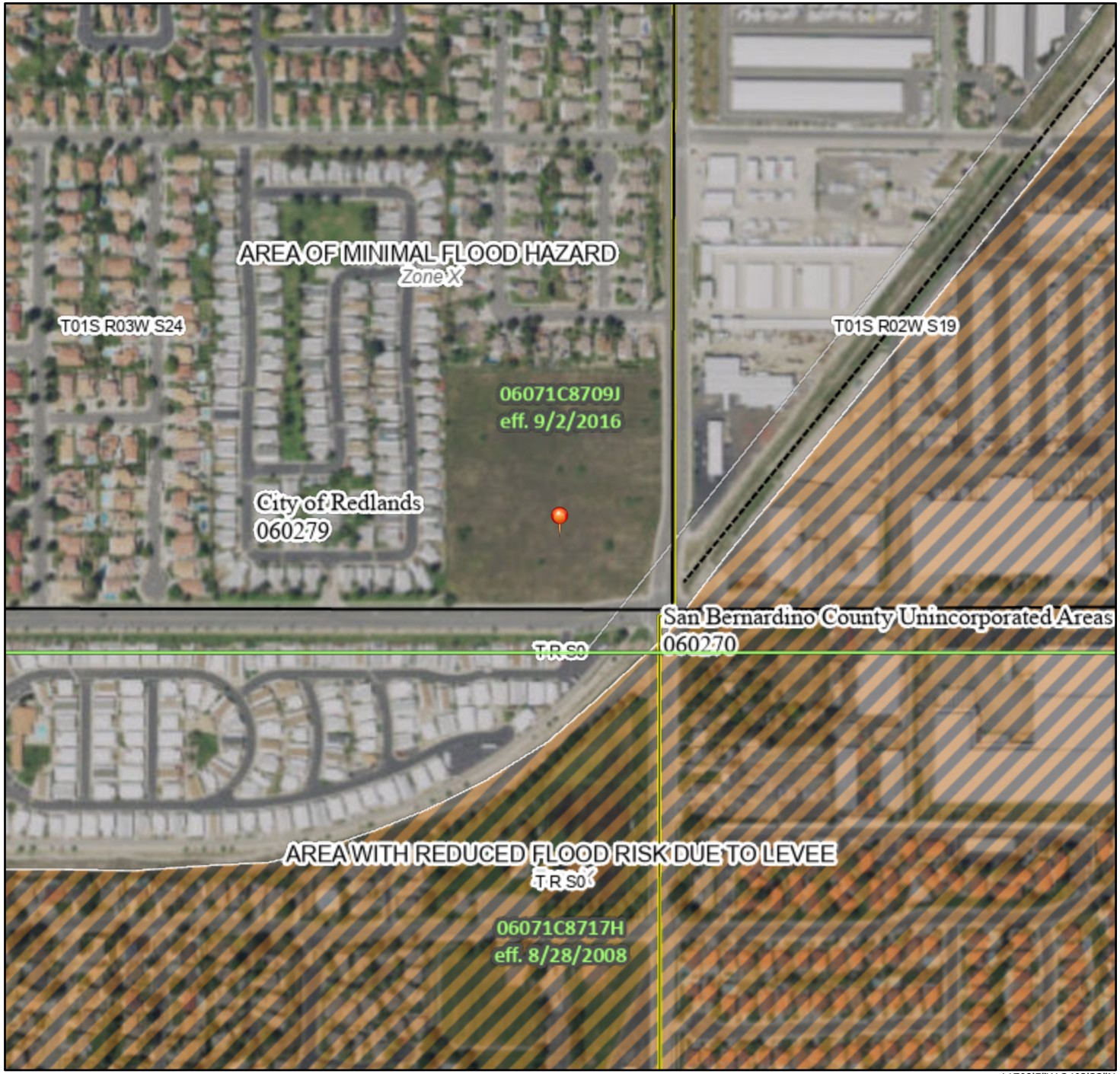
COLTON & WABASH, REDLANDS

EXHIBIT C: FIRM MAP

National Flood Hazard Layer FIRMette

FEMA

117°8'43"W 34°4'3"N



117°8'5"W 34°3'33"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/18/2022 at 6:54 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

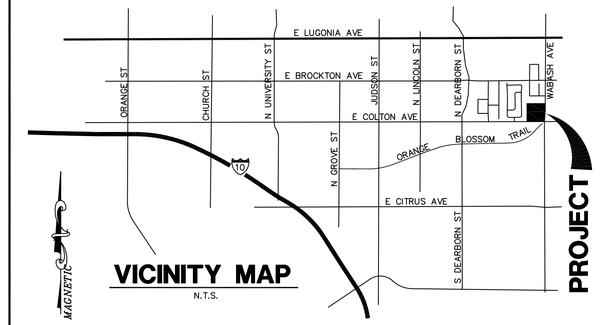
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

EXHIBIT D: WQMP SITE PLAN



BMP LEGEND

- DRAINAGE AREAS **DA 1**
- SURFACE FLOW DIRECTION
- STORM DRAIN FLOW DIRECTION
- UNDERGROUND INFILTRATION PIPE PER DETAIL HEREON
- LANDSCAPE AREA EFFICIENT IRRIGATION
  LANDSCAPE AREA RUNOFF-MINIMIZING DESIGN
- PROPOSED BUILDING
- ASPHALT CONCRETE DRIVE AISLES
- CONCRETE DRIVEWAY APPROACH
- CATCH BASIN WITH INSERT FILTER & STORM DRAIN STENCIL SIGNAGE



VICINITY MAP

N.T.S.

PROJECT DATA:

TOTAL SITE AREA OF PROPOSED DEVELOPMENT: 9.01 AC (392,503 SF)

BUILDING AREA: 122,630 SF
DRIVEWAYS / DRIVE AISLES / PARKING AREAS: 95,896 SF
WALKWAYS / CONC. HARDSCAPE: 95,476 SF

78,501 SF LANDSCAPING PROVIDED (20.0% PERVIOUS AREA)

CURRENT USE: VACANT
PROPOSED USE: RESIDENTIAL

WATERSHED:
SANTA ANA RIVER

LID DCV CALCULATION

AREA 1

AREA – 8.73 AC (380,199 SF)
RUNOFF COEFFICIENT (80% IMPERVIOUS)
C = 0.858 * (0.80)^3 –0.78 * (0.80)^2 + 0.774 * (0.80) + .04 = 0.599
2YR 1 HR STORM – 0.491 IN
P6 = 1.4807 * 0.491 = 0.727 IN
DCV = 380,199 SF * 0.599 * 0.727 IN / 12IN/FT * 1.963 = 27,084 CF

BMP VOLUME CALCULATION

BMP VOLUME
PIPE CROSS SECTIONAL AREA – (50.26) * 2 CF/LF = 100.52 CF/LF
ROCK CROSS SECTIONAL AREA – 79.48 CF/LF ROCK AREA * .35 = 27.82 CF/LF
TOTAL CROSS SECTIONAL AREA – 128.34 CF/LF * 183 LF = 23,486 CF
EFFECTIVE DEPTH – 23,486 CF / 3,660 SF BOTTOM = 6.42'

Vret = (Pdesign/12 * SAinf * Tfill) + (SAres * Dres * Nagg)
Pdesign = 7.98" MEASURED / 2.00 S.F. = 3.99"/HR
SAinf = 3,660 SF
SAres = 3,660 SF
Tfill = 3 HRS
Dres = EFFECTIVE DEPTH = 6.42'
Nagg = 1.0 (EFFECTIVE DEPTH ACCOUNTED FOR ROCK)
Vret = (3.99/12 * 3,660 * 3) + (3,660 * 6.42 * 1)
Vret = 27,148 CF
BMP VOLUME (27,148 CF) > DCV VOLUME (27,084 CF)

EXISTING CN = 38 (AREA WEIGHTED)
PROPOSED CN = 84.8 (AREA WEIGHTED)
V_{HCOC}= VOLUME REDUCTION NEEDED TO MEET HCOC REQUIREMENTS
PRE-RV = PRE-DEVELOPED RUNOFF VOLUME = 2,615 CF
POST-RV = POST DEVELOPED RUNOFF VOLUME = 28,119 CF
V_{HCOC}= (POST-RV * 0.95) – PRE-RV = (28,199 CF * 0.95) – 2,615 CF
= 24,098 CF
BMP VOLUME (27,148 CF) > V_{HCOC} (24,098 CF)

LID DCV CALCULATION

AREA 2

AREA – 0.28 AC (12,304 SF)
RUNOFF COEFFICIENT (80% IMPERVIOUS)
C = 0.858 * (0.80)^3 –0.78 * (0.80)^2 + 0.774 * (0.80) + .04 = 0.599
2YR 1 HR STORM – 0.491 IN
P6 = 1.4807 * 0.594 = 0.727 IN
DCV = 12,304 SF * 0.599 * 0.727 IN / 12IN/FT * 1.963 = 876 CF

BMP VOLUME CALCULATION

BMP VOLUME
PIPE CROSS SECTIONAL AREA – (50.26) CF/LF
ROCK CROSS SECTIONAL AREA – 39.74 CF/LF ROCK AREA * .35 = 13.91 CF/LF
TOTAL CROSS SECTIONAL AREA – 64.17 CF/LF * 20 LF = 1,283 CF
EFFECTIVE DEPTH – 1,283 CF / 200 SF BOTTOM = 6.42'

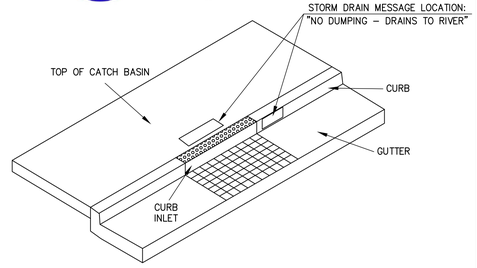
Vret = (Pdesign/12 * SAinf * Tfill) + (SAres * Dres * Nagg)
Pdesign = 7.98" MEASURED / 2.00 S.F. = 3.99"/HR
SAinf = 200 SF
SAres = 200 SF
Tfill = 3 HRS
Dres = EFFECTIVE DEPTH = 6.42'
Nagg = 1.0 (EFFECTIVE DEPTH ACCOUNTED FOR ROCK)
Vret = (3.99/12 * 200 * 3) + (200 * 6.42 * 1)
Vret = 1,484 CF
BMP VOLUME (1,484 CF) > DCV VOLUME (876 CF)

EXISTING CN = 61 (AREA WEIGHTED)
PROPOSED CN = 89.6 (AREA WEIGHTED)
V_{HCOC}= VOLUME REDUCTION NEEDED TO MEET HCOC REQUIREMENTS
PRE-RV = PRE-DEVELOPED RUNOFF VOLUME = 105 CF
POST-RV = POST DEVELOPED RUNOFF VOLUME = 1,218 CF
V_{HCOC}= (POST-RV * 0.95) – PRE-RV = (1,218 CF * 0.95) – 105 CF
= 1,052 CF
BMP VOLUME (1,484 CF) > V_{HCOC} (1,052 CF)

STENCIL SAMPLE*



*THE STENCIL SHALL BE BLUE ON A WHITE BACKGROUND WITH LETTERING 2-1/2" IN HEIGHT AND READING "NO DUMPING –DRAINS TO RIVER". A FISH OR SIMILAR WATER DEPENDENT CREATURE SILHOUETTE MAY BE INCLUDED SUBJECT TO CITY APPROVAL. IN LIEU OF A STENCIL, A CATCH BASIN CURB MARKER, CIRCULAR OR RECTANGULAR, AT LEAST 4" IN HEIGHT OR DIAMETER, MAY BE USED. THE MESSAGE WILL BE THE SAME AND IS SUBJECT TO CITY APPROVAL. A PAINTED CIRCULAR STENCIL SHALL NOT BE BIGGER THAN 8"IN DIAMETER. LEGIBILITY WILL BE CHECKED AND REPAINTED ANNUALLY.



STORM DRAIN STENCIL SIGNAGE - CURB INLET

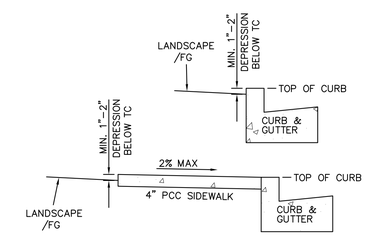
NTS

BMP LOCATIONS

AREA#1 – LATITUDE: 34.063951° / LONGITUDE: –117.140385°
AREA#2 – LATITUDE: 34.062953° / LONGITUDE: –117.140843°

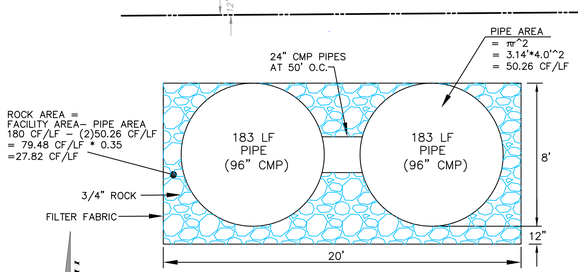
FEASIBILITY CONSTRAINTS

THERE ARE NO FEASIBILITY CONSTRAINTS FOR INFILTRATION



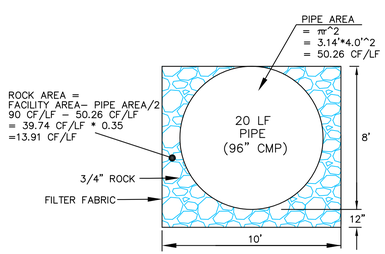
LANDSCAPE DEPRESSION DETAIL

SCALE: 1"=2'



DUAL INFILTRATION BMP CROSS SECTION

SCALE: 1"=4'



INFILTRATION BMP CROSS SECTION

SCALE: 1"=4'

NORTH

GRAPHIC SCALE
0 50
(IN FEET)
1 inch = 50 ft.

PRELIMINARY WQMP SITE PLAN
COLTON AVE + WABASH AVE
REDLANDS, CA

Soni 2012 Irrevocable Trusts
1423 Georgina Avenue Santa Monica
Santa Monica, CA 90402
(949) 922-7075
Contact: Vanita Soni Puri

REGISTERED PROFESSIONAL ENGINEER FRED CORNWELL No. 45591 CIVIL STATE OF CALIFORNIA

FRED CORNWELL R.C.E. 45591 DATE

PREPARED BY:
CA ENGINEERING, INC.
Planning • Engineering • Surveying
13821 NEWPORT AVE., STE 110
TUSTIN, CA 92780
949-724-9480 949-724-9484 FAX

DATE	BY	REVISION

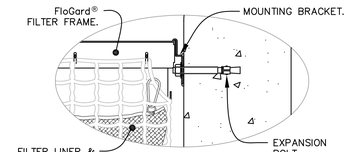
SHEET C1.3
DATE Oct 05 2022
JOB NO. 816-1
Sht. C-2

FloGard®

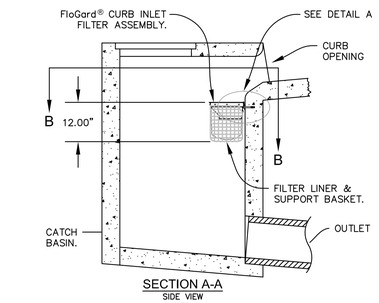
Catch Basin Insert Filter

Curb Inlet Style

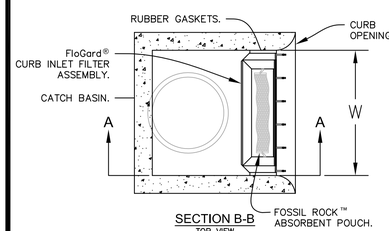
DRAWING NO. FGP-0002



DETAIL A
MOUNTING BRACKET & EXPANSION BOLTS
SEE NOTE 2
NTS



SECTION A-A
SIDE VIEW
NTS



SECTION B-B
TOP VIEW
NTS

NOTES:

1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be Fossil Rock, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

EXHIBIT E: GEOTECHNICAL PERCOLATION TESTING REPORT

Geotechnical
Environmental
Hydrogeology
Material Testing
Construction Inspection

April 8, 2022 Project No. 22-7455

Vanita Soni Puri
1423 Georgina Ave.,
Santa Monica, CA 90402

Subject: Preliminary Geotechnical Investigation Report, Northwest Corner of E. Colton Avenue and N. Wabash Avenue, Redlands, California 92374, APN 0168-291-02.

Vanita,

In accordance with your request and authorization, TGR Geotechnical, Inc. (TGR) has performed a preliminary geotechnical investigation for the proposed development at the subject site in the city of Redlands, California. The subject site is an approximately 9-acre, undeveloped parcel of land covered in grass and vegetation. It is our understanding that the proposed development will consist of 103 single family homes with associated streets, driveways, parking, and a central common open park space. This report presents the findings of our geotechnical investigation, including site seismicity, settlement potential, infiltration rates and provides geotechnical design recommendations for the proposed improvements. The work was performed in general accordance with our proposal dated March 7, 2022.

Based on our investigation the proposed development is feasible from a geotechnical viewpoint provided the recommendations presented in this report are implemented during design and construction.

If you have any questions regarding this report, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

TGR GEOTECHNICAL, INC.

Robert Aguilar
Staff Engineer

REGISTERED PROFESSIONAL ENGINEER
SANJAY GOVIL
No. GE2382
EXP. 6/30/2022
GEOTECHNICAL
STATE OF CALIFORNIA

Sanjay Govil, PhD, PE, GE 2382
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EDWARD LOUIS BURROWS
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ATTACHMENTS

Plate 1 – Boring Location Map

Figure 1 – Site Location Map
Figure 2 – Regional Geology Map
Figure 3 – Regional Fault Map
Figure 4 – Seismic Hazard Zone Map

Table 1 – Percolation Test Worksheet

Appendix A – References
Appendix B – Log of Borings
Appendix C – Laboratory Testing Procedures and Results
Appendix D – Site Seismic Design and Deaggregated Parameters
Appendix E – Standard Grading Specifications

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INTRODUCTION

Site Descriptions and Proposed Project Development

The subject site is located on the northwest corner of E. Colton Avenue and N. Wabash Avenue in the city of Redlands, California (Figure 1). The subject site is an approximately 9-acre, undeveloped parcel of land covered in grass and vegetation. It is our understanding that the proposed development will consist of 103 single family homes with associated streets, driveways, parking, and a central common open park space. No grading plans were available at the time of this report. However, it is our understanding that minor cuts and fills will be required to reach design grades.

Scope of Work

The scope of work for this preliminary geotechnical investigation included the following:

- Site reconnaissance to assess current site conditions, mark boring locations and call Dig-Alert for utility clearance.
- Sampling and logging nine (9) borings utilizing a hollow stem drill rig to approximate depths ranging from 3 to 9 feet at the subject site to evaluate subsurface soil conditions. All borings encountered refusal due to cobbles. The borings were backfilled with cuttings and surface tamped.
- Percolation testing of the near surface soils at two (2) locations from depths of 5 to 9 feet below existing grade. The testing procedures followed the County of San Bernardino guidelines.
- Laboratory testing of selected samples to include in-situ moisture and dry density, maximum density and optimum moisture content, shear, consolidation, passing No. 200 sieve, corrosion series and R-value.
- Engineering analysis including infiltration rates, site seismicity, seismic settlement, foundation design and soils engineering/earthwork with respect to the suitability of the proposed development.
- Preparation of this report summarizing current subsurface soil conditions, findings, and presenting our recommendations for the proposed development.

Field Investigation

Field exploration was performed on March 15th, 2022 by members from our firm who logged the borings and obtained representative samples, which were subsequently transported to the laboratory for further review and testing. The approximate locations of the borings are indicated on the enclosed Boring Location Map (Plate 1).

The subsurface conditions were explored by drilling, sampling, and logging nine (9) borings with a truck mounted hollow stem auger drill rig. Borings B-1 through B-9 were advanced to approximate depths ranging from 3 to 9 feet below existing grade. All borings encountered refusal in cobbles and/or boulders. Subsequent to drilling, all borings were backfilled with excavated soil and surface tamped. The log of borings presenting soil conditions and descriptions are presented in Appendix B.

The drill rig was equipped with a sampling apparatus to allow for recovery of driven modified California Ring Sampler (CRS), 3-inch outside diameter, and 2.42-inch inside diameter and SPT samples.

The samples were driven using an automatic 140-pound hammer falling freely from a height of 30 inches. The blow counts for CRS were converted to equivalent SPT blow counts. Soil descriptions were entered on the logs in general accordance with the Unified Soil Classification System (USCS). Driven samples and bulk samples of the earth materials encountered at selected intervals were recovered from the borings. The locations and depths of the soil samples recovered are indicated on the boring logs in Appendix B.

Two (2) percolation test borings, B-5/P-1 and P-2, were advanced to an approximate depth of 9 feet below existing ground surface and percolation testing was performed at depths of approximately 5 to 9 feet below existing grade. Subsequent to percolation testing the borings were backfilled with excavated soils and surface tamped.

Percolation Testing

Upon completion of drilling and sampling Borings B-5/P-1 and P-2 were converted into a field percolation test well. Field percolation testing was performed in general accordance with the with the San Bernardino Technical Guidance for WQMP for sandy soils.

The boreholes were converted to field percolation test wells by placing approximately two inches of gravel at the bottom of the borehole, installing three-inch diameter PVC pipes and backfilling the annular space with gravel. A correction factor was applied to account for the placement of gravel.

Infiltration test rates were determined utilizing the referenced County of San Bernardino guidelines. Results of the infiltration testing are summarized in Table 1 below:

Table 1 – Infiltration Rates

Test Location	Test Depth (feet)	Infiltration Rate (Inches/hour)
B-5/P-1	5-9	10.45
P-2	5-9	7.98

Suitability Assessment Safety Factor

Factor values (v), for Factor Category A, were assigned according to the San Bernardino Technical Guidance Document for WQMP, VII.4.

Table 2 (below) presents assigned factor values and the calculated Suitability Assessment Safety Factor (Σp) in Worksheet H from the San Bernardino Technical Guidance Document for WQMP Appendix VII.

Table 2 – Worksheet H

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w * v
A	Suitability Assessment	Soil assessment methods	0.25	2	0.50
		Predominant soil texture	0.25	1	0.25
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	1	0.25
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.25

The above values should be used in conjunction with Factor Category B parameters (to be determined by others) as specified in Worksheet H of the San Bernardino Technical Guidance Document for WQMP Appendix VII to evaluate the combined safety factor that should be applied to the tested infiltration rates.

Laboratory Testing

Laboratory tests were performed on representative samples to verify the field classification of the recovered samples and to evaluate the geotechnical properties of the subsurface soils. The following tests were performed:

- In-situ Moisture Content (ASTM D2216) and Dry Density (ASTM D7263);
- Maximum Dry Density and Optimum Moisture Content (ASTM D1557);
- Direct Shear Strength (ASTM D3080);
- Consolidation (ASTM D2435);
- Expansion Potential (ASTM D4829);
- Passing No. 200 Sieve (ASTM 1140);
- R-value (CAL 301); and
- Corrosion series:
    1. Soluble Sulfate (CAL.417A);
    2. Soluble Chlorides (CAL.422);
    3. Minimum Resistivity (CAL.643); and
    4. pH (CAL 747)

Laboratory tests for geotechnical characteristics were performed in general accordance with the ASTM procedures. The results of the in-situ moisture content and density tests are shown on the borings logs. The results of other laboratory tests are presented in Appendix C.

GEOTECHNICAL FINDINGS

Geology

Regional Geologic Setting

The project site is located in the east central portion of the Redlands 7.5-minute quadrangle, San Bernardino County, California. Per the Geologic Map of the Harrison Mountain/north ½ of Redlands quadrangle, California (Dibblee, 2004), the subject site is underlain by Quaternary alluvium, consisting of gravel and sand of stream channels. Figure 2 presents the Regional Geology Map.

Earth Units

Based on our subsurface investigation, the subject area is generally underlain by approximately 5 feet of light brown silty sand, with some gravel in a dry condition. The silty sand is underlain by sand, gravel and cobbles to an approximate depth of 9 feet below existing grade, the maximum depth explored. Detailed descriptions of the earth units encountered in our borings are presented in the log of the borings. (Appendix B)

Groundwater

Subsurface water was not encountered to a depth of approximately 9 feet below existing grade during the subsurface exploration.

USGS groundwater data from wells nearest to the subject site indicate a historic high groundwater of between 49 feet below existing grade and 1601 feet above NGVD 1929 (USGS 340346117080001 001S002W30C001S).

Seasonal and long-term fluctuations in the groundwater may occur as a result of variations in subsurface conditions, rainfall, run-off conditions and other factors. Therefore, variations from our observations may occur. Static groundwater is not anticipated to impact the proposed development.

Static groundwater is not anticipated to impact the proposed development.

Expansive Soil

Onsite soils have a tested expansion index of 0, correlating to a “very low” expansion potential. The recommendations provided in this report account for the expansion potential of the onsite soils.

Hydro Collapse

Laboratory testing indicates near surface soils undergo approximately 1% to 2% hydro collapse when inundated under load, correlating to a “low” potential for hydro collapse. The recommendations in this report account for the hydro collapse potential of near surface soils.

Cement Type and Corrosion

Based on laboratory testing concrete used should be designed in accordance with the provisions of ACI 318-14, Chapter 19 for Exposure Class S0: Cement with a minimum unconfined compressive strength of 2,500 psi, and for Exposure Class C1 (Moderate) – Concrete exposed to moisture but not a significant source of chlorides, per ACI 318-14 Table 19.3.1.1.

Corrosion tests indicate a mild corrosion potential for ferrous metals exposed to site soils.

TGR does not practice corrosion engineering. If needed, a qualified specialist should review the site conditions and evaluate the corrosion potential of the site soil to the proposed improvements and to provide the appropriate corrosion mitigations for the project.

Seismic Review

Faulting and Seismicity

The subject site, like the rest of Southern California, is located within a seismically active region as a result of being located near the active margin between the North American and Pacific tectonic plates. The principal source of seismic activity is movement along the northwest-trending regional faults such as the San Andreas, San Jacinto and Elsinore fault zones. These fault systems produce approximately 5 to 35 millimeters per year of slip between the plates.

We consider the most significant geologic hazard to be the potential for moderate to strong seismic shaking that is likely to occur at the subject site. The subject site is located in the highly seismic Southern California region within the influence of several faults that are considered to be Holocene-active or pre-Holocene faults. A Holocene-active fault is defined by the State of California as a fault that has exhibited surface displacement within the Holocene time (about the last 11,700 years). A pre-Holocene fault is defined by the State as a fault whose history of past movement is older than 11,700 years ago and does not meet the criteria for a Holocene-active fault.

These Holocene-active and pre-Holocene faults are capable of producing potentially damaging seismic shaking at the site. It is anticipated that the subject site will periodically experience ground acceleration as the result of small to moderate magnitude earthquakes. Other active faults without surface expression (blind faults) or other potentially active seismic sources that are not currently zoned and may be capable of generating an earthquake are known to be present under in the region.

The subject site is not included within any Earthquake Fault Zones as created by the Alquist-Priolo Earthquake Fault Zoning Act (Hart, 1997). Our review of geologic literature pertaining to the site area indicates that there are no known active or potentially active faults located within or immediately adjacent to the subject property.

The nearest fault to the subject site is the Redlands fault mapped approximately 0.7 miles southeast of the site. Other nearby faults include the Reservoir Canyon fault mapped approximately 1.6 miles to the southeast of the site, the Crafton Hills fault mapped approximately 2.9 miles southeast of the site, the Western Heights fault mapped approximately 3.1 miles southeast of the site, the South Branch San Andreas fault mapped approximately 3.1 miles northeast of the site, the Chicken Hill fault mapped approximately 4.3 miles southeast of the site, the Live Oak Canyon fault mapped approximately 4.4 miles southwest of the site, the Mill Creek fault mapped approximately 5.1 miles northeast of the site and the Loma Linda fault mapped approximately 5.6 miles to the southwest of the site. The Regional Fault Map, Figure 3, shows the location of the subject site in respect to the regional faults.

Secondary Seismic Hazards

Surface Fault Rupture and Ground Shaking

Since no known faults are located within the site, surface fault rupture is not anticipated. However, due to the close proximity of known active and potentially active faults, severe ground shaking should be expected during the life of the proposed structures.

Liquefaction

Liquefaction is a seismic phenomenon in which loose, saturated, fine-grained granular soils behave similarly to a fluid when subjected to high-intensity ground shaking. Liquefaction occurs when these ground conditions exist: 1) Shallow groundwater; 2) Low density, fine, clean sandy soils; and 3) High-intensity ground motion. Effects of liquefaction can include sand boils, settlement, and bearing capacity failures below foundations.

A review of the San Bernardino County General Plan: Geologic Hazard Overlays, Map FH31C indicates that the subject site is not located within an area mapped as having a potential for earthquake induced liquefaction (Figure 4).

Based on the above and depth to groundwater, potential for liquefaction is considered to be negligible.

Seismically Induced Settlement

Ground accelerations generated from a seismic event can produce settlements in sands or in granular earth materials both above and below the groundwater table. This phenomenon is often referred to as seismic settlement and is most common in relatively clean sands, although it can also occur in other soil materials. Based on the nature and density of site soils encountered, seismic settlement is anticipated to be negligible.

Landsliding

Landsliding involves downhill motion of earth materials during or subsequent to earth shaking. Historically, landslides triggered by earthquakes have been a significant cause of damage. Areas that are most susceptible to earthquake induced landslides are areas with steep slopes in poorly cemented or highly fractured bedrock, areas underlain by loose, weak soils, and areas on or adjacent to existing landslide deposits.

A review of the San Bernardino County General Plan: Geologic Hazard Overlays, Map FH31C, this property is not located within a mapped zone of landsliding and adjacent areas are situated on relatively flat topography. Based on the above, the general landslide susceptibility is considered to be negligible.

Lateral Spreading

Seismically induced lateral spreading involves primarily movement of earth materials due to earth shaking. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. The topography in the vicinity of the subject site is relatively flat. Based on the above and absence of liquefaction, the potential for lateral spreading at the subject site is considered very low.

DISCUSSIONS AND CONCLUSIONS

General

Based on our field exploration, laboratory testing and engineering analysis, it is our opinion that the proposed structure and proposed grading will be safe against hazard from landslide, settlement, or slippage and the proposed construction will have no adverse effect on the geologic stability of the adjacent properties provided our recommendations presented in this report are followed.

Conclusions

Based on our findings and analyses, the subject site is likely to be subjected to moderate to severe ground shaking due to the proximity of known active and potentially active faults. This may reasonably be expected during the life of the structure and should be designed accordingly.

The primary conditions affecting the proposed project site development are as follows:

- Potential for caving during excavation.
- The site is underlain by alluvium composed of gravels, cobbles, and boulders in a sandy matrix. As such, oversized materials are anticipated to be encountered during grading operations.

The engineering evaluation performed concerning site preparation and the recommendations presented are based on information provided to us and obtained by us during our office and fieldwork. This report is prepared for the development of 103 single family homes with associated streets, driveways, parking, and a central common open park space. In the event that any significant changes are made to the proposed development, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the recommendations of this report are verified or modified in writing by TGR.

RECOMMENDATIONS

Seismic Design Parameters

When reviewing the 2019 California Building Code the following data should be incorporated into the design.

Parameter	Value
Latitude (degree)	34.0638
Longitude (degree)	-117.1400
Site Class	D – Stiff Soil
Site Coefficient, F_a	1.0
Site Coefficient, F_v	N/A
Mapped Spectral Acceleration at 0.2-sec Period, S_s	1.914 g
Mapped Spectral Acceleration at 1.0-sec Period, S_1	0.789 g
Spectral Acceleration at 0.2-sec Period Adjusted for Site Class, S_{MS}	2.914 g
Spectral Acceleration at 1.0-sec Period Adjusted for Site Class, S_{M1}	N/A
Design Spectral Acceleration at 0.2-sec Period, S_{DS}	1.276 g
Design Spectral Acceleration at 1.0-sec Period, S_{D1}	N/A

Site Specific Response Spectra

The USGS Unified Hazard tool, the USGS RTGM Calculator and the USGS App for Deterministic Spectra Acceleration were utilized to develop site specific ground motion spectra. The analysis was performed utilizing the following attenuation relationships that are part of NGA as required by 2019 CBC code requirements.

- Campbell & Bozorgnia (2014)
- Boore, Stewart, Seyhan & Atkinson (2014)
- Chiou & Youngs (2014)
- Abrahamson, Silva & Kamal (2014)

The results of the Site Specific Response Spectra are incorporated in Table 1 and on Figure 1 in Appendix D. The results include deterministic spectra at 5% damping, maximum rotated component at 0.84 fractile and the probabilistic spectra, maximum rotated component at 5% damping for a return period of 2475 year and subsequently multiplied by risk coefficient to obtain the MCER probabilistic spectral acceleration. The Vs30 utilized was 260 m/s.

The probabilistic response spectrum was determined using the OSHPD generated seismic values and raw output generated from the U.S. Geological Survey Unified Hazard Tool. The spectral response acceleration data generated from the U.S. Geological Survey Unified Hazard Tool was entered into the U.S. Geological Survey Risk-Targeted Ground Motion Calculator tool for each time period. The data is presented on Table 2 in Appendix D.

The deterministic response spectrum was determined using the greatest Deaggregation Contributor from the U.S. Geological Survey Unified Hazard Tool. The largest contributing fault parameters were entered into the Pacific Earthquake Engineering Research Center NGAW2 tool with a user defined sigma + 5% damping. For the deterministic analysis for the subject site, the fault utilized was the San Andreas (San Bernardino S) fault, with a characteristic magnitude M of 7.47 and a fault distance R of 5.81 km. The data is presented on Table 3 in Appendix D.

The above generated spectral accelerations were compared against the minimum code requirements in ASCE7-16 (Chapters 11 and 21) resulting in the final design response spectra which is presented in Table 1 and on Figure 1 in Appendix D.

Based on Table 1 and Figure 1, the recommended Site Specific S_{DS} and S_{D1} are as follows:

S_{DS} = 1.211
S_{D1} = 1.409

Mapped values may be used in lieu of site-specific values to design structures on Site Class D sites with an S1 greater than or equal to 0.2, provided the value of the seismic response coefficient Cs is determined by Eq. (12.8-2) for values of T ≤ 1.5Ts and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for TL ≥ T > 1.5Ts or Eq. (12.8-4) for T > TL.

The structural consultant should review the above parameters and the 2019 California Building Code to evaluate the seismic design.

Conformance to the criteria presented in the above table for seismic design does not constitute any type of guarantee or assurance that significant structural damage or ground failure will not occur during a large earthquake event. The intent of the code is “life safety” and not to completely prevent damage of the structure, since such design may be economically prohibitive.

Foundation Design Recommendations

The proposed residential structures may be supported on continuous and/or spread footings. Bearing capacity recommendations for shallow foundations are presented below. These recommendations assume that the footings will be supported on a minimum of two (2) feet of engineered fill.

For foundations supported on two (2) feet of engineered fill with minimum ninety (90) percent relative compaction at near optimum moisture content, an allowable bearing pressure of 2,500 pounds per square foot may be used in design.

The allowable bearing pressure for shallow foundations supported on minimum ninety (90) percent compacted fill shall be equal to 2,000 pounds per square foot. The recommended minimum footing depth is twelve (12) inches for single story structures and eighteen (18) inches for 2-story structures.

The minimum recommended continuous footing width is fifteen (15) inches for single story structures, eighteen (18) inches for 2-story structures and twenty-four (24) inches for pad footings. A minimum reinforcement of two (2) No. 4 steel bar top and two (2) No. 4 steel bar bottom is required for continuous footings from a geotechnical viewpoint. Foundation design details such as concrete strength, reinforcements, etc should be established by the Structural Engineer.

A one-third (1/3) increase on the aforementioned bearing pressure may be used in design for short-term wind or seismic loads.

The total and differential static settlement is anticipated to be 1 inch and 0.5 inches over 30 feet or less.

Resistance to lateral loads including wind and seismic forces may be provided by frictional resistance between the bottom of concrete and the underlying fill soils and by passive pressure against the sides of the foundations. A coefficient of friction of 0.43 may be used between concrete foundation and underlying soil. The recommended passive pressure of the engineered fill may be taken as an equivalent fluid pressure of 300 pounds per cubic foot (3,000 psf max).

Footings located near property lines where the lateral removal cannot be achieved shall be designed for a reduced bearing capacity of 1,500 pounds per square foot and the passive resistance shall be ignored.

Slab-On-Grade

Slab-on-grade should be a minimum of five (5) inches thick and reinforced with a minimum of No. 4 reinforcing bar on 18-inch centers in two horizontally perpendicular directions. Reinforcing should be properly supported to ensure placement near the vertical midpoint of the slab. "Hooking" of the reinforcement is not considered an acceptable method of positioning the steel. The slab should not be structurally connected to the buildings.

Subgrade material for the slab-on-grade should be compacted to a minimum of ninety (90) percent of the maximum laboratory dry density to a minimum depth of two (2) feet. Prior to placement of concrete, the subgrade soils should be moistened to near optimum moisture content and verified by our field representative.

The actual thickness and reinforcement of the slab shall be designed by the structural engineer per the 2019 California Building Code.

For moisture sensitive flooring, the floor slab should be underlain by an impermeable polyethylene membrane (Stego Wrap, Moistop Plus, or any equivalent meeting the requirements of ASTM D1745) as a capillary break. The membrane shall be a minimum 10-mil thick and overlain and underlain by a minimum of 2-inch thick layer of moistened (not saturated) sand to both protect the membrane and provide proper concrete curing. The polyethylene membrane joints should be lapped not less than 6 inches.

Flatwork

Flatwork should be a minimum of four (4) inches thick should be reinforced with a minimum of No. 3 reinforcing bar on 24-inch centers in two horizontally perpendicular directions. Reinforcing should be properly supported to ensure placement near the vertical midpoint of the slab. "Hooking" of the reinforcement is not considered an acceptable method of positioning the steel. The subgrade material should be compacted to a minimum of ninety (90) percent of the maximum laboratory dry density (ASTM D1557) to a minimum depth of one (1) foot. Prior to placement of concrete, the subgrade soils should be moistened to near percent of optimum moisture content and verified by our field representative. The actual thickness and reinforcement of the slab shall be designed by the structural engineer and should include the anticipated loading condition.

Retaining Wall Recommendations

The following soil parameters may be used for the design of the retaining wall with level backfill and a maximum height of six (6) feet:

Conditions	Parameters
Active (Level)	35 psf/ft
Passive	300 (maximum 3,000 psf)
Friction Coefficient	0.43

- Unrestrained retaining wall, such as a cantilever wall, the active earth pressure shall be used.
- Any import backfill shall be granular non-expansive select fill with a minimum sand equivalent of 30 The import fill should be tested and approved by TGR prior to backfill.
- An allowable coefficient of friction between properly compacted on-site fill soil and concrete of 0.43 may be used with the dead-load forces.
- Passive pressure and frictional resistance could be combined in determining the total lateral resistance. However, one of them shall be reduced by 50 percent.
- The passive pressure in the upper 6 inches of soil not confined by slabs or pavement should be neglected.

Retaining structures should be provided with a drainage system to prevent buildup of hydrostatic pressure behind the walls. Provisions should be made to collect and dispose of excess water away from the wall. Wall drainage may be provided by a perforated pipe encased in gravel or crushed rock and enclosed by geo-synthetic filter fabric. We do not recommend omitting the drains behind walls.

In addition to the above lateral forces due to retained earth, surcharge due to improvements, such as an adjacent structure, should be considered in the design of the retaining wall. A minimum vertical surcharge load of 300 psf should be used in design of walls due to adjacent traffic unless the traffic is kept at least 6 feet from the walls. Loads applied within a 1:1 projection from any surcharging structure on the stem of the wall shall be considered as lateral surcharge.

For uniform lateral surcharge conditions applied to free-to-deflect walls and restrained walls, we recommend utilizing a minimum horizontal load equal to 33 percent and 50 percent of the vertical load, respectively, and should be applied uniformly over the entire height of the wall. This horizontal load should be applied below the 1:1 projection plane. To minimize the surcharge load from an adjacent footing, deepened footings may be considered.

Retaining wall footings should have a minimum embedment of twenty-four (24) inches below the lowest adjacent grade. The retaining walls footings shall be supported on a minimum two (2) feet of compacted engineered fill compacted to a minimum ninety (90) percent relative compaction as per ASTM D1557.

Shrinkage/Subsidence

Removal and recompaction of the near surface soils is estimated to result in shrinkage ranging from 5 to 10 percent. Based on our previous experience with similar projects, additional volume loss can be anticipated due to the presence of oversized materials in the near surface soils. Minor ground subsidence is expected to occur in the soils below the zone of removal, due to settlement and machinery working. The subsidence is estimated to be between one and two tenths of a foot.

Site Development Recommendations

General

During earthwork construction, all site preparation and the general procedures of the contractor should be observed, and the fill selectively tested by a representative of TGR. If unusual or unexpected conditions are exposed in the field, they should be reviewed by this office and if warranted, modified and/or additional recommendations will be offered. During demolition of the existing buildings, large concrete slab and associated site work, voids created from removal of buried elements (footings, pipelines, septic pits, etc.) shall be backfilled with engineered fill to a minimum ninety (90) percent relative compaction per ASTM D1557 under the observation of TGR.

Grading

All grading should conform to the guidelines presented in the California Building Code (2019 edition), except where specifically superseded in the text of this report. Prior to grading, TGR's representative should be present at the pre-construction meeting to provide grading guidelines, if needed, and review any earthwork. Oversize particles may be encountered during grading. All particles greater than 4-inches shall be removed and disposed offsite.

Oversized materials may be crushed to 1" minus and mixed with onsite soil in a controlled manner as recommended by the geotechnical consultant and used as engineered fill.

The footings and slab-on-grade shall be supported on a minimum two (2) feet of engineered fill. A minimum one (1) foot of engineered fill is recommended under flatwork and pavement. Site soils may be reused as engineered fill provided, they are free of oversized particles and the recommendations presented in this report are implemented. Exposed bottoms should be scarified a minimum of 6-inches, moisture conditioned to near optimum moisture and compacted to a minimum ninety (90) percent relative compaction. Subsequently, site fill soils should be re-compacted to a minimum of ninety (90) percent relative compaction at near optimum moisture content. The lateral extent of removals beyond the building/structure/footing limits should be equal to at least 5 feet.

The depth of over-excavation should be reviewed by the Geotechnical Consultant during the actual construction. Any subsurface obstruction buried structural elements, and unsuitable material encountered during grading, should be immediately brought to the attention of the Geotechnical Consultant for proper exposure, removal and processing, as recommended.

Fill Placement

Prior to any fill placement TGR should observe the exposed surface soils. The site soils may be re-used as engineered fill provided, they are free of organic content and particle size greater than 4-inches. All particles greater than 4-inches shall be removed and disposed offsite. Fill shall be moisture conditioned to near optimum moisture and compacted to a minimum relative compaction of ninety (90) percent in accordance with ASTM D1557. Any import soils shall be non-expansive and approved by TGR Geotechnical Inc.

Compaction

Prior to fill placement, the exposed surface should be scarified to a minimum depth of six (6) inches, fill placed in eight (8) inch loose lifts moisture conditioned to near optimum moisture and compacted to a minimum relative compaction of ninety (90) percent in accordance with ASTM D1557.

Trenching

All excavations should conform to CAL-OSHA and local safety codes.

Temporary Excavation and Shoring

Due the dry, granular nature of onsite soils, all cuts shall be properly shored or sloped back to at least 1.H:1V (Horizontal: Vertical) or flatter. Some sloughing may be anticipated due to the granular nature of site soils. The exposed slope face should be kept moist (but not saturated) during construction to reduce local sloughing. No surcharge loads should be permitted within a horizontal distance equal to the height of cut from the toe of excavation unless the cut is properly shored. Excavations that extend below an imaginary plane inclined at 45 degrees below the edge of any nearby adjacent existing site facilities should be properly shored to maintain foundation support at the adjacent structures.

Utility Trench Backfill

All utility trench backfills in structural areas and beneath hardscape features should be brought to near optimum moisture content and compacted to a minimum relative compaction of ninety (90) percent of the laboratory standard. Flooding/jetting is not recommended.

Sand backfill, (unless trench excavation material), should not be allowed in parallel exterior trenches adjacent to and within an area extending below a 1:1 plane projected from the outside bottom edge of the footing. All trench excavations should minimally conform to CAL-OSHA and local safety codes. Soils generated from utility trench excavations may be used provided it is moisture conditioned and compacted to ninety (90) percent minimum relative compaction.

Drainage

Positive site drainage should be maintained at all times. Drainage should not flow uncontrolled down any descending slope or retaining wall. 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/parking or other approved area. Roof gutters and down spouts should be utilized to control roof drainage. Down spouts should outlet a minimum of 5 feet from the proposed structure or into an approved subsurface drainage system. 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.

Preliminary Pavement Design

The Caltrans method of design was utilized to develop the following asphalt pavement section. The section was developed based on a tested “R-Value” for compacted site subgrade soils of 73.

Traffic indices of 4.5, 5 and 6 were assumed for use in the evaluation of the asphalt pavement sections. The traffic indices are subject to approval by controlling authorities and shall be approved by the project civil engineer.

ASPHALT PAVEMENT SECTION			
Traffic Index	Asphalt (Inch)	Aggregate Base (Inch)	Total (Inch)
4.5	3.0	4.0	7.0
5.0	3.0	6.0	9.0
6.0	4.0	6.0	10.0

Aggregate base material for Asphalt Pavement should consist of CAB/CMB complying with the specifications in Section 200-2.2/200-2.4 of the current "Standard Specifications for Public Works Construction" and should be compacted to at least ninety-five (95) percent of the maximum dry density (ASTM D1557). The surface of the base should exhibit a firm and unyielding condition just prior to the placement of asphalt concrete paving. The asphalt concrete shall be compacted to a minimum of ninety-five (95) percent relative compaction.

The pavement subgrade should be constructed in accordance with the recommendations presented in the grading section of this report.

The R-value and the associated pavement section should be confirmed at the completion of site grading.

Geotechnical Review of Plans

All grading and foundation plans should be reviewed and accepted by the geotechnical consultant prior to construction. If significant time elapses since preparation of this report, the geotechnical consultant should verify the current site conditions, and provide any additional recommendations (if necessary) prior to construction.

Geotechnical Observation/Testing During Construction

Per sections 1705.6 and table 1705.6 of the 2019 California Building Code, periodic special inspection shall be performed to:

- Verify materials below shallow foundations are adequate to achieve the design bearing capacity;
- Verify excavations are extended to the proper depth and have reached proper material;
- Verify classification and test compacted materials; and
- Prior to placement of compacted fill, inspect subgrade and verify that the site has been prepared properly.

Per sections 1705.6 and table 1705.6 of the 2019 California Building Code, continuous special inspection shall be performed to:

- Verify use of proper materials, densities and lift thickness during placement and compaction of compacted fill.

The geotechnical consultant should also perform observation and/or testing at the following stages:

- During any grading and fill placement;
- After foundation excavation and prior to placing concrete;
- Prior to placing slab and flatwork concrete;
- During placement of aggregate base and asphalt or Portland cement concrete; and
- When any unusual soil conditions are encountered during any construction operation subsequent to issuance of this report.

Limitations

This report was prepared for a specific client and a specific project, based on the client's needs, directions and requirements at the time.

This report was necessarily based upon data obtained from a limited number of observances, site visits, soil and/or other samples, tests, analyses, histories of occurrences, spaced subsurface exploration and limited information on historical events and observations. Such information is necessarily incomplete. Variations can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time.

This report is not authorized for use by and is not to be relied upon by any party except the client with whom TGR contracted for the work. Use or reliance on this report by any other party is that party's sole risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify TGR from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, or strict liability of TGR.



B-9 APPROXIMATE LOCATION OF EXPLORATORY BORING

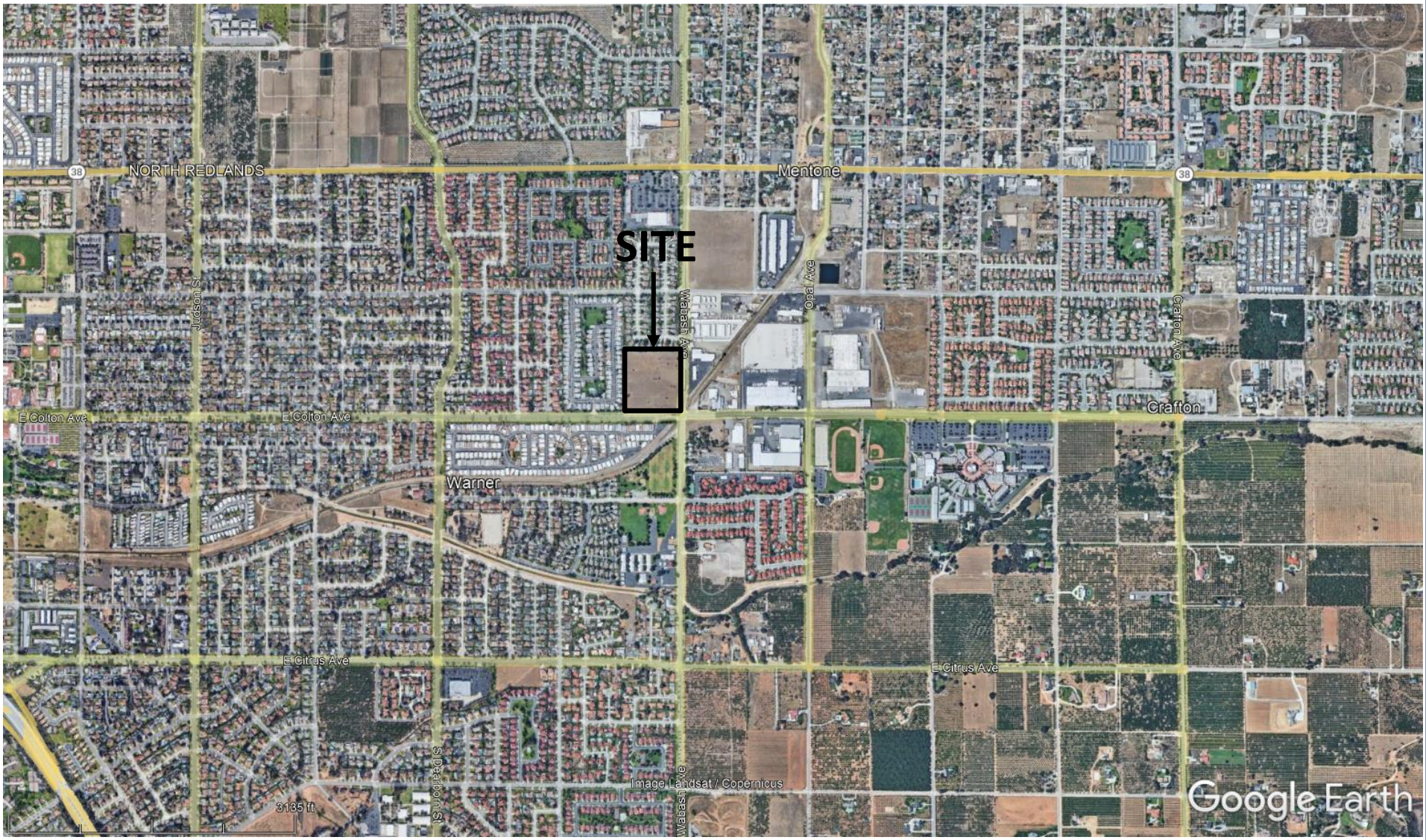
P-2 APPROXIMATE LOCATION OF PERCOLATION BORING

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BORING LOCATION MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

PLATE 1

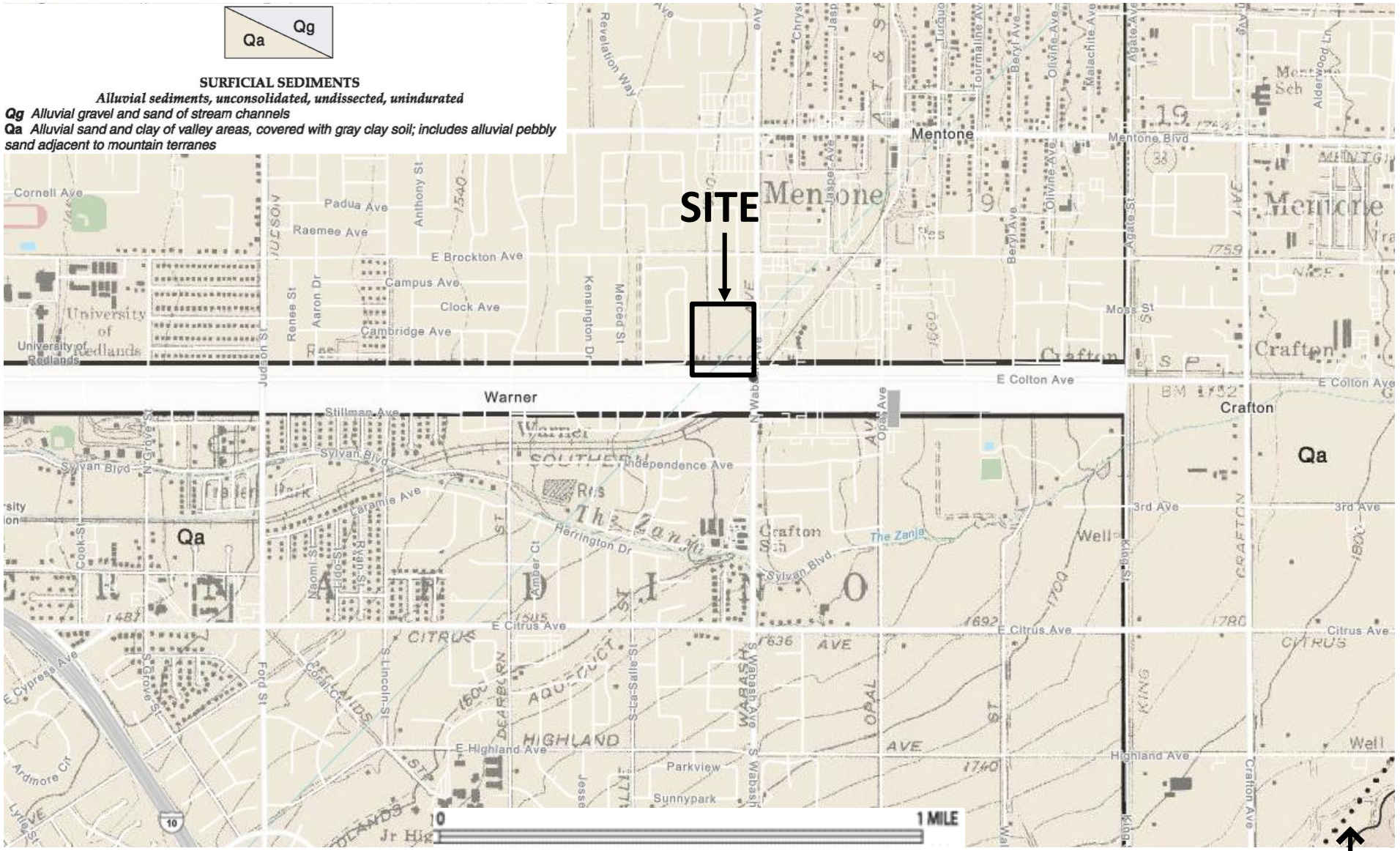


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Construction Inspection

SITE LOCATION MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 1



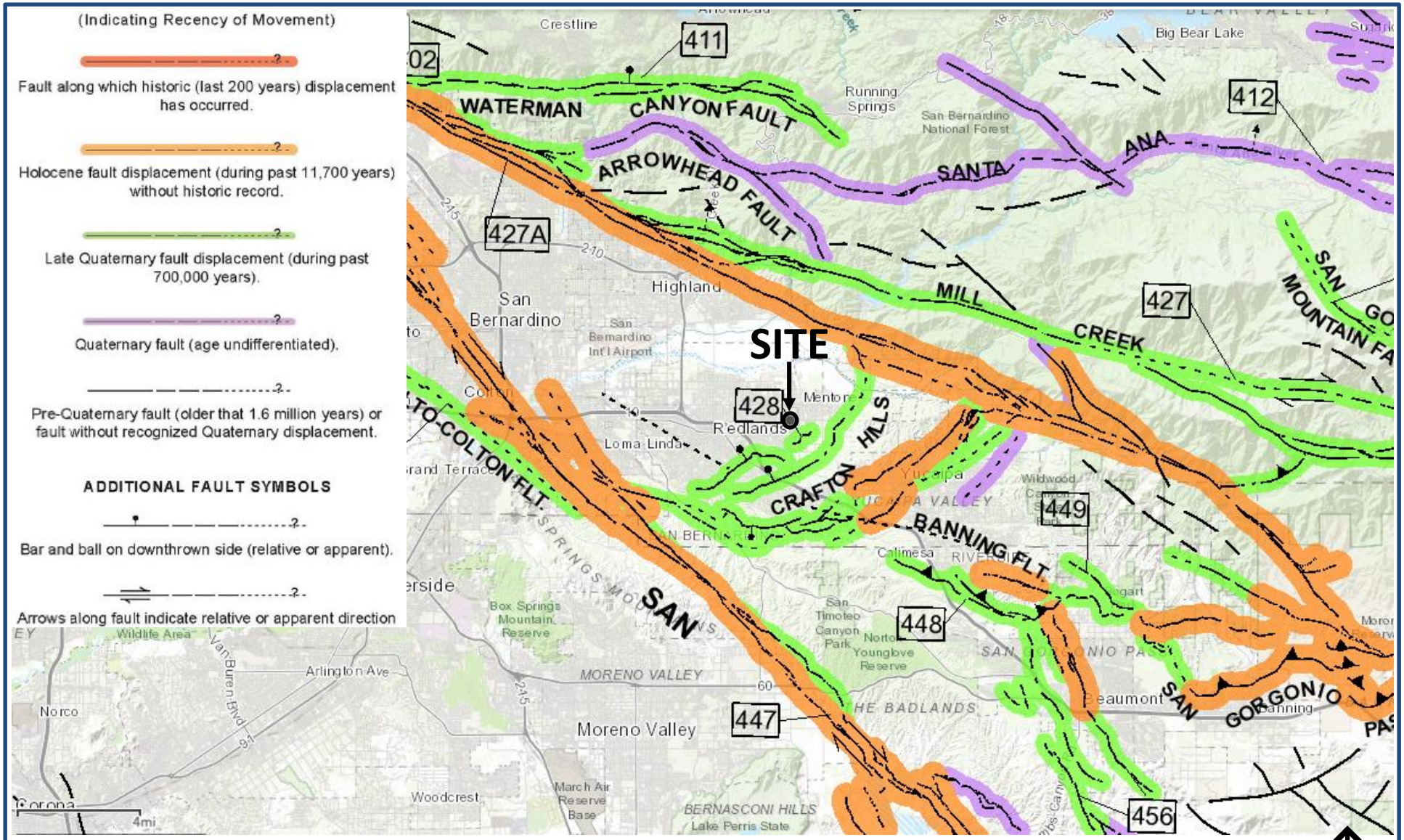
Modified From: Dibblee, T.W., and Minch, J.A., 2004, Geologic map of the Harrison Mountain/north 1/2 of Redlands quadrangles, San Bernardino and Riverside County, California: Dibblee Geological Foundation, DF-126, scale 1:24,000.

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REGIONAL GEOLOGY MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 2



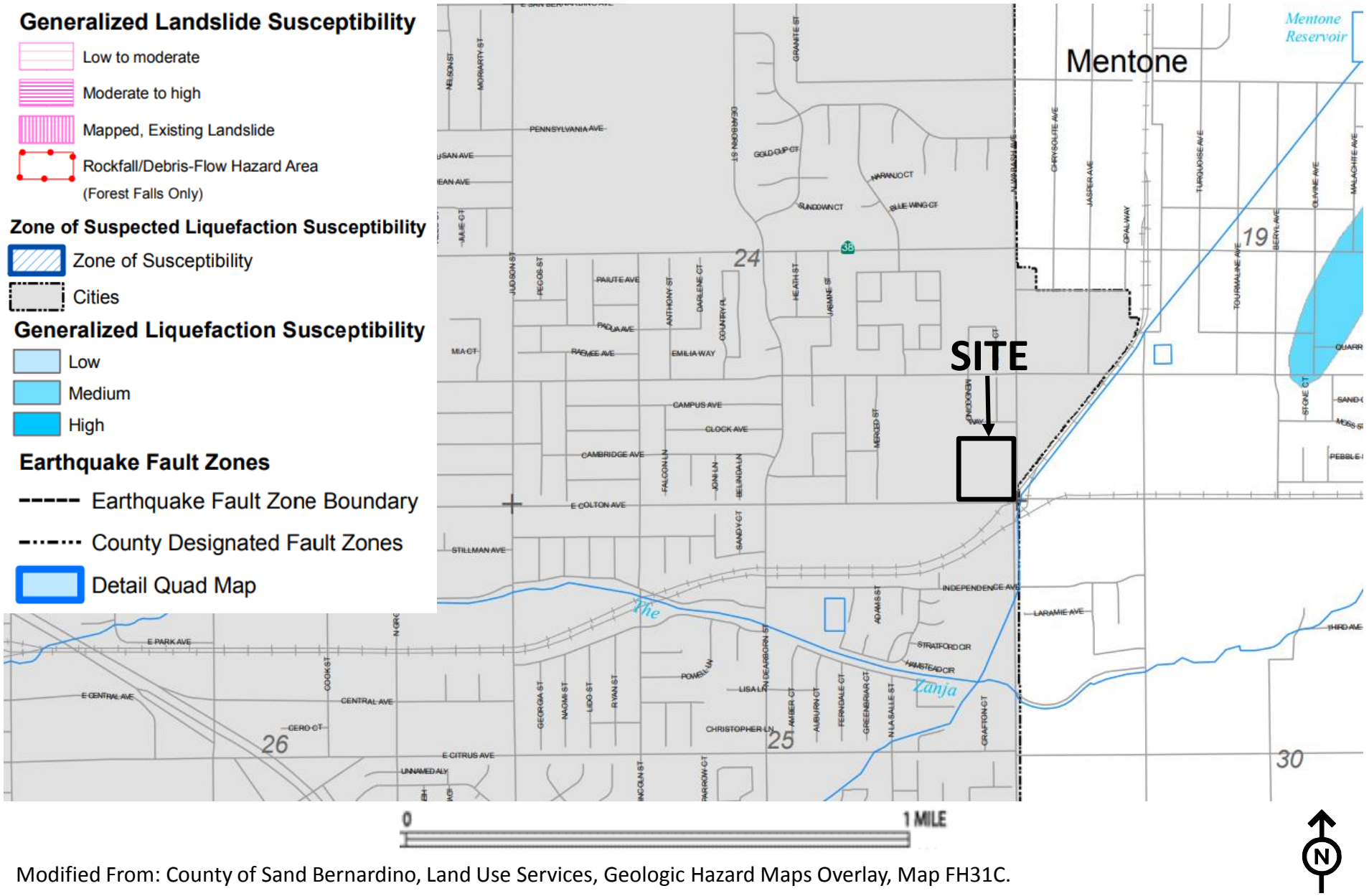
Modified From: Jennings, C. W., 2010, Fault Activity Map of California and Adjacent Areas, California Division of Mines and Geology, Geologic Data Map Series, No. 6, Scale 1:750,000.

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REGIONAL FAULT MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 3



Modified From: County of Sand Bernardino, Land Use Services, Geologic Hazard Maps Overlay, Map FH31C.

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GEOLOGIC HAZARDS MAP
NW CORNER OF E. COLTON AVENUE AND N. WABASH AVENUE
REDLANDS, CALIFORNIA

PROJECT NO. 22-7455

FIGURE 4

Test Hole	Total Depth (in)	Initial Depth (in)	Final Depth (in)	ΔWater Level (in)	Initial Time (min)	Final Time (min)	Δ Time (min)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Gravel Factor	Infiltration Rate (in/hr)
P-1/B-5	108	70.20	96.96	26.76	0.0	5.0	5.0	37.80	11.04	24.42	0.54	13.13
	108	62.76	89.88	27.12	0.0	5.0	5.0	45.24	18.12	31.68	0.54	10.44
	108	63.60	91.44	27.84	0.0	5.0	5.0	44.40	16.56	30.48	0.54	11.11
	108	62.64	89.76	27.12	0.0	5.0	5.0	45.36	18.24	31.80	0.54	10.40
	108	64.08	91.32	27.24	0.0	5.0	5.0	43.92	16.68	30.30	0.54	10.93
	108	63.00	90.00	27.00	0.0	5.0	5.0	45.00	18.00	31.50	0.54	10.45
P-2	108	64.44	92.52	28.08	0.0	5.0	5.0	43.56	15.48	29.52	0.54	11.55
	108	64.56	89.88	25.32	0.0	5.0	5.0	43.44	18.12	30.78	0.54	10.01
	108	63.84	85.20	21.36	0.0	5.0	5.0	44.16	22.80	33.48	0.54	7.80
	108	62.76	84.36	21.6	0.0	5.0	5.0	45.24	23.64	34.44	0.54	7.68
	108	64.20	84.96	20.76	0.0	5.0	5.0	43.80	23.04	33.42	0.54	7.60
	108	63.60	85.44	21.84	0.0	5.0	5.0	44.40	22.56	33.48	0.54	7.98

$$I_t = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

ΔH = Change in height

Δt = Time interval

r = Radius

I_t Infiltration Rate

H_{ave} Average Head Height over the time interval

APPENDIX A
REFERENCES

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APPENDIX A

References

California Department of Conservation – California Geological Survey, 2018, Earthquake Fault Zones, A Guide for Government Agencies, Property Owners/Developers and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42

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APPENDIX B
LOG OF BORINGS

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THE FOLLOWING DESCRIBES THE TERMS AND SYMBOLS USED ON THE LOG OF BORINGS TO SUMMARIZE THE RESULTS OBTAINED IN THE FIELD INVESTIGATION AND SUBSEQUENT LABORATORY TESTING

DENSITY AND CONSISTENCY

The consistency of fine grained soils and the density of coarse grained soils are described on the basis of the Standard Penetration Test as follows:

COARSE GRAINED SOILS		ESTIMATED UNCONFINED COMPRESSIVE STRENGTH (Tsf)	FINE GRAINED SOILS	
Very Loose	< 4	< 0.25	Very Soft	< 2
Loose	4 – 10	0.35 – 0.50	Soft	2 – 4
Medium	10 – 30	0.50 – 1.0	Firm (Medium)	4 – 8
Dense	30 – 50	1.0 – 2.0	Stiff	8 – 15
Very Dense	> 50	2.0 – 4.0	Very Stiff	15 – 30
		> 4.0	Hard	> 30

PARTICLE SIZE DEFINITION (As per ASTM D2487 and D422)

Boulder	⇒ Larger than 12 inches	Coarse Sands	⇒ No. 10 to No. 4 sieve
Cobbles	⇒ 3 to 12 inches	Medium Sands	⇒ No. 40 to No. 10 sieve
Coarse Gravel	⇒ 3/4 to 3 inches	Fine Sands	⇒ No. 200 to 40 sieve
Fine Gravel	⇒ No. 4 to 3/4 inches	Silt	⇒ 5µm to No. 200 sieve
		Clay	⇒ Smaller than 5µm

SOIL CLASSIFICATION

Soils and bedrock are classified and described based on their engineering properties and characteristics using ASTM D2487 and D2488.

Percentage description of minor components:

Trace	1 – 10%	Some	20 – 35%
Little	10 – 20%	And or y	25 – 50%

Stratified soils description:

Parting	0 to 1/16 inch thick	Layer	½ to 12 inches thick
Seam	1/16 to ½ inch thick	Stratum	> 12 inches thick

SOIL CLASSIFICATION CHART

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

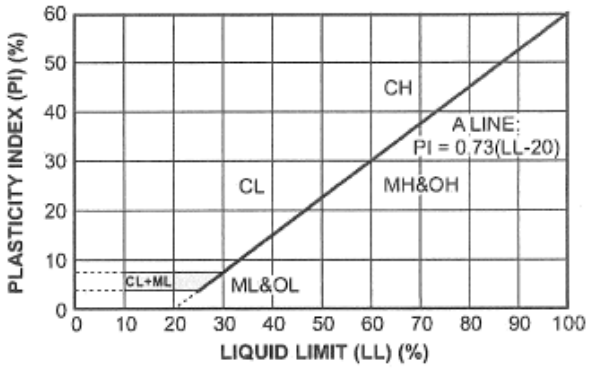
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



PARTICLE SIZE LIMITS

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	
	3"	¾"	NO. 4	NO. 10	NO. 40	NO. 200

TGR Geotechnical Environmental Hydrogeology Material Testing Construction Inspection

LOG OF BORING EXPLANATION

LOG OF EXPLORATORY BORING B-1

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1604**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1604	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, medium dense, very fine to fine grained sand.			
1600	5			■	39		SP	SAND- grey and white, dry, dense, fine to coarse grained, fine to coarse grained gravel, cobbles.	1	117	Consol
1595	10							Total Depth: 8 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1590											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 2

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-2

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1606**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1605								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			EI, Corrosion, R-Value
	5							...Same as above, some cobbles.			
1600					46		SM		2	109	
								Total Depth: 6.5 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
	10										
1595											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 3

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-3

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1611**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								Total Depth: 3 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1605	5										
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 4

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-4

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1603**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1600											
	5			■	46		SP	SAND- light brown, slightly moist, very dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles.	3	117	
								Total Depth: 6.5 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											
	10										
1590											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 5

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-5/P-1

Sheet **1** of **1**

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1607**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1605											
	5			■	50		SP	SAND- light brown, dry, very dense, fine grained sand, fine to coarse grained gravel, some silt.	2	113	-200= 5.7%
1600			■				SP		2		-200= 10.2%
	10							Total Depth: 9 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 6

TGR GEOTECHNICAL, INC.

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

LOG OF EXPLORATORY BORING B-6

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1611**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								...Same as above, cobbles.			
1605	5				53		SPG	Gravelly SAND- grey brown, dry, very dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles.	2	115	Consol
								Total Depth: 7 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 7

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-7

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1605**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
1600	5				59		SM	...Same as above, cobbles.	2	103	
								Total Depth: 7 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 8

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-8

Sheet **1** of **1**

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1608**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
								Surface is grass and vegetation.			
1605							SM	NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			Max, Shear
	5				14		SP	SAND- grey brown, dry, medium dense, fine to coarse grained sand, fine to coarse grained gravel, cobbles, some silt.	2	107	Consol
1600								Total Depth: 8 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
	10										
1595											

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 9

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING B-9

Project Number:	**22-7455**	Logged By:	**RA**
Project Name:	**Colton Ave. and Wabash Ave., Redlands**	Project Engineer:	**SG**
Date Drilled:	**3/15/22 - 3/15/22**	Drill Type:	**Hollow Stem**
Ground Elev:	**1611**	Drive Wt & Drop:	**140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1610	0							Surface is grass and vegetation.			
								NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
								Total Depth: 3 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1605	5										
1600	10										

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 10

TGR GEOTECHNICAL, INC.

LOG OF EXPLORATORY BORING P-2

Project Number: **22-7455**
Project Name: **Colton Ave. and Wabash Ave., Redlands**
Date Drilled: **3/15/22 - 3/15/22**
Ground Elev: **1606**

Logged By: **RA**
Project Engineer: **SG**
Drill Type: **Hollow Stem**
Drive Wt & Drop: **140lbs / 30in**

Shelby Tube | Standard Split Spoon | No recovery | Modified California | Water Table ATD

Elevation (ft)	Depth (ft)	Graphic Log	FIELD RESULTS: Bulk Sample	Drive Sample	SPT blows/ft (or equivalent N)	Pocket Pen (tsf)	USCS	SUMMARY OF SUBSURFACE CONDITIONS	LAB RESULTS: Moisture Content (%)	Dry Density, (pcf)	Other Tests
1605								Surface is grass and vegetation. NATIVE: Silty SAND- light brown, dry, stiff, very fine to fine grained sand, some fine to coarse grained gravel.			
	5										
1600					16		SP	SAND- light brown, dry, medium dense, fine grained sand, fine to coarse grained gravel, cobbles.	2	117	-200= 10.3%
	10							Total Depth: 9 feet due to refusal in cobbles. No groundwater encountered during drilling. No caving observed. Boring utilized for percolation testing. Boring backfilled with soil cuttings upon completion. Ground elevation estimated with Google Earth.			
1595											

This Boring Log should be evaluated in conjunction with the complete geotechnical report. This Boring Log represents conditions observed at the specific location and date indicated, it is not warranted to be representative of subsurface conditions at other locations and times.

PLATE 11

TGR GEOTECHNICAL, INC.

LOG OF BORING 22-7455 E. COLTON AVENUE AND N. WABASH AVENUE, REDLANDS.GPJ TGR GEOTECH.GDT 3/31/22

APPENDIX P

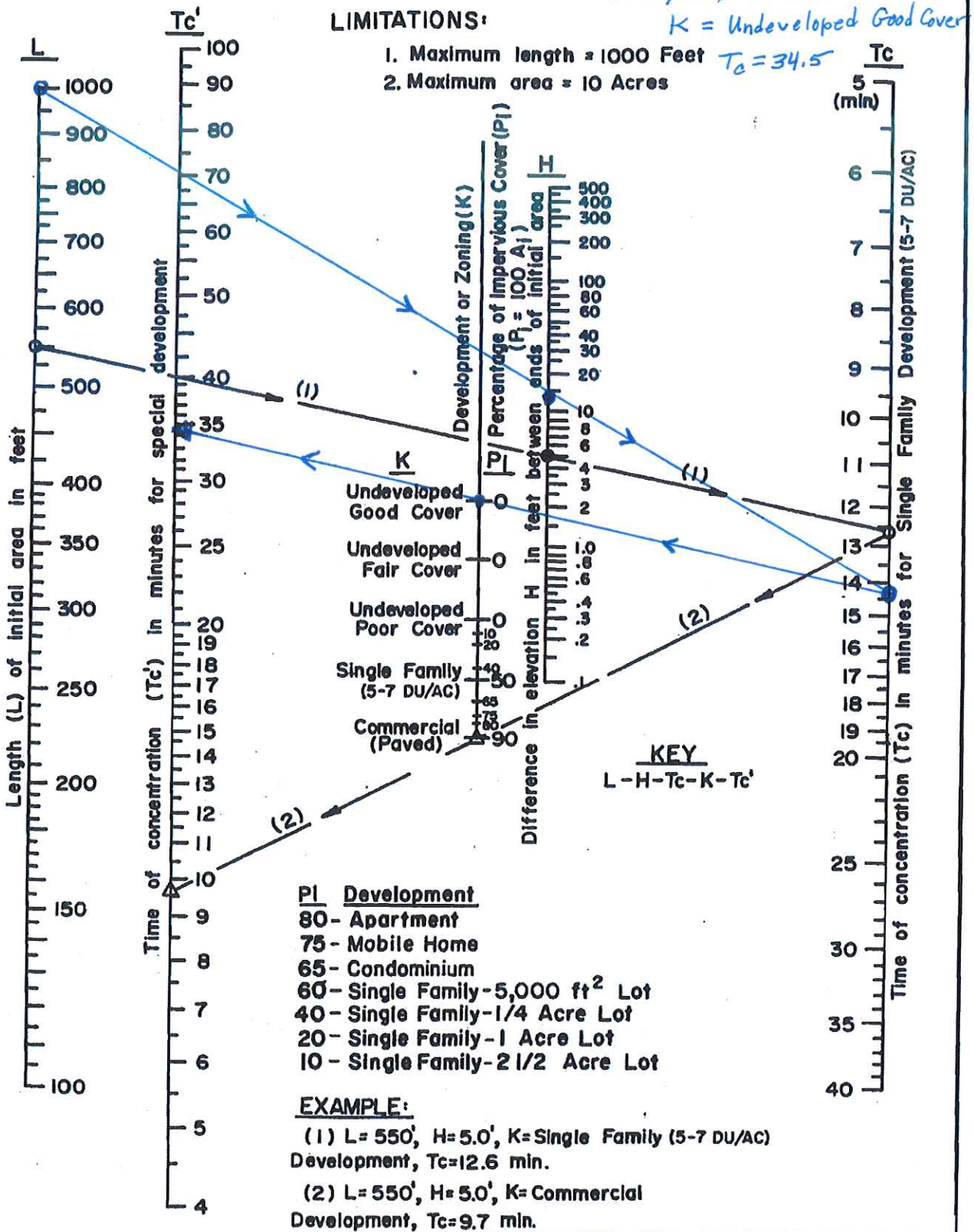
Initial Time of Concentration Nomographs, San Bernardino County Hydrology Manual Figure D-1

Pre-developed DA1

L = 1,000', H = 14.9'

K = Undeveloped Good Cover

T_c = 34.5

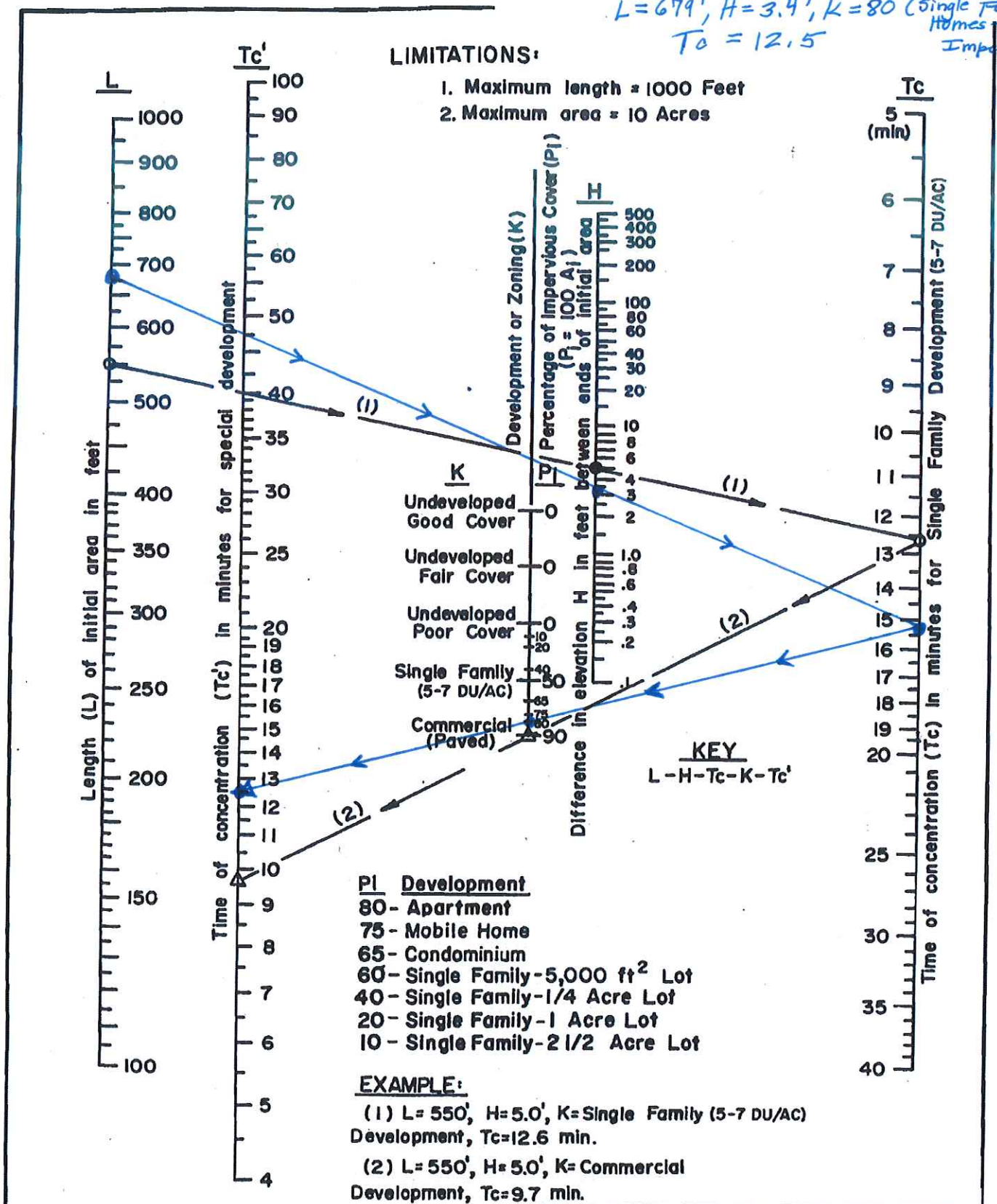


SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

Post-developed DA 1
L = 679', H = 3.4', K = 80 (Single Family Homes - 80% Impervious Cover)
To = 12.5

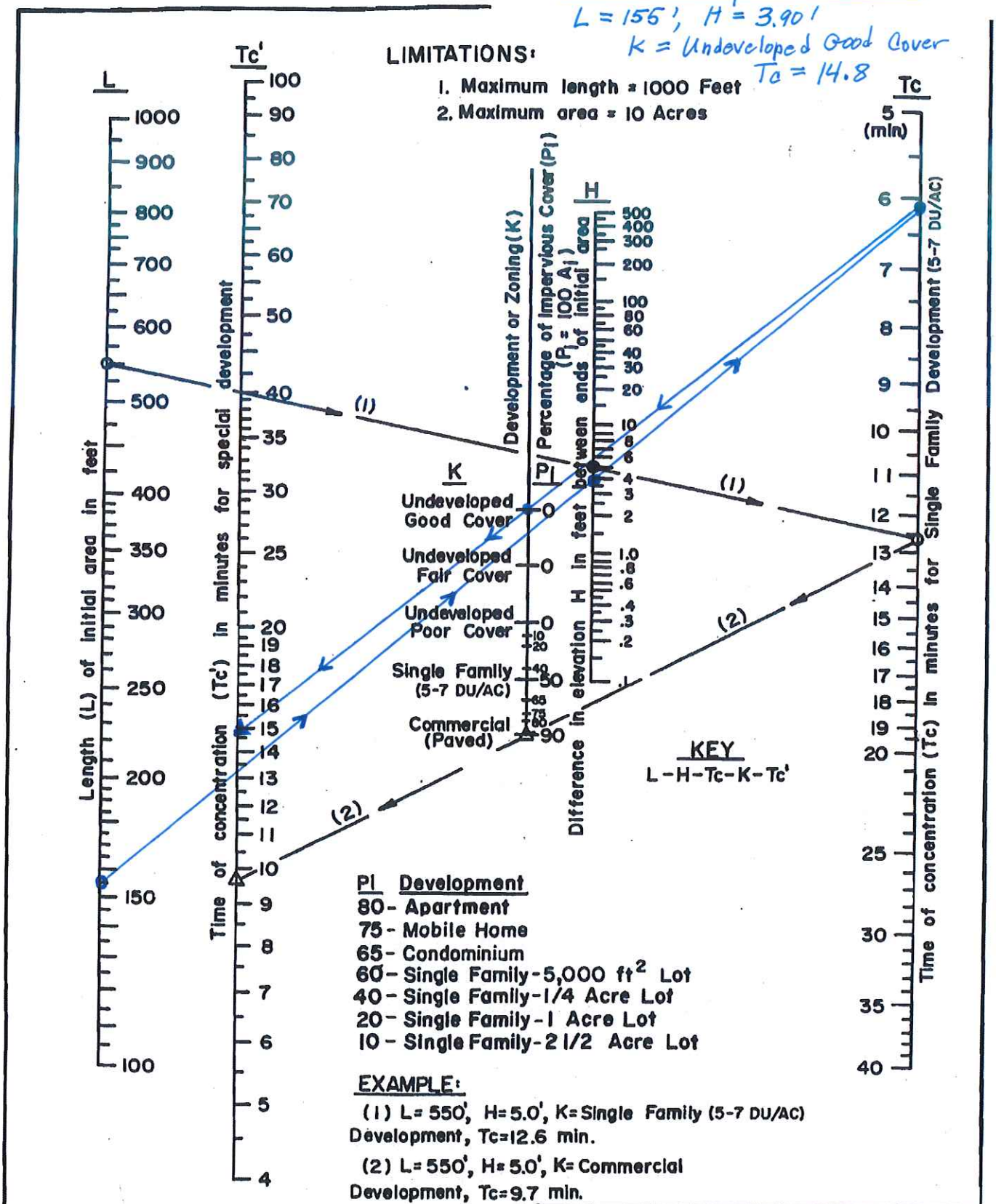


SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

Pre-developed DA 2
L = 155', H = 3.90'
K = Undeveloped Good Cover
Tc = 14.8



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

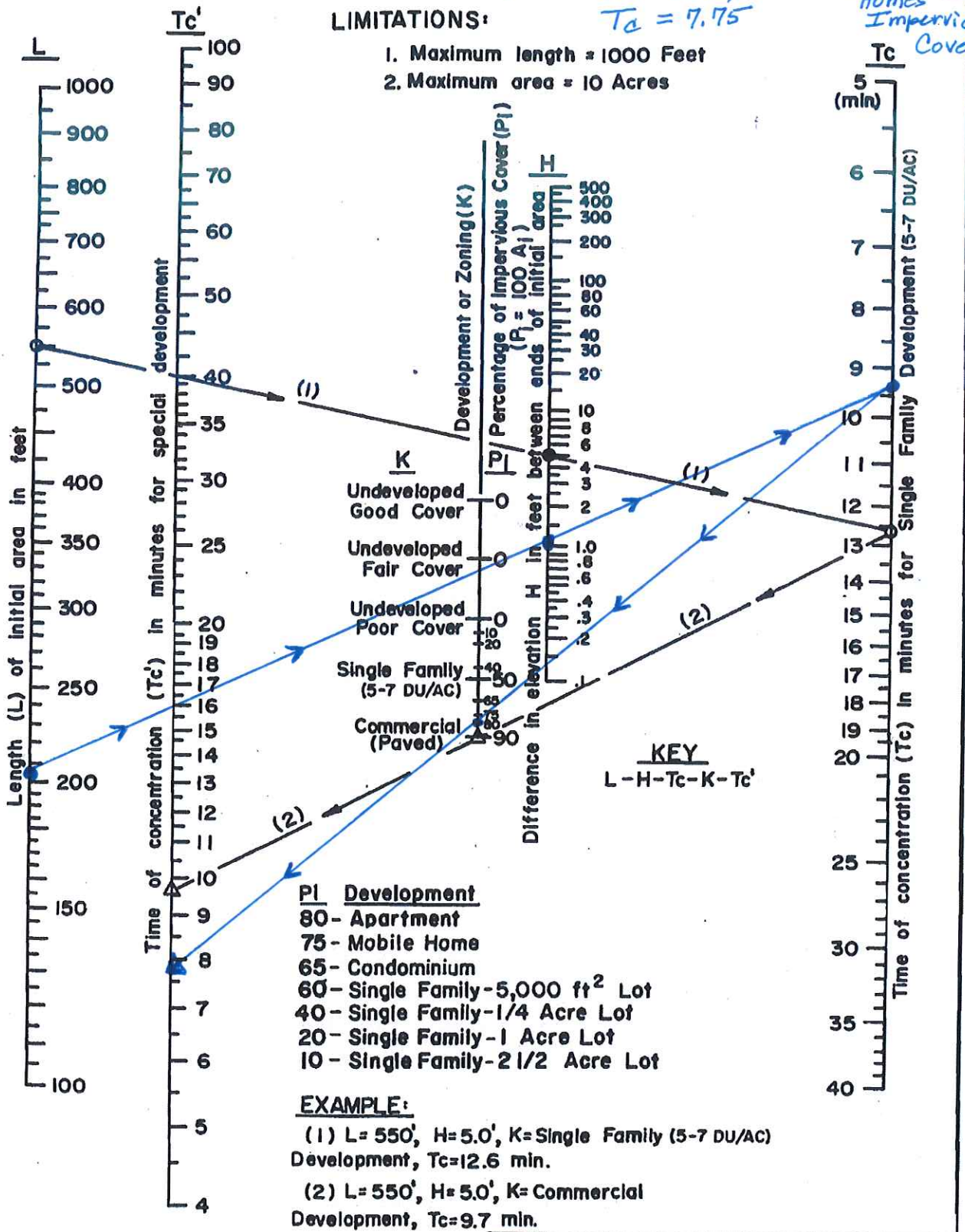
TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

Post-developed DA 2

L = 205', H = 1.03', K = 80 (Single Family Homes — 80% Impervious Cover)

Tc = 7.75



SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

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1650 SPRUCE STREET, STE 106
RIVERSIDE, CA 92507
951.787.9222
WWW.MIGCOM.COM

Memo

To: Ryan Murphy, Senior Planner, City of Redlands

CC: Cameron Hile and Bob Prasse, MIG

From: Kasey Kitowski and Chris Dugan

Date: July 7, 2023

SUBJECT: Noise and Vibration Analysis for Madera at Citrus Trail Project, Redlands, CA

MIG, Inc. (MIG) has prepared this memorandum at the request of the City of Redlands. This memorandum evaluates the potential noise and vibration impacts resulting from the implementation of the proposed Madera at Citrus Trail Project (proposed Project). As explained in this memorandum, the proposed Project has incorporated mitigation measures to ensure construction and operational activities would not exceed applicable noise and vibration standards, would not otherwise result in a substantial increase in ambient noise levels in the vicinity of the Project, and would not be subjected to excessive airport-related noise levels. The proposed Project, therefore, would not have the potential to result in significant noise or vibration impacts with mitigation incorporated.

PROJECT DESCRIPTION

The proposed Project involves the construction of 103 single family residential buildings on a parcel of undeveloped land in the eastern part of Redlands, California.

The approximately 9.01-acre Project site is located at the northwest corner of Colton Avenue and Wabash Avenue. The proposed Project would include 216,567 square feet of gross building space, 65,470 square feet of landscaped space for private yards and for a central common area, and 20,100 square feet of impervious surfaces such as walkways, drive aisles, driveways, and parking spaces. Each dwelling unit would range from approximately 1,544 to 1,858 square feet. The site would contain 206 garage stalls and 63 guest stalls. The site would be internally connected by A Street, which would run north to south, and by B Street and C Street, which would run east to west. Refer to Attachment 1 for the proposed Project site plan.

The Project site is bound on the north and west by single-family residential uses, on the east by Wabash Avenue and on the south by Colton Avenue. Commercial uses are located across Wabash Avenue, approximately 90 feet east of the site and single-family residential uses are located across Colton Avenue, approximately 100 feet south of the site. The Project site is located approximately 0.4 miles south of State Route (SR) 38, approximately 1.4 miles northeast of Interstate 10 (I-10), and approximately 3.4 miles east of the I-210. The nearest airport, Redlands Municipal Airport, is approximately 1.3 miles north of the Project site and the nearest school, Crafton Elementary School, is located approximately 960 feet south of the Project site. The nearest park, Orange Blossom Trail head, is located approximately 80 feet south of the Project site, across Colton Avenue.

The proposed Project would involve site preparation, grading, new building construction, paving, and architectural coating. Construction activities are assumed to begin in early-2024 and last

approximately 14 months. The proposed Project's construction schedule and anticipated equipment usage is listed in Table 1.

Table 1: Madera at Citrus Trail Project Construction Activities		
Construction Phase	**Duration (Days)**	**Typical Equipment Used**
Site Preparation	10	Dozer, Tractor/Loader/Backhoe
Grading	20	Excavator, Grader, Dozer, Backhoe
Building Construction	230	Crane, Forklift, Backhoe, Generator, Welder
Paving	20	Paver, Roller, Paving Equipment
Architectural Coating	20	Air Compressor

The Project is expected to be operational in 2025. Once operational, the proposed Project would operate as a residential land use, similar to the existing residential uses in the area.

The following sections describe the ambient noise environment near the proposed Project and evaluate the proposed Project's potential to impact the existing noise environment near the Project. Please refer to Attachment 2 for background information on environmental noise and vibration, including commonly used terminology.

EXISTING NOISE ENVIRONMENT

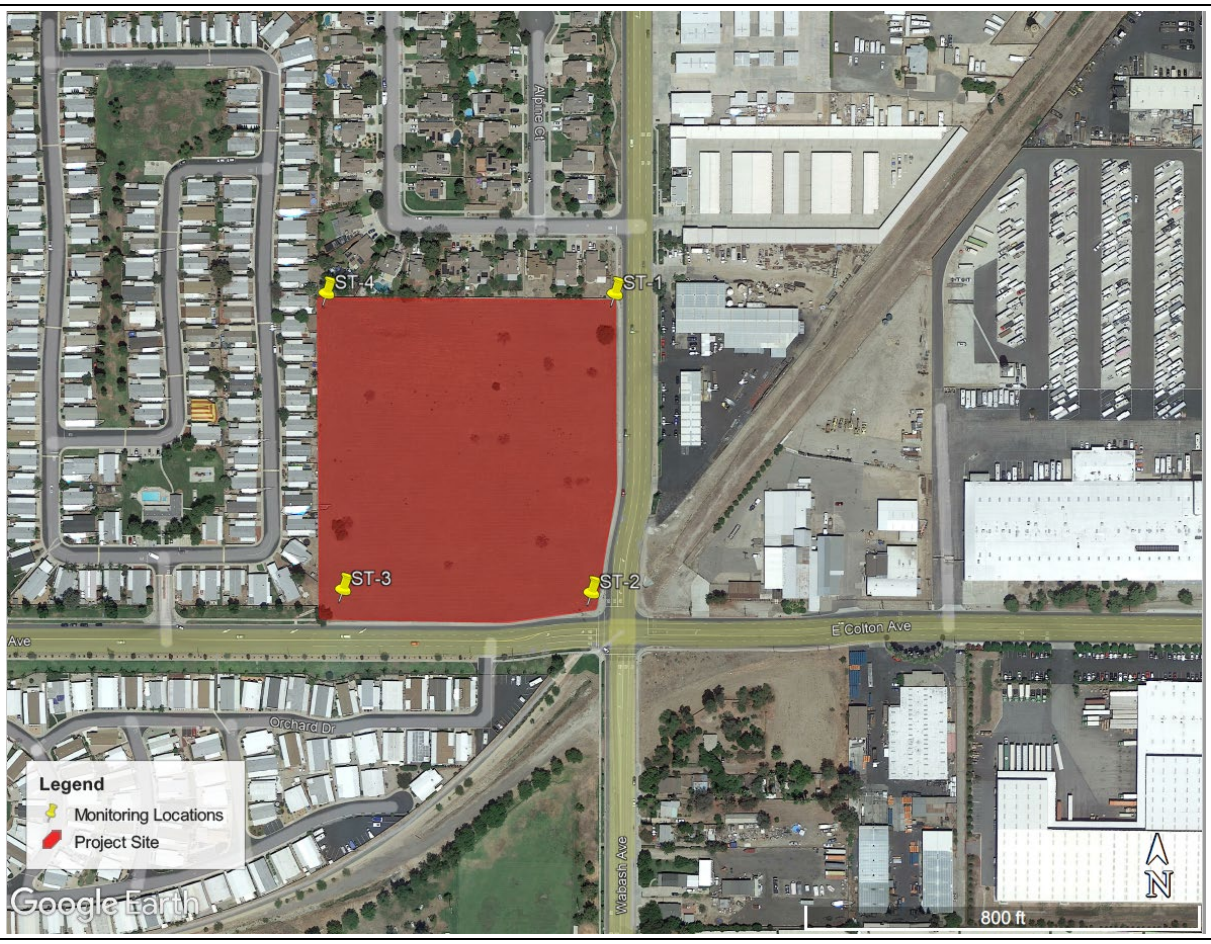
The proposed Project is located in eastern Redlands, in an area classified and designated as Single-Family Residential and as Low Density Residential by the City's Zoning Code and General Plan, respectively. The City's General Plan identifies transportation corridors as noise sources that are of particular attention to the City and states that future residential development will need to meet land use compatibility and noise standards (City of Redlands, 2017).

Existing ambient noise levels in the Project area were monitored on May 30, 2023 (MIG, 2023; see Attachment 3). Noise levels were measured with one Larson Davis Model LxT, Type 1, sound level meter and one Piccolo II, Type 2 sound level meter. The meter's receiving microphone was set at a high of roughly five feet above ground level to approximate a human receptor. Noise monitoring was conducted in one-minute intervals. Conditions during the monitoring were partly cloudy with temperatures ranging from the high 60s to the low 70s, with light winds (not exceeding eight (8) miles per hour (mph)).

Four (4) short-term measurements were conducted to determine typical ambient noise levels in the vicinity of the Project area, provide direct observations of existing noise sources at and in the vicinity of the Project area, and evaluate Project noise levels at nearby sensitive receptors. The four monitoring locations are described below and shown in Figure 1.

- Location ST-1 was at the northeast corner of the Project site, approximately 28 feet west of the centerline of the outermost lane of Wabash Avenue.
- Location ST-2 was at the southeast corner of the Project site, at the intersection of Wabash Avenue and Colton Avenue. The meter was approximately 35 feet east of the centerline of the outermost lane of Wabash Avenue and approximately 30 feet north of the centerline of the outermost lane of Colton Avenue.
- Location ST-3 was at the southwest corner of the Project site, approximately 65 feet north of the centerline of the outermost lane of Colton Avenue.
- Location ST-4 was at the northwest corner of the Project site, approximately 680 feet north and west of the centerline of the outermost lanes of Colton Avenue and Wabash Avenue, respectively.

Figure 1: Ambient Noise Monitoring Locations



Based on observations made during the ambient noise monitoring, the existing noise environment in the Project vicinity consists primarily of vehicles on Wabash Avenue and Colton Avenue and overhead air traffic. Table 2 summarizes the results of the ambient noise monitoring.

Table 2: Measured Short-Term Ambient Noise Levels (dBA)

Monitor	Duration	Measured Noise Level		
		L_{eq}	L_{min}	L_{max}
ST-1	1 hour	64.3	41.9	83.7
ST-2	1 hour	65.3	46.1	83.1
ST-3	1 hour	59.3	42.7	80.3
ST-4	4 hours	47.6	34.4	76.1

Source: MIG, 2023 (See Attachment 3)

As shown in Table 2, measured ambient noise levels were highest along Wabash Avenue (ST-1) and at the intersection of Wabash Avenue and Colton Avenue (ST-2). Noise levels along Colton Avenue (ST-3) were lower than along Wabash Avenue. Noise levels on the interior of the site (ST-4) were much lower than noise levels along Wabash Avenue and Colton Avenue and indicates traffic noise levels attenuation at rate of approximately 4.5 decibels per doubling of distance from the roadway centerline.

NOISE AND VIBRATION ANALYSIS

The proposed Project would generate noise during construction and operation of the proposed facilities. The following analysis evaluates if the Project would:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of the standards established in:
    - City of Redlands Municipal Code Section 8.06.070 (Exterior Noise Limits), Section 8.06.080 (Interior Noise Standards), Section 8.06.100 (Residential Air Conditioning Or Air Handling Equipment), or Section 8.06.120 (Exemptions); or
    - The City of Redlands General Plan Healthy Community Chapter;
- Generate excessive groundborne vibration or groundborne noise levels; or
- Expose people residing or working in the Project area to excessive airport-related noise levels.

With regard to item a), the City's Municipal Code and General Plan establish the following standards and policies that would apply to the proposed Project's construction and operational noise sources:

- Construction Noise (Redlands Municipal Code Title 8, Health and Safety, Chapter 8.06, Community Noise Control):
    - Section 8.06.120(G) exempts construction activity from noise regulations between the hours of 7 AM and 6 PM on Monday through Saturday. Construction shall not occur on Sundays and federal holidays.
    - Section 8.06.090 prohibits loading and unloading activities between the hours of 10 PM and 6 AM in such a manner as to cause a noise disturbance across a residential property line or at any time in violation of Municipal Code Section 8.060.030 (see below).
- Construction Noise (Redlands General Plan Healthy Communities Chapter):
    - Policy 9.0w requires limiting hours for all construction or demolition work where site-related noise is audible beyond the site boundary.
- Operational Noise (Redlands Municipal Code Title 8, Health and Safety, Chapter 8.06, Community Noise Control):
    - Section 8.060.070 (Exterior Noise Limits) sets forth the maximum permissible sound level that may be generated by a project at single-family and multi-family residential districts is 60 dBA L_{eq} during the daytime (7 AM to 10 PM) and 50 dBA L_{eq} during the nighttime (10 PM to 7 AM). The Municipal Code also establishes:
        - The noise standard is not to be exceed for a cumulative period of more than 30 minutes any hour.
        - The exterior noise standard plus five (5) dBA is not to be exceeded for a cumulative period of more than 15 minutes in any hour.
        - The exterior noise standard plus 10 dBA is not to be exceeded for a cumulative period of more than 5 minutes in any hour.
        - The exterior noise standard plus 15 dBA is not to be exceeded for a cumulative period of more than one (1) minute in any hour.

        - The exterior noise standard plus 20 dBA, or the maximum measured ambient noise level, is not to be exceed at any period of time.
    - Section 8.060.080 (Interior Noise Limits) sets forth the maximum permissible sound level that may be generated by a project at single-family and multi-family residential districts is 45 dBA L_{eq} at any time. The Municipal Code also establishes:
        - The interior noise standard is not to be exceed for a cumulative period of more than five (5) minutes any hour.
        - The interior noise standard plus five (5) dBA is not to be exceeded for a cumulative period of more than one (1) minute in any hour.
        - The interior noise standard plus 10 dBA or the maximum measured ambient noise level, is not to be exceeded at any time.
    - Section 8.060.100 (Residential Air Conditioning or Air Handling Equipment) specifically identifies that it is unlawful to operate or permit the operation of any air conditioning or air handling equipment in such a manner as to exceed the exterior noise standards set forth in Municipal Code Section 8.06.070 (see above).
- Operational Noise (Redlands General Plan Healthy Communities Chapter):
    - Policy 9.0s requires mitigation to ensure that indoor noise levels for residential living spaces do not exceed 45 dBA CNEL due to the combined effect of all exterior noise sources.
    - Policy 9.0v considers the following increases in noise levels to be possibly significant:
        - An increase in exposure of four (4) dB or more if the resulting noise level would exceed that described as clearly compatible for the affected land use as established in General Plan Table 7-10 and Table 7-11.
        - Any increase of six (6) dB or more due to the potential for adverse community response.

With regard to item b), the City's Municipal Code establishes the following standards that would apply to the proposed Project's potential vibration sources:

- Groundborne Vibration and Noise (Redlands Municipal Code):
    - Section 8.06.090(G) prohibits the operating or permitting the operation of device that creates a vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty feet (150') from the source if on a public space or public right of way. Municipal Code Section 8.06.020 defines the vibration perception threshold of 0.01 inches/second peak particle velocity (PPV).

Increases in Ambient Noise Levels in Excess of Applicable Standards

Project Construction

The proposed Project involves construction activities including site preparation, grading, building construction, paving and architectural coating on an undeveloped parcel in an existing residential area of the City. Construction activities are anticipated to begin early 2024 and may last approximately 14 months in total.

In general, construction activities would involve the use of worker vehicles, delivery trucks, dump trucks, and heavy-duty construction equipment such as (but not limited to) backhoes, tractors, loaders, graders, excavators, rollers, cranes, material lifts, generators, and air compressors. These types of construction activities would generate noise and vibration from the following sources:

- Heavy equipment operations at different work areas. Some heavy equipment would consist of mobile equipment such as a loader and excavator that would move around work areas; other equipment would consist of stationary equipment (e.g., cranes or material hoists/lifts) that would generally operate in a fixed location until work activities are complete. Heavy equipment generates noise from engine operation, mechanical systems, and components (e.g., fans, gears, propulsion of wheels or tracks), and other sources such as back-up alarms. Mobile equipment generally operates at different loads, or power outputs, and produces higher or lower noise levels depending on the operating load. Stationary equipment generally operates at a steady power output that produces a constant noise level.
- Vehicle trips, including worker, vendor, and haul truck trips. These trips are likely to primarily occur on Colton Avenue and Wabash Avenue.

Typical construction equipment noise levels at different distances are shown in Table 3.

Table 3: Potential Project Construction Equipment Noise Levels

Typical Equipment	Noise Level at 50 feet (L_{max})(A)	Percent Usage Factor(B)	Predicted Equipment Noise Levels (L_{eq})(C)						
			50 Feet	75 Feet	100 Feet	150 Feet	200 Feet	250 Feet	300 Feet
Air Compressor	80	40	76	72	70	66	64	62	56
Bulldozer	85	40	81	77	75	71	69	67	65
Backhoe	80	40	76	72	70	66	64	62	56
Compact Roller	80	20	73	69	67	63	61	59	57
Concrete mixer	85	40	81	77	75	71	69	67	65
Crane	85	16	77	74	71	67	65	63	61
Excavator	85	40	81	77	75	71	69	67	65
Grader	85	40	81	77	75	71	69	67	65
Generator	82	50	79	75	73	69	67	65	66
Paver	85	50	82	78	76	72	70	68	66
Pneumatic tools	85	50	82	78	76	72	70	68	66
Scraper	85	40	81	77	75	71	69	67	65
Welder	73	40	69	65	63	59	57	55	53

Sources: Caltrans, 2013 and FHWA, 2010.

(A) L_{max} noise levels based on manufacturer's specifications.

(B) Usage factor refers to the amount (percent) of time the equipment produces noise over the time period

(C) Estimate does not account for any atmospheric or ground attenuation factors. Calculated noise levels based on Caltrans, 2013: L_{eq} (hourly) = L_{max} at 50 feet – 20log (D/50) + 10log (UF), where: L_{max} = reference L_{max} from manufacturer or other source; D = distance of interest; UF = usage fraction or fraction of time period of interest equipment is in use.

With regard to construction noise, site preparation and grading phases typically result in the

highest temporary noise levels due to the use of heavy-duty equipment such as dozers, excavators, graders, loaders, and trucks. Construction noise impacts generally occur when construction activities occur in areas immediately adjoining noise sensitive land uses, during noise sensitive times of the day, or when construction durations last over extended periods of time.

Construction activities associated with the proposed Project would last approximately 14 months. Construction activities would, at times, occur directly adjacent to existing residential properties to the north and west. As shown in Table 3, estimated worst case hourly L_{eq} and L_{max} construction equipment noise levels are predicted to be approximately 82 and 85 dBA, respectively, at 50 feet; however, the magnitude of the Project's temporary and periodic increase in ambient noise levels would depend on the nature of the construction activity (i.e., grading, building construction, paving) and the distance between the construction activity and sensitive receptors/outdoor use areas. Sensitive residential receptors would be within 25 feet of work areas for specific but limited times (e.g., site grading along the property line), at which distance construction equipment may generate noise levels up to 88 dBA L_{eq}. Project construction in the middle of the site would be approximately 300 feet from sensitive receptors to the north and west. At a distance of 300 feet, construction equipment could generate noise levels of 66 dBA L_{eq} at sensitive receptor locations The concurrent operation of two or more pieces of equipment could, depending on the equipment being operated, increase estimated noise levels by 2 dBA to 4 dBA L_{eq}.

There is an existing, approximately three- (3) to six (6)-foot-tall concrete wall on the western boundary of the Project site that may provide up to 5 dBA of shielding and construction noise attenuation for residences bordering the Project site to the west; however, not all residences would receive shielding, as the concrete wall changes height over the length of the site boundary. Specifically, the residences adjacent to the southwest corner of the Project site would be exposed to higher noise levels than residences adjacent to the northwest corner of the Project site because of the difference in height of the existing concrete wall.

The City's Municipal Code (Section 8.06.120(G)) limits construction activities to the hours of 7 AM and 6 PM on Monday through Saturday; however, neither the City's General Plan nor Municipal Code establish a specific numeric noise standard (e.g., 90 dBA L_{eq}) for construction noise levels. As discussed above, the Project's potential exterior construction noise levels would range from approximately 66 dBA L_{eq} to 88 dBA L_{eq} depending on the specific equipment in use and the distance between the equipment and adjacent residential properties. These noise levels would be approximately 1 dB to 40 dB above the existing ambient noise levels measured at the Project site (see Table 2). Although the City does not maintain a specific construction noise level standard, the temporary increase in noise levels associated with the proposed construction activities could, at times, be substantial and have the potential to annoy adjacent residential receptors and/or interfere with the receptors normal use and enjoyment of their property.

Although the proposed Project's construction activities may result in a substantial temporary increase in ambient noise levels, they are not anticipated to result in physical harm (e.g., temporary or permanent hearing loss or damage) to any adjacent sensitive residential noise receptor for several reasons. First, the construction phases using the most large equipment - site preparation and grading - are anticipated to occur for no more than 30 total days (not necessarily consecutive) out of the anticipated 14-month construction schedule. In addition, the estimated worst-case noise levels would only occur when equipment operations occur directly adjacent to a receptor. As equipment moves along the property line and throughout the site, noise levels would decrease at one receptor and increase at a different receptor. Worst-case conditions (i.e., equipment operating directly adjacent to a specific receptor), are estimated to occur up to four (4) hours per day for no more than several days. Thus, any individual receptor would not be continuously exposed to estimated worst-case noise levels (i.e., noise levels would

lower when equipment moves away and return to ambient conditions when construction ceases for the day). Finally, the estimated construction noise level values presented in Table 3 are exterior noise levels, whereas receptors would be likely to be inside residential buildings. Interior noise levels associated with the Project's construction at nearby sensitive receptors would be approximately 12 dBA to 30 dBA lower depending on the presence of existing barriers, setback distances, façade construction type, and whether windows or doors were open or closed. Physiological effects occur when the human ear is subjected to either very high noise levels (e.g., 110 dB or more) for a short period or prolonged exposure to high noise environments. For example, to protect workers from noise-induced hearing loss, the U.S. Occupational Safety and Health Administration (OSHA) limits worker noise exposure to 90 dBA as averaged over an 8-hour time period (29 CFR 1910.95). Similarly, the National Institute for Occupational Safety and Health (NIOSH) recommends workers limit noise exposure to no more than 85 dBA over an 8-hour period to protect against noise-induced hearing loss (NIOSH, 1998). Although hourly construction noise levels may approach approximately 88 dBA L_{eq}, such noise levels would not be sustained over an 8-hour period (due to movement of equipment and changes in operations that occur during daily construction activities). Therefore, at worst-case, noise from construction activities may pose a temporary interference or annoyance effect on nearby sensitive receptors but would not result in adverse physiological effects on human receptors in the surrounding area.

To reduce the potential for the proposed Project's construction activities to result in a substantial temporary increase in ambient noise levels in the vicinity of the Project site that could annoy adjacent residential receptors and/or interfere with the normal use and enjoyment of residential properties, MIG recommends Mitigation Measure NOI-1 be incorporated into the Project:

Mitigation Measure NOI-1: Reduce Potential Project Construction Noise Levels

To reduce potential noise levels from Project construction activities, the Applicant shall:

1) *Notify Residential Land Uses of Planned Construction Activities.* This notice shall be provided at least two (2) weeks prior to the start of any construction activities, describe the noise control measures to be implemented by the Project, and include the name and phone number of the designated contact for the Applicant/Project representative and the City of Redlands responsible for handling construction-related noise complaints (per action #5 below). This notice shall be provided to the owner/occupants of residential dwelling units that border the Project site to the north and west and that are directly across Colton Avenue from the Project site.

2) *Restrict Work Hours:* All construction-related work activities, including material deliveries, shall be subject to the requirements of City Municipal Code Section 8.06.120(G). Construction activities, including deliveries, shall occur only during the hours of 7 AM to 6 PM Monday to Saturday and shall not occur any time on Sundays and holidays. The Applicant/Project representative and/or its contractor shall post a sign at all entrances to the construction site informing contractors, subcontractors, other workers, etc. of this requirement.

3) *Construction Equipment Selection, Use, and Noise Control Measures*: The following measures shall apply to construction equipment used at the Project site:

    a. Contractors shall use the smallest size equipment capable of safely completing work activities.

    b. Construction staging shall occur as far away from residential land uses as possible given site and active work constraints.

    c. Electric hook-ups shall be provided for stationary equipment (e.g., pumps, compressors, welding sets). This measure shall be subject to the approval of the

local electric utility. If electric service is denied, the Applicant shall ensure actions 3a, 3b, and 3d are implemented.

d. All stationary noise generating equipment shall be shielded and located as far as possible from residential land uses given site and active work constraints. Shielding may consist of a three-or four-sided enclosure provided the structure/enclosure breaks the line of sight between the equipment and the receptor and provides for proper ventilation and equipment operation.

e. Heavy equipment engines shall be equipped with standard noise suppression devices such as mufflers, engine covers, and engine/mechanical isolators, mounts, and be maintained in accordance with manufacturer's recommendations during active construction activities.

f. Pneumatic tools shall include a suppression device on the compressed air exhaust.

g. No radios or other amplified sound devices shall be audible beyond the property line of the construction site.

4) *Install Construction Noise Barrier:* The following measures shall apply to Project construction activities:

   a. Site Preparation, Grading, and Foundation Work: During all site preparation, grading, and structure foundation work activities, a physical noise barrier shall be installed and maintained around the north, south, and western site perimeter to the maximum extent feasible given site constraints and access requirements. The noise barrier shall extend to a height of six (6) feet above grade. Potential barrier options capable of reducing construction noise levels could include, but are not limited to:

      i. A plywood or other barrier installed at-grade (or mounted to structures located at-grade, such as a K-Rail), and consisting of a solid material (i.e., free of openings or gaps other than weep holes) that has a minimum rated transmission loss value of 20 dB.

      ii. Commercially available acoustic panels or other products such as acoustic barrier blankets that have a minimum sound transmission class (STC) or transmission loss value of 20 dB.

      iii. Any combination of noise barriers and commercial products capable of achieving required construction noise reductions during site preparation, grading, and structure foundation work activities.

      iv. The noise barrier may be removed following the completion of building foundation work (i.e., it is not necessary once framing and typical vertical building construction begins provided no other grading, foundation, etc. work is still occurring on-site).

      The noise barrier shall not be required if the perimeter concrete masonry unit wall included in the project's site plan is fully constructed prior to the start of substantial site preparation and grading activities at the site (i.e., only clearing and grubbing and grading necessary to access the site and install the perimeter wall may occur).

5) *Prepare a Construction Noise Complaint Plan:* The Applicant shall prepare a Construction Noise Complaint Plan that shall:

a. Identify the name and/or title and contact information (including phone number and email) for a designated Project and City representative responsible for addressing construction-related noise issues.

b. Includes procedures describing how the designated Project representative will receive, respond, and resolve construction noise complaints.

c. At a minimum, upon receipt of a noise complaint, the Project representative shall notify the City contact, identify the noise source generating the complaint, determine the cause of the complaint, and take steps to resolve the complaint.

The implementation of Mitigation Measure NOI-1 would reduce construction noise levels by 5 dBA to 10 dBA at individual receptor locations during the daytime. Based on the estimated worst-case scenario (88 dBA L_{eq}), exterior noise levels at individual receptors could reach 78 dBA L_{eq} to 83 dBA L_{eq} for limited periods of time with the incorporation of Mitigation Measure NOI-1. Such noise levels would be similar to the maximum measured daytime noise levels in the project vicinity, but noticeably louder (approximately 20 dBA to 30 dBA) than the typical measured daytime noise levels ((approximately 48 dBA L_{eq} to 65 dBA L_{eq}, see Table 2). Although worst-case noise levels could be noticeably louder than typical hourly daytime noise levels, Mitigation Measure NOI-1 would require the Applicant to provide advance warning of the proposed Project's potentially noisy construction activities, restrict work hours to periods when humans are less sensitive to elevated noise levels in accordance with Municipal Code requirements, implement equipment noise control measures, install a temporary noise barrier between work areas and affected receptors, and prepare and plan for potential unanticipated or unexpected construction noise issues. By providing advanced notice of loud construction activities and implementing equipment control measures and temporary noise barriers, the potential for sensitive residential receptors to be surprised or annoyed by loud exterior noises would be substantially reduced. In addition, daytime noise levels inside potential residential buildings would be approximately 12 dBA to 30 dBA lower, depending on whether windows and doors were open or closed. Thus, interior noise levels at individual receptors locations could potentially reach 58 dBA L_{eq} to 71 dBA L_{eq} during daytime hours, when humans are less sensitive to higher noise levels. At no time would the proposed Project's exterior or interior construction noise be loud enough to result in physical harm to adjacent residential receptors. Finally, although worst-case construction noise levels could be noticeably louder than typical conditions, this impact would occur intermittently (anticipated to be up to four (4) hours per day) for several days during the Project's anticipated 30-day site preparation and grading phases), which would not constitute sustained or prolonged exposure to substantially temporary noise increases. The implementation of Mitigation NOI-1 would lower overall Project construction noise levels, reduce the potential for Project construction noise levels to surprise or annoy residential receptors, and reduce the potential for Project construction noise levels to interfere with normal use of residential properties. The implementation of Mitigation Measure NOI-1 would, therefore, render the proposed Project's potential construction noise levels less than significant with mitigation.

Project Operation (On-Site Noise Sources)

The existing residential land uses near the Project site generate noise from vehicle parking activities, garbage collection activities, landscaping activities, stationary heating, ventilation, and air conditioning (HVAC) equipment, and other residential activities (e.g., building maintenance). The proposed Project would have a similar density as the existing land uses surrounding the Project site and involve similar noise generating sources and activities. Although the proposed Project could increase the amount of noise sources and noise-generating activities compared to existing conditions, the Project would have a limited potential to generate significant on-site

noise levels or substantially change overall noise levels in the vicinity of the Project. In general, single-family residential land uses are not a substantial noise-generating land use type because they do not involve substantial noise-generating activities, buildings and equipment are usually setback from shared property lines, and properties are usually screened from public view by landscaping, fences, or walls and, therefore, shielded from adjacent property lines. For example, the short-term noise levels measured the interior of the site, away from Wabash Avenue and Colton Avenue, were less than 50 dBA L_{eq} (see Table 2), which is indicative of the fact that most residential land uses do not generate significant noise levels.

Once constructed, the proposed Project's primary on-site noise generating activities would include traffic on the new interior circulation roads, human activity from use of the small community park, and mechanical equipment such as garage doors and HVAC equipment; however, the Project includes several design features that limit the potential for Project noise sources to impact adjacent residential receptors. First, the proposed Project design includes a six (6)-foot high, four (4)-inch thick concrete wall along its entire northern and western perimeter, which would provide shielding between rear yards and adjacent residential uses (Sitescapes 2022). Second, the proposed Project layout generally places the housing units around the perimeter of the site, which would further shield potential noise originating from the interior of the Project from adjacent residences. Finally, the Project would be subject to Municipal Code provisions that generally govern the use of noise-generating equipment on residential properties, such as Municipal Code Section 8.06.090, which prohibits the use of domestic power tools and machinery (e.g., powered saws, lawn and garden tools) during nighttime hours if they create a noise disturbance.

The only stationary noise generating equipment at the Project site would be the proposed HVAC units, which would be located at ground-level, in the backyard area of each residential building (KTGY Architecture and Planning, 2022). Although the exact make and model of the HVAC units are unknown at this time, the type of HVAC unit anticipated to be installed is a small fan-type residential unit capable of generating noise levels between 70 and 76 dBA at a distance of three (3) feet, depending on the type of model installed (Carrier, 2021).

The site plan indicates that the Project's residential buildings would be set back a minimum of 25 feet from existing residences to the north and west (CA Engineering Inc., 2023). With distance, the typical residential HVAC unit would generate a noise level between 51.6 dBA L_{eq} and 57.6 dBA L_{eq} at adjoining property lines, which is above the City's 50 dBA L_{eq} nighttime noise standard for residential land uses. The proposed Project design also includes a six (6)-foot tall concrete masonry unit perimeter wall that would provide between approximately five (5) and 10 dB of attenuation in the rear yards of adjacent property lines. The difference in barrier attenuation is due to differences in receiver, source (i.e., HVAC), and top of barrier elevations along the site's northern and western property lines. In general, receptors adjacent to the western property line are situated below the project grade and the differences in elevations between the receptor, HVAC unit, and top of barrier height are greater. In contrast, receptors adjacent to the northern property line are situated closer to (on the west) or above (on the east) the project grade, and the differences in elevations between the receptor, HVAC unit, and top of barrier height are less pronounced. The proposed Project's estimated HVAC unit noise levels with distance and barrier attenuation are provided in Table 4. Refer to Appendix 04 for the detailed HVAC noise and barrier attenuation estimates.

Table 4: Potential HVAC System Noise Levels		
HVAC System Variable	**Property Line Receptor(A)**	
	West	**North**
HVAC Unit Noise Level	71 to 76 dBA	71 to 76
Distance to Receptor	25 feet	25 feet
Noise Level at 25 Feet	51.6 dBA L_{eq} to 57.6 dBA L_{eq}	51.6 dBA L_{eq} to 57.6 dBA L_{eq}
Perimeter Barrier Attenuation	-9.0 dBA to -10.4 dBA	-5.2 dBA to -7.5 dBA
Resulting HVAC Noise Level	41.2 dBA L_{eq} to 48.6 dBA L_{eq}	44.1 dBA L_{eq} to 52.4 dBA L_{eq}
City Municipal Code Standard	60 dBA L_{eq} (7 AM – 10 PM) 50 dBA L_{eq} (10 PM – 7 AM)	60 dBA L_{eq} (7 AM – 10 PM) 50 dBA L_{eq} (10 PM – 7 AM)
Additional Attenuation Needed	0 dBA	Up to 2.4 dBA (10 PM – 7 AM)

Source: MIG (see Attachment 04)

(A) The data presented are the worst-case prediction along the property line. Refer to Appendix XYZ for detailed information on HVAC noise level estimates.

As shown in Table 4, HVAC units that generate higher noise levels (74.6 dBA or higher) would require additional attenuation to ensure potential HVAC units do not exceed the City's nighttime noise standard of 50 dBA L_{eq}.

To reduce the potential for the proposed Project's operational HVAC noise levels to generate noise levels above the City's exterior standards for residential properties, MIG recommends Mitigation Measure NOI-2 be incorporated into the Project:

Mitigation Measure NOI-2: Reduce Potential Project HVAC Noise Levels

To reduce potential noise levels from Project heating, ventilation, and air conditioning (HVAC) equipment, the City shall prohibit the installation of HVAC systems that generate a noise level greater than 76 dBA at three (3) feet. In addition, for HVAC systems located in the rear or side yards of residential units along the Project's northern property line, the Applicant shall, prior to the release of the grading or building permit that authorizes the construction of any such unit, submit evidence of one the following:

1) The HVAC units to be installed shall be located at least 25 feet from the northern property line (as measured from the edge of the HVAC compressor/condenser equipment) and shall not generate a noise level in excess of 74.6 dBA at three (3) feet from the unit. The City may accept a manufacturer's specifications or other information, such as actual empirical noise measurements, as evidence of the noise levels that may be generated by the final proposed HVAC system(s).
2) If the HVAC units to be installed generate a noise level between 74.6 dBA and 76 dBA at three (3) feet they shall be located a minimum of 34 feet from the northern property line (as measured from the edge of the HVAC compressor/condenser equipment).
3) If the HVAC units to be installed generate a noise level between 74.6 dBA and 76 dBA at three (3) feet) and they are located closer than 34 feet from the northern property line (as measured from the edge of the HVAC compressor/condenser equipment), then the height of the planned northern perimeter concrete masonry unit wall shall be increased from six (6) feet to eight (8) feet in height above the planned finished surface elevation.

The implementation of Mitigation Measure NOI-2 would provide a minimum of 2.5 dBA of additional HVAC noise attenuation at existing residential receptors along the shared northern property line and ensure that HVAC noise levels would not exceed the City's 50 dBA L_{eq} exterior nighttime noise standard, nor any other exterior noise standard (e.g., the City's 60 dBA L_{eq} daytime standard for residential properties).

The Project also would not have the potential to result in noise levels that exceed the City's maximum permissible interior noise limit of 45 dBA L_{eq} for residential properties. Noise levels inside existing residential buildings would be approximately 12 dBA to 30 dBA lower than estimated exterior noise levels, depending on whether windows and doors were open or closed. Thus, potential HVAC-related interior noise levels at existing residential receptors adjacent to the Project would be less than 40 dBA L_{eq} even with windows open, which is less than the City's 45 dBA L_{eq} interior noise standard.

Finally, it is noted that HVAC equipment does not operate continuously and would not affect ambient noise levels when the equipment is not in use. For these reasons, potential HVAC equipment would not generate noise levels that have the potential to exceed the 45 dBA CNEL interior noise standard established by General Plan Policy 9.0s. Furthermore, with Mitigation Measure NOI-2, potential HVAC noise is estimated to be less than 50.0 dBA L_{eq} when in operation, which would be approximately 2.4 dBA above measured ambient noise levels on the interior of the site (47.6 dBA L_{eq} at ST-4, see Table 2). Since HVAC equipment would not operate continuously, the net change in 24-hour noise exposure levels at adjacent residential properties would be less than 2.4 dBA. The proposed Project, therefore, does not have the potential to result in incompatible noise levels at adjacent residences or otherwise result in a substantial permanent increase in ambient noise levels in the vicinity of the Project (considered by General Plan Policy 9.0v to be 4 dBA if a land use compatibility threshold is exceeded or 6 dBA in any situation).

As described above, the proposed Project would not result in a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of City standards with the incorporation of Mitigation Measure NOI-2. This impact would be less than significant with mitigation.

Project Operation (Off-Site Vehicle Trip Noise)

The Transportation Study Screening Analysis prepared for the proposed Project indicates the Project would result in a net increase of 918 daily vehicle trips (Ganddini Group, 2023). Currently, there are approximately 7,400 vehicles per day on Wabash Avenue north of Colton Avenue, 5,800 vehicles per day on Wabash Avenue south of Colton Avenue, 4,100 vehicles per day on Colton Avenue east of Wabash Avenue, and 5,400 vehicles per day on Colton Avenue between Wabash Avenue and Dearborn Street (Ganddini Group, 2023). In general, it takes a doubling of traffic to increase traffic noise volumes by 3 dBA, which is considered an audible increase for exterior noise environments by the City's General Plan (Caltrans, 2013 and City of Redlands, 2017). The addition of 918 passenger cars to the roadway system would not result in a doubling of traffic on any roadway segment at or in the vicinity of the Project site and, therefore, would result in a less than 3 dBA increase in noise levels on local roads used to access the Project site. The proposed Project would not result in a substantial, permanent increase in noise levels along the roadways used to access the proposed Project as compared to existing or future conditions. This impact would be less than significant.

Groundborne Vibration

Construction vibration impacts generally occur when construction activities occur in close proximity to buildings and vibration-sensitive areas, during evening or nighttime hours, or when construction activities last extended periods of time. The potential for groundborne vibration is

typically greatest when vibratory or large equipment such as rollers or bulldozers are in operation. For the proposed Project, these types of equipment would primarily operate during the site preparation, grading, and paving phases. Site preparation and grading would occur over a total of approximately 30 days at the beginning of construction and paving would occur over approximately 20 days near the end of construction. During site preparation and grading activities, large equipment could, at worst-case, operate adjacent to the site's property lines and within approximately 25 feet of the nearest residential buildings (to the north and west), although most operations would generally take place further from receptor locations. For example, equipment operating in the middle of the site could be 300 feet from receptors, and equipment operating along the southern and eastern perimeters could be approximately 600 feet from receptors. Paving operations would generally take place near the interior of the site, usually at least 50 feet from any adjacent residential building. The groundborne vibration levels generated by the type of equipment that would be used to construct the proposed Project are shown in Table 5. Refer to Attachment 05 for detailed vibration estimates.

Table 5: Potential Project Construction Vibration Levels

Equipment	Estimated Peak Particle Velocity at Distance (in/sec) [(A),(B)]							
	25 feet	50 feet	100 feet	200 feet	250 feet	300 feet	350 feet	400 feet
Small bulldozer	0.003	0.001	0.001	0.000	0.000	0.000	0.000	0.000
Jackhammer	*0.035*	*0.016*	0.008	0.006	0.005	0.004	0.003	0.002
Large bulldozer	*0.089*	*0.042*	*0.019*	*0.015*	*0.012*	0.009	0.007	0.006
Vibratory Roller	*0.210*	*0.098*	*0.046*	*0.034*	*0.029*	*0.021*	*0.017*	*0.010*

Sources: MIG (see Attachment 05)' Caltrans, 2020; and FTA, 2018.

(A) Estimated PPV calculated as: PPV(D)=PPV(ref)*(25/D)^1.1 where PPV(D)= Estimated PPV at distance; PPVref= Reference PPV at 25 ft; D= Distance from equipment to receiver; and n= ground attenuation rate (1.1 for dense, compacted hard soils). All distances are lateral distances and do not consider changes in topography.

(B) *Italicized* values indicate the estimated vibration level exceeds the vibration perception threshold of 0.01 in/sec established by City Municipal Code Section 8.06.090(G).

As shown in Table 5, specific vibration levels associated with typical construction equipment are highly dependent on the type of equipment used. The use of typical equipment during construction activities (e.g., bulldozer, jack hammer) is estimated to produce vibration levels above the City's vibration perception threshold of 0.01 in/sec PPV when operated within 250 feet of a residential building façade. For specific vibration-inducing equipment, such as a vibratory roller, it is estimated vibration levels may be above the City's vibration perception threshold when operated within 400 feet of a residential building façade. It is noted the vibration estimates shown in Table 5 do not take into account differences in grade or other subsurface conditions that may limit vibration transmission. In addition, the vibration estimated shown in Table 5 do not consider any loss of vibratory energy associated with the transfer of vibrations across different medium (e.g., from the soil to a concrete foundation to a floor or wall assembly). The vibration estimates shown in Table 5, therefore, are likely to overestimate potential vibration levels associated with construction equipment.

As shown in Table 5, the proposed Project's potential construction activities would have the potential to exceed the City's vibration perception threshold of 0.01 in/sec PPV; however, the vibration levels that could be generated by potential construction activities would not be considered excessive for several reasons. First, potential worst-case construction vibrations

would be intermittent, lasting only a few hours each day at any individual receptor. Second, potential worst-case construction vibrations would occur only when equipment operates directly adjacent to a receptor, which is not anticipated to last more than several days in total. Third, all construction activity would occur during the daytime, when human beings are less sensitive to vibrations, and would not interfere with evening or knighting use of residences. Finally, potential construction vibrations would not result in physical damage to any building or structure because estimated worst-case vibration levels would be below Caltrans' guidelines for damage to sensitive residential structures (0.3 in/sec PPV; Caltrans, 2013).

While potential construction vibrations would not be considered excessive, the potential exists for construction equipment to generate vibration levels above the City's vibration perception threshold of 0.01 in/sec PPV. To reduce the proposed Project's potential to temporarily exceed the City's vibration standard, MIG recommends Mitigation Measure NOI-3 be incorporated into the Project.

> **Mitigation Measure NOI-3: Prohibit Vibratory Construction Equipment.** To reduce potential vibration levels associated with construction of the proposed Project, the Applicant and/or its designated contractor, contractor's representatives, or other appropriate personnel shall use tamper and drum/wheel style rollers during Project construction. The use of large vibratory rollers or other vibratory equipment shall be prohibited during construction unless geotechnical evaluations indicate the use of this equipment is specifically required to address compaction or other building requirements, in which case the use of vibratory rollers and equipment shall be limited to the area/conditions specified in the geotechnical report.

The implementation of Mitigation Measure NOI-3 would prohibit or limit the use of construction equipment with the greatest potential to exceed the City's vibration perception threshold. In addition, Mitigation Measure NOI-1 would require the Applicant to provide advance warning to adjacent residents of the proposed Project's construction activities, restrict work hours to daytime periods, and use the smallest equipment capable of safely completing work activities. By prohibiting and limiting the use of vibration inducing equipment, providing advanced notice of construction activities, and implementing equipment control measures, the potential for sensitive residential receptors to be exposed to disturbing or excessive perceptible vibrations would be substantially reduced. Thus, with Mitigation Measure NOI-3, the proposed Project's potential construction vibration levels would be rendered a less than significant impact.

Once operational, the proposed Project would not have any large equipment that would generate vibration. This impact would be less than significant.

Airport-Related Noise

The proposed Project is located approximately 1.3 miles south of the Redlands Municipal Airport. Noise from overhead flights was observed during the ambient noise monitoring conducted for the Project; however, the predominant source of noise was traffic noise from Wabash Avenue and Colton Avenue. As noted in the City's General Plan, aircraft noise is a relatively minor contribution to the City's overall noise environment (City of Redlands 2017). The Project site is located outside of the 60 CNEL noise contour for the Redlands Municipal Airport and is not located within any other airport planning boundary (City of Redlands 2003). The proposed Project, therefore, would not expose people living at the site to excessive airport-related noise levels.

Other Planning Considerations (Noise / Land Use Compatibility)

The California Supreme Court in *California Building Industry Association v. Bay Area Air Quality Management District*, 62 Cal.4th 369 (2015) ruled that CEQA review is focused on a project's

impact on the environment "and not the environment's impact on the project." Per this ruling, a Lead Agency is not required to analyze how existing conditions might impact a project's existing or future population except where specifically required by CEQA; however, a Lead Agency may elect to disclose information relevant to a project even if it not is considered an impact under CEQA. Furthermore, the City's General Plan sets noise standards for receiving land uses which require evaluation for consistency and compliance even if such evaluation is not required by CEQA to be identified as a physical impact of the project. Specifically, General Plan Policy 7-A.135 establishes that the clearly compatible and normally incompatible noise levels for residential land uses are 60 CNEL and 75 CNEL, respectively.

The General Plan Healthy Community Element contains noise level contours along Wabash Avenue and Colton Avenue. The traffic noise modeling conducted for the General Plan indicates traffic noise levels 50 feet from the outermost lane of Colton Avenue and Wabash Avenue are approximately 59.4 and 63.2 CNEL, respectively, and will increase to approximately 61.2 CNEL and 64.3 CNEL, respectively, by 2035. It is noted the existing traffic noise levels in the General Plan were generally confirmed by ambient noise monitoring conducted at the Project site (See Table 2).

Exterior Noise Levels in Rear Yards

The proposed Project's rear yards would be located approximately 40 feet from the center of the outermost travel lane on Wabash Avenue and 48 feet from the center of the outermost travel lane on Colton Avenue. At this distance, under 2035 conditions, the estimated noise levels at the proposed Project's eastern and southern rear yards are estimated to be 62.2 CNEL and 64.5 CNEL, respectively. The proposed six (6)-foot-tall perimeter concrete masonry unit wall would provide, at minimum, six (6) dB of traffic noise attenuation in the rear yards that abut Colton and Wabash Avenues (see Attachment 04). Thus, with the proposed perimeter wall, the proposed Project would not be subject to exterior noise levels that exceed the City's clearly compatible noise level limit of 60 CNEL.

Interior Noise Levels in Proposed Residential Units

The proposed Project's exterior building façades would be located a minimum of 50 feet from the center of the outermost travel lane on Wabash Avenue and 58 feet from the center of the outermost travel lane on Colton Avenue. At this distance, under 2035 conditions, the estimated noise levels at the proposed Project's eastern and southern rear yards are estimated to be 61.2 CNEL and 63.7 CNEL, respectively (see Attachment 04). As explained previously, standard construction techniques and materials for new residential buildings are commonly accepted to provide a minimum exterior to interior noise attenuation (i.e., reduction) of 12 to 30 dBA , depending on whether all windows and doors closed.[1] The proposed Project includes individual HVAC systems for each residential units, which would permit residents to occupy residential units with windows closed and result in interior noise levels in residential units fronting Wabash Avenue and Colton Avenue that would be, at minimum, less than 35 CNEL. Thus, with standard construction techniques, the proposed Project would satisfy the City's 45 dBA CNEL interior

1 The U.S. Department of Housing and Urban Development (HUD) Noise Guidebook and supplement (2009a, 2009b) includes information on noise attenuation provided by building materials and different construction techniques. As a reference, a standard exterior wall consisting of 5/8-inch siding, wall sheathing, fiberglass insulation, two by four wall studs on 16-inch centers, and 1/2-inch gypsum wall board with single strength windows provides approximately 35 dBs of attenuation between exterior and interior noise levels. This reduction may be slightly lower (2-3 dBs) for traffic noise due to the specific frequencies associated with traffic noise but will still be sufficient to meet the 45 CNEL standard for dwelling units fronting Colton Avenue and Wabash Avenue. Increasing window space may also decrease attenuation, with a reduction of 10 dBs possible if windows occupy 30% of the exterior wall façade.

building code noise requirement established by General Plan Policy 9.0s and State building code requirements.

CONCLUSION

As described in this memo, the proposed Project, with mitigation incorporated, would not generate temporary or permanent noise levels that would exceed the City's standards or otherwise result in a substantial increase in ambient noise levels, would not generate excessive groundborne vibration or groundborne noise levels, and would not expose people residing or working in the Project area to excessive aircraft noise levels. The proposed Project, therefore, would not result in a substantial, adverse noise-related effect on the environment. In addition, the proposed Project would not be subjected to incompatible noise levels.

REFERENCES

The following references were used to prepare this memorandum:

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U.S. Federal Highway Administration (FHWA) 2010. "Construction Noise Handbook, Chapter 9 Construction Equipment Noise Levels and Ranges: <https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm>

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U.S. HUD. 2009a.HUD Noise Guidebook. Prepared by the Environmental Planning Division, Office of Environment and Energy. March 2009.

_____2009b. HUD Noise Guidebook, Chapter 4 Supplement: Sound Transmission Class Guidance. Prepared by the Environmental Planning Division, Office of Environment and Energy. March 2009.

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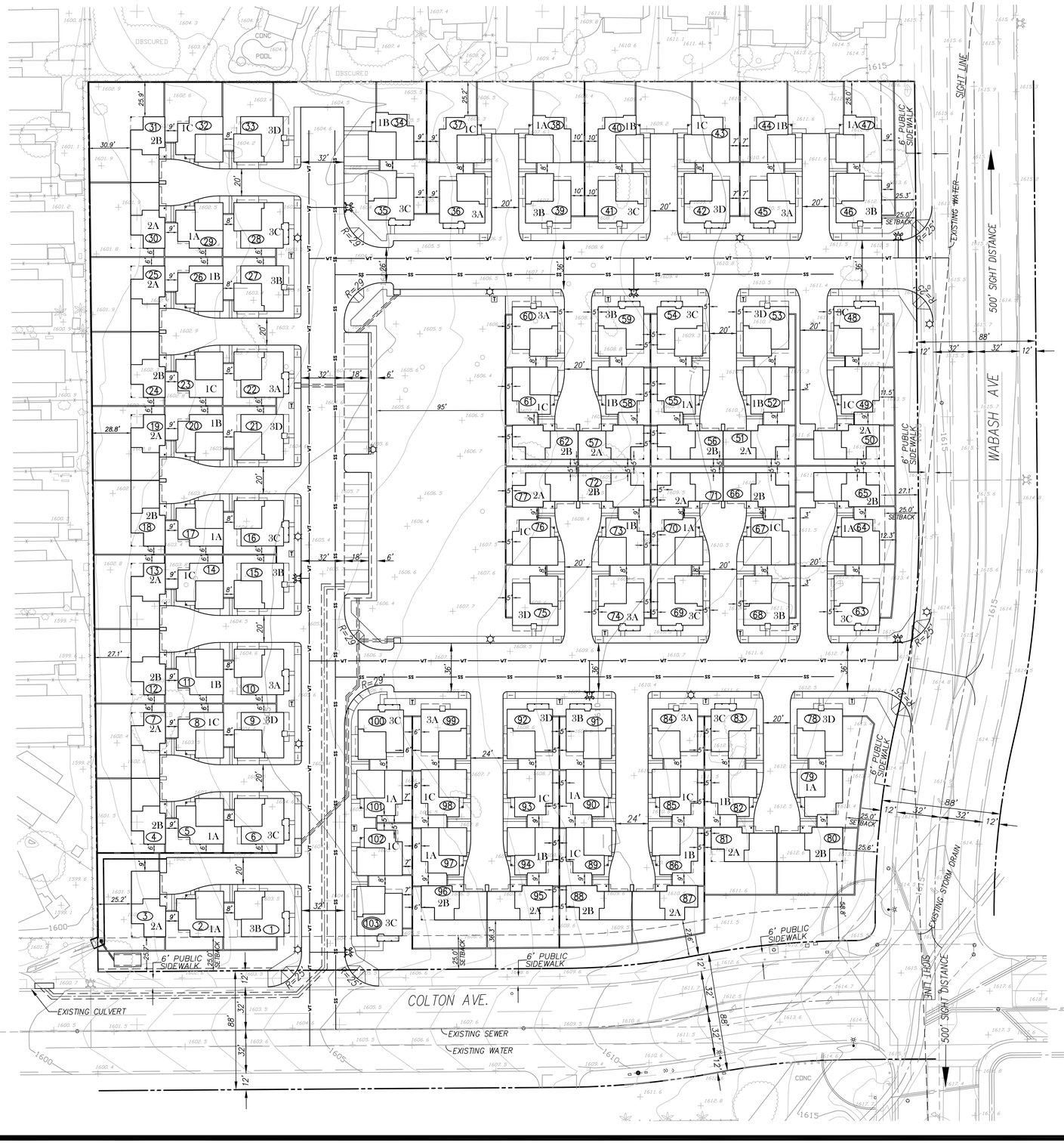
Attachment 01

Project Site Plan

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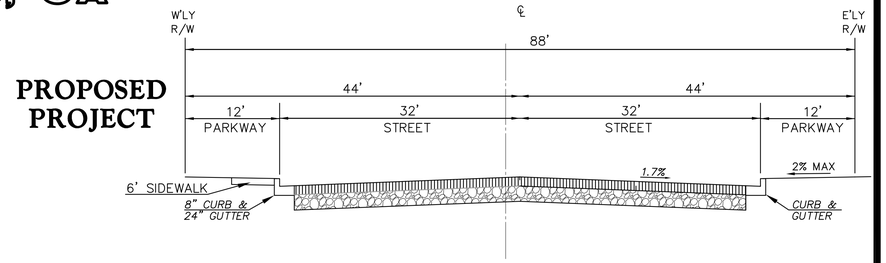
SITE PLAN

COLTON AVE & WABASH AVE, REDLANDS, CA



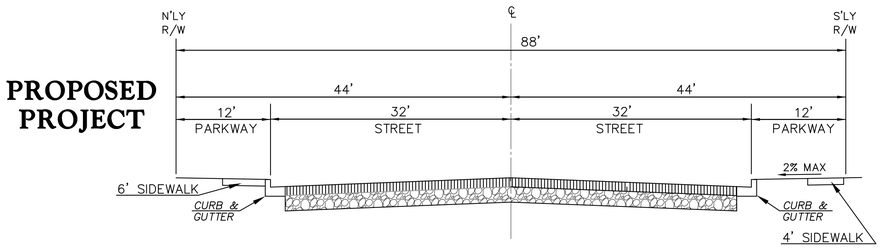
WABASH AVE. TYPICAL SECTION

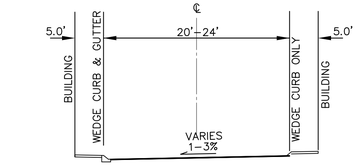
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COLTON AVE. TYPICAL SECTION

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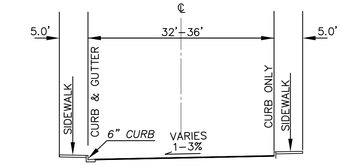




PRIVATE ON-SITE ALLEY

STREET SECTION

NO SCALE



PRIVATE ON-SITE STREET

STREET SECTION

NO SCALE

LEGEND

- PROP. LOT LINE
- BOUNDARY LINE
- PROP. CURB
- EX. CURB
- PROPOSED SEWER
- EXISTING SEWER
- PROPOSED WATER
- EXISTING WATER
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN

NORTH

CA

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PROJECT SUMMARY

9.01 ACRES (NET & GROSS)
11.43 DU/ACRE
103 TOTAL UNITS

PRODUCT 1
40 UNITS
1,544 SF

PRODUCT 2
27 UNITS
1,700 SF

PROCUCT 3
36 UNITS
1,858 SF

PARKING SUMMARY
63 GUEST STALLS
206 GARAGE STALLS
269 TOTAL STALLS

MIX SUMMARY
PRODUCT 1 – 40 UNITS 38.8%
PRODUCT 2 – 27 UNITS 26.2%
PRODUCT 3 – 36 UNITS 35.0%

Soni 2012 Irrevocable Trusts
1423 Georgina Avenue Santa Monica
Santa Monica, CA 90402
(949) 922-7075
Contact: Vanita Soni Puri

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Planning • Engineering • Surveying
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TUSTIN, CA 92780
949-724-9480 949-724-9484 FAX

SHEET C1.2
Mar 10 2023
JOB NO. 816-1
SHEET NO. 1 OF 1 SHTS.

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Attachment 02

Environmental Noise Background

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ENVIRONMENTAL NOISE BACKGROUND

Noise may be defined as loud, unpleasant, or unwanted sound. The frequency (pitch), amplitude (intensity or loudness), and duration of noise all contribute to the effect on a listener, or receptor, and whether the receptor perceives the noise as objectionable, disturbing, or annoying.

The Decibel Scale (dB)

The decibel scale (dB) is a unit of measurement that indicates the relative amplitude of a sound. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a tenfold increase in acoustic energy, while 20 dBs is 100 times more intense, 30 dBs is 1,000 more intense, and so on. In general, there is a relationship between the subjective noisiness, or loudness of a sound, and its amplitude, or intensity, with each 10 dB increase in sound level perceived as approximately a doubling of loudness. Due to the logarithmic basis, decibels cannot be directly added or subtracted together using common arithmetic operations:

$$50\ decibels + 50\ decibels\ \neq 100\ decibels$$

Instead, the combined sound level from two or more sources must be combined logarithmically. For example, if one noise source produces a sound power level of 50 dBA, two of the same sources would combine to produce 53 dB as shown below.

$$10 * \ 10\ log\left(10^{\left(\frac{50}{10}\right)} + \ 10^{\left(\frac{50}{10}\right)}\right) = 53\ decibels$$

In general, when one source is 10 dB higher than another source, the quieter source does not add to the sound levels produced by the louder source because the louder source contains ten times more sound energy than the quieter source.

Sound Characterization

There are several methods of characterizing sound. The most common method is the "A-weighted sound level," or dBA. This scale gives greater weight to the frequencies of sound to which the human ear is typically most sensitive. Thus, most environmental measurements are reported in dBA, meaning decibels on the A-scale.

Human hearing matches the logarithmic A-weighted scale, so that a sound of 60 dBA is perceived as twice as loud as a sound of 50 dBA. In a quiet environment, an increase of 3 dB is usually perceptible, however, in a complex noise environment such as along a busy street, a noise increase of less than 3 dB is usually not perceptible, and an increase of 5 dB is usually perceptible. Normal human speech is in the range from 50 to 65 dBA. Generally, as environmental noise exceeds 50 dBA, it becomes intrusive and above 65 dBA noise becomes excessive. Nighttime activities, including sleep, are more sensitive to noise and are considered affected over a range of 40 to 55 dBA.

Sound levels are typically not steady and can vary over a short time period. The equivalent noise level (L_{eq}) is used to represent the average character of the sound over a period of time. The L_{eq} represents the level of steady noise that would have the same acoustical energy as the sum of the time-varying noise measured over a given time period. L_{eq} is useful for evaluating shorter time periods over the course of a day. The most common L_{eq} averaging period is hourly, but L_{eq} can describe any series of noise events over a given time period.

Variable noise levels are values that are exceeded for a portion of the measured time period. Thus, L_{01} is the level exceeded one percent of the time and L90 is the level exceeded 90

percent of the time. The L_{90} value usually corresponds to the background sound level at the measurement location.

Noise exposure over the course of an entire day is described by the day/night average sound level, or DNL (also referred to as L_{dn}), and the community noise equivalent level, or CNEL. Both descriptors represent the 24-hour noise impact on a community. For DNL, the 24-hour day is divided into a 15-hour daytime period (7 AM to 10 PM) and a nine-hour nighttime period (10 PM to 7 AM) and a 10 dB "penalty" is added to measure nighttime noise levels when calculating the 24-hour average noise level. For example, a 45-dBA nighttime sound level would contribute as much to the overall day-night average as a 55-dBA daytime sound level. The CNEL descriptor is similar to DNL, except that it includes an additional 5 dBA penalty beyond the 10 dBA for sound events that occur during the evening time period (7 PM to 10 PM). The artificial penalties imposed during DNL and CNEL calculations are intended to account for a receptor's increased sensitivity to sound levels during quieter nighttime periods.

Sound Propagation

The energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out and travels away from the noise generating source. Theoretically, the sound level of a point source attenuates, or decreases, by 6 dB with each doubling of distance from a point source. Sound levels are also affected by certain environmental factors, such as ground cover (asphalt vs. grass or trees), atmospheric absorption, and attenuation by barriers. Outdoor noise is also attenuated by the building envelope so that sound levels inside a residence are from 10 to 20 dB less than outside, depending mainly on whether windows are open for ventilation or not.

For an ideal "point" source of sound, the energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out in a spherical pattern and travels away from the point source. Theoretically, the sound level attenuates, or decreases, by 6 dB with each doubling of distance from the point source. The change in noise levels between two distances can be calculated according to Equation 1 (California Department of Transportation (Caltrans), 2013) as follows:

Equation 1

$$dBA2 = dBA1 + 20\log (D1/D2)$$

Where:

dBA1 = Known noise level, such as a reference noise level
D1 = Distance associated with dBA1
dBA2 = Noise level at distance 2
D2 = Distance associated with dBA2

For an ideal line source of sound, the energy contained in a sound pressure wave dissipates and is absorbed by the surrounding environment as the sound wave spreads out in a cylindrical pattern from the source. Theoretically, the sound level attenuates, or decreases, by 3 dB with each doubling of distance from the line source. The change in noise levels between two distances can be calculated according to Equation 2 as follows:

Equation 2

$$dBA2 = dBA1 + 10log (D1/D2)$$

Where:

dBA1 = Known noise level, such as a reference noise level
D1 = Distance associated with dBA1
dBA2 = Noise level at distance 2
D2 = Distance associated with dBA2

Noise Effects on Humans

Noise effects on human beings are generally categorized as:

- Subjective effects of annoyance, nuisance, and/or dissatisfaction
- Interference with activities such as speech, sleep, learning, or relaxing
- Physiological effects such as startling and hearing loss

Most environmental noise levels produce subjective or interference effects; physiological effects are usually limited to high noise environments such as industrial manufacturing facilities or airports.

Predicting the subjective and interference effects of noise is difficult due to the wide variation in individual thresholds of annoyance and past experiences with noise; however, an accepted method to determine a person's subjective reaction to a new noise source is to compare it the existing environment without the noise source, or the "ambient" noise environment. In general, the more a new noise source exceeds the ambient noise level, the more likely it is to be considered annoying and to disturb normal activities.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness that would almost certainly cause an adverse response from community noise receptors.

When exposed to high noise levels, humans may suffer hearing damage. Sustained exposure to high noise levels (e.g., 90 dBs for hours at a time) can cause gradual hearing loss, which is usually temporary, whereas sudden exposure to a very high noise level (e.g., 130 to 140 dBs) can cause sudden and permanent hearing loss. In addition to hearing loss, noise can cause stress in humans and may contribute to stress-related diseases, such as hypertension, anxiety, and heart disease (Caltrans, 2013).

Vibration

Vibration is the movement of particles within a medium or object such as the ground or a building. As is the case with airborne sound, groundborne vibrations may be described by amplitude and frequency. Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared, in inches per second (in/sec). PPV represents the maximum instantaneous positive or negative peak of a vibration signal and is most appropriate for evaluating the potential for building damage. Human response to groundborne vibration is subjective and varies from person to person

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Attachment 03

Ambient Noise Monitoring Data

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Madera at Citrus Trail Residential Development
Wabash Avenue and Colton Avenue, Redlands, CA

Attachment 03: On-site HVAC Noise and Barrier Attenuation Estimates
Prepared by: MIG, Inc.
July 2023

Contents:

Sheet 1	Project Noise Level Estimates (dBA Leq)
Sheet 2	Perimeter Wall Attenuation Estimates (HVAC Low Noise)
Sheet 3	Perimeter Wall Attenuation Estimates (HVAC High Noise)
Sheet 4	Noise Compatibility Estimates

Madera at Citrus Trail Residential Project
Wabash Avenue and Colton Avenue, Redlands, CA
Attachment 03: On-site HVAC Noise and Barrier Attenuation Estimates

Sheet 1: Project HVAC Noise Level Estimates (dBA Leq)

Table 1: Estimated Noise Levels at Adjacent Property Lines						
On-Site Noise Source	Reference Noise Data		Property Line (No Barrier)		Property Line (With Barrier)	
	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA	Distance	Hourly Leq dBA
HVAC (low range)	3	70.0	25	51.6	25	48.6
HVAC (high range)	3	76.0	25	57.6	25	52.4
HVAC (high range)	3	76.0	34	54.9	34	49.8

Madera at Citrus Trail Residential Project
Wabash Avenue and Colton Avenue, Redlands, CA
Attachment 03: On-site HVAC Noise and Barrier Attenuation Estimates

Sheet 2: Noise Barrier Attenuation Estimates (HVAC Low Range)

Table 1: Source/ Property Line Receiver Information									
Noise Source:	Residential Fan-type HVAC Unit (Low)								
Source Noise Level:	PL=	51.6							
Receptor Noise Level:	PL=	50.0							
Noise Reduction Level:	PL=	1.6							
Source Frequency:	125	Hertz							

Note: "PL" = Property Line

Table 2: Source, Receptor, and Barrier Elevation Data						
Receptor	**Elevation Above Mean Sea Level**					
	Grade	**Receiver**	**Source**	**fective Source**	**Barrier**	**Top of Barrier**
PL - West (South)	1599.1	1604.1	1603.1	1606.1	1603.1	1609.1
PL - West (mid)	1600.6	1605.6	1603.3	1606.3	1603.3	1609.3
PL - North (west)	1604.0	1609.0	1605.5	1608.5	1605.5	1611.5
PL - North (center)	1610.6	1615.6	1609.8	1612.8	1609.8	1615.8

Table 3: Barrier Insertion Loss Summary			
Property Line	**Preliminary Barrier Insertion Loss Estimate**		
	Predicted Noise Level	**Barrier Attenuation**	**Noise Level with Barrier**
PL - West (South)	51.6	10.4	41.2
PL - West (mid)	51.6	9.0	42.6
PL - North (west)	51.6	7.5	44.1
PL - North (center)	51.6	5.2	46.4

Table 4: Barrier Attenuation 6-Foot High Wall (West -South)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	7.07	30.07	30	25	5	2.0	5.0

Table 5: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (West-South)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	2.18	9.00	0.4853	10.4

Table 6: Barrier Attenuation 6-Foot High Wall (West-Mid)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	6.22	30.01	30	25	5	0.7	3.7

Table 7: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (West-Mid)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	1.39	9.00	0.3092	9.0

Table 8: Barrier Attenuation 6-Foot High Wall (North-West)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	5.59	30.00	30	25	5	-0.5	2.5

Table 9: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North-West)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.77	9.00	0.1701	7.5

Table 10: Barrier Attenuation 6-Foot High Wall (North-Central)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	5.00	30.13	30	25	5	-2.8	0.2

Table 11: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North-Central)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.05	9.00	0.0118	5.2

Madera at Citrus Trail Residential Project
Wabash Avenue and Colton Avenue, Redlands, CA
Attachment 03: On-site HVAC Noise and Barrier Attenuation Estimates

Sheet 3: Noise Barrier Attenuation Estimates (HVAC High Range)

Table 1: Source/ Property Line Receiver Information									
Noise Source:	Residential Fan-type HVAC Unit (Low)								
Source Noise Level:	PL=	57.6		54.9	(34 ft setback)				
Receptor Noise Level:	PL=	50.0							
Noise Reduction Level:	PL=	7.6							
Source Frequency:	125	Hertz							

Note: "PL" = Property Line

Table 2: Source, Receptor, and Barrier Elevation Data						
Receptor	**Elevation Above Mean Sea Level**					
	Receiver Grade	**Receiver Height**	**Source Grade**	**Effective Source Height**	**Barrier Grade**	**Top of Barrier**
PL - West (South)	1599.1	1604.1	1603.1	1606.1	1603.1	1609.1
PL - West (mid)	1600.6	1605.6	1603.3	1606.3	1603.3	1609.3
PL - North (west)	1603.8	1608.8	1605.5	1608.5	1605.5	1611.5
PL - North (mid)	1610.6	1615.6	1609.8	1612.8	1609.8	1615.8
PL - North (mid, 8 ft)	1610.6	1615.6	1609.8	1612.8	1609.8	1617.8
PL - North (east)	1614.0	1619.0	1613.8	1616.8	1613.8	1619.8
PL - North (east, 8 ft)	1614.0	1619.0	1613.8	1616.8	1613.8	1621.8

Table 3: Barrier Insertion Loss Summary			
Property Line	**Preliminary Barrier Insertion Loss Estimate**		
	Predicted Noise Level	**Barrier Attenuation**	**Noise Level with Barrier**
PL - West (South)	57.6	10.4	47.2
PL - West (mid)	57.6	9.0	48.6
PL - North (west)	57.6	7.7	49.8
PL - North (mid)	57.6	5.2	52.4
PL - North (mid, 8 ft)	57.6	7.7	49.9
PL - North (mid, 34 ft)	54.9	5.1	49.8
PL - North (east)	57.6	5.6	52.0
PL - North (east, 8 ft)	57.6	8.4	49.2
PL - North (east, 34 ft)	54.9	5.5	49.4

Table 4: Barrier Attenuation 6-Foot High Wall (West -South)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	7.07	30.07	30	25	5	2.0	5.0

Table 5: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (West - South)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	2.18	9.00	0.4853	10.4

Table 6: Barrier Attenuation 6-Foot High Wall (West - Mid)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	6.22	30.01	30	25	5	0.7	3.7

Table 7: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (West - Mid)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	1.39	9.00	0.3092	9.0

Table 8: Barrier Attenuation 6-Foot High Wall (North - West)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	5.68	30.00	30	25	5	-0.3	2.7

Table 9: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North - West)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.86	9.00	0.1912	7.7

Table 10: Barrier Attenuation 6-Foot High Wall (North - Mid)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	5.00	30.13	30	25	5	-2.8	0.2

Table 11: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North - Mid)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.05	9.00	0.0118	5.2

Table 12: Barrier Attenuation 8-Foot High Wall (North - Mid)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.50	5.46	30.13	30	25	5	-2.8	2.2

Table 13: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North - Mid)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.83	9.00	0.1838	7.7

Table 14: Barrier Attenuation 6-Foot High Wall, 34-foot Setback (North - Mid)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	34.13	5.00	39.10	39	34	5	-2.8	0.2

Table 15: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North - Mid)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.04	9.00	0.0079	5.1

Table 16: Barrier Attenuation 6-Foot High Wall (North - East)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.18	5.06	30.08	30	25	5	-2.2	0.8

Table 17: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North - East)

Receptor	δ (Feet)	λ (Feet)	N_0	Insertion Loss (dB)
Property Line	0.16	9.00	0.0361	5.6

Table 18: Barrier Attenuation 8-Foot High Wall (North - East)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.50	5.73	30.08	30	25	5	-2.2	2.8

Table 19: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North - East)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	1.15	9.00	0.2545	8.4

Table 20: Barrier Attenuation 6-Foot High Wall, 34-foot Setback (North - East)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	34.13	5.06	39.06	39	34	5	-2.2	0.8

Table 21: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (North - East)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.13	9.00	0.0297	5.5

Madera at Citrus Trail Residential Project
Wabash Avenue and Colton Avenue, Redlands, CA
Attachment 03: On-site HVAC Noise and Barrier Attenuation Estimates

Sheet 4: Noise Compatibility Estimates

Table 1: Existing and Future Traffic Noise Levels

Road	General Plan Traffic Noise Level 50 Feet from Outermost Lane (CNEL)	Distance to Rear Yard or Building Façade	Estimated Traffic Noise Level at Rear Yard or Building Façade (CNEL)
Wabash Ave - Ex Yrd	59.4	40.0	60.4
Wabash Ave - Future Yrd	61.2	40.0	62.2
Wabash Ave - Future Bldg	61.2	50.0	61.2
Colton Ave - Ex Yrd	63.2	48.0	63.4
Colton Ave - Future Yrd	64.3	48.0	64.5
Colton Ave - Future Bldg	64.3	58.0	63.7

Table 2: Source/ Property Line Receiver Information					
Noise Source:	Traffic				
Source Noise Level:	PL=	62.2	Wabash	64.5	Colton
Receptor Noise Level:	PL=	60.0			
Noise Reduction Level:	PL=	2.2	Wabash	4.5	Colton
Source Frequency:	500	Hertz			

Note: "PL" = Property Line

Table 3: Source, Receptor, and Barrier Elevation Data						
Receptor	**Elevation Above Mean Sea Level**					
	Receiver Grade	**Receiver Height**	**Source Grade**	**Effective Source Height**	**Barrier Grade**	**Top of Barrier**
Wabash Rear Yard 1	1615.0	1620.0	1614.5	1619.5	1615.0	1621.0
Wabash Rear Yard 2	1614.0	1619.0	1614.5	1619.5	1614.0	1620.0
Wabash Rear Yard 3	1613.0	1618.0	1614.5	1619.5	1613.0	1619.0
Colton Rear Yard 1	1612.0	1617.0	1612.0	1617.0	1612.0	1618.0
Colton Rear Yard 2	1609.0	1614.0	1609.0	1614.0	1609.0	1615.0
Colton Rear Yard 3	1606.0	1611.0	1606.0	1611.0	1606.0	1612.0

Table 4: Barrier Insertion Loss Summary			
Property Line	**Preliminary Barrier Insertion Loss Estimate**		
	Predicted Noise Level	**Barrier Attenuation**	**Noise Level with Barrier**
Wabash Rear Yard 1	62.2	6.7	55.5
Wabash Rear Yard 2	62.2	6.4	55.8
Wabash Rear Yard 3	62.2	6.0	56.2
Colton Rear Yard 1	64.5	6.5	58.0
Colton Rear Yard 2	64.5	6.5	58.0
Colton Rear Yard 3	64.5	6.5	58.0

Table 5: Barrier Attenuation 6-Foot High Wall (Wabash Rear Yard 1)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	40.03	5.10	45.00	45	40	5	-0.5	1.0

Table 6: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (Wabash Rear Yard 1)

Receptor	δ (Feet)	λ (Feet)	N_0	Insertion Loss (dB)
Property Line	0.12	2.30	0.10814	6.7

Table 7: Barrier Attenuation 6-Foot High Wall (Wabash Rear Yard 2)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.00	5.10	30.00	30	25	5	0.5	1.0

Table 8: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (Wabash Rear Yard 2)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.10	2.30	0.08683	6.4

Table 9: Barrier Attenuation 6-Foot High Wall (Wabash Rear Yard 3)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	25.00	5.10	30.04	30	25	5	1.5	1.0

Table 10: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (Wabash Rear Yard 3)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.07	2.30	0.05786	6.0

Table 11: Barrier Attenuation 6-Foot High Wall (Colton Rear Yard 1)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	48.01	5.10	53.00	53	48	5	0.0	1.0

Table 12: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (Colton Rear Yard 1)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.11	2.30	0.09516	6.5

Table 13: Barrier Attenuation 6-Foot High Wall (Colton Rear Yard 2)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	48.01	5.10	53.00	53	48	5	0.0	1.0

Table 14: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (Colton Rear Yard 2)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.11	2.30	0.09516	6.5

Table 15: Barrier Attenuation 6-Foot High Wall (Colton Rear Yard 3)								
Receptor	**A**	**B**	**C**	**D**	**D1**	**D2**	**H1**	**H2**
Property Line	48.01	5.10	53.00	53	48	5	0.0	1.0

Table 16: Fresnel Number (N_0) and Barrier Insertion Loss Estimate (Colton Rear Yard 3)				
Receptor	**δ (Feet)**	**λ (Feet)**	**N_0**	**Insertion Loss (dB)**
Property Line	0.11	2.30	0.09516	6.5

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Attachment 04

Groundborne Vibration Estimates

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Madera at Citrus Trail Residential Development
Wabash Avenue and Colton Avenue, Redlands, CA

Attachment 03: On-site HVAC Noise and Barrier Attenuation Estimates
Prepared by: MIG, Inc.
July 2023

Contents:

Sheet 1 Construction Vibration Estimates

Madera at Citrus Trail Residential Project
Wabash Avenue and Colton Avenue, Redlands, CA
Attachment 04: Construction Vibration Estimates

Sheet 1: Construction Vibration Estimates

Table 1: Typical Peak Particle Velocity (PPV) Estimates (in/sec) - Equipment at Top of Bluff

Equipment	Reference PPV at 25 ft (in/sec)	Soil Attenuation Rate (n)	Estimated PPV (in/sec) at Specified Distance from Source (in feet)								
			50	100	130	150	200	250	300	350	400
Small bulldozer	0.003	1.1	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jackhammer	0.035	1.1	*0.016*	0.008	0.006	0.005	0.004	0.003	0.002	0.002	0.002
Large bulldozer	0.089	1.1	*0.042*	*0.019*	*0.015*	*0.012*	0.009	0.007	0.006	0.005	0.004
Vibratory roller	0.210	1.1	*0.098*	*0.046*	*0.034*	*0.029*	*0.021*	*0.017*	*0.014*	*0.012*	0.010

Notes:
Reference PPV from Caltrans Transportation and Construction Vibration Guidance Manual (2020), Table 18
Soil attenuation rate from Caltrans (2020, Table 17). Assumes Soil Class III - hard soils.
Italicized values indicate the estimated vibration level exceeds City of Redlands vibration perception threshold (0.01 PPV in/sec).

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REDLANDS MADERA AT CITRUS TRAIL TRAFFIC IMPACT ANALYSIS

City of Redlands

June 23, 2023

gandini

Traffic Engineering ● Transportation Planning ● Parking ● Noise & Vibration
Air Quality ● Global Climate Change ● Health Risk Assessment

REDLANDS MADERA AT CITRUS TRAIL TRAFFIC IMPACT ANALYSIS

City of Redlands

June 23, 2023

prepared by

Perrie Ilercil, P.E. (AZ)
Giancarlo Ganddini, PE, PTP

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Project No. 19620

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EXECUTIVE SUMMARY

This section summarizes the proposed project, operational findings, and identifies recommendations (if any) as specified in this study.

Project Description

The 9.0-acre project site (APN 0168-291-02) is located at the northwest corner of Wabash Avenue and Colton Avenue in the City of Redlands, California. The project site is currently vacant.

The proposed project involves construction of a 103-dwelling unit single-family residential development. Vehicle access for the proposed project site is proposed via three internal residential streets, of which one will connect to Colton Avenue and two will connect to Wabash Avenue.

Project Trip Generation

The proposed project is forecast to generate a total of approximately 918 daily trips, including 67 trips during the AM peak hour and 88 trips during the PM peak hour.

Level of Service Analysis

The study intersections are forecast to operate within acceptable Levels of Service (C or better) during the peak hours for the Existing and Existing Plus Project, except for the following intersection that is forecast to continue operating at Level of Service D during the peak hours:

1. Judson Street (NS) at Colton Avenue (EW)

The addition of project trips does not degrade the Level of Service below the current Level of Service grade. Therefore, the proposed project is forecast to result in no substantial transportation effects at the study intersections for Existing Plus Project conditions.

Summary of Improvements

Project design features necessary to provide project access are outlined in the Site Access & On-Site Circulation (Section 7).

No off-site improvements are warranted since the project is forecast to result in no substantial transportation effects at the study intersections for Existing Plus Project conditions. However, all development projects are required, as a condition of approval, to pay the Development Impact Fee in effect at the time of the building permit issuance.

Vehicle Miles Traveled Analysis

Based on review of the proposed development and location, the project satisfies the County-established VMT screening criteria. Therefore, preparation of a transportation impact study with vehicle miles traveled (VMT) analysis is not warranted and the proposed project may be presumed to result in a less than significant VMT impact. The project VMT assessment is documented separately in the *Redlands Madera at Citrus Trail Vehicle Miles Traveled Assessment* (Ganddini Group, Inc., April 7, 2023)..

1. INTRODUCTION

This section provides an overview of the proposed project and the general scope of the analysis.

PURPOSE AND OBJECTIVES

The purpose of this study is to evaluate the potential for transportation impacts resulting from the development of the proposed project in the context of the City of Redlands's discretionary authority for conformance with locally established operational standards. Although this is a technical report, effort has been made to prepare the report clearly and concisely. A glossary is provided in Appendix A to assist the reader with technical terms.

This study was prepared in consultation with the City of Redlands staff following the procedures and methodologies for assessing transportation impacts established by the City of Redlands. To assess the project's conformance with local operational standards, this study evaluates the project's effect on traffic operations and, if necessary, identifies recommended improvements or corrective measures to alleviate operational deficiencies substantially caused or worsened by the proposed project.

For compliance with California Environmental Quality Act (CEQA) requirements, a vehicle miles traveled (VMT) assessment is documented separately in the *Redlands Madera at Citrus Trail Vehicle Miles Traveled Assessment* (Ganddini Group, Inc., April 7, 2023).

PROJECT DESCRIPTION

The 9.0-acre project site (APN 0168-291-02) is located at the northwest corner of Wabash Avenue and Colton Avenue in the City of Redlands, California. The project site is currently vacant. Figure 1 and Figure 2 show the regional and project location maps.

The proposed project involves construction of a 103-dwelling unit single-family residential development. Vehicle access for the project site is proposed via three internal residential streets, of which one will connect to Colton Avenue and two will connect to Wabash Avenue. Figure 3 illustrates the project site plan.

SCOPE OF ANALYSIS

The scope of this analysis was determined in consultation with the City of Redlands as documented in the approved scoping agreement provided in Appendix B.

Study Area

Figure 4 illustrates the study area. In accordance with the City of Redlands requirements, the study area was determined in consultation with the City of Redlands engineering staff and consists of classified roadway intersections to which the project is forecast to contribute 50 or more peak hour trips. Based on the project trip generation and distribution forecasts presented later in this report, the study area consists of the following study intersections, each within the City of Redlands jurisdiction:

1. Judson Street (NS) at Colton Avenue (EW)[1]
2. Dearborn Street (NS) at Colton Avenue (EW)
3. Wabash Avenue (NS) at Colton Avenue (EW)
4. Wabash Avenue (NS) at Project North Driveway (EW)
5. Wabash Avenue (NS) at Project South Driveway (EW)
6. Project Driveway (NS) at Colton Avenue (EW)

Analysis Scenarios

This study includes an evaluation of the following analysis scenarios for weekday AM and PM peak hour conditions:

- Existing
- Existing Plus Project

[1] (NS) = north-south roadway; (EW) = east-west roadway.

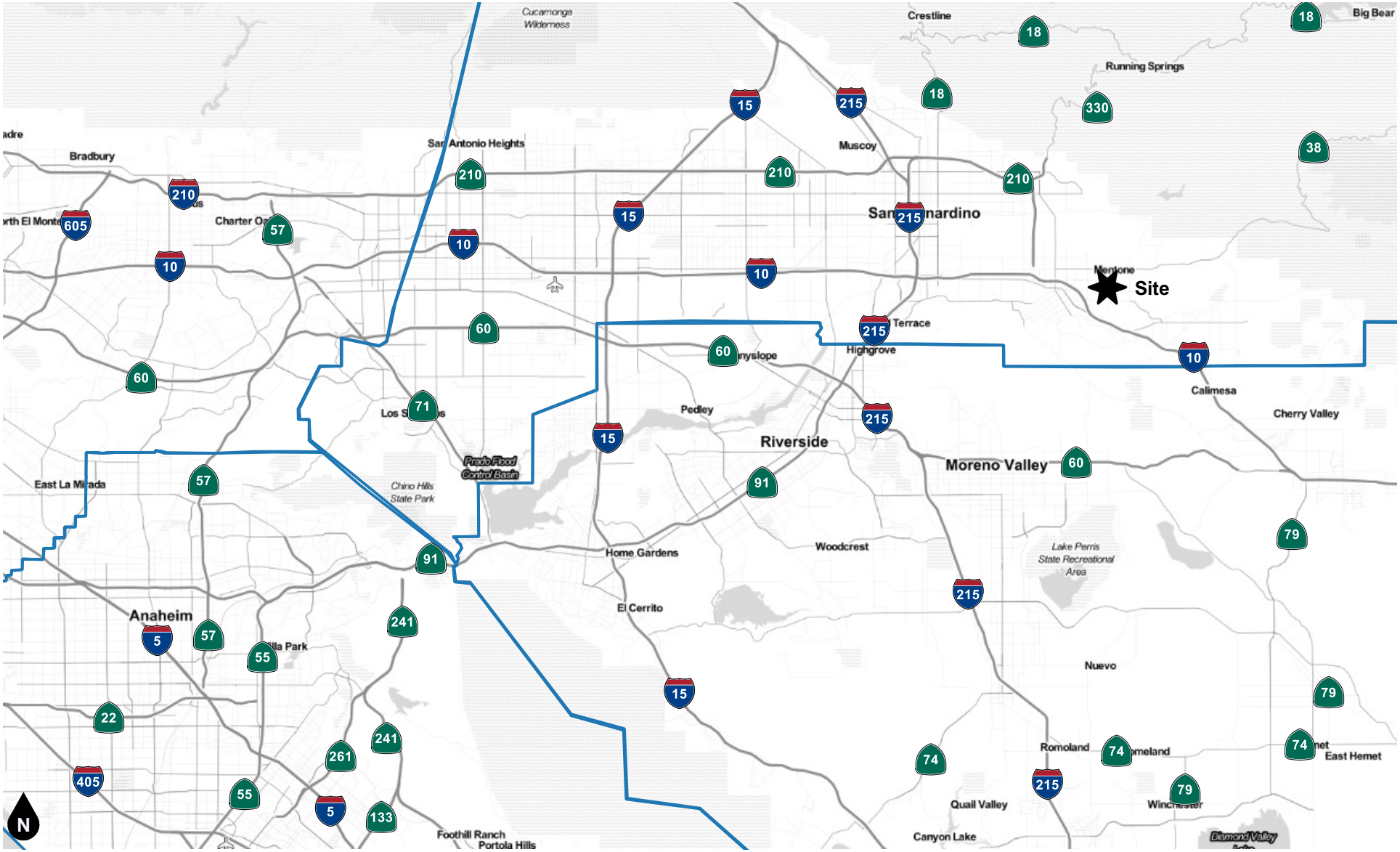


Figure 1
Regional Location map

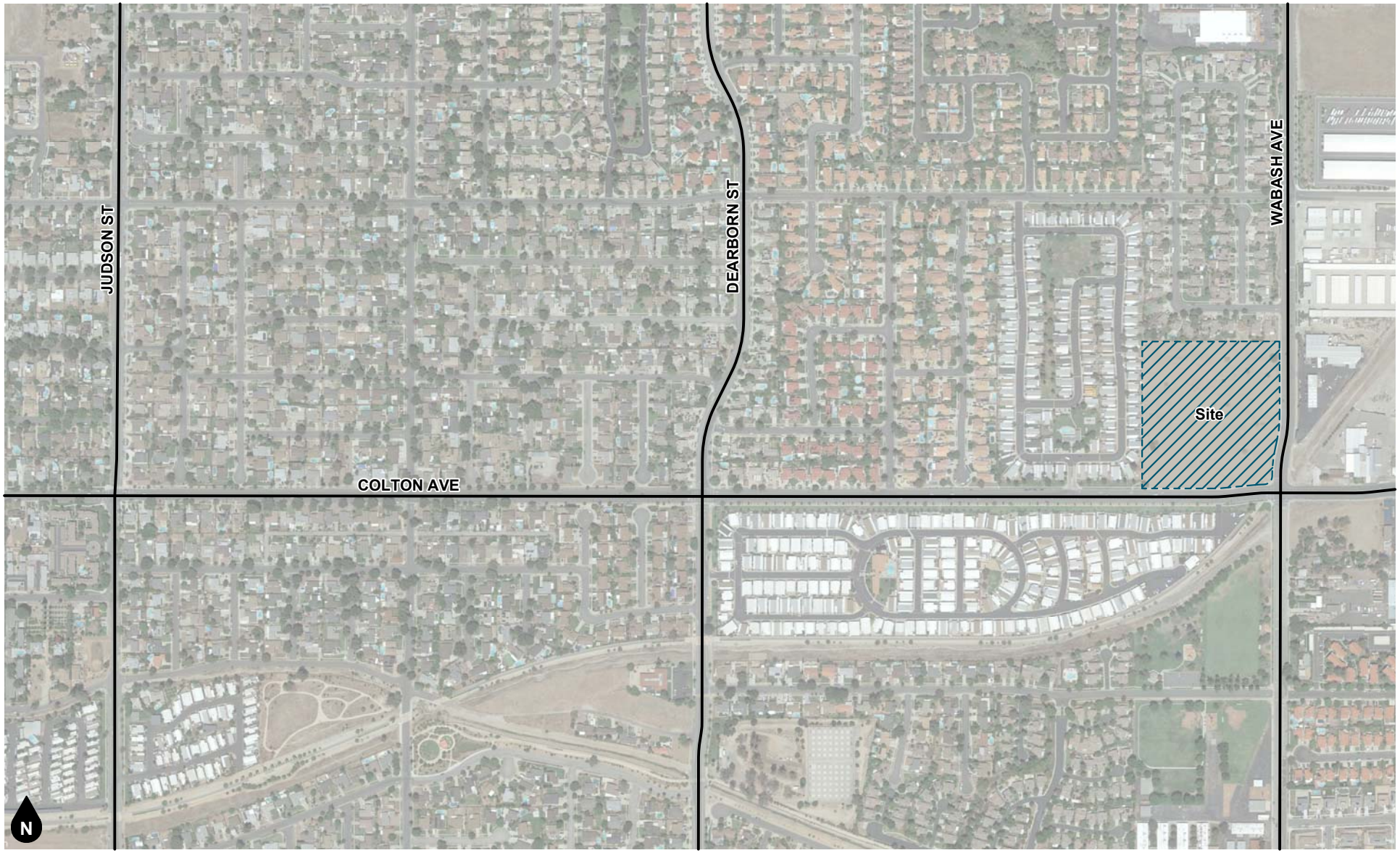
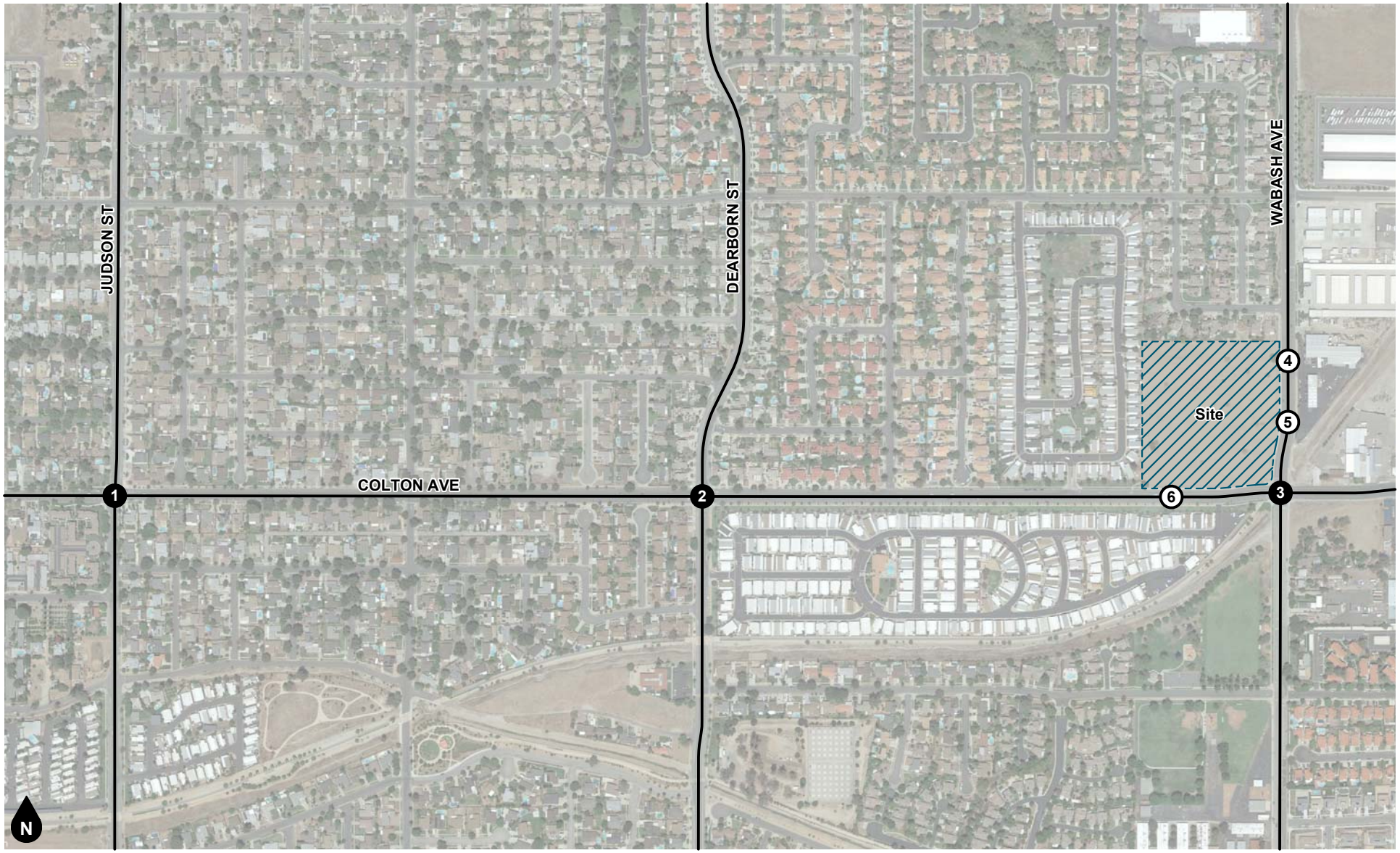


Figure 2
Project Location Map



Figure 3
Site Plan



Legend

(#) Study Intersection

(#) Project Driveway

Figure 4
Study Area

2. METHODOLOGY

This section discusses the analysis methodologies used to assess transportation facility performance as adopted by the respective jurisdictional agencies. This traffic impact analysis is based on the City of Redlands requirements, which are based on the methodologies outline in the *County of San Bernardino Transportation Impact Study Guidelines* (July 2019) ["County TIA Guidelines"].

LEVEL OF SERVICE/OPERATIONAL ANALYSIS METHODOLOGY (NON-CEQA)

Level of Service analysis is performed to assess conformance with General Plan and operational standards established by the applicable agencies. In accordance with current CEQA provisions, a project's effect on automobile delay (as measured by Level of Service) shall not constitute a significant environmental impact.

Intersections: Highway Capacity Manual Delay Methodology

City of Redlands intersections are analyzed using the intersection delay methodology based on procedures contained in the *Highway Capacity Manual* (HCM) (Transportation Research Board, 7th Edition). The methodology considers the traffic volume and distribution of movements, traffic composition, geometric characteristics, and signalization details to calculate the average control delay per vehicle and corresponding Level of Service. At intersections with cross street stop control (i.e., one- or two-way stop control), the Level of Service is determined by the average control delay for the worst minor street approach or major street left-turn movement. Intersection delay analysis was performed with default capacity values and adjustment factors recommended in the HCM. The intersection Level of Service is based on the thresholds contained within the HCM.

Level of Service	Delay Methodology [1]	
	Signalized Intersection	Unsignalized Intersection
	Seconds per Vehicle	Seconds per Vehicle
A	≤ 10.0	≤ 10.0
B	> 10.0 to ≤ 20.0	> 10.0 to ≤ 15.0
C	> 20.0 to ≤ 35.0	> 15.0 to ≤ 25.0
D	> 35.0 to ≤ 55.0	> 25.0 to ≤ 35.0
E	> 55.0 to ≤ 80.0	> 35.0 to ≤ 50.0
F	> 80.0	> 50.0

1. Source: Transportation Research Board *Highway Capacity Manual* (7th Edition).

Level of Service is used to qualitatively describe the performance of a roadway facility, ranging from Level of Service A (free-flow conditions) to Level of Service F (extreme congestion and system failure). Intersection analysis was performed using the Vistro software. The Level of Service analysis was performed in accordance with parameters specified in the County TIA Guidelines.

At intersections with traffic signal or all way stop control, Level of Service is determined by the average control delay for the overall intersection. At intersections with cross street stop control (i.e., one- or two-way stop control), Level of Service is determined by the average control delay for the worst minor street approach or major street left-turn movement.

Transportation Effects

The City of Redlands General Plan and Measure U Section 1A.60 Principle Six has established the minimum acceptable Level of Service (C or better) for roadway segment and peak hour intersection operations. Where the current Level of Service is lower than C, roadway improvements shall be provided such that the LOS is not reduced below the LOS at the time of the application, or as provided in Section 5.20 of the Redlands General Plan where a more intense Level of Service is specifically permitted, for Existing Plus Project conditions.

For study intersections within the City of Redlands, a project traffic impact requires improvement if the addition of project-generated trips is forecast to cause a degradation in Level of Service D, E, or F at a study intersection. For project impacts at facilities with existing acceptable Level of Service (C or better), the project shall provide improvements that would, at a minimum, provide Level of Service C or better. For project impacts at facilities with existing unacceptable Level of Service (D, E, or F), the project shall provide improvements that would, at a minimum, provide Level of Service that is equal to or better than existing conditions.

VEHICLE MILES TRAVELED ANALYTICAL METHODOLOGY (CEQA)

The metric used to evaluate the transportation impact of land use and transportation projects under CEQA is known as vehicle miles traveled (VMT). In general terms, VMT quantifies the amount and distance of automobile travel attributable to a project or region. The City of Redlands *CEQA Assessment VMT Analysis Guidelines*, June 2020 [City VMT Guidelines], were developed based on guidance from the Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA* (State of California, December 2018). The project VMT assessment is documented separately in the *Redlands Madera at Citrus Trail Vehicle Miles Traveled Assessment* (Ganddini Group, Inc., April 7, 2023).

3. EXISTING CONDITIONS

This section describes the existing transportation setting of the project study area.

EXISTING ROADWAY SYSTEM

Figure 5 shows the lane geometry and intersection traffic controls for existing conditions based on a field survey of the study area. Regional access to the project site is provided by Interstate-10 approximately 2.5 miles west and SR-38 (Lugonia Avenue) 0.50 miles north of the project site. Local north-south circulation is provided by Wabash Avenue, Dearborn Street, and Judson Street and east-west circulation is provided by Colton Avenue.

Wabash Street: This four-lane undivided to four-lane divided (two-way left-turn lane) roadway trends in a north-south direction and is classified as a Minor Arterial (two-lane divided to four-lane undivided with various roadway cross-section) on the City of Redlands General Plan. On-street parking is prohibited on both the east and west side of the road north and south of Colton Avenue. There are currently no designated bicycle facilities in the project vicinity; however, a bike route is proposed for this roadway. Sidewalks are provided on both sides of the roadway, except for the northeast corner of Wabash Avenue and Colton Avenue. The posted speed is 40 miles per hour.

Dearborn Street: This two-undivided to two-lane divided (two-way left-turn lane) roadway trends in a north-south direction and is classified as a Collector (various roadway cross-section with 10 to 8-foot shoulders) on the City of Redlands General Plan. On-street parking is generally permitted on both the east and west side of the road. On-street bicycle lanes are provided on both sides of the roadway. Sidewalks are in the study area. The posted speed is 30 miles per hour.

Judson Street is a two-lane divided to three-lane divided (two-way left-turn lane) roadway trends in a north-south direction and is classified as a Minor Arterial (two-lane divided to four-lane undivided with various roadway cross-section) on the City of Redlands General Plan. On-street parking is generally permitted on both sides of the roadway. On-street bicycle lanes are provided on both sides of the road north of Colton Avenue and on the west side of the street south of Colton Avenue. On-street bicycle lane sharrows are provided on the east side of the road south of Colton Avenue. Sidewalks are provided on both sides of the road north of Colton Avenue and on the east side of the road south of Colton Avenue. The posted speed is 40 miles per hour.

Colton Avenue: This two-undivided to two-lane divided (two-way left-turn lane) roadway trends in an east-west direction and is classified as a Minor Arterial (two-lane divided to four-lane undivided with various roadway cross-section) on the City of Redlands General Plan. On-street parking is generally permitted on both the north and south side of the road. On-street bicycle lanes are not provided on either side of the road; however, a bike route is proposed for this roadway. Sidewalks are generally provided in the study area. The posted speed is 35 miles per hour from Judson Street to Dearborn Street and 40 miles per hour from Dearborn Street to Wabash Street.

PEDESTRIAN FACILITIES

Existing pedestrian facilities in the project vicinity are shown in Figure 6. As shown in Figure 6, sidewalks are not provided along the project site frontage, currently.

TRANSIT FACILITIES

Figure 7 shows the existing Omnitrans system map in the project vicinity. There are no bus routes in the study area; however, the site is 1.5 miles from Redlands/University Metrolink station.

General Plan Context

Figure 8 shows the City of Redlands General Plan Circulation Element roadway classifications map. This figure shows the nature and extent of arterial and collector highways that are needed to adequately serve the ultimate development depicted by the Land Use Element of the General Plan. The City of Redlands standard roadway cross-sections are illustrated in Figure 9.

Bicycle Facilities Master Plan

The City of Redlands Bicycle Master Plan is shown in Figure 10. This figure shows the bicycle facilities master plan. As shown in Figure 10, there are proposed bike routes on Wabash Street and Colton Avenue

Designated Truck Routes

The City of Redlands Truck Routes are shown in Figure 11. This figure shows the designated truck routes. As shown in Figure 11, Wabash Street and Judson Street are designated truck routes on the City Plan.

Existing Roadway Volumes

Figure 12 shows the existing average daily traffic volumes. The existing average daily traffic volumes have been factored from peak hour intersection turning movement volumes at locations using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) x 11.5 = Leg Volume

Figure 13 and Figure 14 show the existing AM and PM peak hour intersection turning movement volumes. Existing peak hour intersection turning movement volumes are based upon AM peak period and PM peak period intersection turning movement counts obtained in April 2023 during typical weekday conditions. The weekday AM peak period was counted between 7:00 AM and 9:00 AM and the weekday PM peak period was counted between 4:00 PM and 6:00 PM; these periods generally capture the peak times for commuter traffic when the roadway system is typically experiencing peak demand. The actual peak hour within each two-hour count period is determined based on the sum of the four consecutive 15-minute periods with the highest total volume entering the intersection. Thus, the weekday PM peak hour at one intersection may be 4:45 PM to 5:45 PM and may vary at other intersections depending on the four consecutive 15-minute periods that have the highest total volume. Intersection turning movement count worksheets are provided in Appendix C.

Existing Intersection Level of Service

The study intersection Levels of Service for Existing conditions are shown in Table 1. Detailed Level of Service worksheets are provided in Appendix D.

As shown in Table 1, the study intersections currently operate within acceptable Levels of Service (C or better), except for the following intersection that is forecast to operate at Level of Service D during the peak hours:

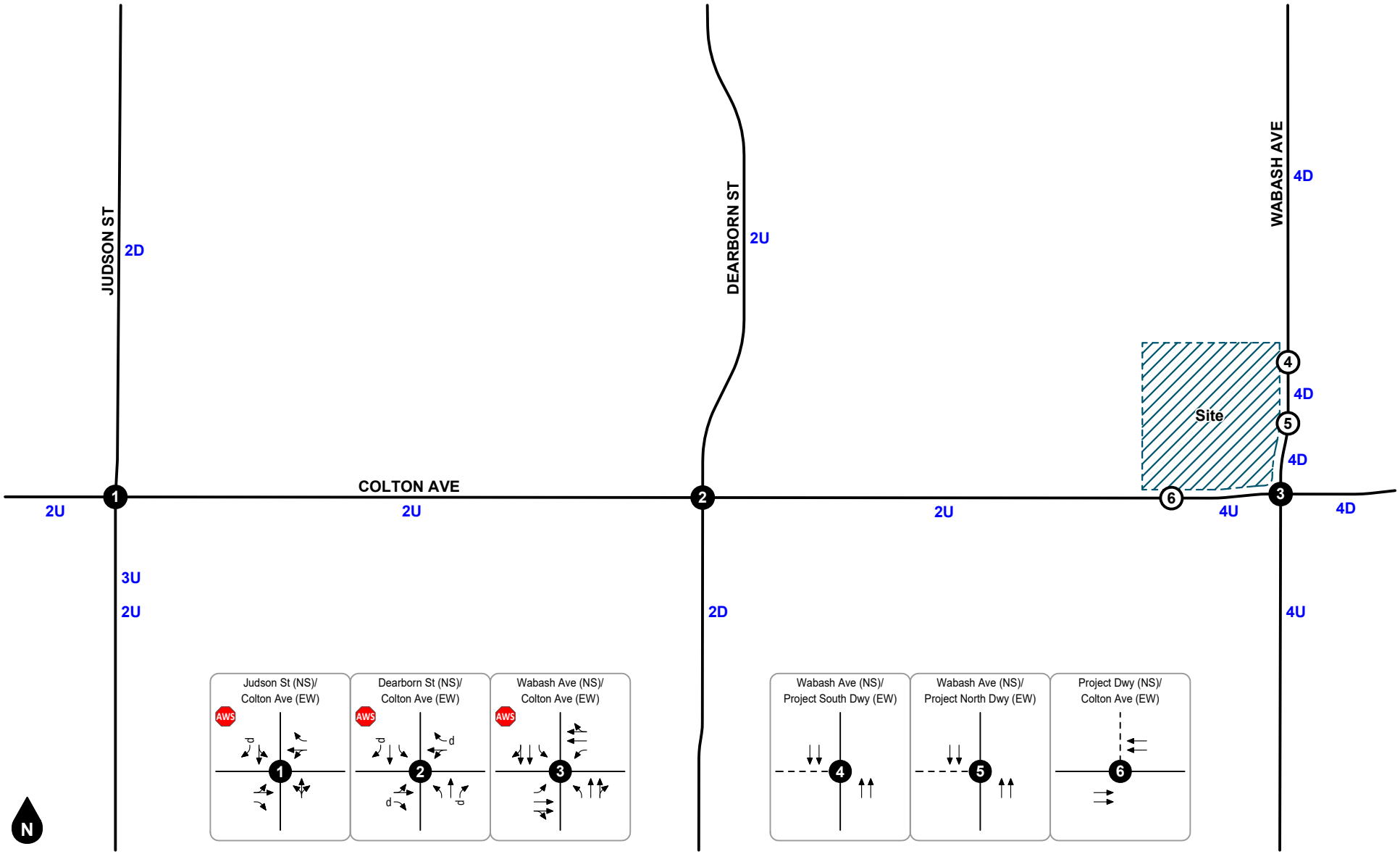
1. Judson Street (NS) at Colton Avenue (EW)

Table 1
Existing Intersection Levels of Service

Study Intersection	Traffic Control[1]	AM Peak Hour		PM Peak Hour	
		Delay[2]	LOS[3]	Delay[2]	LOS
1. Judson Street at Colton Avenue	AWS	28.2	D	27.2	D
2. Dearborn Street at Colton Avenue	AWS	19.3	C	17.2	C
3. Wabash Avenue at Colton Avenue	AWS	11.1	B	10.9	B

Notes:

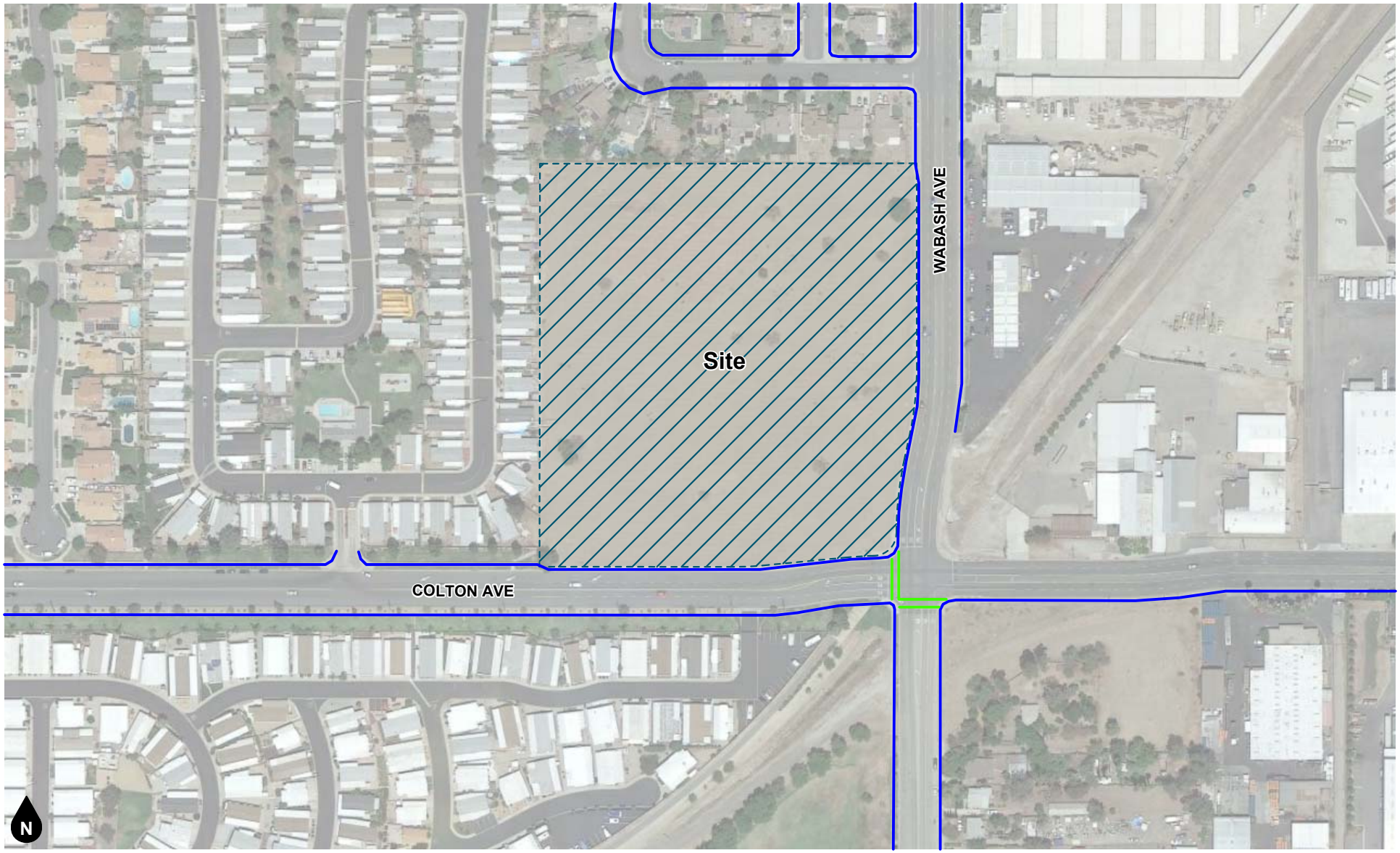
1. AWS = All Way Stop.
2. Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst minor street approach or major street left turn movement.
3. LOS = Level of Service



Legend

- Traffic Signal
- All Way Stop
- Stop Sign
- #D #-Lane Divided Roadway
- #U #-Lane Undivided Roadway
- Existing Lane
- d De Facto Right Turn Lane
- Project Driveway

Figure 5
Existing Lane Geometry and Intersection Traffic Controls



Legend
- Sidewalk
- Cross Walk

Figure 6
Existing Pedestrian Facilities

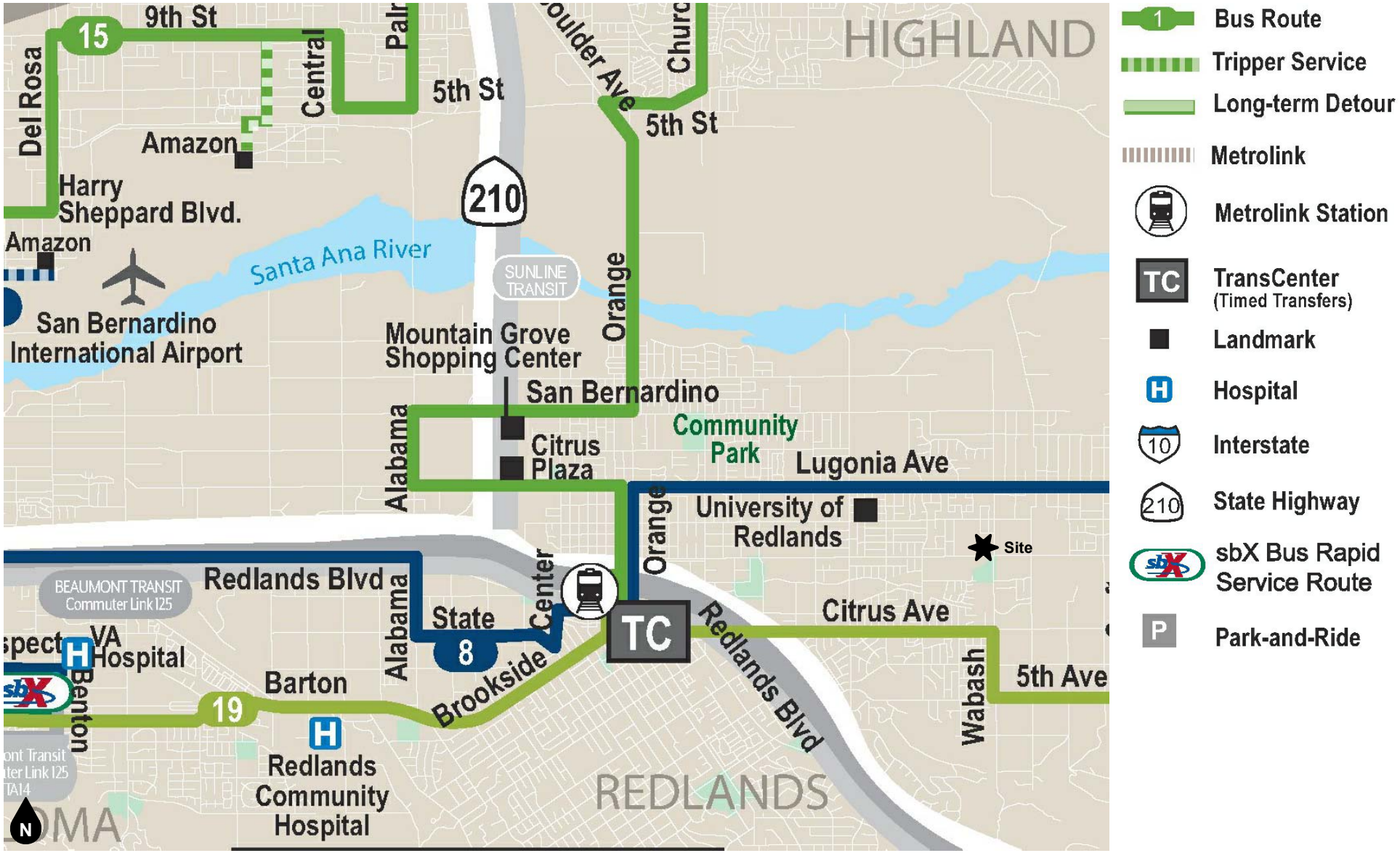


Figure 7
Existing Transit Routes

Source: Omnitrans

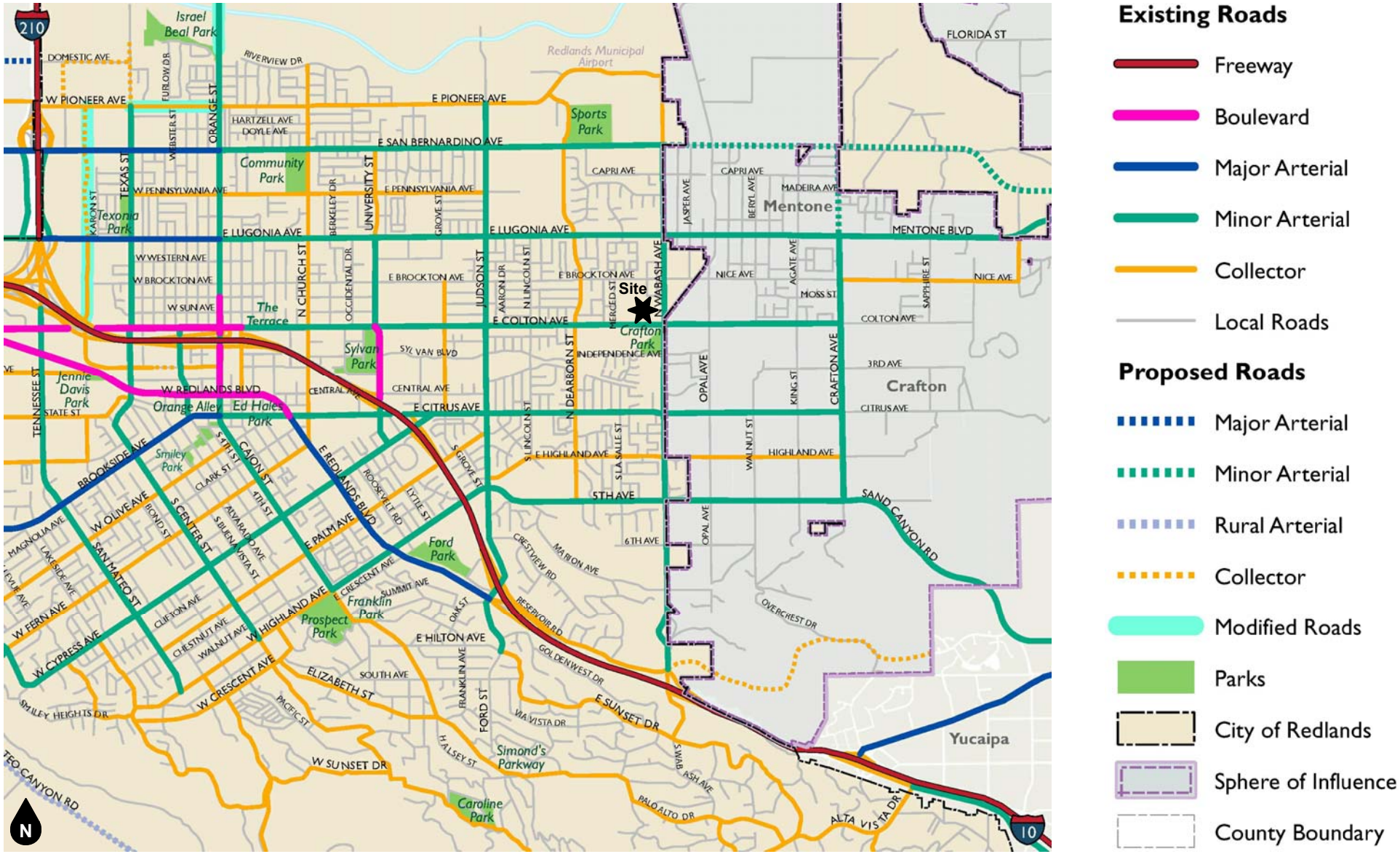
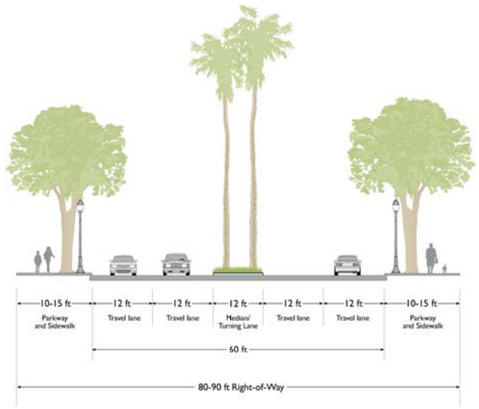


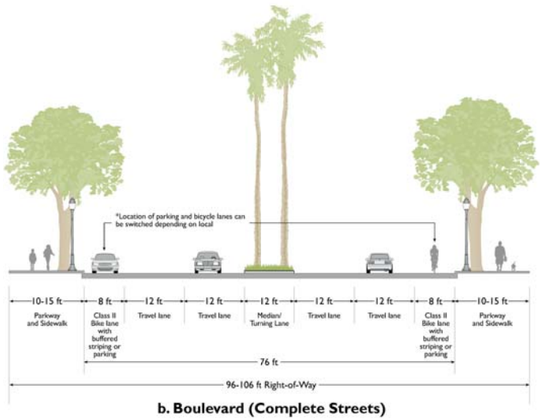
Figure 8
City of Redlands General Plan Circulation Element

Source: City of Redlands

BOULEVARDS

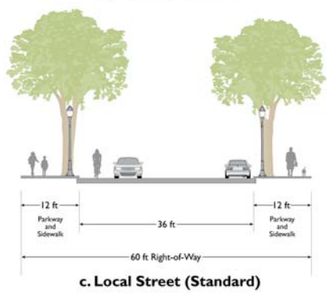


a. Boulevard (Standard)

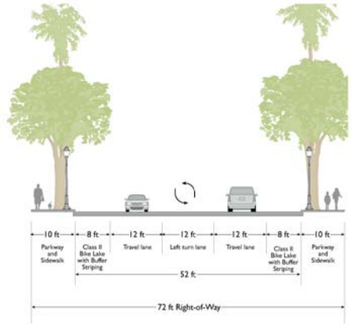


b. Boulevard (Complete Streets)

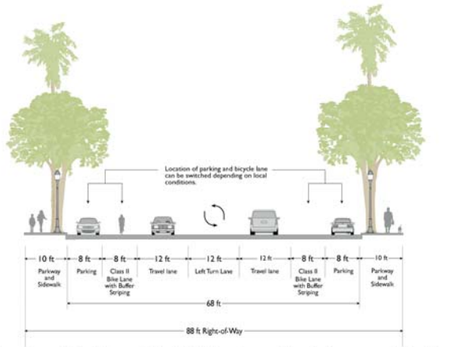
LOCAL STREET



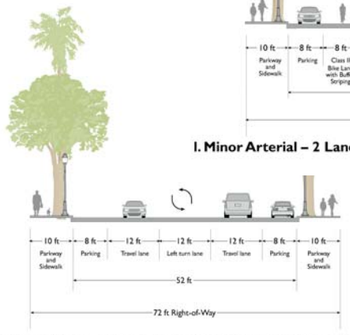
c. Local Street (Standard)



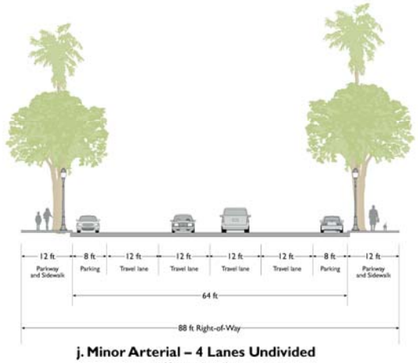
k. Minor Arterial – 2 Lanes Plus Left Turn Lane (Complete Streets)



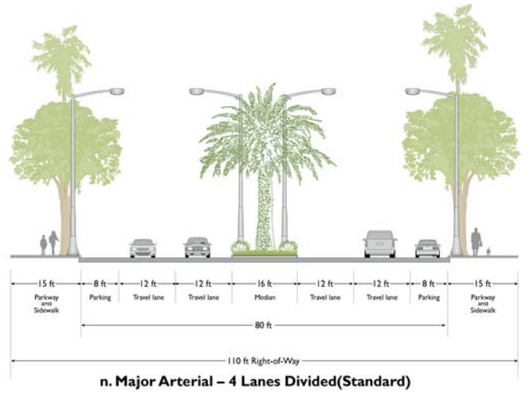
l. Minor Arterial – 2 Lanes Plus Left Turn Lane, Bicycle Lanes, and Parking (Complete Streets)



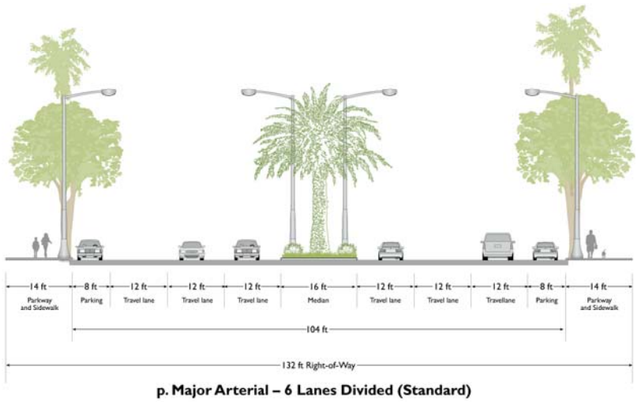
i. Minor Arterial – 2 Lanes Plus Left Turn Lane (Standard)



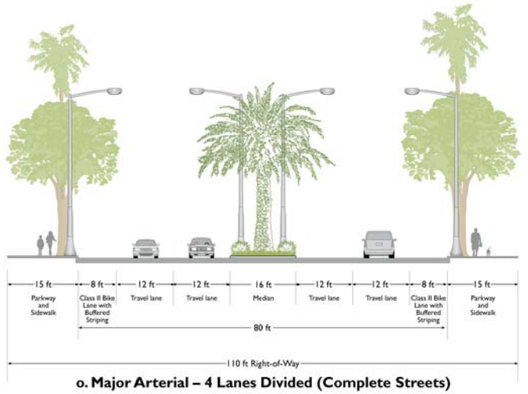
j. Minor Arterial – 4 Lanes Undivided (Standard)



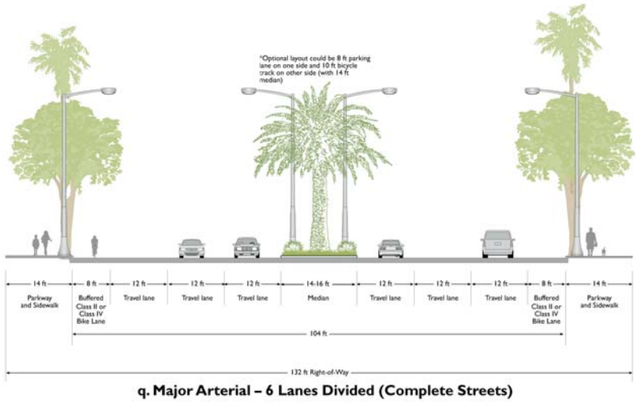
n. Major Arterial – 4 Lanes Divided(Standard)



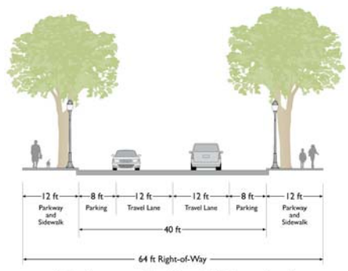
p. Major Arterial – 6 Lanes Divided (Standard)



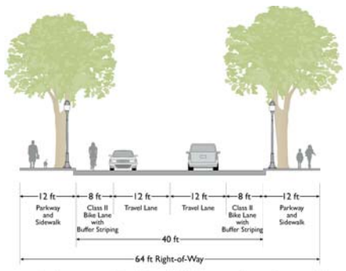
o. Major Arterial – 4 Lanes Divided (Complete Streets)



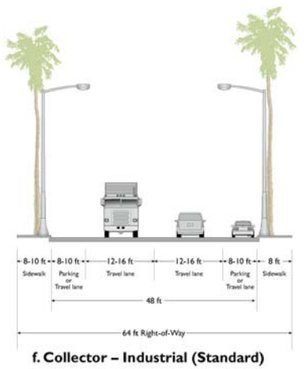
q. Major Arterial – 6 Lanes Divided (Complete Streets)



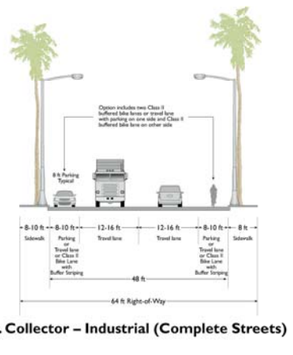
d. Collector – Residential (Standard)



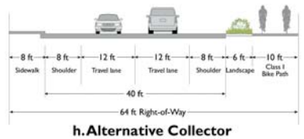
e. Collector – Residential (Complete Streets)



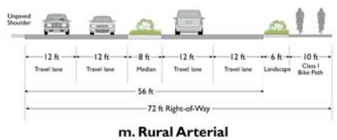
f. Collector – Industrial (Standard)



g. Collector – Industrial (Complete Streets)



h. Alternative Collector



m. Rural Arterial

Figure 9
City of Redlands General Plan Roadway Cross-Sections

Source: City of Redlands

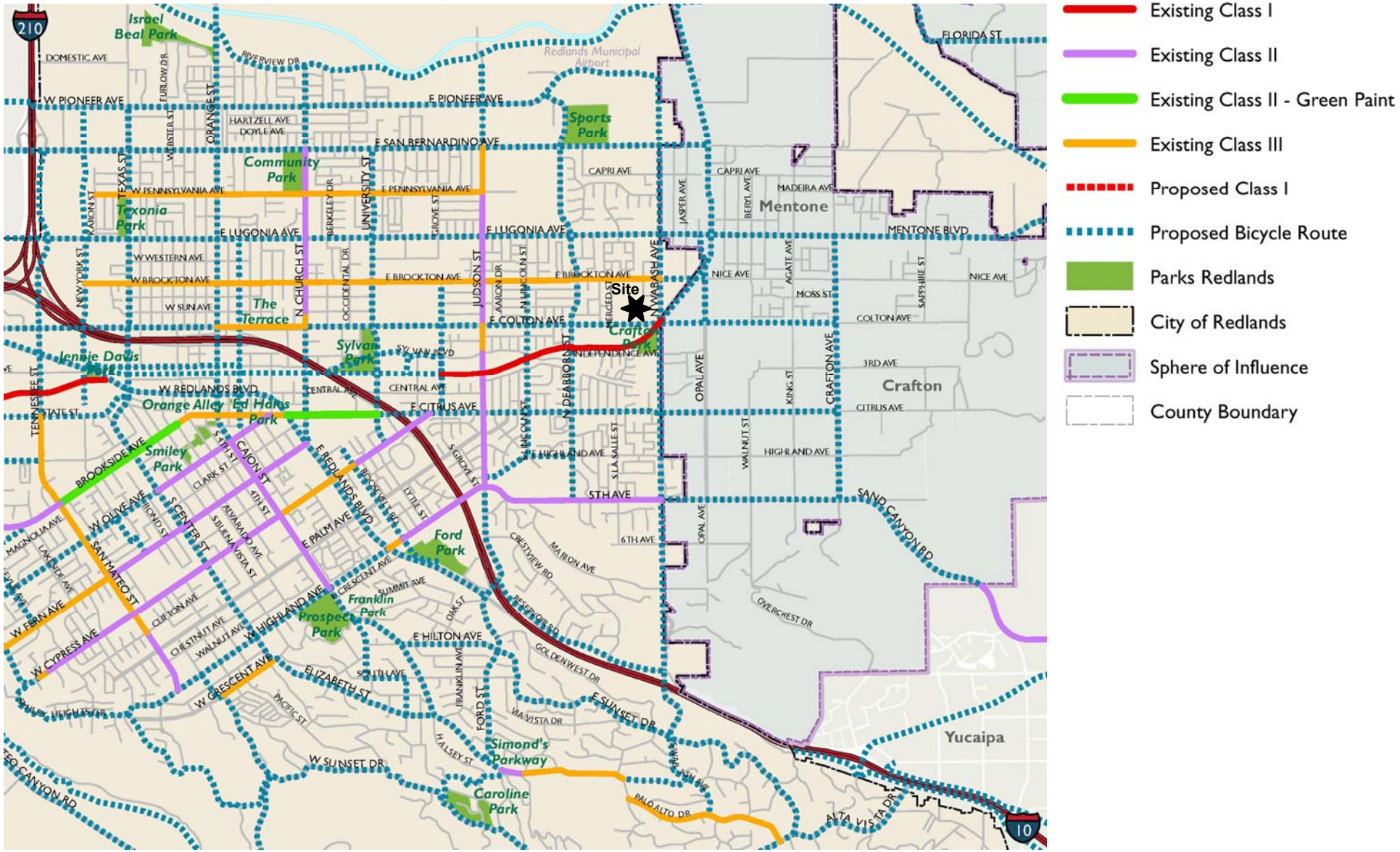


Figure 10
City of Redlands Bicycle Facilities Master Plan

Source: City of Redlands

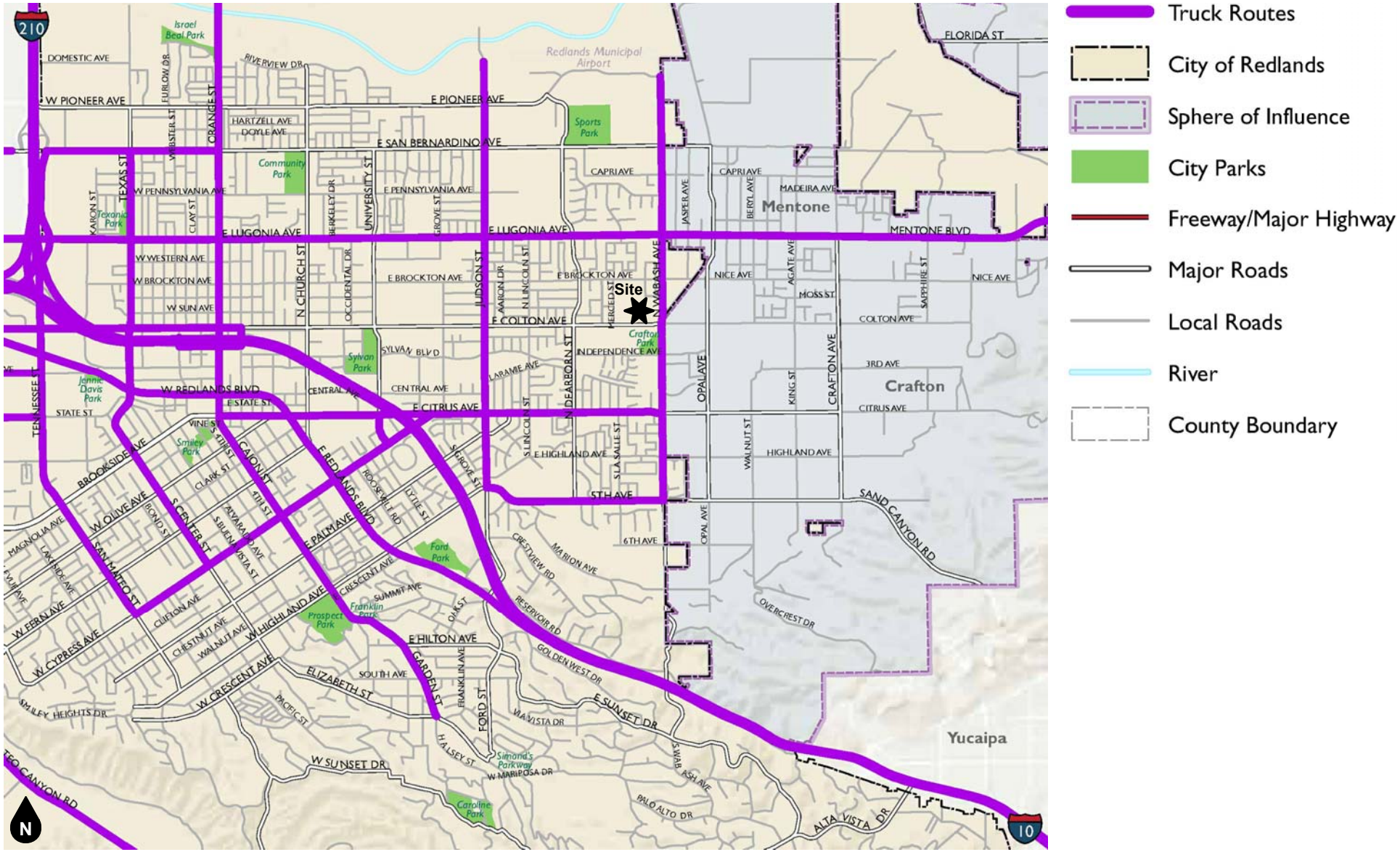
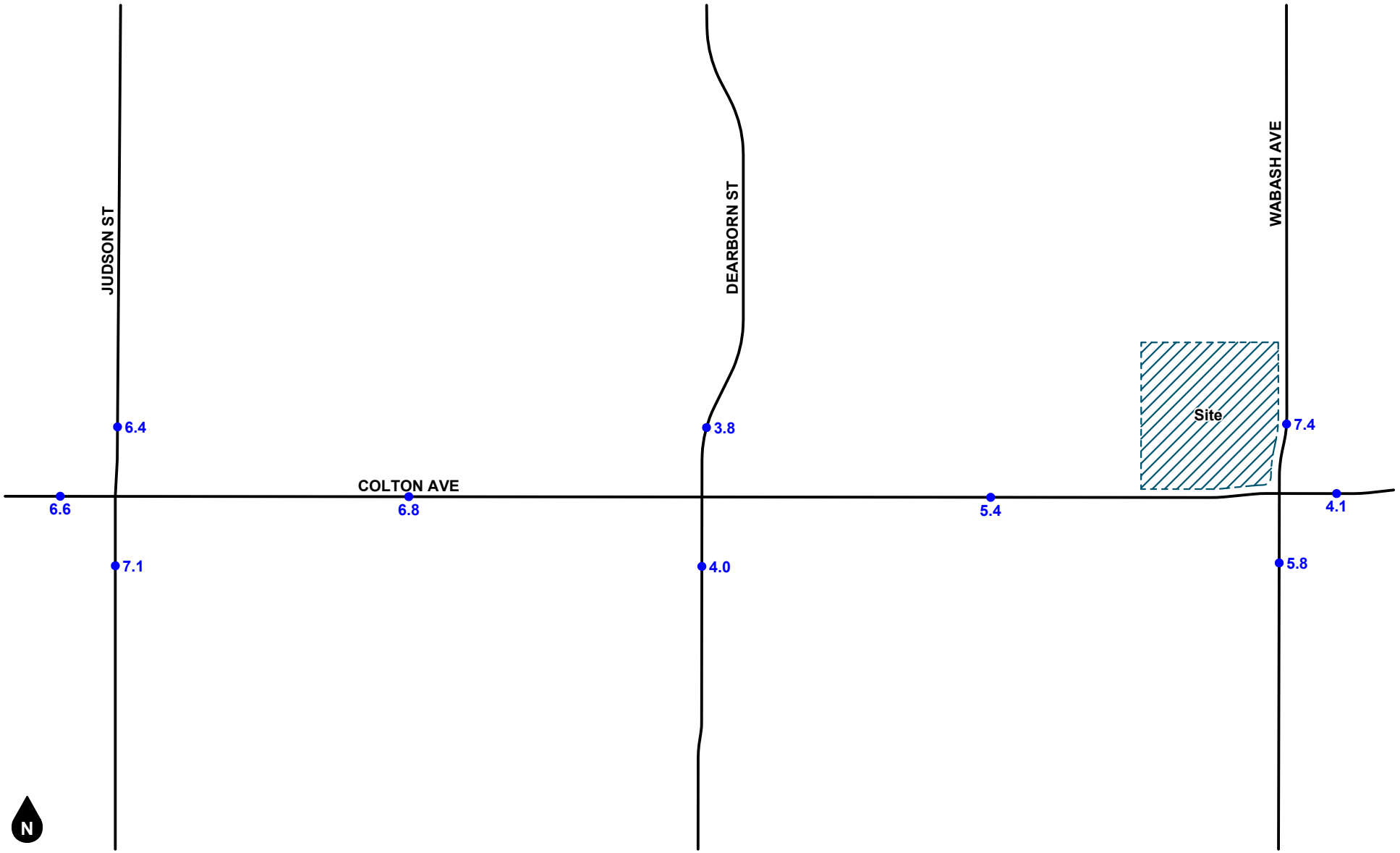


Figure 11
City of Redlands Truck Routes

Source: City of Redlands



Legend

●## Vehicles Per Day (1,000's)

Figure 12
Existing Average Daily Traffic Volumes

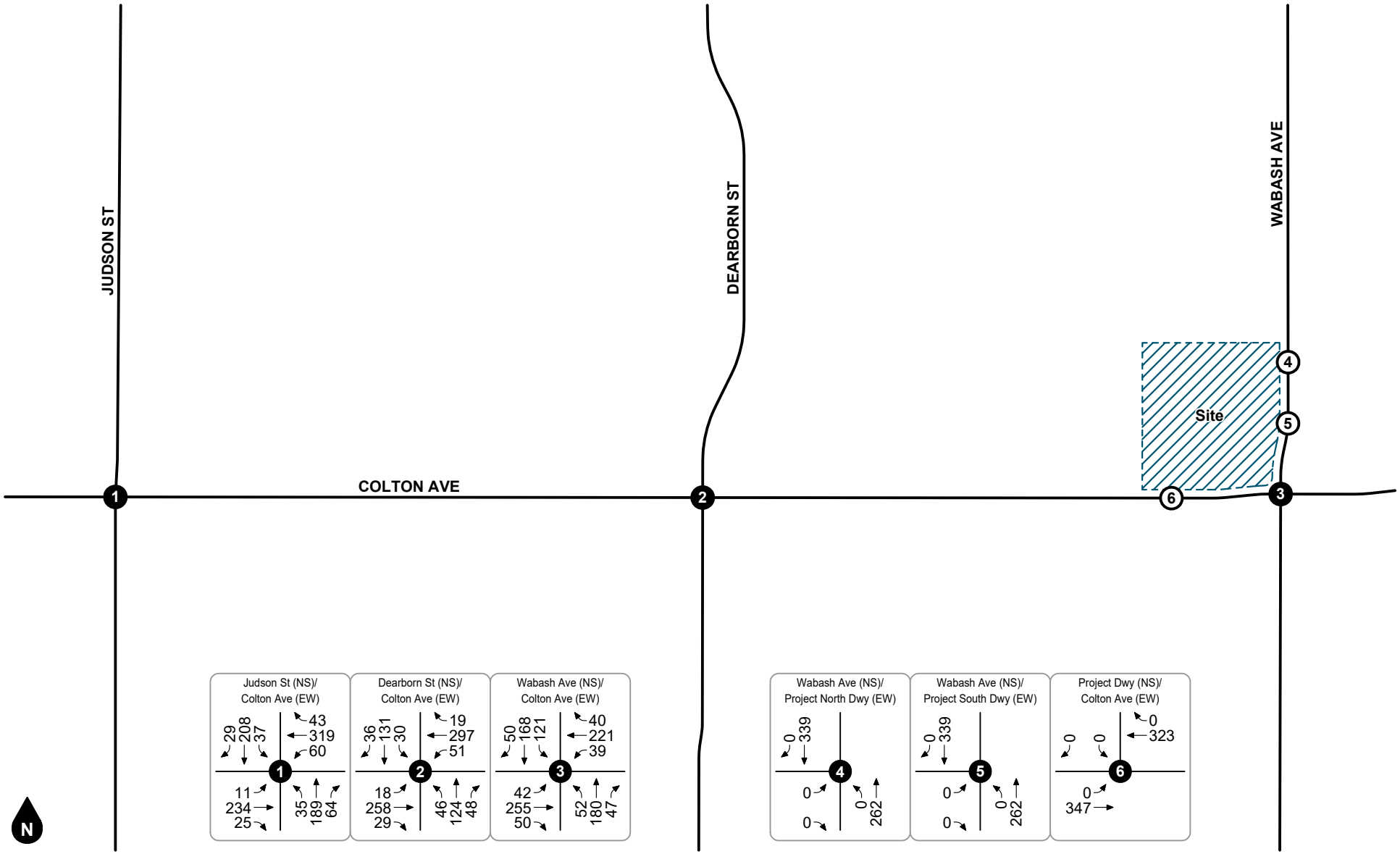


Figure 13
Existing AM Peak Hour Intersection Turning Movement Volumes

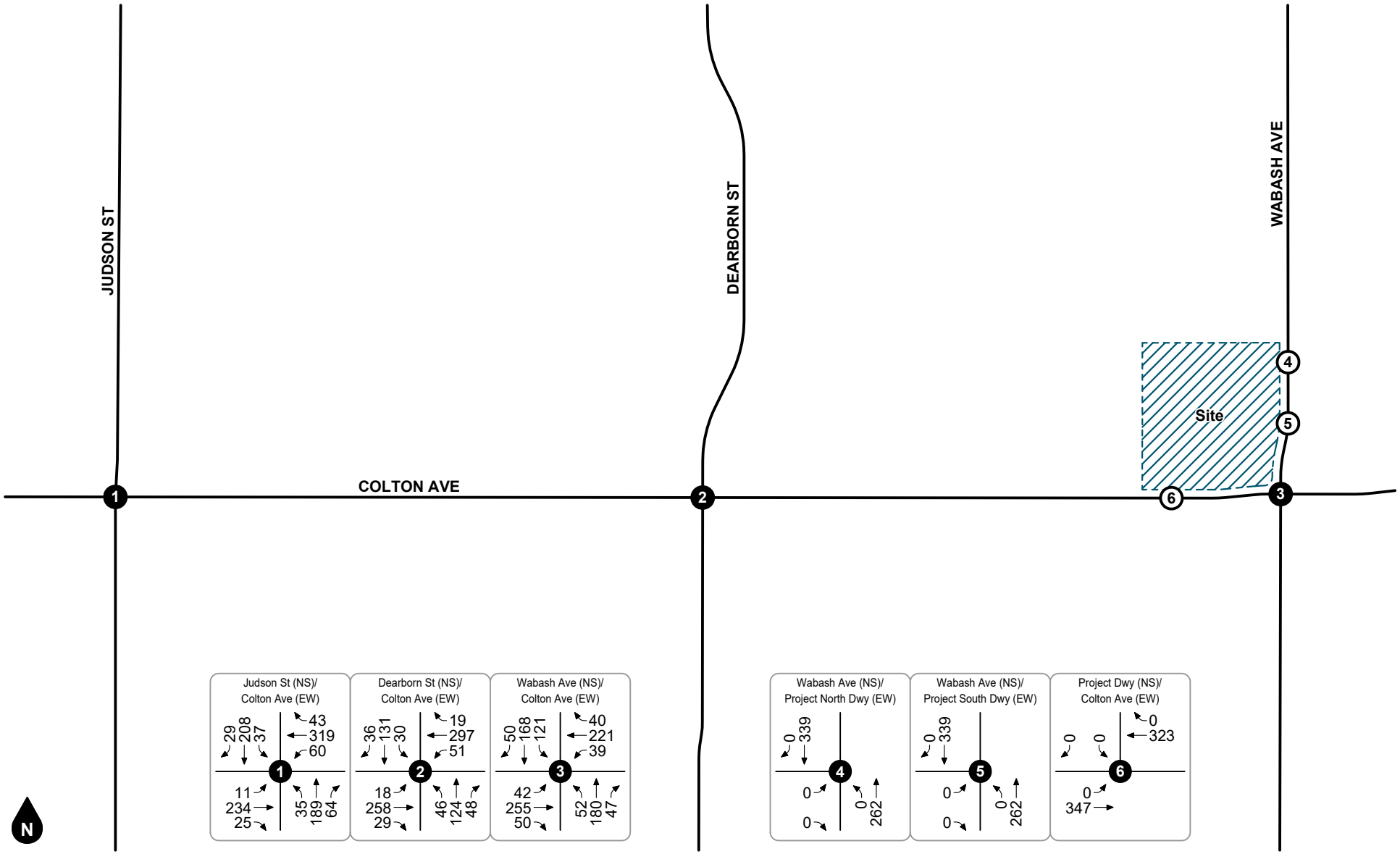


Figure 14
Existing PM Peak Hour Intersection Turning Movement Volumes

4. PROJECT TRIP FORECASTS

This section describes how project trip generation, trip distribution, and trip assignment forecasts were developed. The forecast project volumes are illustrated in the figures contained in this section.

PROJECT TRIP GENERATION

Table 2 shows the proposed project trip generation forecast is based on average rates obtained from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition, 2021) for Land Use Codes 210 (Single-family Detached Housing) and 215 (Single-family Attached Housing).

As shown in Table 2, the proposed project is forecast to generate a total of approximately 918 new daily trips, including 67 trips during the AM peak hour and 88 trips during the PM peak hour.

PROJECT TRIP DISTRIBUTION & ASSIGNMENT

Figure 15and Figure 16 show the forecast outbound and inbound directional distribution patterns for the project generated trips, respectively. The project trip distribution patterns were developed using engineering judgment in consultation with City of Redlands engineering staff based on a review of existing traffic data, surrounding land uses, and the local and regional roadway facilities in the project vicinity.

Based on the identified project trip generation and distributions, project-generated average daily traffic volumes are shown in Figure 17. Project-generated AM peak hour and PM peak hour intersection turning movement volumes are shown in Figure 18 and Figure 19.

Table 2
Project Trip Generation

Trip Generation Rates									
			AM Peak Hour			PM Peak Hour			
Land Use	Source[1]	Land Use Variable[2]	% In	% Out	Rate	% In	% Out	Rate	Daily Rate
Single-Family Detached Housing	ITE 210	DU	26%	74%	0.70	63%	37%	0.94	9.43
Single-Family Attached Housing	ITE 215	DU	31%	69%	0.48	57%	43%	0.57	7.20

Trips Generated									
			AM Peak Hour			PM Peak Hour			
Land Use	Source	Quantity	In	Out	Total	In	Out	Total	Daily
Single-Family Detached Housing	ITE 210	79 DU	14	41	55	47	27	74	745
Single-Family Attached Housing	ITE 215	24 DU	4	8	12	8	6	14	173
TOTAL PROJECT TRIPS			**18**	**49**	**67**	**55**	**33**	**88**	**918**

Notes:
1. ITE = Institute of Transportation Engineers *Trip Generation Manual* (11th Edition, 2021); ### = Land Use Code. All rates based on General Urban/Suburban setting.
2. DU = Dwelling Unit.

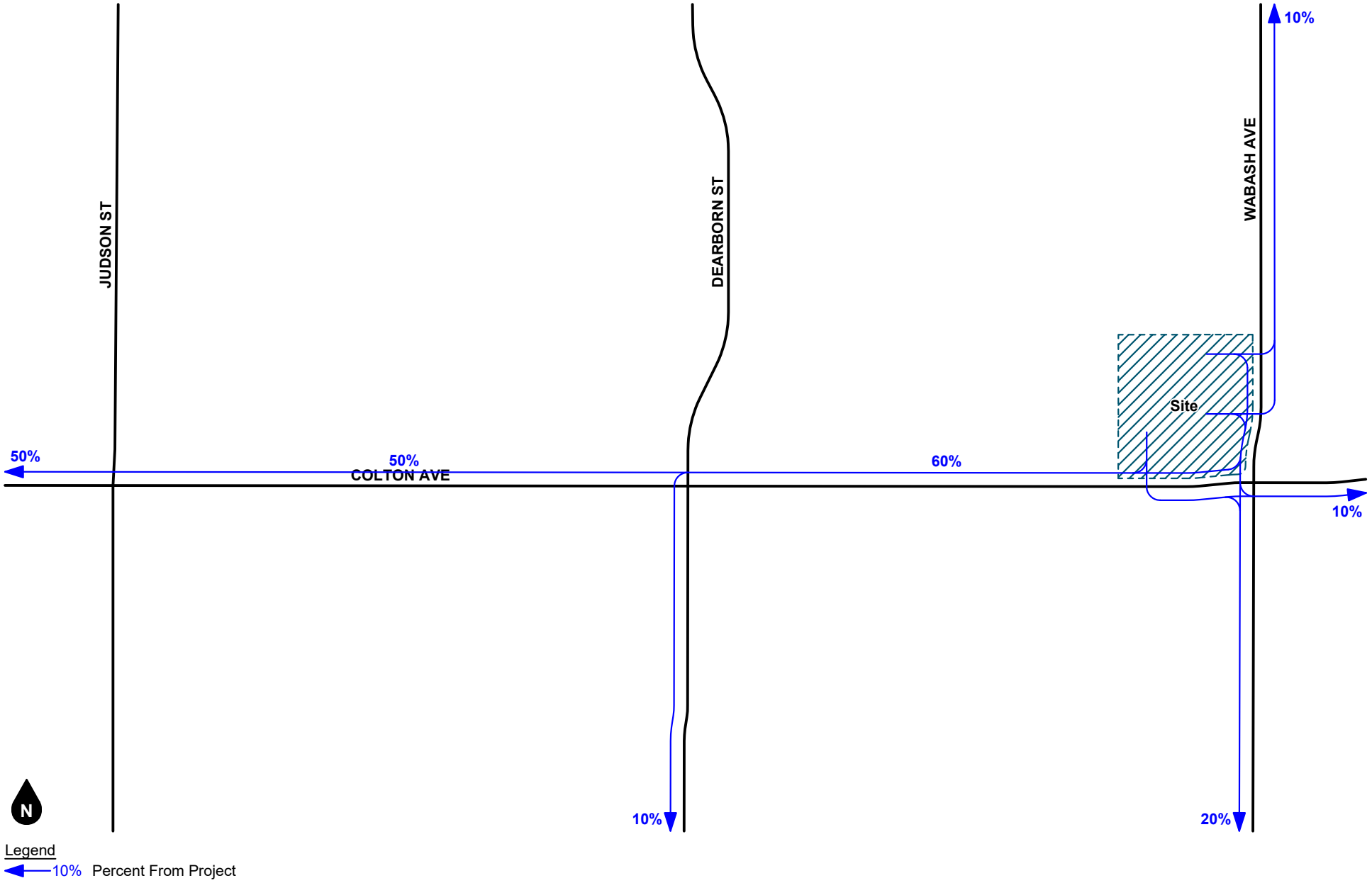


Figure 15
Project Trip Distribution (Outbound)

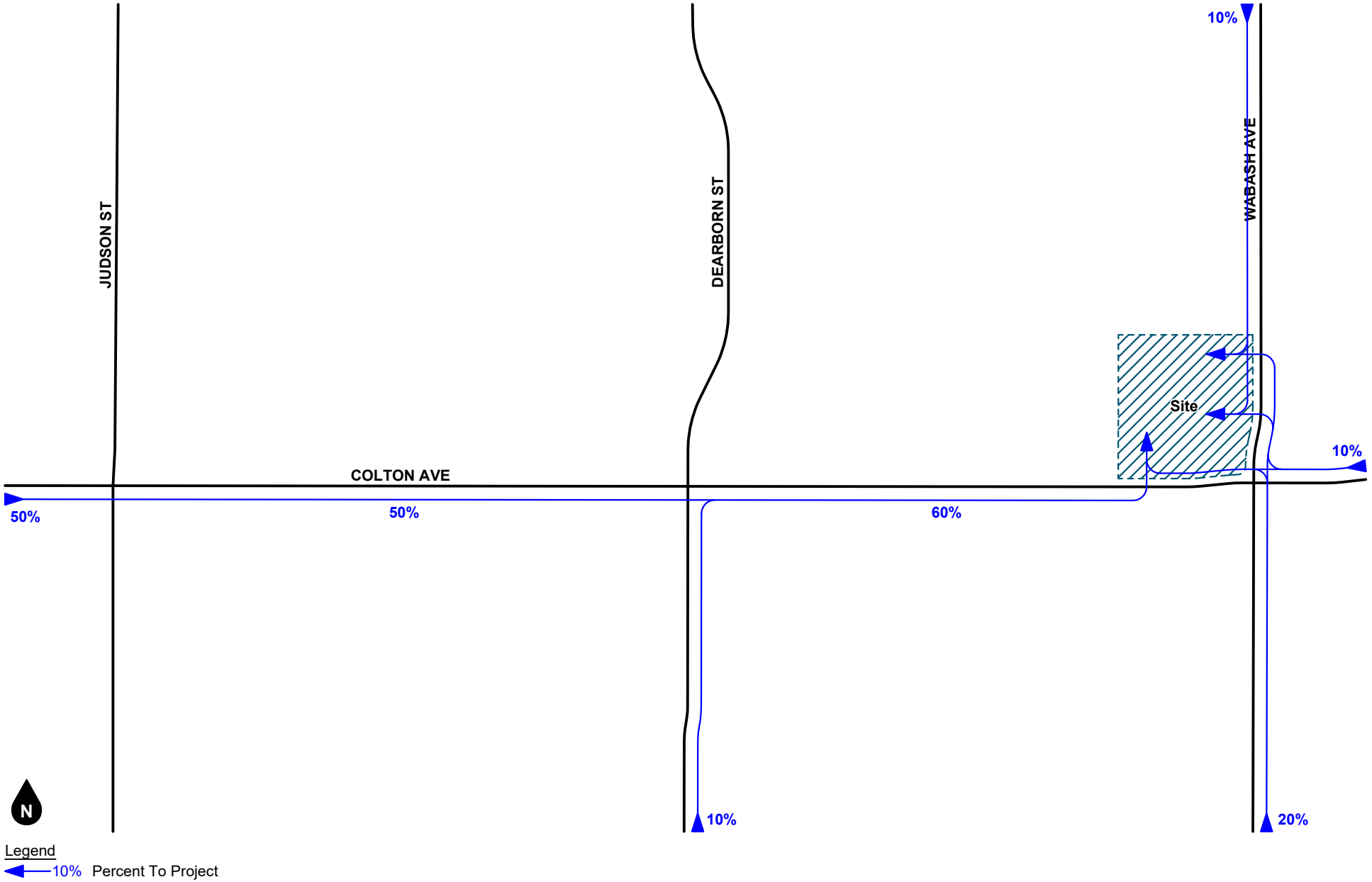


Figure 16
Project Trip Distribution (Inbound)

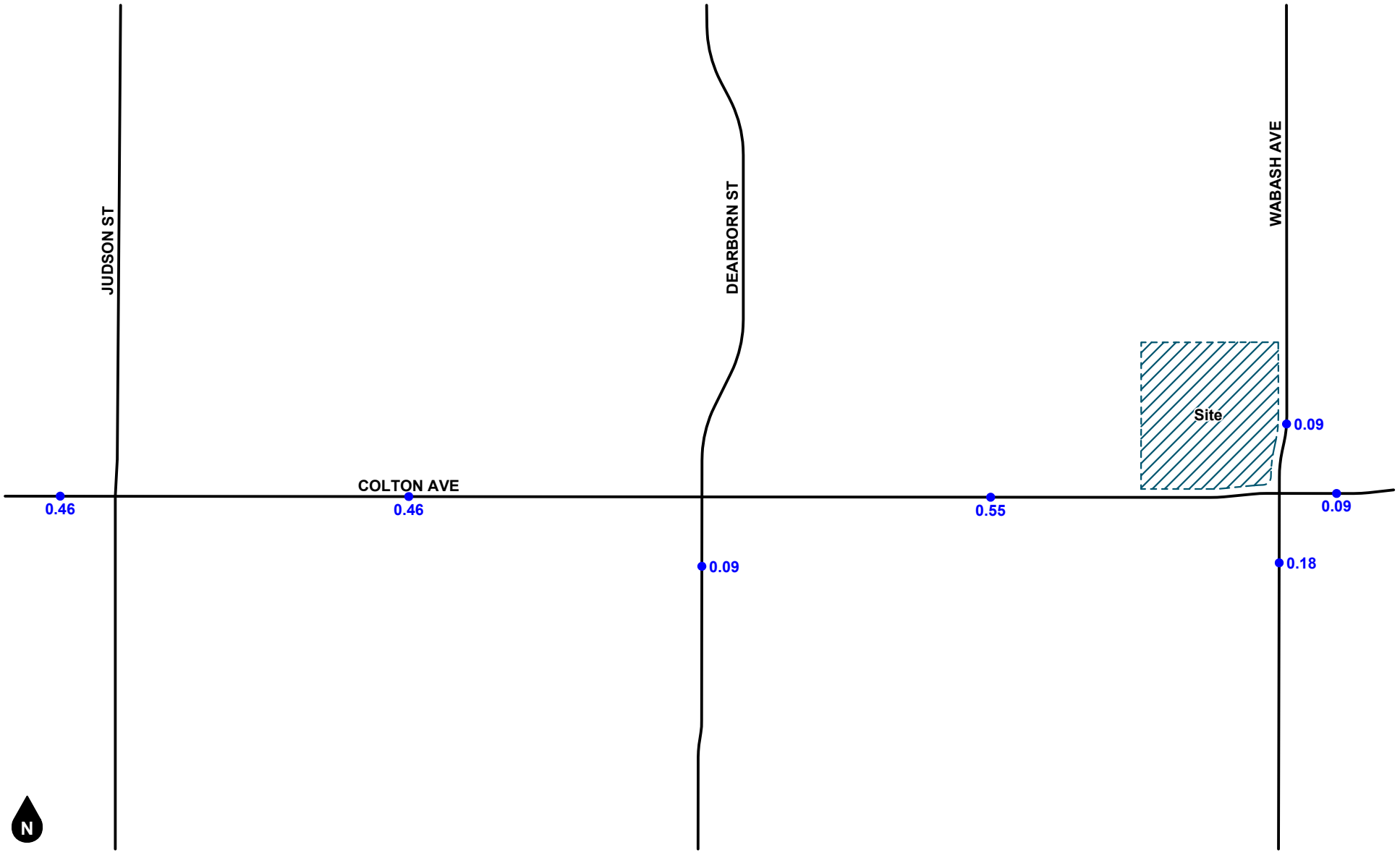
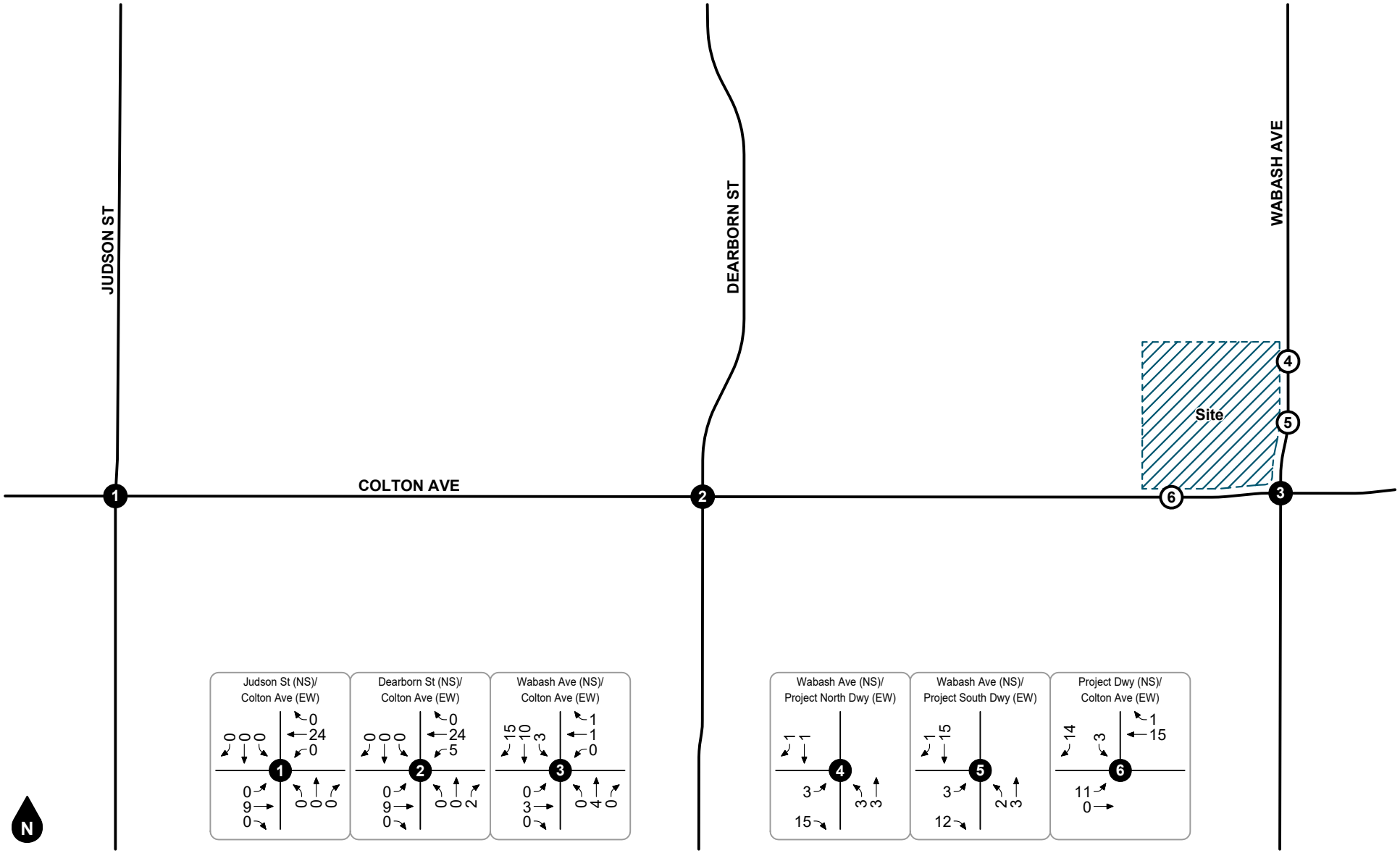


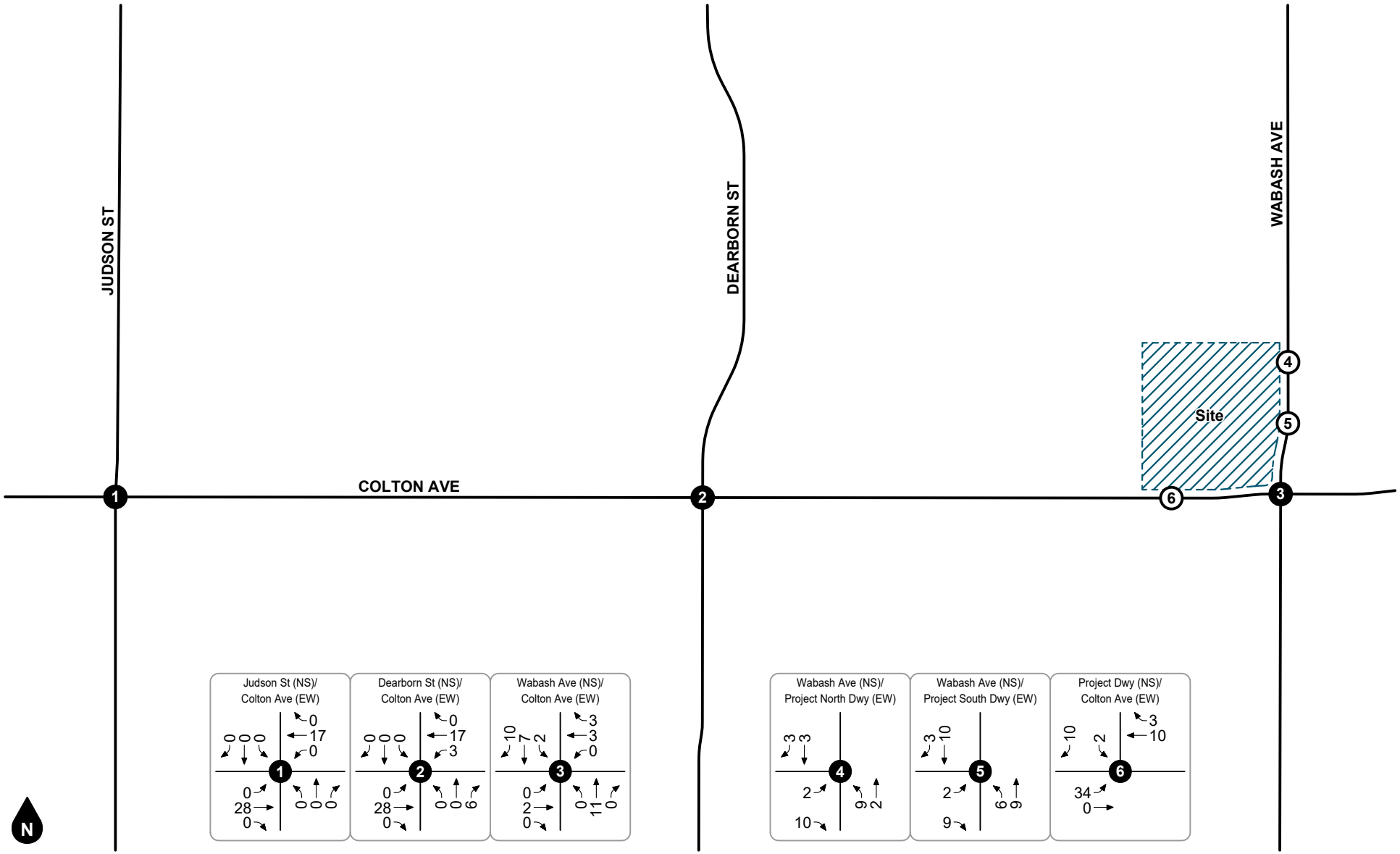
Figure 17
Project Average Daily Traffic Volumes



Legend

- # Study Intersection
- (#) Project Driveway

Figure 18
Project AM Peak Hour Intersection Turning Movement Volumes



Legend

(#) Study Intersection

(#) Project Driveway

Figure 19
Project PM Peak Hour Intersection Turning Movement Volumes

5. EXISTING PLUS PROJECT VOLUME FORECASTS

This section describes how volume forecasts were developed. Forecast study area volumes are illustrated in the figures contained in this section.

The Existing Plus Project volume forecast was developed by adding project-generated trips to the Existing volumes. Existing Plus Project average daily traffic volumes are shown in Figure 20. Existing Plus Project AM peak hour and PM peak hour intersection turning movement volumes are shown in Figure 21 and Figure 22.

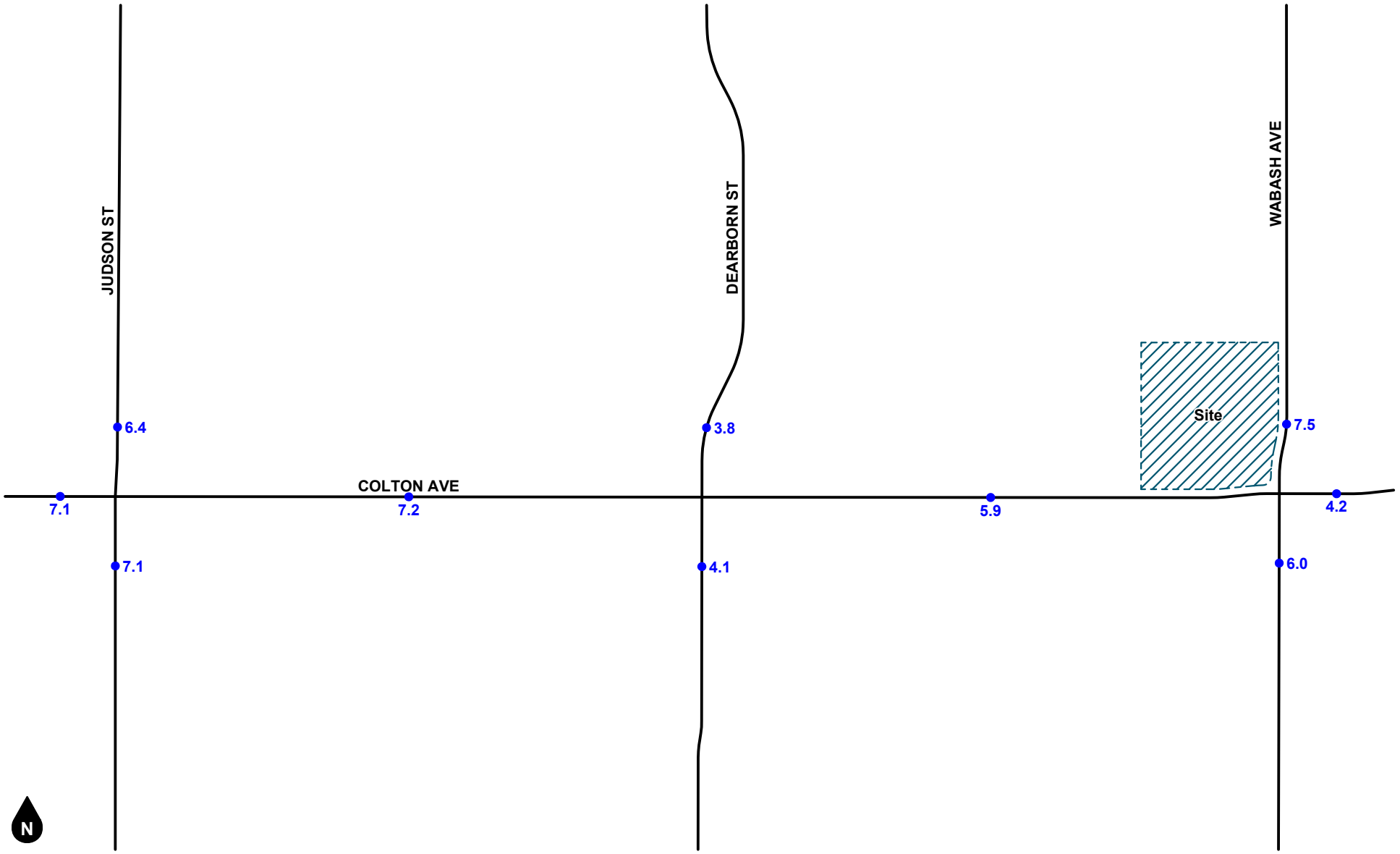
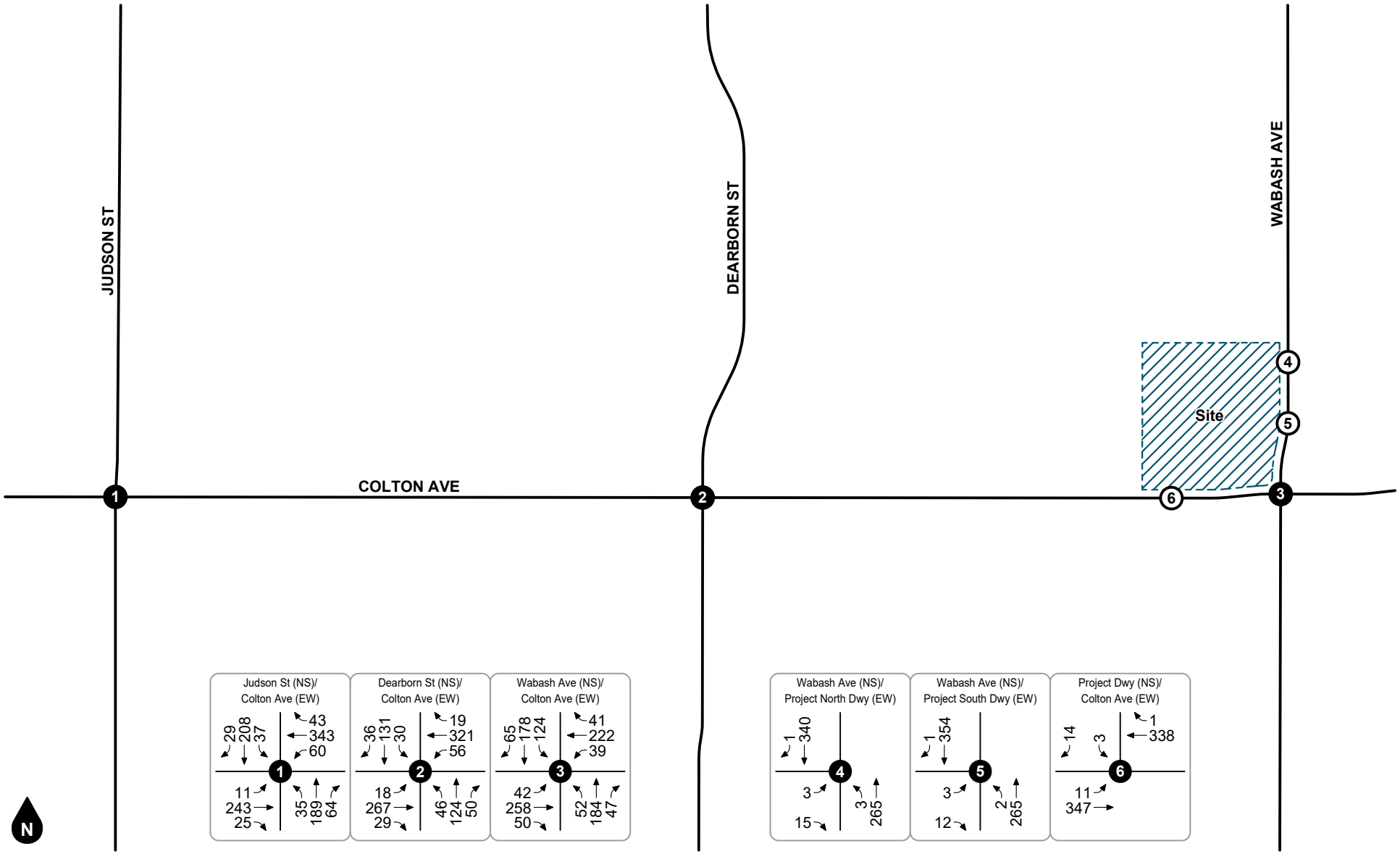


Figure 20
Existing Plus Project Average Daily Traffic Volumes



Legend

- (#) Study Intersection
- (#) Project Driveway

Figure 21
Existing Plus Project
AM Peak Hour Intersection Turning Movement Volumes

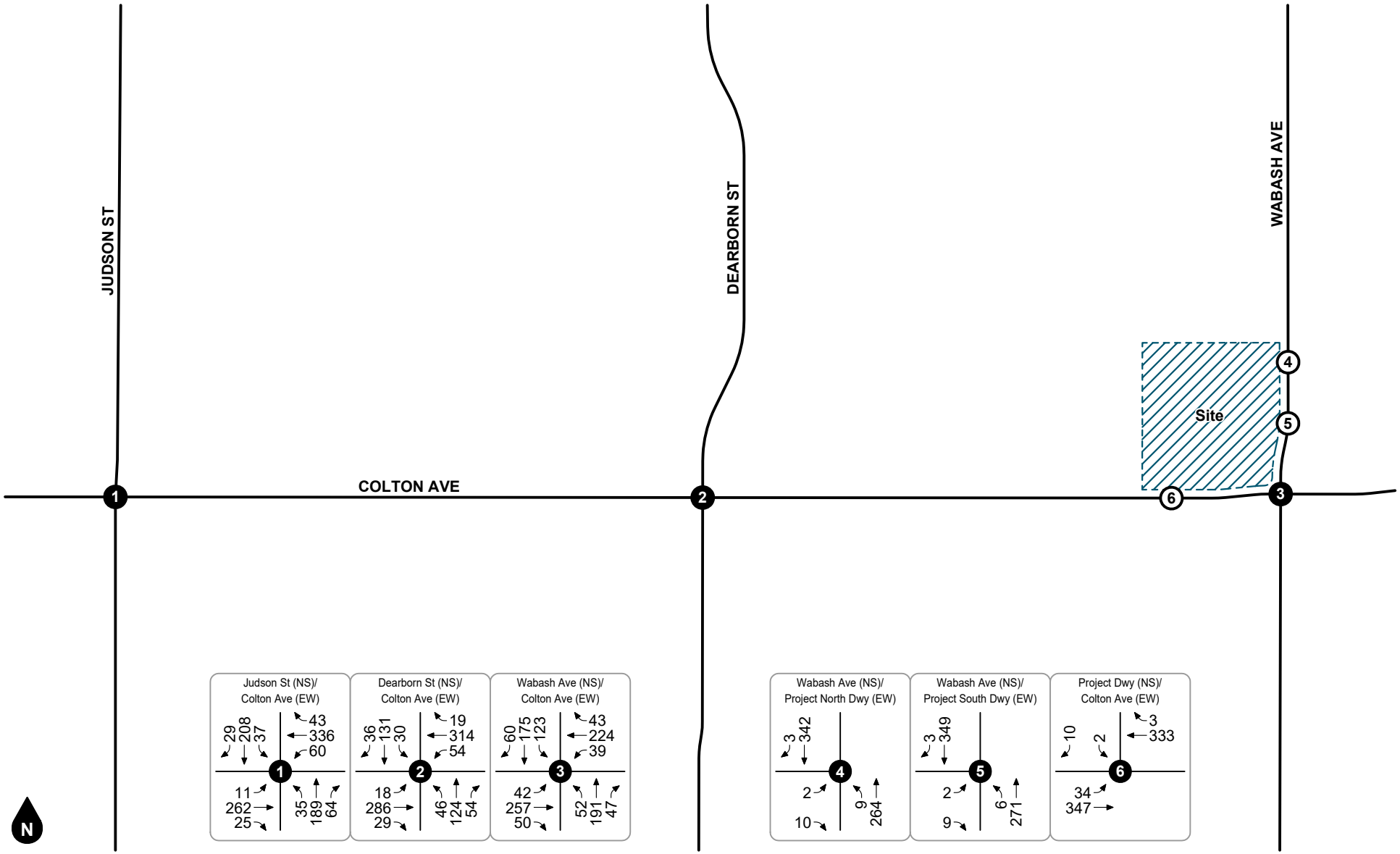


Figure 22
Existing Plus Project
PM Peak Hour Intersection Turning Movement Volumes

6. EXISTING PLUS PROJECT LEVELS OF SERVICE

Detailed intersection Level of Service calculation worksheets are provided in Appendix D.

Project design features, such as improvements necessary to provide project site access, are assumed to be constructed by the proposed project and are described in further detail in the Site Access & Circulation section presented later in this report.

The study intersection Levels of Service for Existing Plus Project conditions are shown in Table 3. As shown in Table 3, the study intersections are forecast to operate within acceptable Levels of Service (C or better), except for the following intersection that is forecast to continue operating at Level of Service D during the peak hours:

1. Judson Street (NS) at Colton Avenue (EW)

As shown in Table 3, the Judson Street at Colton Avenue intersection operates at Level of Service D under pre-project conditions, and the addition of project trips does not degrade the Level of Service below the current Level of Service grade. Therefore, the proposed project is forecast to result in no substantial transportation effects at the study intersections for Existing Plus Project conditions.

Table 3
Existing Plus Project Intersection Levels of Service & Project-Related Effect

Study Intersection	Traffic Control[1]	Existing				Existing Plus Project				AM Peak Hour		PM Peak Hour	
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour					
		Delay[2]	LOS[3]	Delay[2]	LOS	Delay[2]	LOS[3]	Delay[2]	LOS	Change	Substantial Effect?	Change	Substantial Effect?
1. Judson Street at Colton Avenue	AWS	28.2	D	27.2	D	33.3	D	32.3	D	+5.1	NO[4]	+5.1	NO[4]
2. Dearborn Street at Colton Avenue	AWS	19.3	C	17.2	C	22.5	C	19.5	C	+3.2	NO	+2.3	NO
3. Wabash Avenue at Colton Avenue	AWS	11.1	B	10.9	B	11.2	B	11.0	B	+0.1	NO	+0.1	NO
4. Wabash Ave at Project North Driveway	CSS	-		-		9.9	A	12.7	B	+9.9	NO	+12.7	NO
5. Wabash Ave at Project South Driveway	CSS	-		-		10.1	B	12.7	B	+10.1	NO	+12.7	NO
6. Project Driveway at Colton Avenue	CSS	-		-		10.1	B	13.9	B	+10.1	NO	+13.9	NO

Notes:

1. AWS = All Way Stop; CSS = Cross Street Stop.
2. Delay is shown in seconds per vehicle. For intersections with traffic signal or all way stop control, overall average intersection delay and LOS are shown. For intersections with cross street stop control, LOS is based on average delay of the worst minor street approach or major street left turn movement.
3. LOS = Level of Service
4. Project contributions do not degrade level of service (LOS) from the current LOS grade to a higher grade.

7. SITE ACCESS & ON-SITE CIRCULATION

This section evaluates the project site access and on-site circulation. Vehicular access for the project site is proposed via three full access residential street connections. Two project connects are on Wabash Avenue and one project connection is on Colton Avenue.

PROJECT DESIGN FEATURES

This analysis assumes the following improvements will be constructed by the project to provide project site access:

4. Wabash Avenue (NS) at Project North Driveway (EW)
   - Construct the project driveway to provide one inbound lane and one outbound lane.
   - Northbound: Maintain two existing through lanes and an existing two-way left turn lane median.
   - Southbound: Maintain two existing through lanes and an existing two-way left turn lane median.
   - Eastbound: Install stop control and construct one shared left-turn/right-turn lane

5. Wabash Avenue (NS) at Project South Driveway (EW)
   - Construct the project driveway to provide one inbound lane and one outbound lane.
   - Northbound: Maintain two existing through lanes and an existing two-way left turn lane median.
   - Southbound: Maintain two existing through lanes and an existing two-way left turn lane median.
   - Eastbound: Install stop control and construct one shared left-turn/right-turn lane

6. Project Driveway (NS) at Colton Avenue (EW)
   - Construct the project driveway to provide one inbound lane and one outbound lane.
   - Southbound: Install stop control and construct one shared left-turn/right-turn lane
   - Northbound: Maintain two existing through lanes.
   - Southbound: Maintain two existing through lanes.

This analysis also assumes the project shall comply with the following conditions as part of the City of Redlands standard development review process to ensure adequate geometric design and emergency access:

- Site-adjacent roadways shall be constructed or repaired at their ultimate half-section width, including landscaping and parkway improvements in conjunction with development, or as otherwise required by the City of Redlands.

- All on-site and off-site roadway design, signing/striping, and traffic control improvements relating to the proposed project shall be submitted to the City for review and constructed following applicable State/Federal engineering standards to the satisfaction of the City of Redlands.

- The final grading, landscaping, and street improvement plans shall demonstrate that applicable sight distance requirements are met.

- The project shall comply with the City of Redlands municipal parking requirements which will be reviewed as a part of the standard development review process.

- Final project plans shall demonstrate adequate emergency vehicle access and circulation to the satisfaction of the City of Redlands Public Works and Fire Departments.

- A construction worksite traffic control plan shall comply with applicable engineering standards outlined in the California *Manual of Uniform Traffic Control Devices* and shall be submitted to the City for review and approval before the issuance of a grading permit or start of construction. The plan shall identify any

roadway, sidewalk, bike route, or bus stop closures and detours as well as haul routes and hours of operation. All construction-related trips shall be restricted to off-peak hours to the extent possible.

SITE ACCESS QUEUING ANALYSIS

Table 4 summarizes the results of the queue analysis to check for conflicts between the project driveways and the immediately intersection.
The forecasted queue lengths shown in Table 4 are based on the HCM 95th-percentile back-of-queue methodology as shown in the Level of Service worksheets provided in Appendix D.

As shown in Table 4, adequate storage length/intersection spacing is forecast to be provided at the project driveways and immediately adjacent intersection during the peak hours for the Existing Plus Project Conditions. In particular, the southbound left turn lane at Wabash Avenue/Colton Avenue [#3] provides approximately 130 feet of storage capacity. The distance between the Wabash Avenue/Project South Driveway [#5] is approximately 200 feet. The southbound queue length for the left turn and through lanes at Wabash Avenue/Colton Avenue [#3] are not forecast to exceed 30 feet and northbound queue length at Wabash Avenue/Project South Driveway [#5] is not forecast to exceed 20 feet; therefore, adequate storage length and intersection spacing is expected to be provided between Colton Avenue and the Project South Driveway on Wabash Avenue.

Table 4
Site Access Queuing Analysis

Study Intersection	Approach	Lane	Storage Length (Feet)[2]	Peak Hour 95th-Percentile Queue Length (Feet)[1]		Adequate Storage Provided
				Existing Plus Project		
				AM	PM	
3. Wabash Avenue at Colton Avenue	Northbound	Left	115	<20	<20	YES
	Northbound	Thru-Right	215	25	20	YES
	Southbound	Left	130	30	25	YES
	Southbound	Thru-Right	175	25	<20	YES
	Eastbound	Left	110	<20	<20	YES
	Eastbound	Thru	200	35	30	YES
4. Wabash Ave at Project North Driveway	Northbound	Left	300	<20	<20	YES
	Southbound	Thru-Right	280	<20	<20	YES
	Eastbound	Shared	65	<20	<20	YES
5. Wabash Ave at Project South Driveway	Northbound	Left	60	<20	<20	YES
	Southbound	Thru-Right	300	<20	<20	YES
	Eastbound	Shared	75	<20	<20	YES
6 Project Driveway at Colton Avenue	Southbound	Shared	75	<20	<20	YES
	Eastbound	Left-Thru	445	<20	<20	YES
	Westbound	Thru-Right	395	<20	<20	YES

Notes:

1. The forecast 95th-percentile queue lengths shown in the delay calculation worksheets have been rounded up to nearest 5-foot increment.
2. Length of turning lane storage or distance to the adjacent driveway.

8. CONCLUSIONS

This section summarizes the proposed project, operational findings, and identifies recommendations (if any) as specified in previous sections of this study.

PROJECT TRIP GENERATION

The proposed project is forecast to generate a total of approximately 918 daily trips, including 68 trips during the AM peak hour and 88 trips during the PM peak hour.

LEVEL OF SERVICE ANALYSIS

The study intersections are forecast to operate within acceptable Levels of Service (C or better) during the peak hours for the Existing and Existing Plus Project, except for the following intersection that is forecast to continue operating at Level of Service D during the peak hours:

1. Judson Street (NS) at Colton Avenue (EW)

The addition of project trips does not degrade the Level of Service below the current Level of Service grade. Therefore, the proposed project is forecast to result in no substantial transportation effects at the study intersections for Existing Plus Project conditions.

SUMMARY OF IMPROVEMENTS

Project design features, necessary to provide project access, are outlined in the Site Access & On-Site Circulation (Section 7).

No off-site improvements are warranted since the project is forecast to result in no substantial transportation effects at the study intersections for Existing Plus Project conditions. However, all development projects are required, as a condition of approval, to pay the Development Impact Fee in effect at the time of the building permit issuance.

VEHICLE MILES TRAVELED ANALYSIS

Based on review of the proposed development and location, the project satisfies the County-established VMT screening criteria. Therefore, preparation of a transportation impact study with vehicle miles traveled (VMT) analysis is not warranted and the proposed project may be presumed to result in a less than significant VMT impact. The project VMT assessment is documented separately in the *Redlands Madera at Citrus Trail Vehicle Miles Traveled Assessment* (Ganddini Group, Inc., April 7, 2023).

APPENDICES

Appendix A Glossary
Appendix B Scoping Agreement
Appendix C Traffic Count Data
Appendix D Intersection Level of Service Worksheets

APPENDIX A

GLOSSARY

ACRONYMS

AC	Acres
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
DU	Dwelling Unit
ICU	Intersection Capacity Utilization
GFA	Gross Floor Area
LOS	Level of Service
PCE	Passenger Car Equivalent
SF	Square Foot
SP	Service Population
TSF	Thousand Square Feet
V/C	Volume to Capacity Ratio
VMT	Vehicle Miles Traveled

TERMS

ACTUATED SIGNAL CONTROL: A type of traffic signal control in which display of each phase depends on whether the corresponding phase detector has registered a service call or the phase is on recall.

ACTUATION: Detection of a roadway user that is forwarded to the signal controller.

AVERAGE DAILY TRAFFIC: The average 24-hour volume for a stated period is divided by the number of days in that period. For example, Annual Average Daily Traffic is the total volume during a year divided by 365 days.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A point of constriction along a roadway that limits the amount of traffic that can proceed downstream from its location.

CALL: An indication within a signal controller that a particular phase is waiting for service, either through actuation from a roadway user or phase recall.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass through a roadway facility during a specified period.

CHANNELIZATION: The separation of conflicting traffic movements by use of pavement markings, raised curbs, or other suitable means to facilitate free flow movement.

CLEARANCE INTERVAL: Equal to the yellow plus all-red time, if any, when a traffic signal changes between phases (i.e., the amount of time between the end of a green light from one movement to the beginning of a green light for the next).

COORDINATED SIGNAL CONTROL: A type of traffic signal control in which non-coordinated phases associated with minor movements are constrained such that the coordinated phases are served at a specific time during the signal cycle, thus maintaining the efficient progression of traffic flow along the major roadway.

CONTROL DELAY: The portion of delay attributed to the intersection traffic control (such as a traffic signal or stop sign). It includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay.

CORDON: An imaginary boundary line around or across a study area across which vehicles, persons, or other information can be collected for survey and analytical purposes.

CORNER SIGHT DISTANCE: The minimum sight distance required by the driver of a vehicle to cross or enter the lanes of the major roadway without requiring approaching traffic traveling at a given speed to radically alter their speed or trajectory.

CYCLE: A complete sequence of signal indications for all phases. Also known as a signal cycle.

CYCLE LENGTH: The total time for a traffic signal to complete one full cycle.

DAILY CAPACITY: A theoretical value representing the daily traffic volume that will typically result in a peak hour volume equal to the capacity of the roadway.

DELAY: The total additional travel time experienced by a roadway user (driver, passenger, bicyclist, or pedestrian) beyond that required to travel at a desired speed.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device used to count or determine the presence of a roadway user.

DESIGN SPEED: A speed used for purposes of designing horizontal and vertical alignments of a highway.

DIRECTIONAL SPLIT: The percent of two-way traffic traveling in a specified direction.

DIVERSION: The rerouting of traffic from a normal path of travel between two points, such as to avoid congestion or perform a secondary trip.

FREE FLOW: Traffic flow that is unaffected by a traffic control and/or or upstream or downstream conditions.

GAP: Time or distance between two vehicles measured from rear bumper of the front vehicle to front bumper of the second vehicle.

GAP ACCEPTANCE: The method by which a driver accepts an available gap in traffic to enter or cross the road.

HEADWAY: Time or distance between two successive vehicles measured from same point on both vehicles (i.e., front bumper to front bumper). Also known as gap.

LEVEL OF SERVICE: A grading scale of quantitative performance measures representing the quality of service of a transportation facility or service from an average traveler's perspective.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MULTI-MODAL: More than one mode, such as automobile, transit, bicycle, and pedestrian.

OFFSET: The time interval between the beginning of a traffic signal cycle at one intersection and the beginning of signal cycle an adjacent intersection.

PLATOON: A set of vehicles traveling at similar speed and moving as a general group with clear separation between other vehicles ahead and behind.

PASSENGER CAR EQUIVALENT: A metric used to assess the impact of larger vehicles, such as trucks, recreational vehicles, and buses, by converting the traffic volume of larger vehicles to an equivalent number of passenger cars.

PEDESTRIAN CLEARANCE INTERVAL: Also known as the "Flashing Don't Walk" interval, it signals the end of pedestrian entry into the crosswalk following the "Walk" indication and provides time for pedestrians who have already entered the crosswalk to finishing crossing.

PEAK HOUR: The hour within a day in which the maximum volume occurs.

PEAK HOUR FACTOR: The peak hour volume divided by the four times the peak 15-minute flow rate.

PHASE: In traffic signals, the green, yellow, and red clearance intervals assigned to a specified traffic movement.

PRETIMED SIGNAL: A traffic signal operation in which the cycle length, phasing sequence, and phasing times are predetermined and fixed, regardless of actual demand for any given traffic movement. Also known as a fixed time signal.

PROGRESSION: The coordinated movement of vehicles through signalized intersections along a corridor.

QUEUE: The number of vehicles waiting at a service area such as a traffic signal, stop sign, or access gate.

QUEUE LENGTH: The length of vehicle queue, typically expressed in feet, waiting at a service area such as a traffic signal, stop sign, or access gate.

RECALL: A signal phasing operation in which a specified phase places a call to the signal controller each time a conflicting phase is served, thus ensuring the specified phase will be serviced again.

SEMI-ACTUATED CONTROL: A type of traffic signal control in which only the minor movements are provided detection.

SIGHT DISTANCE: The continuous length of roadway visible to a driver or roadway user.

STACKING DISTANCE: The length of area available behind a service area, such as a traffic signal or gate, for vehicle queuing to occur.

STOPPING SIGHT DISTANCE: The minimum distance required by the driver of a vehicle traveling at a given speed to bring the vehicle to a stop after an object on the road becomes visible, including reaction and response time.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors. Also known as a demand responsive signal.

TRIP OR TRIP END: The one-directional movement of a person or vehicle. Every trip has an origin and a destination at its respective ends (i.e., trip ends). In terms of site trip generation, the same vehicle entering and exiting a site generates two trips: one inbound trip and one outbound trip.

TRIP GENERATION RATE: The rate at which a land use generates trips per the specified land use variable, such per dwelling unit or per thousand square feet.

TURNING RADIUS: The circular arc formed by the smallest turning path radius of the front outside tire of a vehicle, such as that performed by a U-turn maneuver. This is based on the length and width of the wheelbase as well as the steering mechanism of the vehicle.

VEHICLE MILES TRAVELED: A measure of the amount and distance of automobile travel essentially calculated as the sum of each trip times the trip length.

APPENDIX B

SCOPING AGREEMENT

APPENDIX B

SCOPING AGREEMENT

MEMORANDUM OF UNDERSTANDING

TO: Don Young, Land Use Engineering Manager | CITY OF REDLANDS

FROM: Perrie Ilercil, PE (AZ) | GANDDINI GROUP, INC.

DATE: April 7, 2023

SUBJECT: **Madera at Citrus Trail Traffic Scoping Agreement**
19620

INTRODUCTION

The purpose of this scoping document is to outline the proposed traffic analysis parameters and assumptions for the Madera at Citrus Trail project for review/concurrence by the City of Redlands staff.

PROJECT DESCRIPTION

The 9.0-acre project site (APN 0168-291-02) is located at the northwest corner of Wabash Avenue and Colton Avenue in the City of Redlands, California. The project site is currently zoned residential and undeveloped. The proposed project involves a General Plan Amendment (GPA-0474) associated with the Zoning change (ZC-0474) from Low Density Residential (R1) to Medium Density Residential (R2) for the Tentative Tract Map (TTM20571) and Conditional Use Permit (CUP1171) of the development. The project location map is shown on Figure 1.

The proposed project includes the construction of a 103-dwelling unit single-family residential development. Vehicle access to the proposed project will be provided by three driveways one on Colton Avenue and two on Wabash Avenue. The project site plan is illustrated on Figure 2.

PROJECT TRIP GENERATION & DISTRIBUTION

Trip Generation

Table 1 shows the proposed project trips based on trip generation rates obtained from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition, 2021) for Land Use Codes 210 (Single-family Detached Housing) and 215 (Single-family Attached Housing).

As shown in Table 1, the proposed project is forecast to generate a total of approximately 918 daily trips, including 67 trips during the AM peak hour and 88 trips during the PM peak hour.

Project Trip Distributions

Figure 3 illustrates the forecast directional distribution patterns of the project generated trips. The project trip distribution patterns are developed from engineering judgement based on review of existing volume data, surrounding land uses, and the local and regional roadway facilities in the project vicinity.

STUDY AREA

Based on of the project trip generation and distribution patterns consists of the following study intersections:

1. Judson Street (NS) at Colton Avenue (EW)[1]
2. Dearborn Street (NS) at Colton Avenue (EW)
3. Wabash Avenue (NS) at Colton Avenue (EW)
4. Wabash Avenue (NS) at Project North Driveway (EW)
5. Wabash Avenue (NS) at Project South Driveway (EW)
6. Project Driveway (NS) at Colton Avenue (EW)

TRAFFIC COUNTS

New intersection turning movement counts will be collected at the study intersections during the typical weekday AM and PM peak hours (7:00 AM – 9:00 AM and 4:00 - 6:00 PM). The peak hour factor will be determined from the counts for study area intersections.

INTERSECTION ANALYSIS METHODOLOGY

In accordance with the City of Redlands standard procedures, and the County of San Bernardino *Transportation Impact Study Guidelines* (July 2019), intersections shall by analyzed using the intersection delay methodology based on procedures contained in the Transportation Research Board *Highway Capacity Manual* (HCM). Default values not specifically identified in the County guidelines will be based *Highway Capacity Manual* recommended values. Intersection analysis shall be performed using the Vistro software.

PERFORMANCE STANDARDS

The City of Redlands General Plan and Measure U Section 1A.60 Principle Six has established the minimum acceptable Level of Service (C or better) for roadway segment and peak hour intersection operations. Where the current Level of Service is lower C, roadway improvements shall be provided such that the LOS is not reduced below the LOS at the time of the application, or as provided in Section 5.20 of the Redlands General Plan where a more intense Level of Service is specifically permitted, for Existing Plus Project conditions.

ANALYSIS SCENARIOS

The traffic study shall evaluate the following analysis scenarios for typical weekday AM and PM peak hour conditions:

- Existing
- Existing Plus Project

SITE ACCESS & ON-SITE CIRCULATION

The traffic study will review site access considerations such as intersection traffic controls and lane configurations and if necessary, recommend improvements. Additionally, the traffic study will evaluate the project site ingress/egress regarding the proximity of the Wabash/Colton intersection relative to City of Redlands standards, including sight distance analysis for the project driveways.

[1] (NS) = north-south roadway; (EW) = east-west roadway.

VEHICLE MILES TRAVELED (VMT) ASSESSMENT

A VMT letter report supplemental to the traffic study shall be submitted to provide VMT screening analysis for CEQA compliance based on screening criteria established by the City of Redlands. The VMT letter report shall include a narrative of VMT requirements under CEQA and documentation of the project screening results based on the applicable criteria.

CONCLUSION

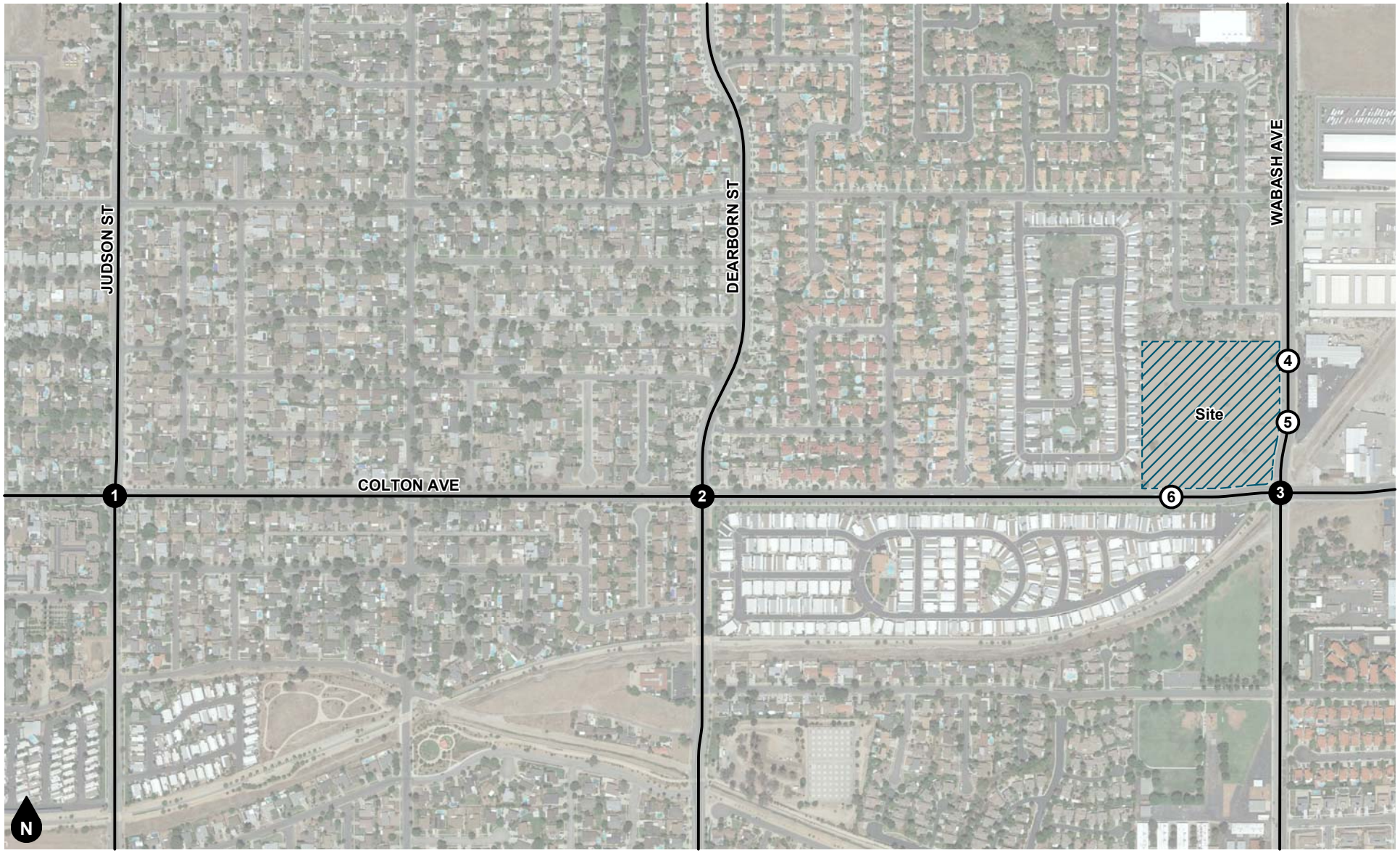
We appreciate the opportunity to provide this memorandum of understanding for your review. Should you have any questions or comments regarding the proposed scope, please contact me at (714) 795-3100 x 103 or 949-257-3126.

Table 1
Project Trip Generation

Trip Generation Rates									
			AM Peak Hour			PM Peak Hour			
Land Use	Source[1]	Land Use Variable[2]	% In	% Out	Rate	% In	% Out	Rate	Daily Rate
Single-Family Detached Housing	ITE 210	DU	26%	74%	0.70	63%	37%	0.94	9.43
Single-Family Attached Housing	ITE 215	DU	31%	69%	0.48	57%	43%	0.57	7.20

Trips Generated									
			AM Peak Hour			PM Peak Hour			
Land Use	Source	Quantity	In	Out	Total	In	Out	Total	Daily
Single-Family Detached Housing	ITE 210	79 DU	14	41	55	47	27	74	745
Single-Family Attached Housing	ITE 215	24 DU	4	8	12	8	6	14	173
TOTAL TRIPS GENERATED		**103 DU**	**18**	**49**	**67**	**55**	**33**	**88**	**918**

Notes:
1. ITE = Institute of Transportation Engineers *Trip Generation Manual* (11th Edition, 2021); ### = Land Use Code.
   All rates based on General Urban/Suburban setting unless otherwise noted.
2. DU = Dwelling Units



Legend

(#) Study Intersection

(#) Project Driveway

Figure 1
Project Location Map



Figure 2
Site Plan

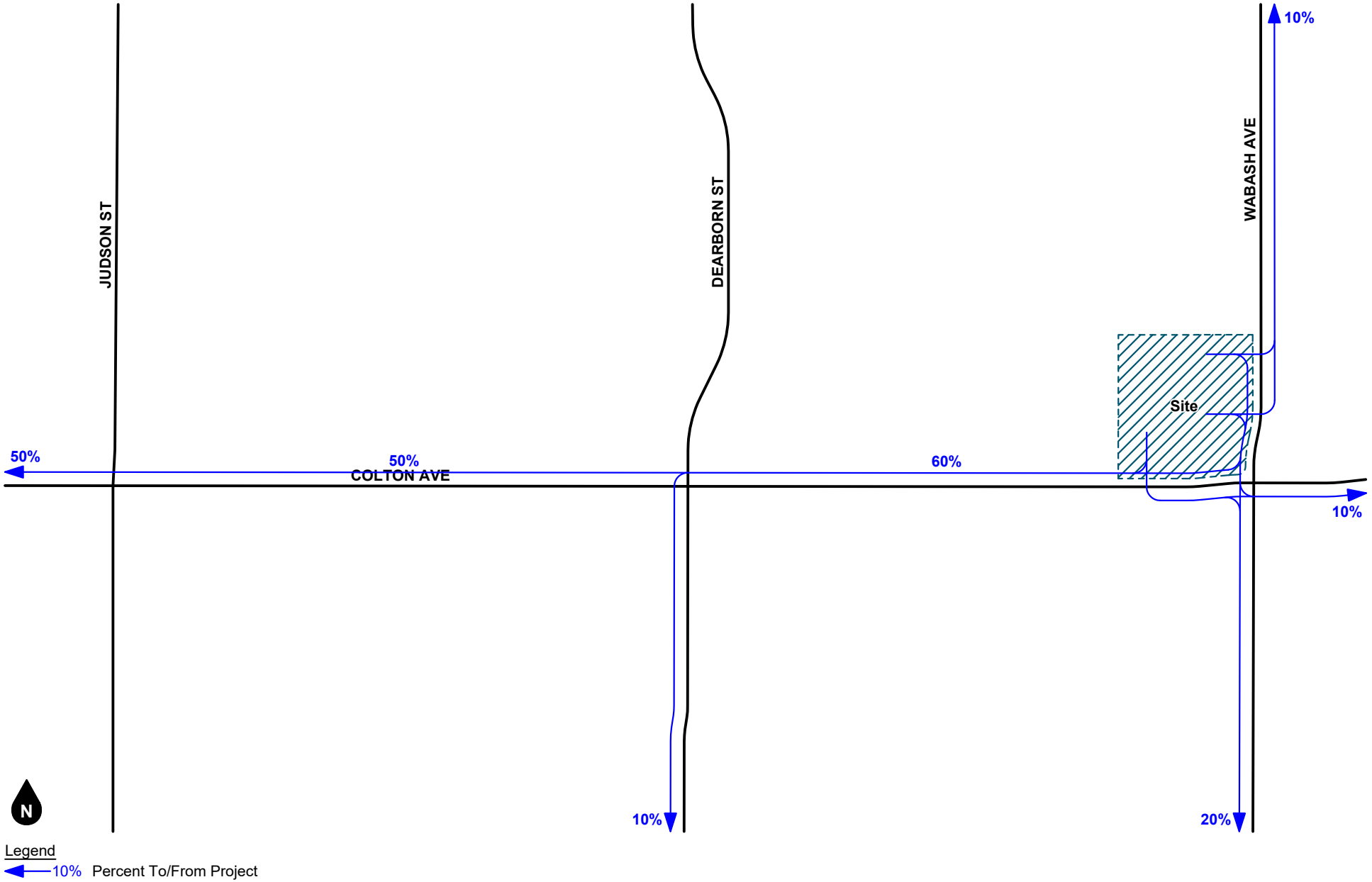


Figure 3
Project Trip Distribution

Perrie Ilercil

From: Don Young
Sent: Wednesday, April 12, 2023 4:21 PM
To: Perrie Ilercil; Sean Reilly
Cc: Pam Steel
Subject: Re: Madera at Citrus Trails Traffic Scoping Agreement and VMT Assessment

your submittals are acceptable. I will wait for submittal of the Measure U analysis.

From: Perrie Ilercil <perrie@ganddini.com>
Sent: Wednesday, April 12, 2023 11:48 AM
To: Sean Reilly
Cc: Pam Steel
Subject: Madera at Citrus Trails Traffic Scoping Agreement and VMT Assessment

[**NOTICE:** This message originated outside of City of Redlands -- **DO NOT CLICK** on **links** or open **attachments** unless you are sure the content is safe.]

Hi Sean,

See the attached files for your records and Don's review.

Don,
At your earliest convenience, let me know if you have any questions or concerns, so these can be addressed before counts are conducted.

Sincerely,

Perrie Ilercil, **PE (AZ)**
Senior Engineer

GANDDINI GROUP, INC.
555 Parkcenter Drive, Suite 225
Santa Ana, CA 92705
o. 714 795 3100 x 103
c. 949 257-3126
e: *perrie@ganddini.com*
www.ganddini.com

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APPENDIX C

TRAFFIC COUNT DATA

APPENDIX C

TRAFFIC COUNT DATA

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

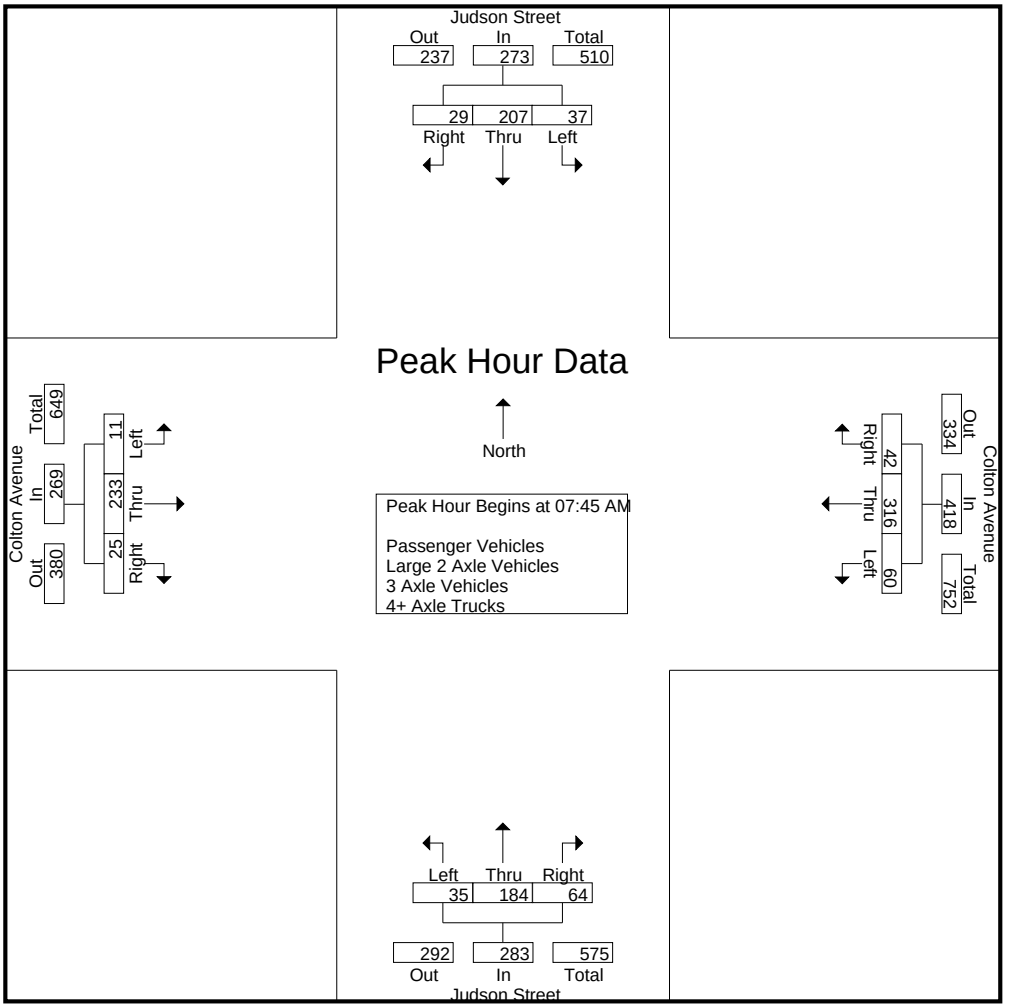
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	33	2	37	5	77	3	85	4	17	7	28	4	15	2	21	171
07:15 AM	2	54	8	64	15	72	9	96	11	26	6	43	3	28	3	34	237
07:30 AM	5	57	7	69	6	83	5	94	13	35	3	51	1	47	11	59	273
07:45 AM	5	50	8	63	17	81	9	107	3	42	17	62	2	67	5	74	306
Total	14	194	25	233	43	313	26	382	31	120	33	184	10	157	21	188	987
08:00 AM	9	54	9	72	9	77	6	92	7	48	25	80	2	69	9	80	324
08:15 AM	15	60	7	82	18	87	16	121	17	43	7	67	2	53	5	60	330
08:30 AM	8	43	5	56	16	71	11	98	8	51	15	74	5	44	6	55	283
08:45 AM	2	42	3	47	14	47	3	64	5	30	5	40	4	21	0	25	176
Total	34	199	24	257	57	282	36	375	37	172	52	261	13	187	20	220	1113
Grand Total	48	393	49	490	100	595	62	757	68	292	85	445	23	344	41	408	2100
Apprch %	9.8	80.2	10		13.2	78.6	8.2		15.3	65.6	19.1		5.6	84.3	10		
Total %	2.3	18.7	2.3	23.3	4.8	28.3	3	36	3.2	13.9	4	21.2	1.1	16.4	2	19.4	
Passenger Vehicles	47	385	49	481	100	591	60	751	68	281	83	432	21	340	40	401	2065
% Passenger Vehicles	97.9	98	100	98.2	100	99.3	96.8	99.2	100	96.2	97.6	97.1	91.3	98.8	97.6	98.3	98.3
Large 2 Axle Vehicles	1	4	0	5	0	3	2	5	0	9	1	10	2	4	1	7	27
% Large 2 Axle Vehicles	2.1	1	0	1	0	0.5	3.2	0.7	0	3.1	1.2	2.2	8.7	1.2	2.4	1.7	1.3
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0.3	0	0.2	0	0	0	0	0
4+ Axle Trucks	0	4	0	4	0	1	0	1	0	1	1	2	0	0	0	0	7
% 4+ Axle Trucks	0	1	0	0.8	0	0.2	0	0.1	0	0.3	1.2	0.4	0	0	0	0	0.3

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	5	50	8	63	17	81	9	107	3	42	17	62	2	67	5	74	306
08:00 AM	9	54	**9**	72	9	77	6	92	7	48	**25**	**80**	2	**69**	**9**	**80**	324
08:15 AM	**15**	**60**	7	**82**	**18**	**87**	**16**	**121**	**17**	43	7	67	2	53	5	60	**330**
08:30 AM	8	43	5	56	16	71	11	98	8	**51**	15	74	**5**	44	6	55	283
Total Volume	37	207	29	273	60	316	42	418	35	184	64	283	11	233	25	269	1243
% App. Total	13.6	75.8	10.6		14.4	75.6	10		12.4	65	22.6		4.1	86.6	9.3		
PHF	.617	.863	.806	.832	.833	.908	.656	.864	.515	.902	.640	.884	.550	.844	.694	.841	.942

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:45 AM				07:45 AM				07:30 AM			
+0 mins.	5	57	7	69	17	81	9	107	3	42	17	62	1	47	**11**	59
+15 mins.	5	50	8	63	9	77	6	92	7	48	**25**	**80**	**2**	67	5	74
+30 mins.	9	54	**9**	72	**18**	**87**	**16**	**121**	**17**	43	7	67	2	**69**	9	**80**
+45 mins.	**15**	**60**	7	**82**	16	71	11	98	8	**51**	15	74	2	53	5	60
Total Volume	34	221	31	286	60	316	42	418	35	184	64	283	7	236	30	273
% App. Total	11.9	77.3	10.8		14.4	75.6	10		12.4	65	22.6		2.6	86.4	11	
PHF	.567	.921	.861	.872	.833	.908	.656	.864	.515	.902	.640	.884	.875	.855	.682	.853

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File Name : 01_RED_Jud_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles

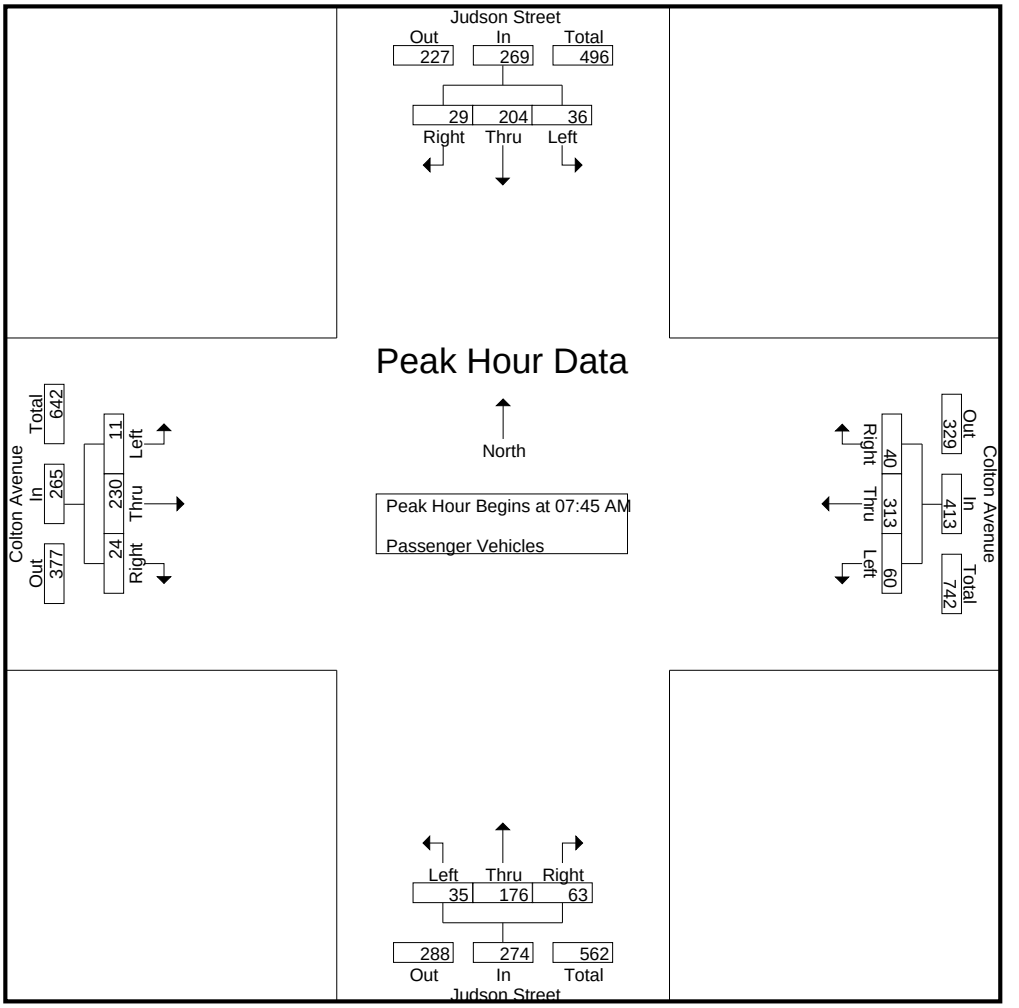
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	30	2	34	5	76	3	84	4	17	7	28	4	14	2	20	166
07:15 AM	2	54	8	64	15	72	9	96	11	26	5	42	3	28	3	34	236
07:30 AM	5	57	7	69	6	83	5	94	13	33	3	49	0	47	11	58	270
07:45 AM	5	50	8	63	17	81	8	106	3	41	17	61	2	65	5	72	302
Total	14	191	25	230	43	312	25	380	31	117	32	180	9	154	21	184	974
08:00 AM	9	53	9	71	9	77	6	92	7	45	25	77	2	68	8	78	318
08:15 AM	14	58	7	79	18	84	15	117	17	39	7	63	2	53	5	60	319
08:30 AM	8	43	5	56	16	71	11	98	8	51	14	73	5	44	6	55	282
08:45 AM	2	40	3	45	14	47	3	64	5	29	5	39	3	21	0	24	172
Total	33	194	24	251	57	279	35	371	37	164	51	252	12	186	19	217	1091
Grand Total	47	385	49	481	100	591	60	751	68	281	83	432	21	340	40	401	2065
Apprch %	9.8	80	10.2		13.3	78.7	8		15.7	65	19.2		5.2	84.8	10		
Total %	2.3	18.6	2.4	23.3	4.8	28.6	2.9	36.4	3.3	13.6	4	20.9	1	16.5	1.9	19.4	

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	5	50	8	63	17	81	8	106	3	41	17	61	2	65	5	72	302
08:00 AM	9	53	**9**	71	9	77	6	92	7	45	**25**	**77**	2	**68**	**8**	**78**	318
08:15 AM	**14**	**58**	7	**79**	**18**	**84**	**15**	**117**	**17**	39	7	63	2	53	5	60	**319**
08:30 AM	8	43	5	56	16	71	11	98	8	**51**	14	73	**5**	44	6	55	282
Total Volume	36	204	29	269	60	313	40	413	35	176	63	274	11	230	24	265	1221
% App. Total	13.4	75.8	10.8		14.5	75.8	9.7		12.8	64.2	23		4.2	86.8	9.1		
PHF	.643	.879	.806	.851	.833	.932	.667	.882	.515	.863	.630	.890	.550	.846	.750	.849	.957

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City of Redlands
N/S: Judson Street
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Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	5	50	8	63	17	81	8	106	3	41	17	61	2	65	5	72
+15 mins.	9	53	**9**	71	9	77	6	92	7	45	**25**	**77**	2	**68**	**8**	**78**
+30 mins.	**14**	**58**	7	**79**	**18**	**84**	**15**	**117**	**17**	39	7	63	2	53	5	60
+45 mins.	8	43	5	56	16	71	11	98	8	**51**	14	73	**5**	44	6	55
Total Volume	36	204	29	269	60	313	40	413	35	176	63	274	11	230	24	265
% App. Total	13.4	75.8	10.8		14.5	75.8	9.7		12.8	64.2	23		4.2	86.8	9.1	
PHF	.643	.879	.806	.851	.833	.932	.667	.882	.515	.863	.630	.890	.550	.846	.750	.849

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City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

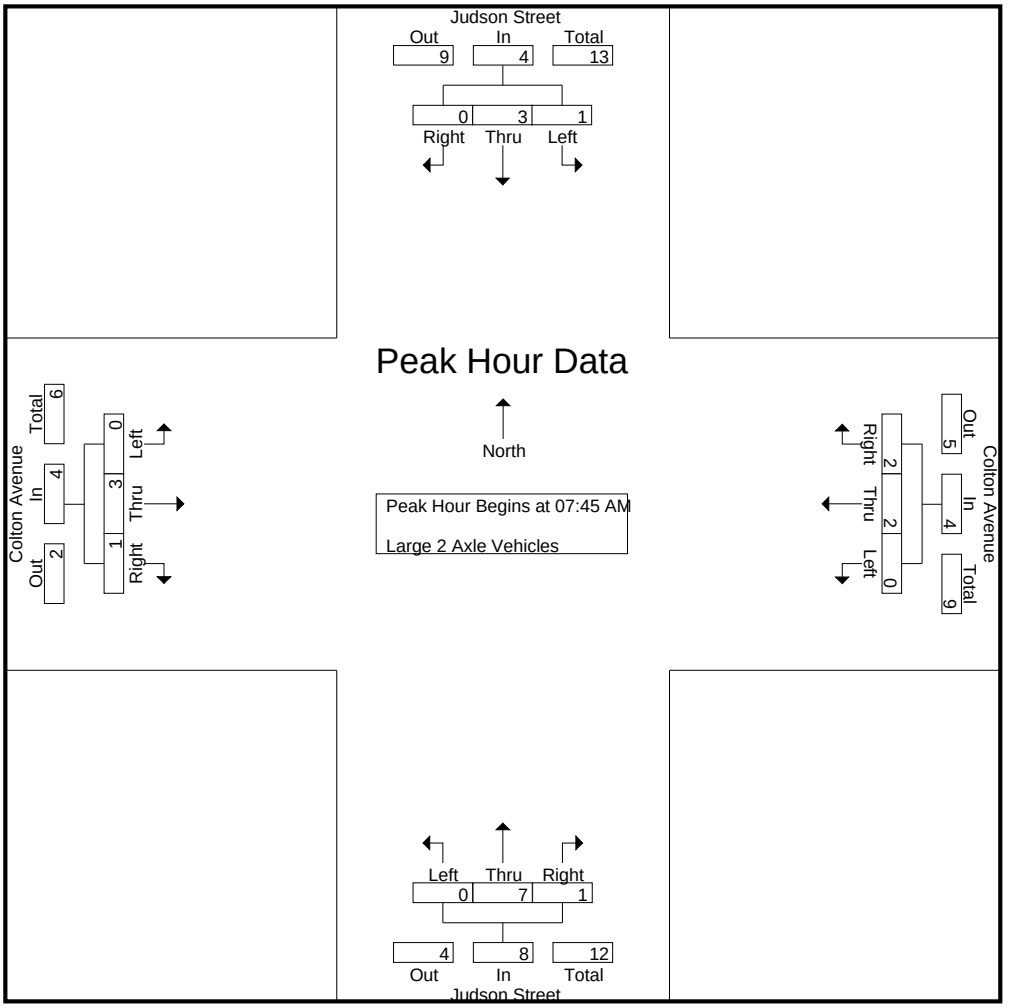
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	1	0	1	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	1	3
07:45 AM	0	0	0	0	0	0	1	1	0	1	0	1	0	2	0	2	4
Total	0	1	0	1	0	1	1	2	0	3	0	3	1	3	0	4	10
08:00 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	1	1	2	5
08:15 AM	1	2	0	3	0	2	1	3	0	4	0	4	0	0	0	0	10
08:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	1	3	0	4	0	2	1	3	0	6	1	7	1	1	1	3	17
Grand Total	1	4	0	5	0	3	2	5	0	9	1	10	2	4	1	7	27
Apprch %	20	80	0		0	60	40		0	90	10		28.6	57.1	14.3		
Total %	3.7	14.8	0	18.5	0	11.1	7.4	18.5	0	33.3	3.7	37	7.4	14.8	3.7	25.9	

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	**1**	1	0	1	0	1	0	**2**	0	**2**	4
08:00 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	1	**1**	2	5
08:15 AM	**1**	**2**	0	**3**	0	**2**	1	**3**	0	**4**	0	**4**	0	0	0	0	**10**
08:30 AM	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0	1
Total Volume	1	3	0	4	0	2	2	4	0	7	1	8	0	3	1	4	20
% App. Total	25	75	0		0	50	50		0	87.5	12.5		0	75	25		
PHF	.250	.375	.000	.333	.000	.250	.500	.333	.000	.438	.250	.500	.000	.375	.250	.500	.500

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City of Redlands
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Weather: Clear

File Name : 01_RED_Jud_Col AM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	**1**	1	0	1	0	1	0	**2**	0	**2**
+15 mins.	0	1	0	1	0	0	0	0	0	2	0	2	0	1	**1**	2
+30 mins.	**1**	**2**	0	**3**	0	**2**	1	**3**	0	**4**	0	**4**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	0
Total Volume	1	3	0	4	0	2	2	4	0	7	1	8	0	3	1	4
% App. Total	25	75	0		0	50	50		0	87.5	12.5		0	75	25	
PHF	.250	.375	.000	.333	.000	.250	.500	.333	.000	.438	.250	.500	.000	.375	.250	.500

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City of Redlands
N/S: Judson Street
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File Name : 01_RED_Jud_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

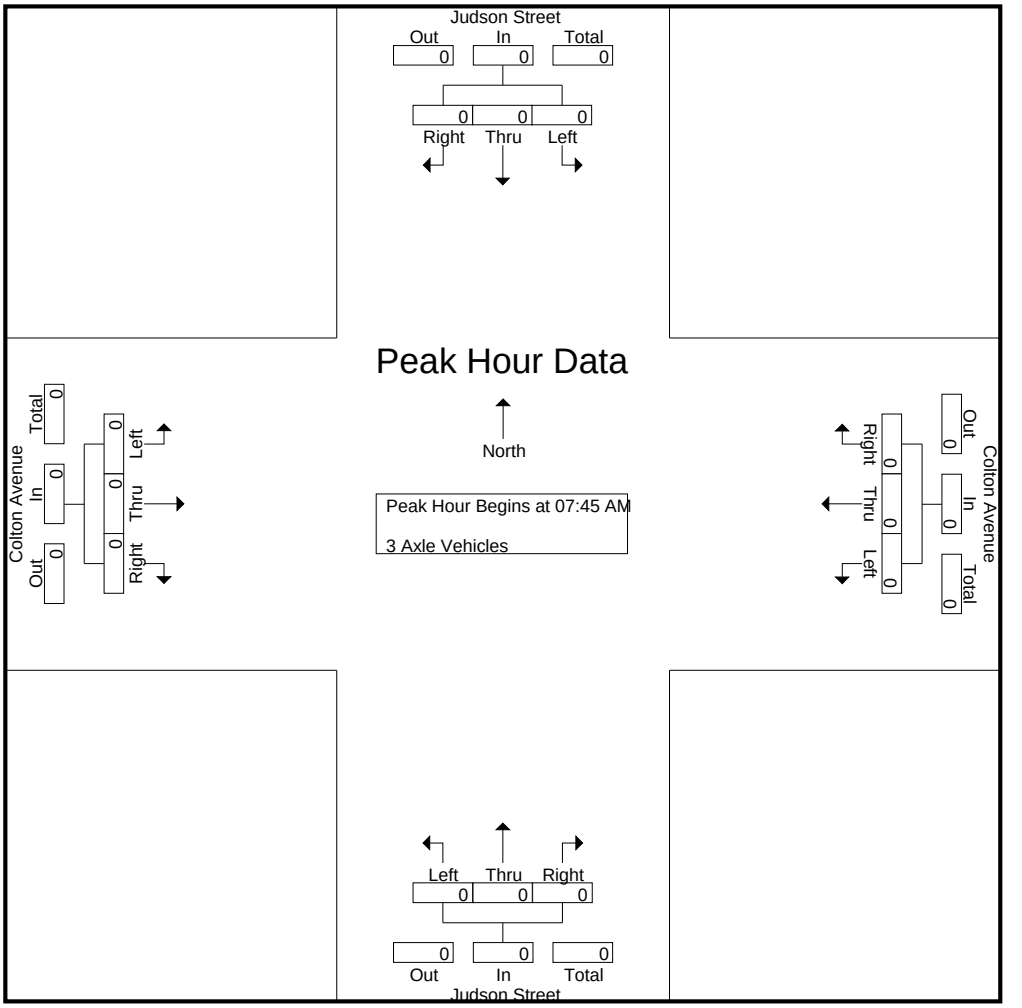
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Apprch %	0	0	0		0	0	0		0	100	0		0	0	0		
Total %	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
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Site Code : 22523363
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Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
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Weather: Clear

File Name : 01_RED_Jud_Col AM
Site Code : 22523363
Start Date : 4/18/2023
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Groups Printed- 4+ Axle Trucks

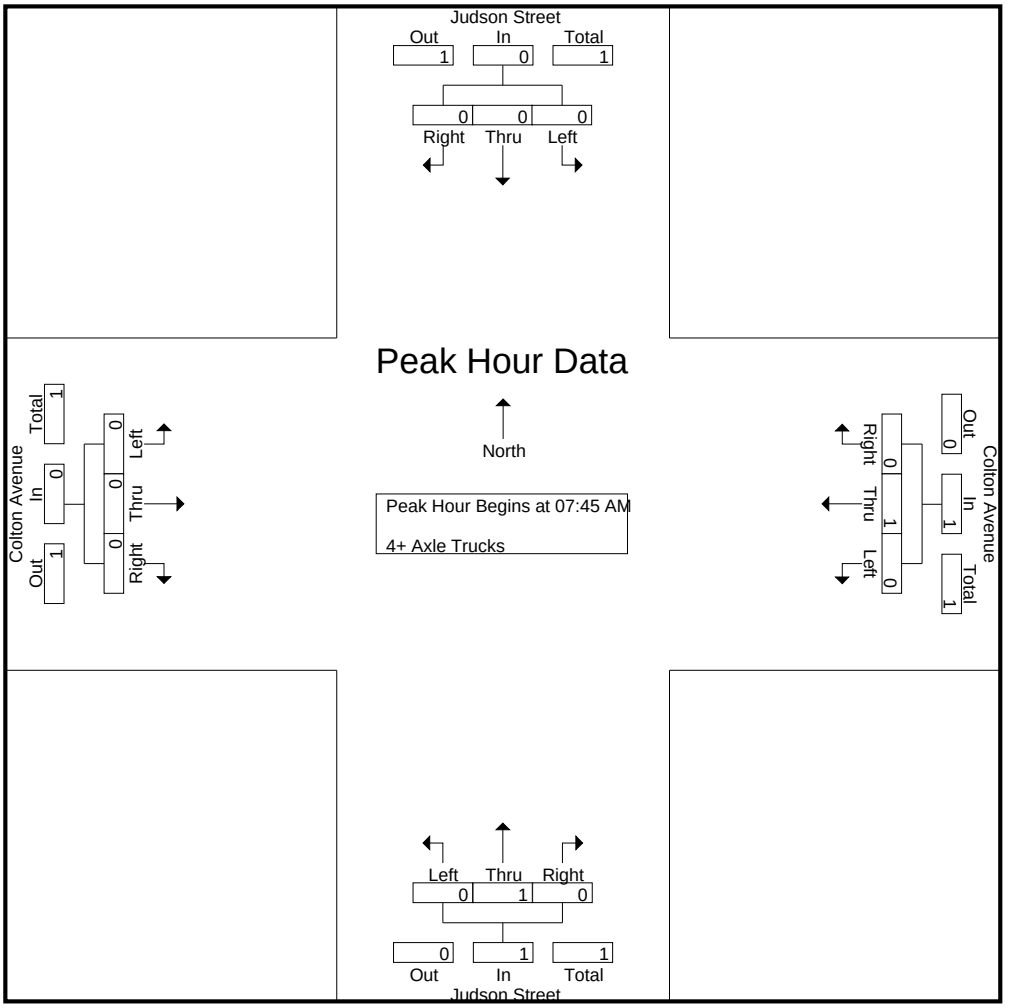
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	2	0	0	0	0	0	0	1	1	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	2	0	2	0	1	0	1	0	1	0	1	0	0	0	0	4
Grand Total	0	4	0	4	0	1	0	1	0	1	1	2	0	0	0	0	7
Apprch %	0	100	0		0	100	0		0	50	50		0	0	0		
Total %	0	57.1	0	57.1	0	14.3	0	14.3	0	14.3	14.3	28.6	0	0	0	0	

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
08:15 AM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
% App. Total	0	0	0		0	100	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250	.000	.000	.000	.000	.500

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File Name : 01_RED_Jud_Col AM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+30 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0
% App. Total	0	0	0		0	100	0		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250	.000	.000	.000	.000

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City of Redlands
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E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

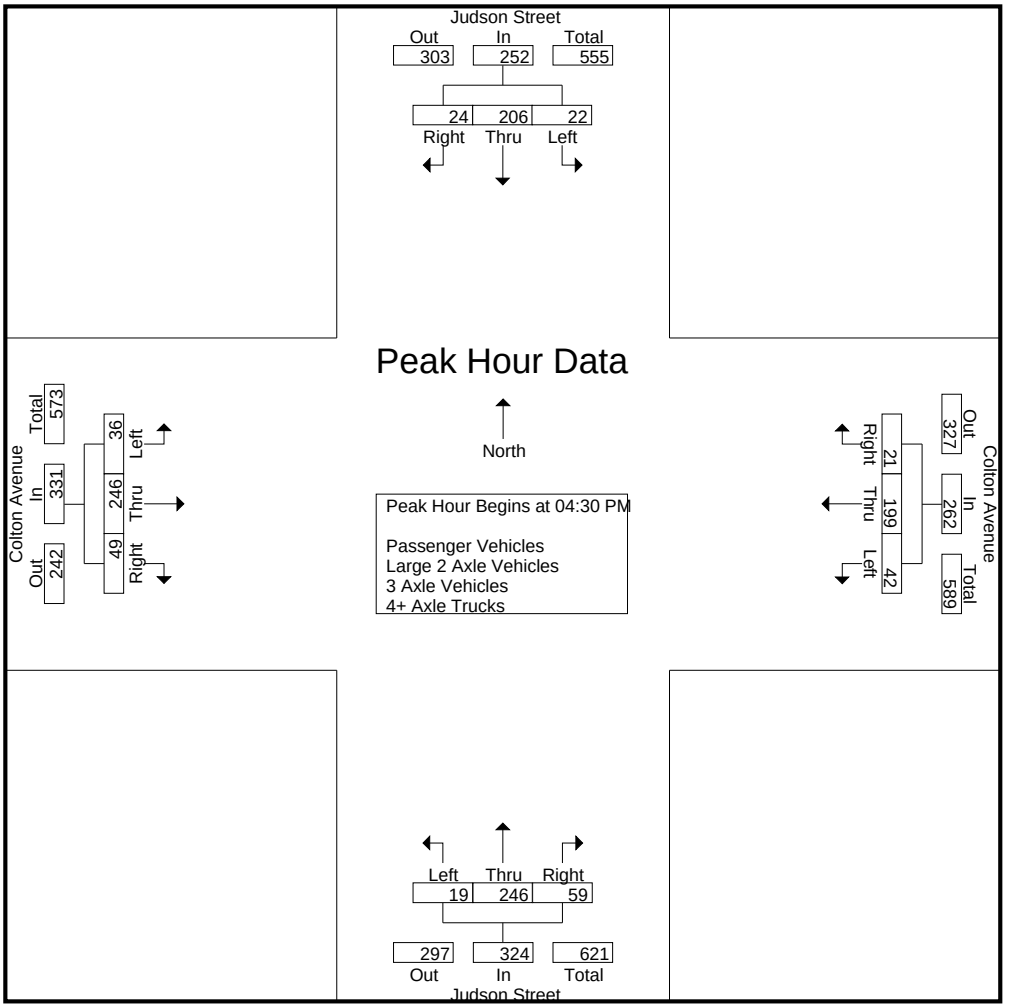
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	33	7	41	8	46	6	60	9	39	18	66	6	67	10	83	250
04:15 PM	2	43	3	48	7	52	5	64	6	55	11	72	8	75	7	90	274
04:30 PM	5	62	8	75	13	42	3	58	1	51	13	65	10	63	9	82	280
04:45 PM	4	44	5	53	10	61	9	80	6	62	10	78	8	62	6	76	287
Total	12	182	23	217	38	201	23	262	22	207	52	281	32	267	32	331	1091
05:00 PM	5	35	7	47	11	43	6	60	9	76	22	107	11	67	16	94	308
05:15 PM	8	65	4	77	8	53	3	64	3	57	14	74	7	54	18	79	294
05:30 PM	3	53	3	59	5	43	6	54	7	47	11	65	7	55	9	71	249
05:45 PM	9	48	3	60	4	46	4	54	10	50	16	76	2	66	9	77	267
Total	25	201	17	243	28	185	19	232	29	230	63	322	27	242	52	321	1118
Grand Total	37	383	40	460	66	386	42	494	51	437	115	603	59	509	84	652	2209
Apprch %	8	83.3	8.7		13.4	78.1	8.5		8.5	72.5	19.1		9	78.1	12.9		
Total %	1.7	17.3	1.8	20.8	3	17.5	1.9	22.4	2.3	19.8	5.2	27.3	2.7	23	3.8	29.5	
Passenger Vehicles	36	379	39	454	66	383	41	490	51	437	115	603	59	508	84	651	2198
% Passenger Vehicles	97.3	99	97.5	98.7	100	99.2	97.6	99.2	100	100	100	100	100	99.8	100	99.8	99.5
Large 2 Axle Vehicles	1	4	1	6	0	3	1	4	0	0	0	0	0	1	0	1	11
% Large 2 Axle Vehicles	2.7	1	2.5	1.3	0	0.8	2.4	0.8	0	0	0	0	0	0.2	0	0.2	0.5
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	5	62	**8**	75	**13**	42	3	58	1	51	13	65	10	63	9	82	280
04:45 PM	4	44	5	53	10	**61**	**9**	**80**	6	62	10	78	8	62	6	76	287
05:00 PM	5	35	7	47	11	43	6	60	**9**	**76**	**22**	**107**	**11**	**67**	16	**94**	**308**
05:15 PM	**8**	**65**	4	**77**	8	53	3	64	3	57	14	74	7	54	**18**	79	294
Total Volume	22	206	24	252	42	199	21	262	19	246	59	324	36	246	49	331	1169
% App. Total	8.7	81.7	9.5		16	76	8		5.9	75.9	18.2		10.9	74.3	14.8		
PHF	.688	.792	.750	.818	.808	.816	.583	.819	.528	.809	.670	.757	.818	.918	.681	.880	.949

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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				04:30 PM				04:15 PM			
+0 mins.	5	62	**8**	75	8	46	6	60	1	51	13	65	8	**75**	7	90
+15 mins.	4	44	5	53	7	52	5	64	6	62	10	78	10	63	9	82
+30 mins.	5	35	7	47	**13**	42	3	58	**9**	**76**	**22**	**107**	8	62	6	76
+45 mins.	**8**	**65**	4	**77**	10	**61**	**9**	**80**	3	57	14	74	**11**	67	**16**	**94**
Total Volume	22	206	24	252	38	201	23	262	19	246	59	324	37	267	38	342
% App. Total	8.7	81.7	9.5		14.5	76.7	8.8		5.9	75.9	18.2		10.8	78.1	11.1	
PHF	.688	.792	.750	.818	.731	.824	.639	.819	.528	.809	.670	.757	.841	.890	.594	.910

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City of Redlands
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File Name : 01_RED_Jud_Col PM
Site Code : 22523363
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Groups Printed- Passenger Vehicles

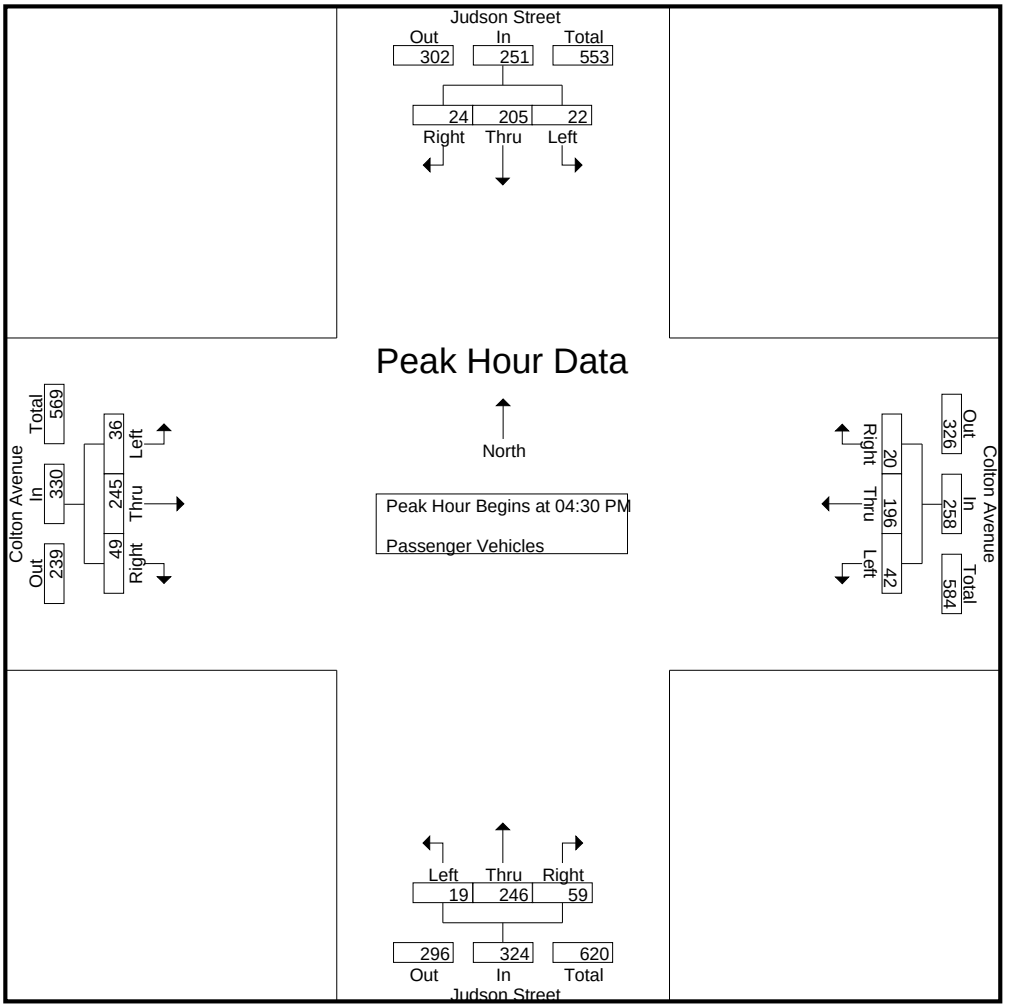
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	30	7	37	8	46	6	60	9	39	18	66	6	67	10	83	246
04:15 PM	2	43	3	48	7	52	5	64	6	55	11	72	8	75	7	90	274
04:30 PM	5	61	8	74	13	41	3	57	1	51	13	65	10	63	9	82	278
04:45 PM	4	44	5	53	10	60	8	78	6	62	10	78	8	62	6	76	285
Total	11	178	23	212	38	199	22	259	22	207	52	281	32	267	32	331	1083
05:00 PM	5	35	7	47	11	42	6	59	9	76	22	107	11	66	16	93	306
05:15 PM	8	65	4	77	8	53	3	64	3	57	14	74	7	54	18	79	294
05:30 PM	3	53	2	58	5	43	6	54	7	47	11	65	7	55	9	71	248
05:45 PM	9	48	3	60	4	46	4	54	10	50	16	76	2	66	9	77	267
Total	25	201	16	242	28	184	19	231	29	230	63	322	27	241	52	320	1115
Grand Total	36	379	39	454	66	383	41	490	51	437	115	603	59	508	84	651	2198
Apprch %	7.9	83.5	8.6		13.5	78.2	8.4		8.5	72.5	19.1		9.1	78	12.9		
Total %	1.6	17.2	1.8	20.7	3	17.4	1.9	22.3	2.3	19.9	5.2	27.4	2.7	23.1	3.8	29.6	

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	5	61	**8**	74	**13**	41	3	57	1	51	13	65	10	63	9	82	278
04:45 PM	4	44	5	53	10	**60**	**8**	**78**	6	62	10	78	8	62	6	76	285
05:00 PM	5	35	7	47	11	42	6	59	**9**	**76**	**22**	**107**	**11**	**66**	16	**93**	**306**
05:15 PM	**8**	**65**	4	**77**	8	53	3	64	3	57	14	74	7	54	**18**	79	294
Total Volume	22	205	24	251	42	196	20	258	19	246	59	324	36	245	49	330	1163
% App. Total	8.8	81.7	9.6		16.3	76	7.8		5.9	75.9	18.2		10.9	74.2	14.8		
PHF	.688	.788	.750	.815	.808	.817	.625	.827	.528	.809	.670	.757	.818	.928	.681	.887	.950

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City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	5	61	**8**	74	**13**	41	3	57	1	51	13	65	10	63	9	82
+15 mins.	4	44	5	53	10	**60**	**8**	**78**	6	62	10	78	8	62	6	76
+30 mins.	5	35	7	47	11	42	6	59	**9**	**76**	**22**	**107**	**11**	**66**	16	**93**
+45 mins.	**8**	**65**	4	**77**	8	53	3	64	3	57	14	74	7	54	**18**	79
Total Volume	22	205	24	251	42	196	20	258	19	246	59	324	36	245	49	330
% App. Total	8.8	81.7	9.6		16.3	76	7.8		5.9	75.9	18.2		10.9	74.2	14.8	
PHF	.688	.788	.750	.815	.808	.817	.625	.827	.528	.809	.670	.757	.818	.928	.681	.887

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City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

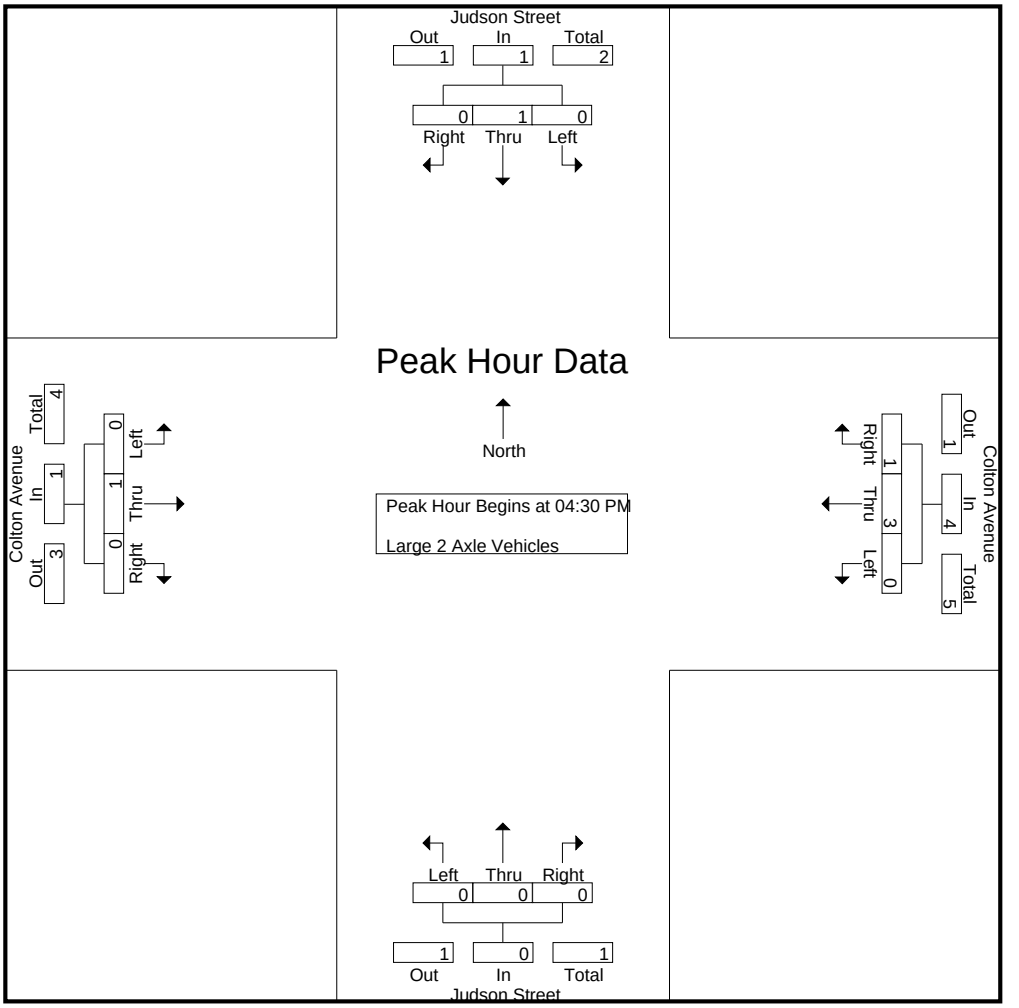
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	2
Total	1	4	0	5	0	2	1	3	0	0	0	0	0	0	0	0	8
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	3
Grand Total	1	4	1	6	0	3	1	4	0	0	0	0	0	1	0	1	11
Apprch %	16.7	66.7	16.7		0	75	25		0	0	0		0	100	0		
Total %	9.1	36.4	9.1	54.5	0	27.3	9.1	36.4	0	0	0	0	0	9.1	0	9.1	

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	**1**	0	**1**	0	**1**	0	1	0	0	0	0	0	0	0	0	**2**
04:45 PM	0	0	0	0	0	1	**1**	**2**	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	**1**	0	**1**	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	3	1	4	0	0	0	0	0	1	0	1	6
% App. Total	0	100	0		0	75	25		0	0	0		0	100	0		
PHF	.000	.250	.000	.250	.000	.750	.250	.500	.000	.000	.000	.000	.000	.250	.000	.250	.750

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City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col PM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	**1**	0	**1**	0	**1**	0	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	1	**1**	**2**	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	**1**	0	**1**
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	3	1	4	0	0	0	0	0	1	0	1
% App. Total	0	100	0		0	75	25		0	0	0		0	100	0	
PHF	.000	.250	.000	.250	.000	.750	.250	.500	.000	.000	.000	.000	.000	.250	.000	.250

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City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

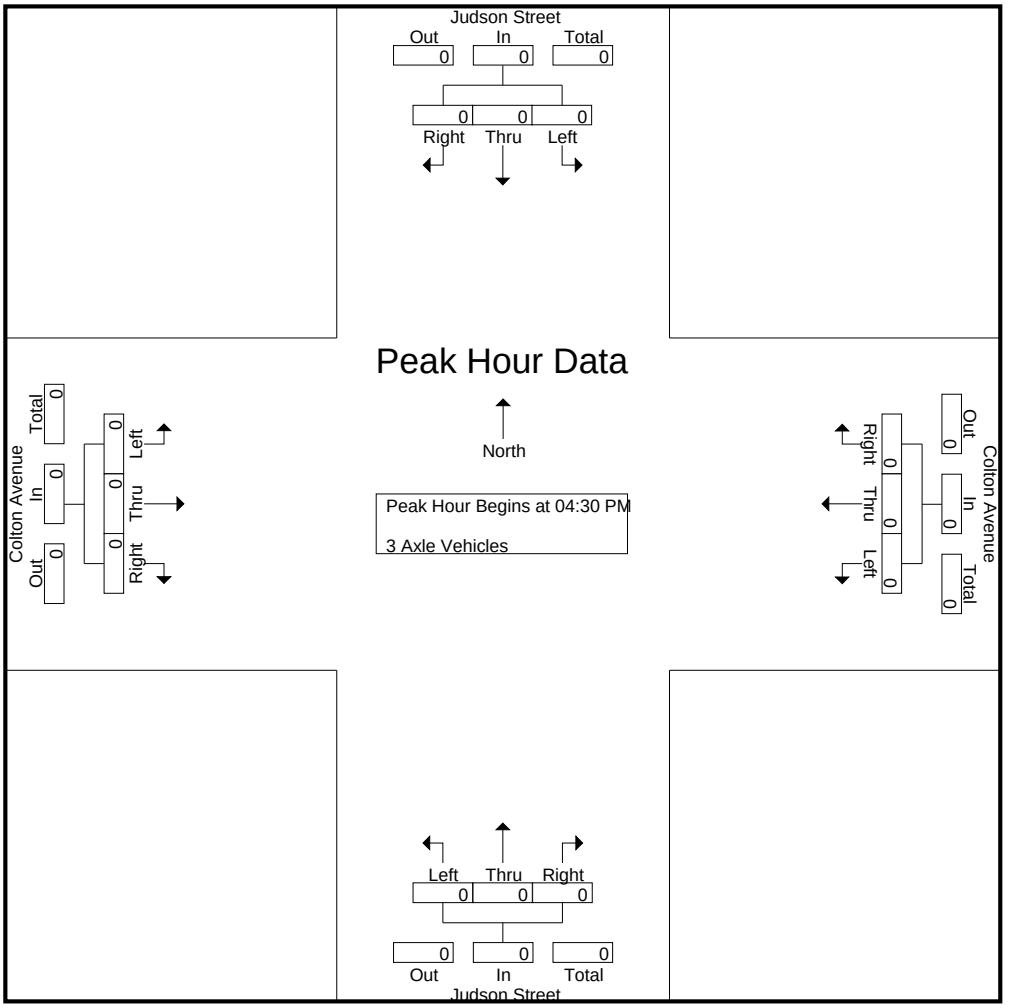
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

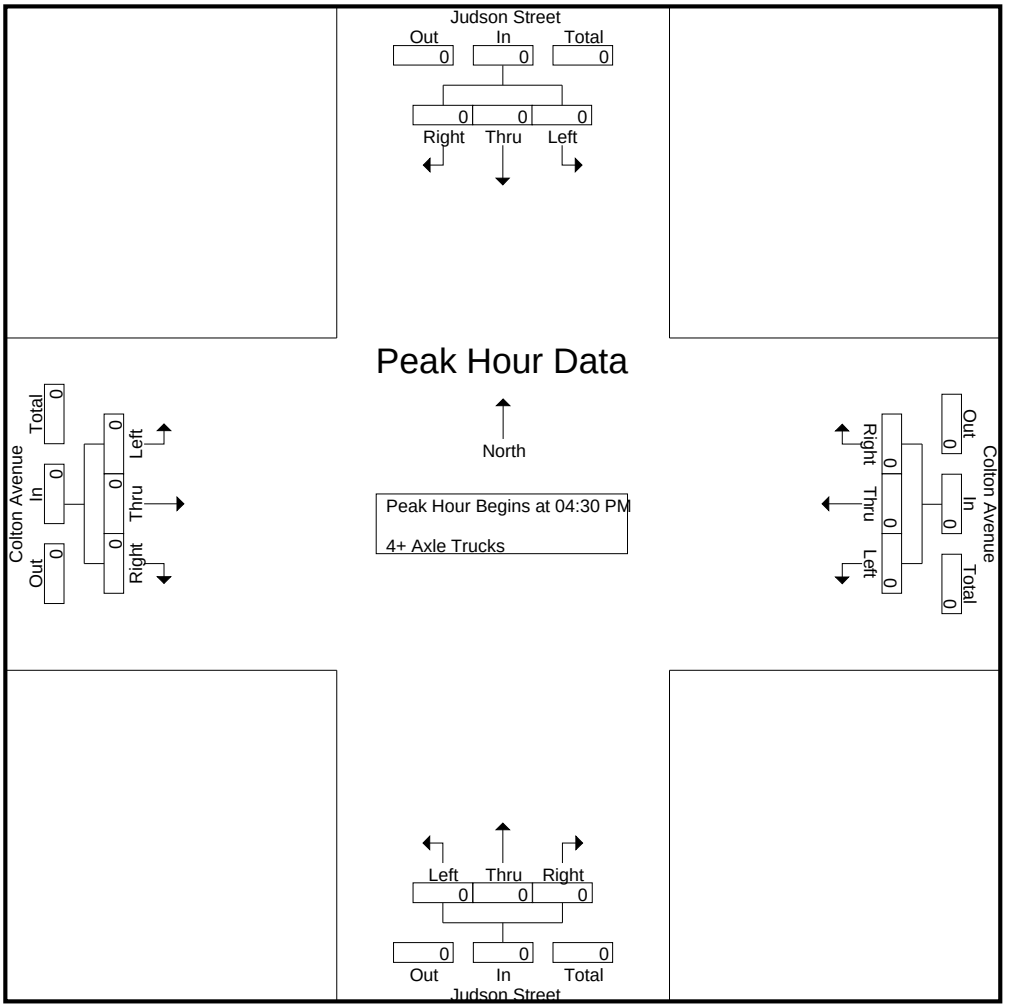
	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

	Judson Street Southbound				Colton Avenue Westbound				Judson Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Judson Street
E/W: Colton Avenue
Weather: Clear

File Name : 01_RED_Jud_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

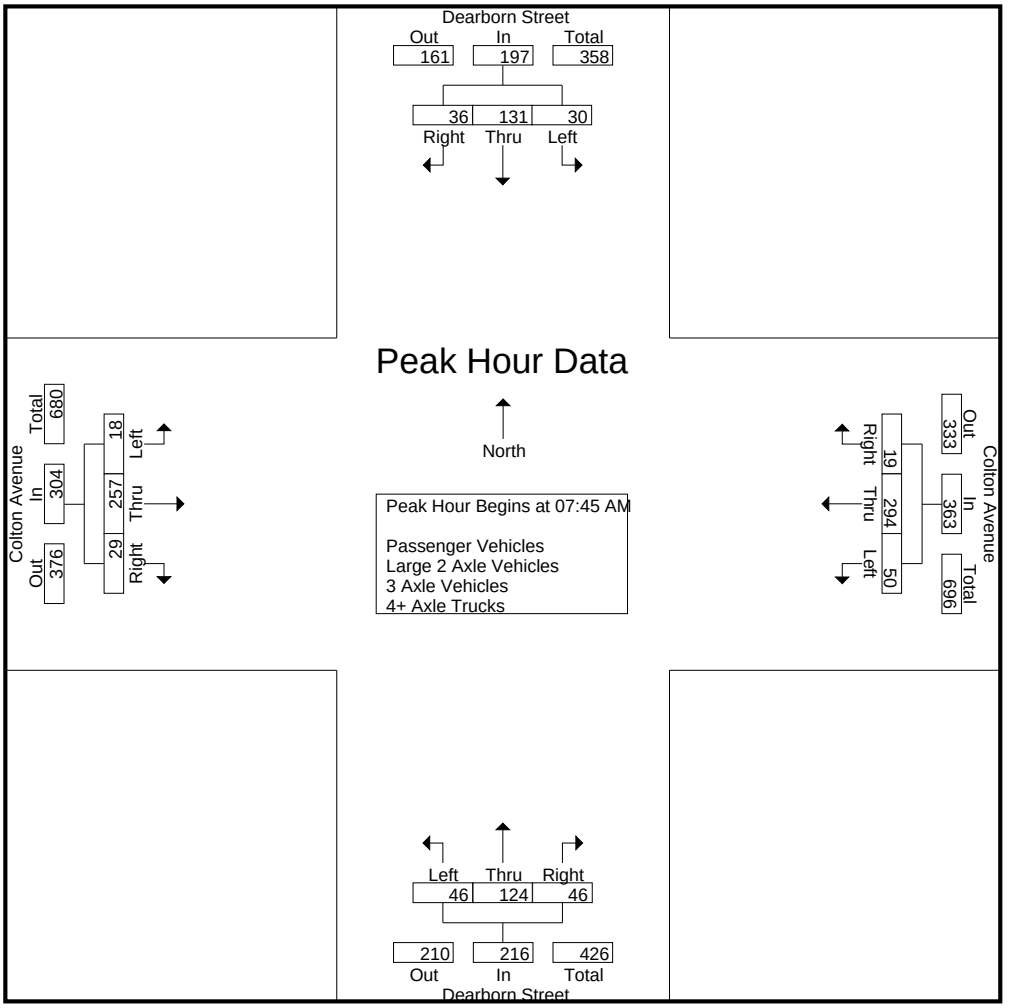
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	3	17	7	27	4	47	1	52	16	11	3	30	2	17	6	25	134
07:15 AM	5	28	13	46	6	63	5	74	13	16	2	31	4	28	4	36	187
07:30 AM	6	27	16	49	6	65	3	74	11	21	6	38	2	40	8	50	211
07:45 AM	10	48	9	67	12	66	5	83	14	33	13	60	3	69	8	80	290
Total	24	120	45	189	28	241	14	283	54	81	24	159	11	154	26	191	822
08:00 AM	8	20	11	39	13	73	2	88	10	30	19	59	9	79	5	93	279
08:15 AM	7	34	11	52	14	87	5	106	15	32	12	59	2	71	9	82	299
08:30 AM	5	29	5	39	11	68	7	86	7	29	2	38	4	38	7	49	212
08:45 AM	4	12	8	24	3	40	3	46	7	12	6	25	3	31	1	35	130
Total	24	95	35	154	41	268	17	326	39	103	39	181	18	219	22	259	920
Grand Total	48	215	80	343	69	509	31	609	93	184	63	340	29	373	48	450	1742
Apprch %	14	62.7	23.3		11.3	83.6	5.1		27.4	54.1	18.5		6.4	82.9	10.7		
Total %	2.8	12.3	4.6	19.7	4	29.2	1.8	35	5.3	10.6	3.6	19.5	1.7	21.4	2.8	25.8	
Passenger Vehicles	48	214	80	342	66	503	31	600	92	183	59	334	28	370	48	446	1722
% Passenger Vehicles	100	99.5	100	99.7	95.7	98.8	100	98.5	98.9	99.5	93.7	98.2	96.6	99.2	100	99.1	98.9
Large 2 Axle Vehicles	0	1	0	1	2	5	0	7	1	1	3	5	1	3	0	4	17
% Large 2 Axle Vehicles	0	0.5	0	0.3	2.9	1	0	1.1	1.1	0.5	4.8	1.5	3.4	0.8	0	0.9	1
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	1.6	0.3	0	0	0	0	0.1
4+ Axle Trucks	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	2
% 4+ Axle Trucks	0	0	0	0	1.4	0.2	0	0.3	0	0	0	0	0	0	0	0	0.1

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**10**	**48**	9	**67**	12	66	5	83	14	**33**	13	**60**	3	69	8	80	290
08:00 AM	8	20	**11**	39	13	73	2	88	10	30	**19**	59	**9**	**79**	5	**93**	279
08:15 AM	7	34	11	52	**14**	**87**	5	**106**	**15**	32	12	59	2	71	**9**	82	**299**
08:30 AM	5	29	5	39	11	68	**7**	86	7	29	2	38	4	38	7	49	212
Total Volume	30	131	36	197	50	294	19	363	46	124	46	216	18	257	29	304	1080
% App. Total	15.2	66.5	18.3		13.8	81	5.2		21.3	57.4	21.3		5.9	84.5	9.5		
PHF	.750	.682	.818	.735	.893	.845	.679	.856	.767	.939	.605	.900	.500	.813	.806	.817	.903

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:45 AM				07:30 AM				07:30 AM			
+0 mins.	6	27	**16**	49	12	66	5	83	11	21	6	38	2	40	8	50
+15 mins.	**10**	**48**	9	**67**	13	73	2	88	14	**33**	13	**60**	3	69	8	80
+30 mins.	8	20	11	39	**14**	**87**	5	**106**	10	30	**19**	59	**9**	**79**	5	**93**
+45 mins.	7	34	11	52	11	68	**7**	86	**15**	32	12	59	2	71	**9**	82
Total Volume	31	129	47	207	50	294	19	363	50	116	50	216	16	259	30	305
% App. Total	15	62.3	22.7		13.8	81	5.2		23.1	53.7	23.1		5.2	84.9	9.8	
PHF	.775	.672	.734	.772	.893	.845	.679	.856	.833	.879	.658	.900	.444	.820	.833	.820

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles

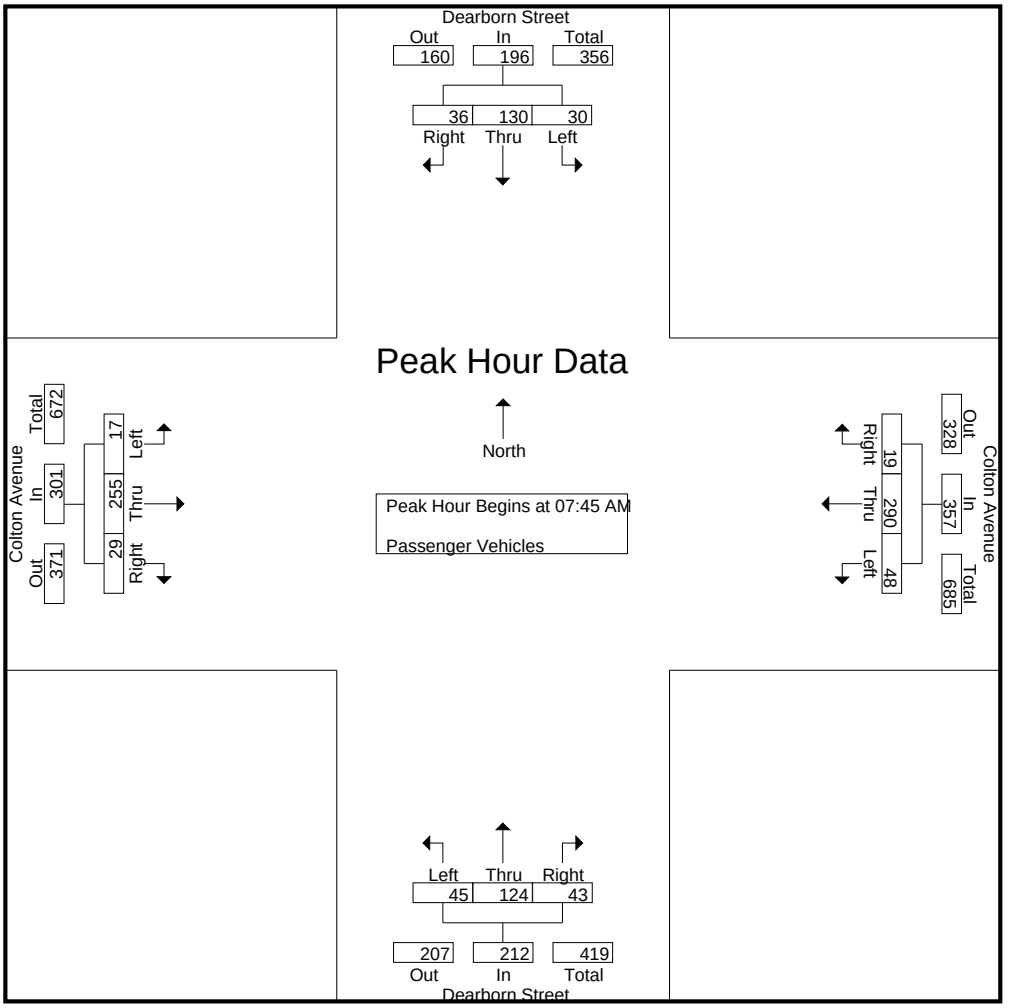
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	3	17	7	27	4	46	1	51	16	10	3	29	2	16	6	24	131
07:15 AM	5	28	13	46	6	62	5	73	13	16	2	31	4	28	4	36	186
07:30 AM	6	27	16	49	6	65	3	74	11	21	6	38	2	40	8	50	211
07:45 AM	10	48	9	67	12	65	5	82	14	33	13	60	2	68	8	78	287
Total	24	120	45	189	28	238	14	280	54	80	24	158	10	152	26	188	815
08:00 AM	8	20	11	39	13	73	2	88	10	30	16	56	9	79	5	93	276
08:15 AM	7	33	11	51	13	84	5	102	14	32	12	58	2	71	9	82	293
08:30 AM	5	29	5	39	10	68	7	85	7	29	2	38	4	37	7	48	210
08:45 AM	4	12	8	24	2	40	3	45	7	12	5	24	3	31	1	35	128
Total	24	94	35	153	38	265	17	320	38	103	35	176	18	218	22	258	907
Grand Total	48	214	80	342	66	503	31	600	92	183	59	334	28	370	48	446	1722
Apprch %	14	62.6	23.4		11	83.8	5.2		27.5	54.8	17.7		6.3	83	10.8		
Total %	2.8	12.4	4.6	19.9	3.8	29.2	1.8	34.8	5.3	10.6	3.4	19.4	1.6	21.5	2.8	25.9	

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	**10**	**48**	9	**67**	12	65	5	82	**14**	**33**	13	**60**	2	68	8	78	287
08:00 AM	8	20	**11**	39	**13**	73	2	88	10	30	**16**	56	**9**	**79**	5	**93**	276
08:15 AM	7	33	11	51	13	**84**	5	**102**	14	32	12	58	2	71	**9**	82	**293**
08:30 AM	5	29	5	39	10	68	**7**	85	7	29	2	38	4	37	7	48	210
Total Volume	30	130	36	196	48	290	19	357	45	124	43	212	17	255	29	301	1066
% App. Total	15.3	66.3	18.4		13.4	81.2	5.3		21.2	58.5	20.3		5.6	84.7	9.6		
PHF	.750	.677	.818	.731	.923	.863	.679	.875	.804	.939	.672	.883	.472	.807	.806	.809	.910

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	**10**	**48**	9	**67**	12	65	5	82	**14**	**33**	13	**60**	2	68	8	78
+15 mins.	8	20	**11**	39	**13**	73	2	88	10	30	**16**	56	**9**	**79**	5	**93**
+30 mins.	7	33	11	51	13	**84**	5	**102**	14	32	12	58	2	71	**9**	82
+45 mins.	5	29	5	39	10	68	**7**	85	7	29	2	38	4	37	7	48
Total Volume	30	130	36	196	48	290	19	357	45	124	43	212	17	255	29	301
% App. Total	15.3	66.3	18.4		13.4	81.2	5.3		21.2	58.5	20.3		5.6	84.7	9.6	
PHF	.750	.677	.818	.731	.923	.863	.679	.875	.804	.939	.672	.883	.472	.807	.806	.809

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

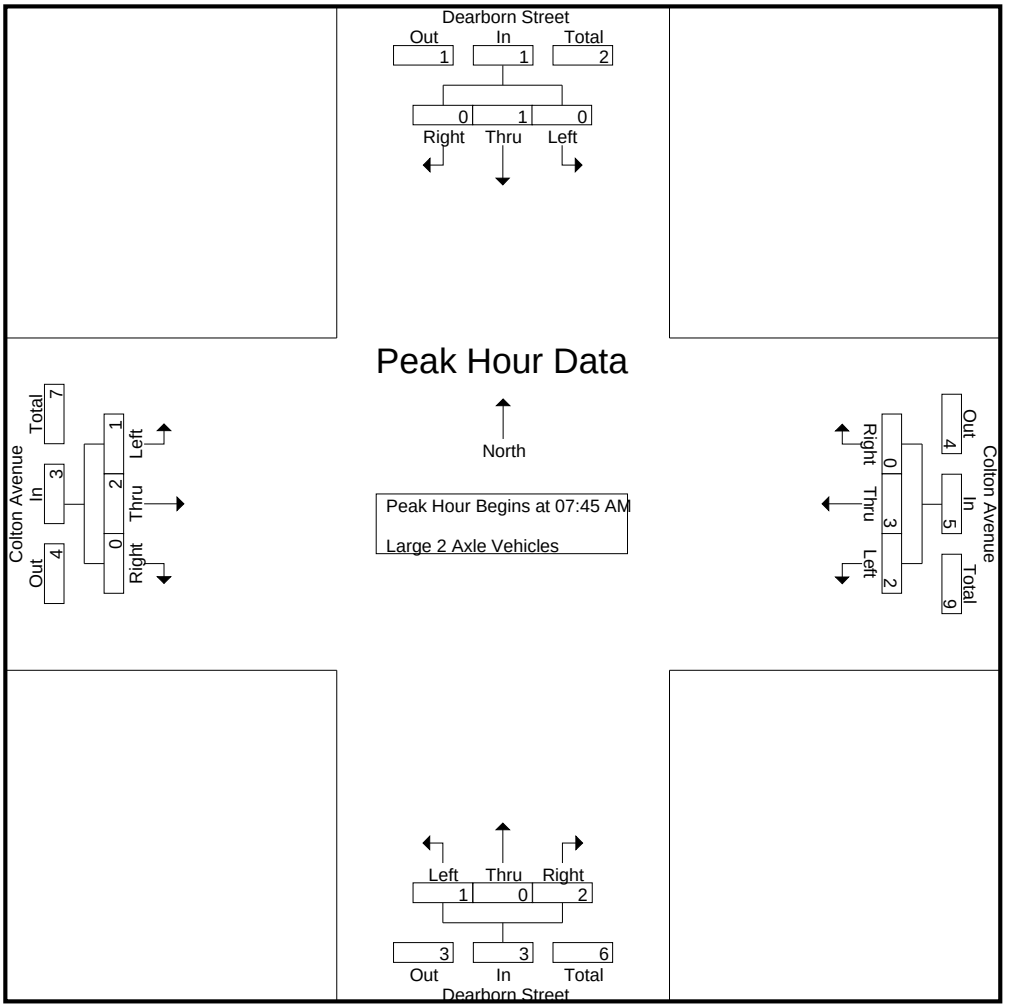
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	1	0	1	0	1	0	1	0	1	0	1	3
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1	1	0	2	3
Total	0	0	0	0	0	3	0	3	0	1	0	1	1	2	0	3	7
08:00 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	2
08:15 AM	0	1	0	1	1	2	0	3	1	0	0	1	0	0	0	0	5
08:30 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Total	0	1	0	1	2	2	0	4	1	0	3	4	0	1	0	1	10
Grand Total	0	1	0	1	2	5	0	7	1	1	3	5	1	3	0	4	17
Apprch %	0	100	0		28.6	71.4	0		20	20	60		25	75	0		
Total %	0	5.9	0	5.9	11.8	29.4	0	41.2	5.9	5.9	17.6	29.4	5.9	17.6	0	23.5	

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	**1**	**1**	0	**2**	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0	2
08:15 AM	0	**1**	0	**1**	**1**	**2**	0	**3**	**1**	0	0	1	0	0	0	0	**5**
08:30 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
Total Volume	0	1	0	1	2	3	0	5	1	0	2	3	1	2	0	3	12
% App. Total	0	100	0		40	60	0		33.3	0	66.7		33.3	66.7	0		
PHF	.000	.250	.000	.250	.500	.375	.000	.417	.250	.000	.250	.375	.250	.500	.000	.375	.600

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	**1**	**1**	0	**2**
+15 mins.	0	0	0	0	0	0	0	0	0	0	**2**	**2**	0	0	0	0
+30 mins.	0	**1**	0	**1**	**1**	**2**	0	**3**	**1**	0	0	1	0	0	0	0
+45 mins.	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1
Total Volume	0	1	0	1	2	3	0	5	1	0	2	3	1	2	0	3
% App. Total	0	100	0		40	60	0		33.3	0	66.7		33.3	66.7	0	
PHF	.000	.250	.000	.250	.500	.375	.000	.417	.250	.000	.250	.375	.250	.500	.000	.375

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

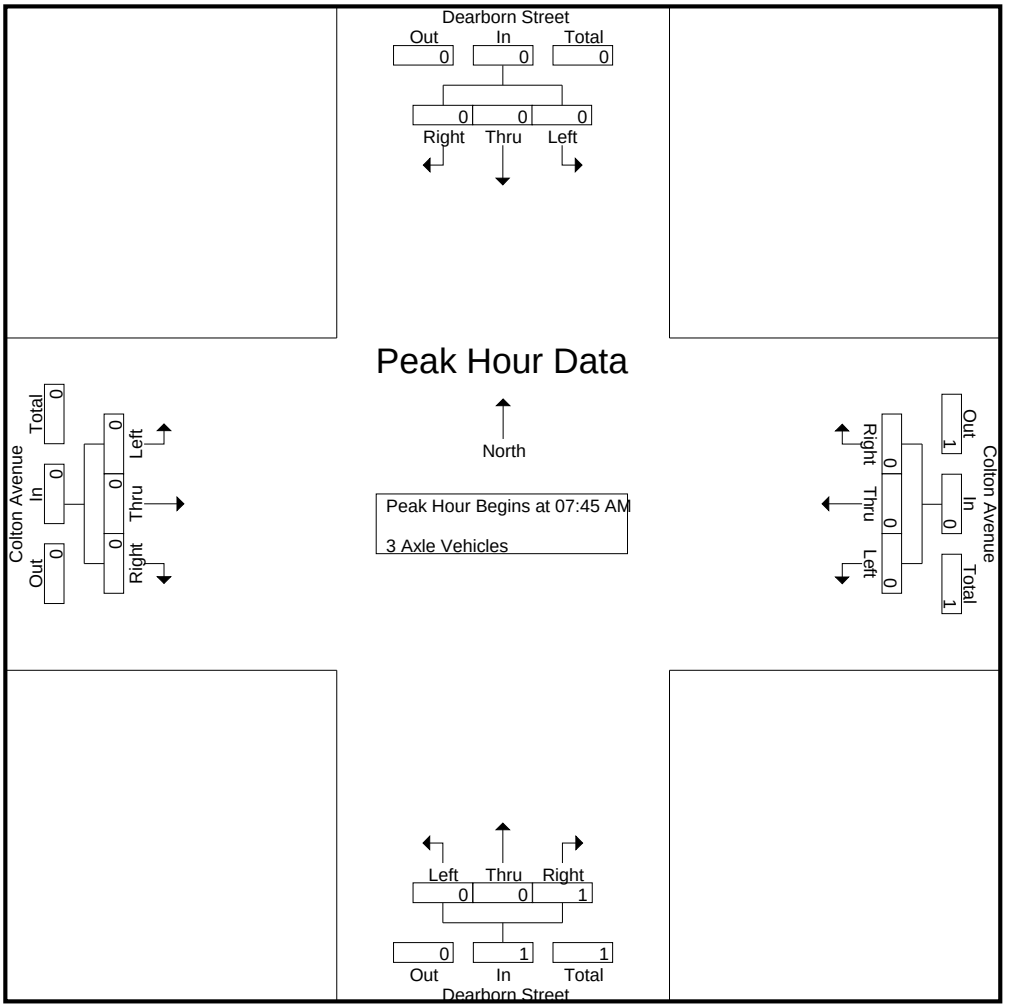
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Apprch %	0	0	0		0	0	0		0	0	100		0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	100	100	0	0	0	0	

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	**1**
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
% App. Total	0	0	0		0	0	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.250

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	100		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

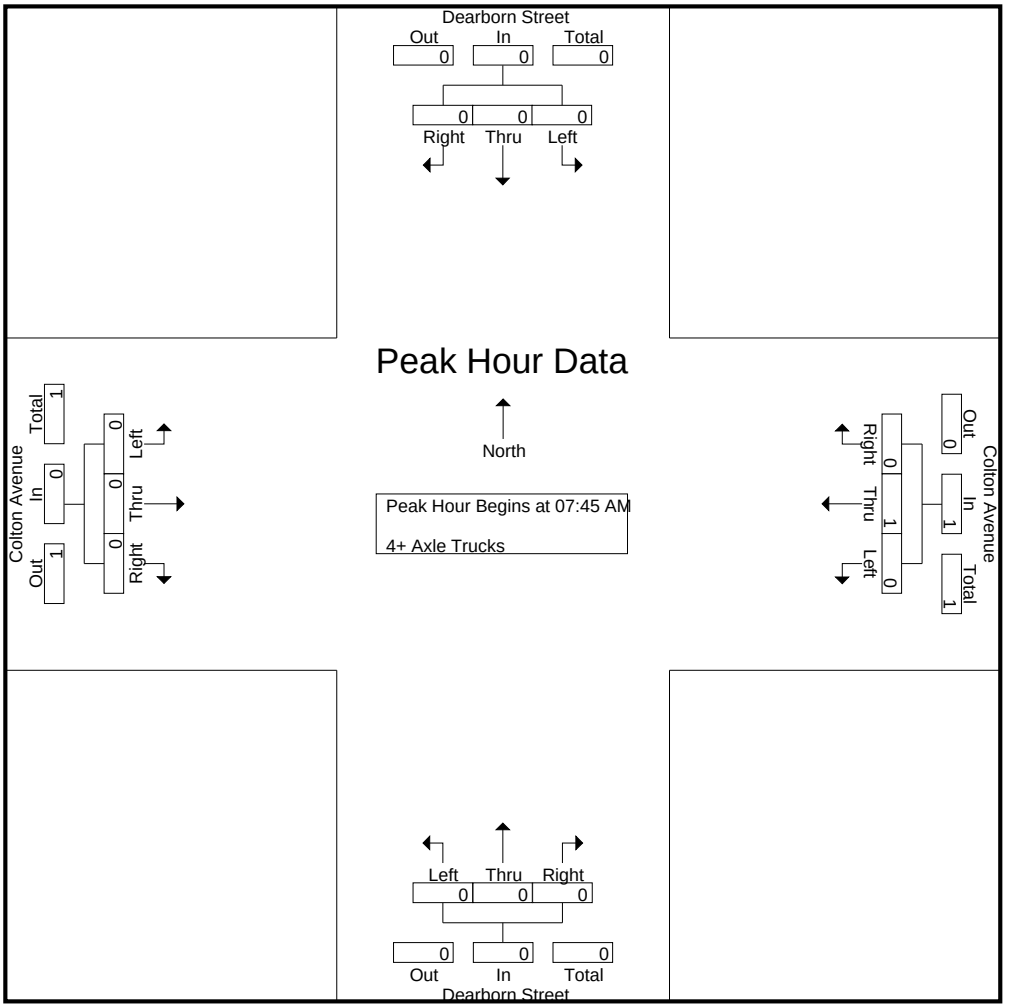
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	2
Grand Total	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	2
Apprch %	0	0	0		50	50	0		0	0	0		0	0	0		
Total %	0	0	0	0	50	50	0	100	0	0	0	0	0	0	0	0	

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**1**
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0		0	100	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	100	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

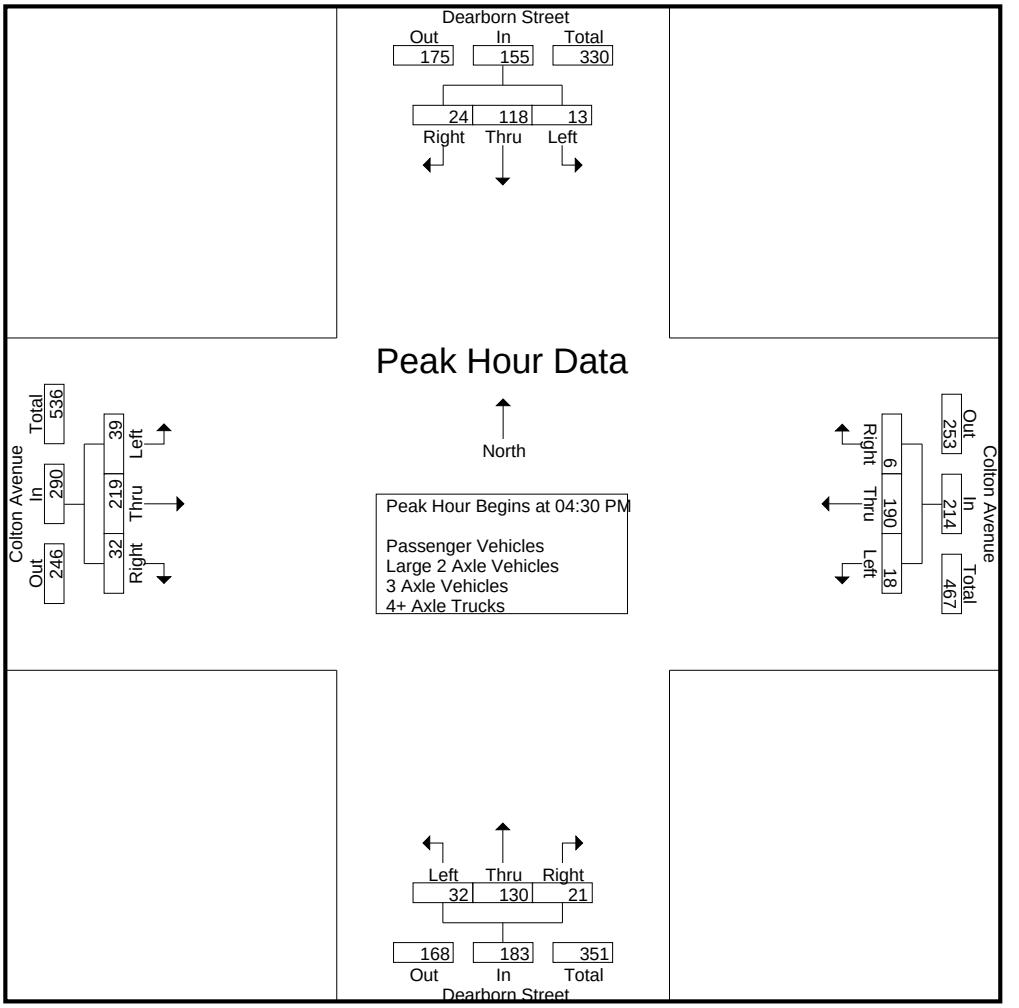
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	3	26	2	31	6	46	4	56	5	22	11	38	7	65	4	76	201
04:15 PM	7	16	8	31	3	48	3	54	6	16	6	28	12	54	11	77	190
04:30 PM	3	32	4	39	4	45	3	52	6	39	10	55	13	55	6	74	220
04:45 PM	6	26	6	38	3	60	1	64	8	29	6	43	10	49	7	66	211
Total	19	100	20	139	16	199	11	226	25	106	33	164	42	223	28	293	822
05:00 PM	3	29	5	37	6	45	2	53	5	30	3	38	13	67	10	90	218
05:15 PM	1	31	9	41	5	40	0	45	13	32	2	47	3	48	9	60	193
05:30 PM	2	23	4	29	7	35	2	44	8	32	10	50	7	49	5	61	184
05:45 PM	4	26	3	33	8	37	0	45	7	25	6	38	19	43	11	73	189
Total	10	109	21	140	26	157	4	187	33	119	21	173	42	207	35	284	784
Grand Total	29	209	41	279	42	356	15	413	58	225	54	337	84	430	63	577	1606
Apprch %	10.4	74.9	14.7		10.2	86.2	3.6		17.2	66.8	16		14.6	74.5	10.9		
Total %	1.8	13	2.6	17.4	2.6	22.2	0.9	25.7	3.6	14	3.4	21	5.2	26.8	3.9	35.9	
Passenger Vehicles	29	208	40	277	42	354	15	411	58	225	52	335	84	429	63	576	1599
% Passenger Vehicles	100	99.5	97.6	99.3	100	99.4	100	99.5	100	100	96.3	99.4	100	99.8	100	99.8	99.6
Large 2 Axle Vehicles	0	1	1	2	0	2	0	2	0	0	2	2	0	1	0	1	7
% Large 2 Axle Vehicles	0	0.5	2.4	0.7	0	0.6	0	0.5	0	0	3.7	0.6	0	0.2	0	0.2	0.4
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	3	**32**	4	39	4	45	**3**	52	6	**39**	**10**	**55**	**13**	55	6	74	**220**
04:45 PM	**6**	26	6	38	3	**60**	1	**64**	8	29	6	43	10	49	7	66	211
05:00 PM	3	29	5	37	**6**	45	2	53	5	30	3	38	13	**67**	**10**	**90**	218
05:15 PM	1	31	**9**	**41**	5	40	0	45	**13**	32	2	47	3	48	9	60	193
Total Volume	13	118	24	155	18	190	6	214	32	130	21	183	39	219	32	290	842
% App. Total	8.4	76.1	15.5		8.4	88.8	2.8		17.5	71	11.5		13.4	75.5	11		
PHF	.542	.922	.667	.945	.750	.792	.500	.836	.615	.833	.525	.832	.750	.817	.800	.806	.957

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				04:30 PM				04:15 PM			
+0 mins.	3	**32**	4	39	**6**	46	**4**	56	6	**39**	**10**	**55**	12	54	**11**	77
+15 mins.	**6**	26	6	38	3	48	3	54	8	29	6	43	**13**	55	6	74
+30 mins.	3	29	5	37	4	45	3	52	5	30	3	38	10	49	7	66
+45 mins.	1	31	**9**	**41**	3	**60**	1	**64**	**13**	32	2	47	13	**67**	10	**90**
Total Volume	13	118	24	155	16	199	11	226	32	130	21	183	48	225	34	307
% App. Total	8.4	76.1	15.5		7.1	88.1	4.9		17.5	71	11.5		15.6	73.3	11.1	
PHF	.542	.922	.667	.945	.667	.829	.688	.883	.615	.833	.525	.832	.923	.840	.773	.853

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City of Redlands
N/S: Dearborn Street
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Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
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Groups Printed- Passenger Vehicles

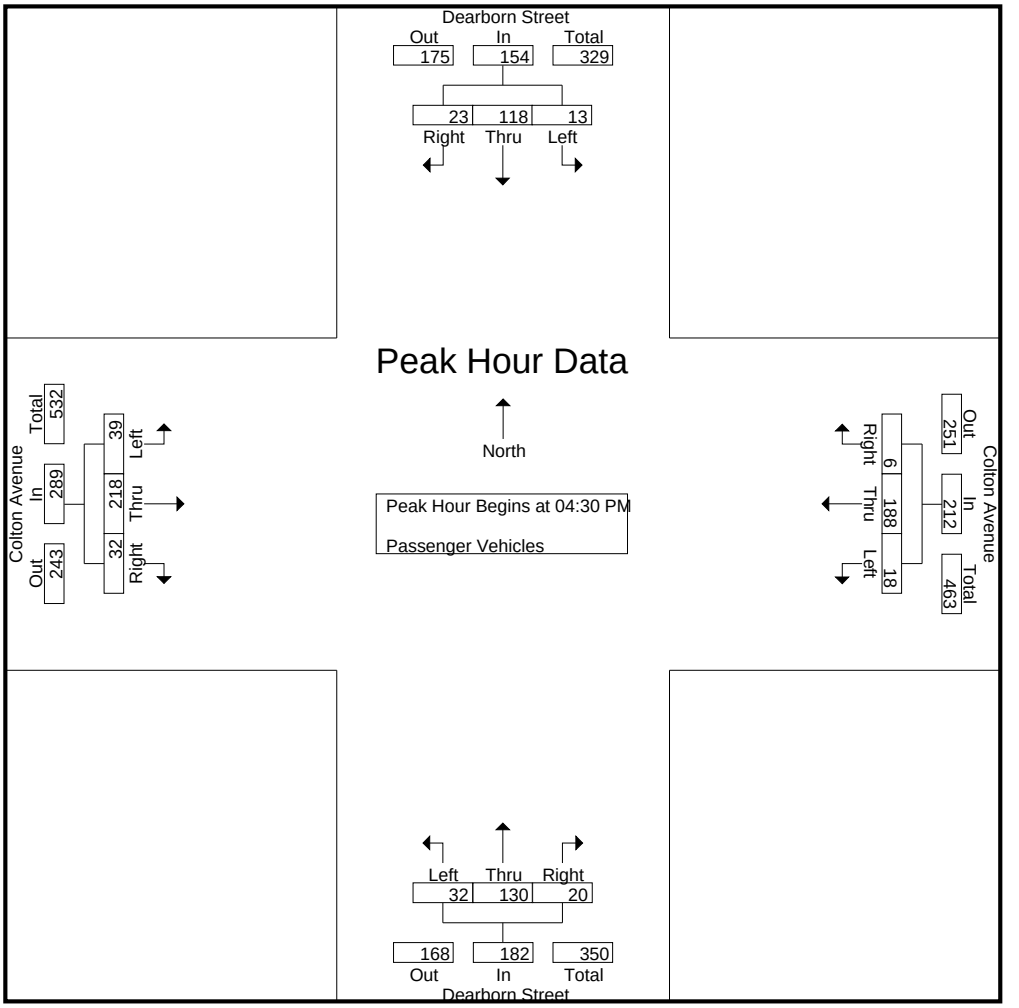
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	3	25	2	30	6	46	4	56	5	22	10	37	7	65	4	76	199
04:15 PM	7	16	8	31	3	48	3	54	6	16	6	28	12	54	11	77	190
04:30 PM	3	32	3	38	4	45	3	52	6	39	9	54	13	55	6	74	218
04:45 PM	6	26	6	38	3	59	1	63	8	29	6	43	10	49	7	66	210
Total	19	99	19	137	16	198	11	225	25	106	31	162	42	223	28	293	817
05:00 PM	3	29	5	37	6	44	2	52	5	30	3	38	13	66	10	89	216
05:15 PM	1	31	9	41	5	40	0	45	13	32	2	47	3	48	9	60	193
05:30 PM	2	23	4	29	7	35	2	44	8	32	10	50	7	49	5	61	184
05:45 PM	4	26	3	33	8	37	0	45	7	25	6	38	19	43	11	73	189
Total	10	109	21	140	26	156	4	186	33	119	21	173	42	206	35	283	782
Grand Total	29	208	40	277	42	354	15	411	58	225	52	335	84	429	63	576	1599
Apprch %	10.5	75.1	14.4		10.2	86.1	3.6		17.3	67.2	15.5		14.6	74.5	10.9		
Total %	1.8	13	2.5	17.3	2.6	22.1	0.9	25.7	3.6	14.1	3.3	21	5.3	26.8	3.9	36	

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	3	**32**	3	38	4	45	**3**	52	6	**39**	**9**	**54**	**13**	55	6	74	**218**
04:45 PM	**6**	26	6	38	3	**59**	1	**63**	8	29	6	43	10	49	7	66	210
05:00 PM	3	29	5	37	**6**	44	2	52	5	30	3	38	13	**66**	**10**	**89**	216
05:15 PM	1	31	**9**	**41**	5	40	0	45	**13**	32	2	47	3	48	9	60	193
Total Volume	13	118	23	154	18	188	6	212	32	130	20	182	39	218	32	289	837
% App. Total	8.4	76.6	14.9		8.5	88.7	2.8		17.6	71.4	11		13.5	75.4	11.1		
PHF	.542	.922	.639	.939	.750	.797	.500	.841	.615	.833	.556	.843	.750	.826	.800	.812	.960

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	3	**32**	3	38	4	45	**3**	52	6	**39**	**9**	**54**	**13**	55	6	74
+15 mins.	**6**	26	6	38	3	**59**	1	**63**	8	29	6	43	10	49	7	66
+30 mins.	3	29	5	37	**6**	44	2	52	5	30	3	38	13	**66**	**10**	**89**
+45 mins.	1	31	**9**	**41**	5	40	0	45	**13**	32	2	47	3	48	9	60
Total Volume	13	118	23	154	18	188	6	212	32	130	20	182	39	218	32	289
% App. Total	8.4	76.6	14.9		8.5	88.7	2.8		17.6	71.4	11		13.5	75.4	11.1	
PHF	.542	.922	.639	.939	.750	.797	.500	.841	.615	.833	.556	.843	.750	.826	.800	.812

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

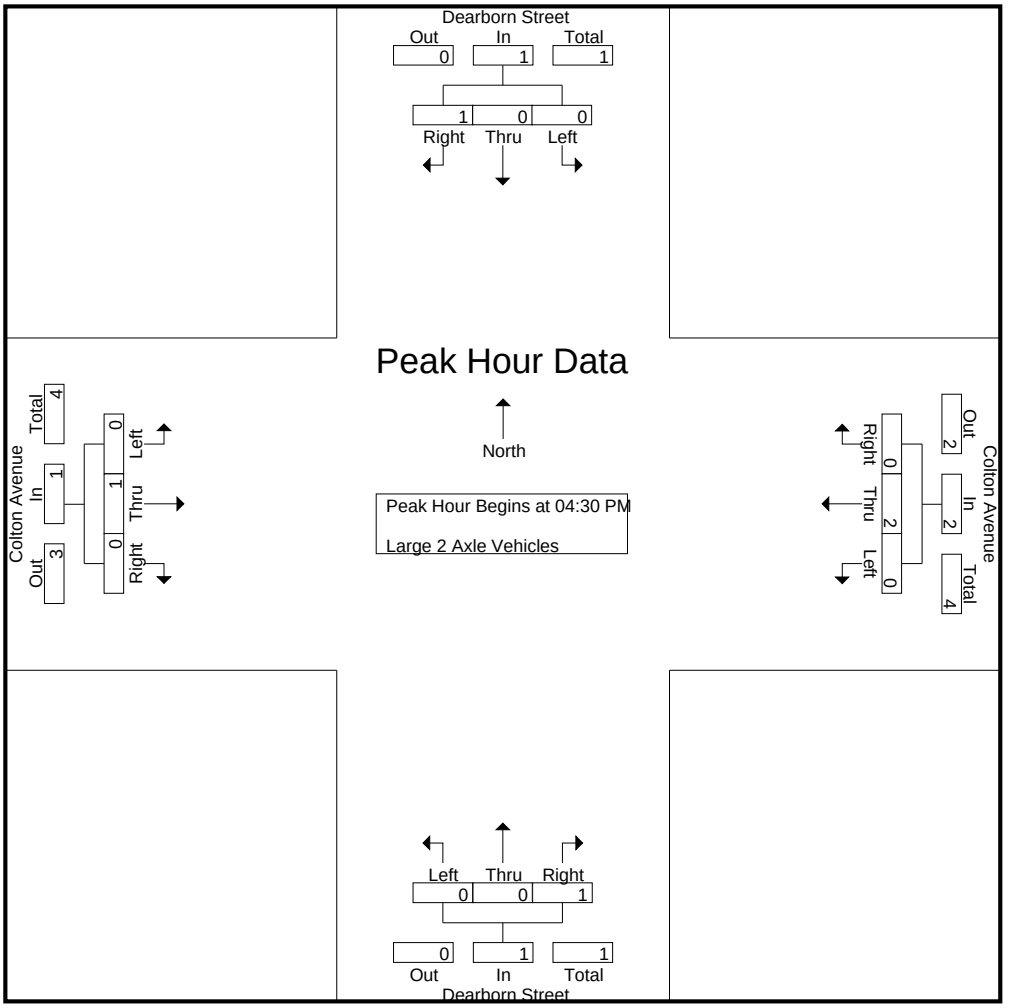
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	2
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	1	1	2	0	1	0	1	0	0	2	2	0	0	0	0	5
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Grand Total	0	1	1	2	0	2	0	2	0	0	2	2	0	1	0	1	7
Apprch %	0	50	50		0	100	0		0	0	100		0	100	0		
Total %	0	14.3	14.3	28.6	0	28.6	0	28.6	0	0	28.6	28.6	0	14.3	0	14.3	

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	**1**	**1**	0	0	0	0	0	0	**1**	**1**	0	0	0	0	**2**
04:45 PM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	**1**	0	**1**	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	1	0	2	0	2	0	0	1	1	0	1	0	1	5
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0		
PHF	.000	.000	.250	.250	.000	.500	.000	.500	.000	.000	.250	.250	.000	.250	.000	.250	.625

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	**1**	**1**	0	0	0	0	0	0	**1**	**1**	0	0	0	0
+15 mins.	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	**1**	0	**1**
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	1	0	2	0	2	0	0	1	1	0	1	0	1
% App. Total	0	0	100		0	100	0		0	0	100		0	100	0	
PHF	.000	.000	.250	.250	.000	.500	.000	.500	.000	.000	.250	.250	.000	.250	.000	.250

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
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Groups Printed- 3 Axle Vehicles

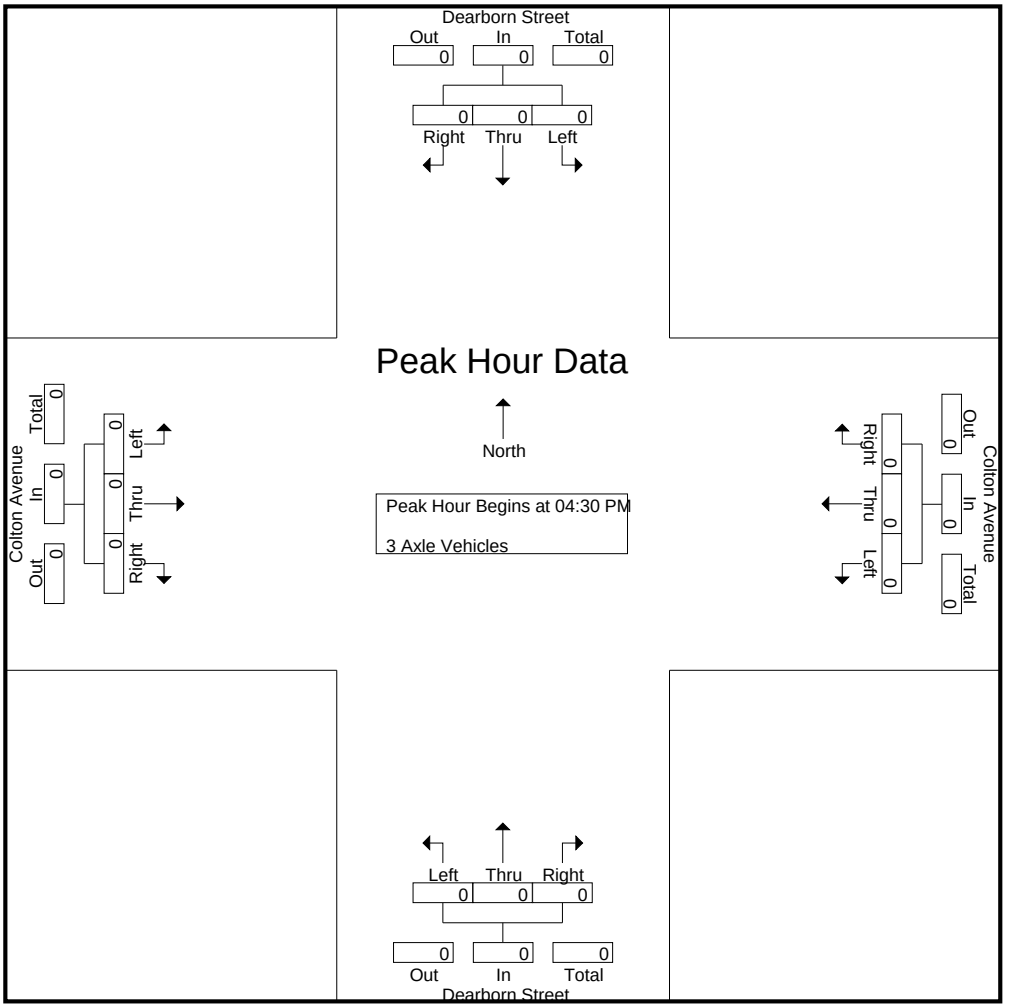
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

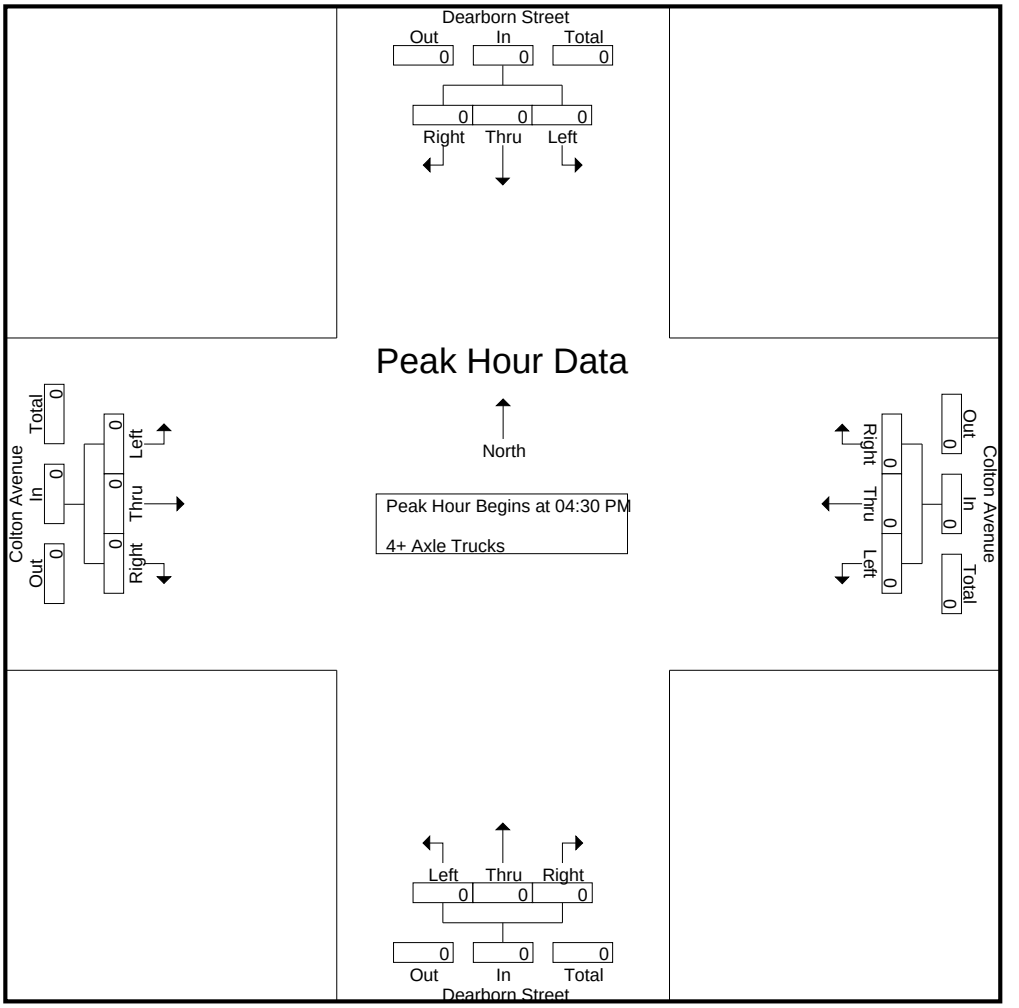
	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

	Dearborn Street Southbound				Colton Avenue Westbound				Dearborn Street Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Dearborn Street
E/W: Colton Avenue
Weather: Clear

File Name : 02_RED_Dear_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

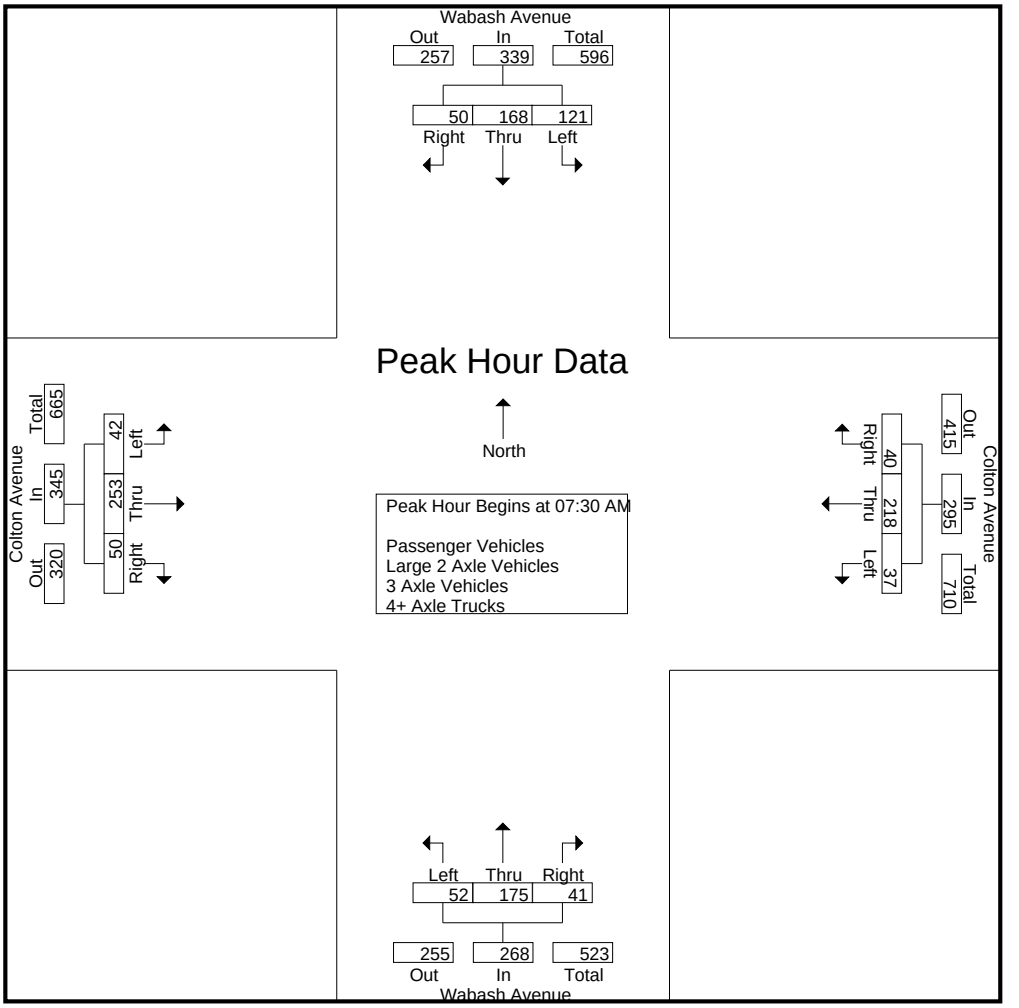
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	10	22	9	41	3	29	10	42	5	17	1	23	10	12	4	26	132
07:15 AM	19	27	20	66	12	35	13	60	5	23	5	33	7	30	4	41	200
07:30 AM	12	41	9	62	13	47	2	62	16	40	5	61	5	30	13	48	233
07:45 AM	16	58	10	84	15	42	7	64	22	44	12	78	9	62	25	96	322
Total	57	148	48	253	43	153	32	228	48	124	23	195	31	134	46	211	887
08:00 AM	40	27	15	82	7	56	14	77	13	56	17	86	14	77	10	101	346
08:15 AM	53	42	16	111	2	73	17	92	1	35	7	43	14	84	2	100	346
08:30 AM	19	29	15	63	0	47	15	62	4	32	3	39	9	33	4	46	210
08:45 AM	7	22	13	42	2	31	7	40	1	26	6	33	12	20	6	38	153
Total	119	120	59	298	11	207	53	271	19	149	33	201	49	214	22	285	1055
Grand Total	176	268	107	551	54	360	85	499	67	273	56	396	80	348	68	496	1942
Apprch %	31.9	48.6	19.4		10.8	72.1	17		16.9	68.9	14.1		16.1	70.2	13.7		
Total %	9.1	13.8	5.5	28.4	2.8	18.5	4.4	25.7	3.5	14.1	2.9	20.4	4.1	17.9	3.5	25.5	
Passenger Vehicles	175	264	105	544	51	353	85	489	66	269	51	386	80	340	68	488	1907
% Passenger Vehicles	99.4	98.5	98.1	98.7	94.4	98.1	100	98	98.5	98.5	91.1	97.5	100	97.7	100	98.4	98.2
Large 2 Axle Vehicles	0	4	2	6	2	5	0	7	1	1	2	4	0	6	0	6	23
% Large 2 Axle Vehicles	0	1.5	1.9	1.1	3.7	1.4	0	1.4	1.5	0.4	3.6	1	0	1.7	0	1.2	1.2
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0.4	0	0.3	0	0.3	0	0.2	0.1
4+ Axle Trucks	1	0	0	1	1	2	0	3	0	2	3	5	0	1	0	1	10
% 4+ Axle Trucks	0.6	0	0	0.2	1.9	0.6	0	0.6	0	0.7	5.4	1.3	0	0.3	0	0.2	0.5

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	12	41	9	62	13	47	2	62	16	40	5	61	5	30	13	48	233
07:45 AM	16	**58**	10	84	**15**	42	7	64	**22**	44	12	78	9	62	**25**	96	322
08:00 AM	40	27	15	82	7	56	14	77	13	**56**	**17**	**86**	**14**	77	10	**101**	**346**
08:15 AM	**53**	42	**16**	**111**	2	**73**	**17**	**92**	1	35	7	43	14	**84**	2	100	346
Total Volume	121	168	50	339	37	218	40	295	52	175	41	268	42	253	50	345	1247
% App. Total	35.7	49.6	14.7		12.5	73.9	13.6		19.4	65.3	15.3		12.2	73.3	14.5		
PHF	.571	.724	.781	.764	.617	.747	.588	.802	.591	.781	.603	.779	.750	.753	.500	.854	.901

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	16	**58**	10	84	13	47	2	62	16	40	5	61	5	30	13	48
+15 mins.	40	27	15	82	**15**	42	7	64	**22**	44	12	78	9	62	**25**	96
+30 mins.	**53**	42	**16**	**111**	7	56	14	77	13	**56**	**17**	**86**	**14**	77	10	**101**
+45 mins.	19	29	15	63	2	**73**	**17**	**92**	1	35	7	43	14	**84**	2	100
Total Volume	128	156	56	340	37	218	40	295	52	175	41	268	42	253	50	345
% App. Total	37.6	45.9	16.5		12.5	73.9	13.6		19.4	65.3	15.3		12.2	73.3	14.5	
PHF	.604	.672	.875	.766	.617	.747	.588	.802	.591	.781	.603	.779	.750	.753	.500	.854

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles

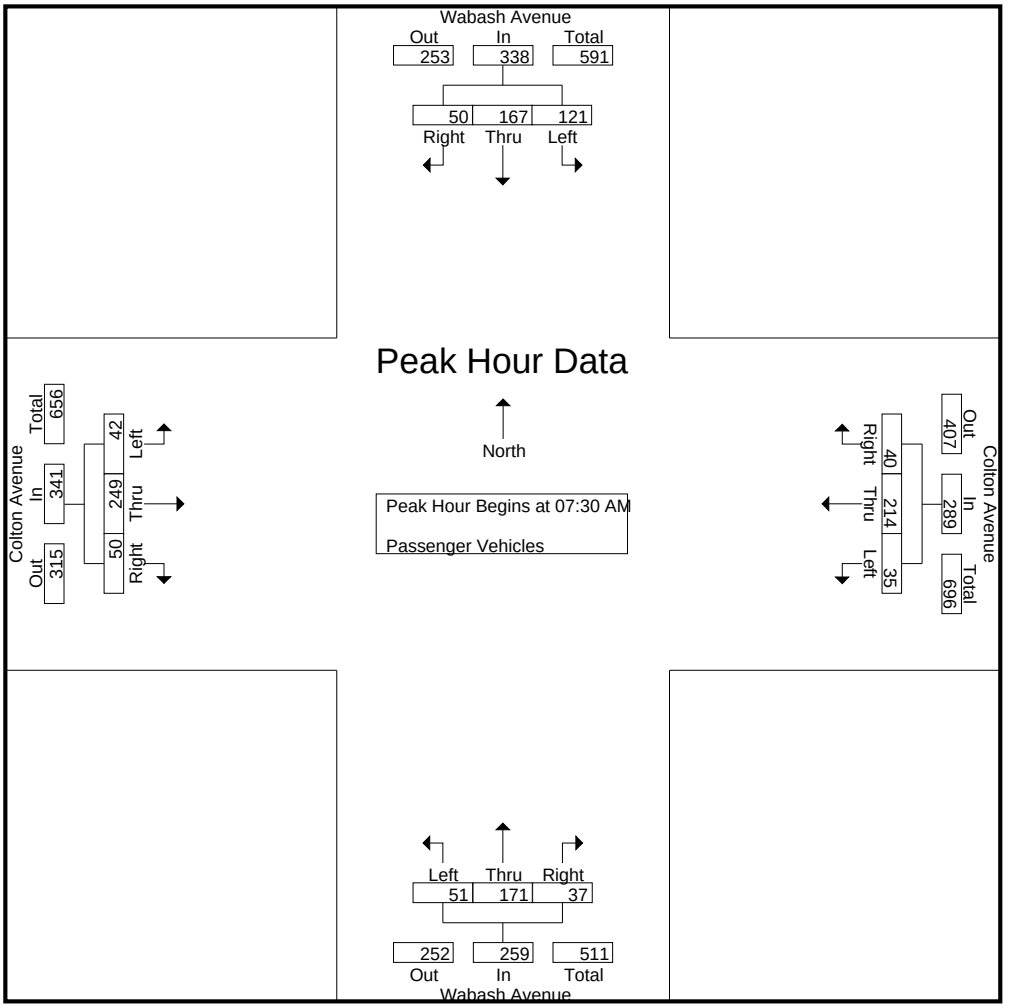
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	10	21	8	39	2	29	10	41	5	17	1	23	10	11	4	25	128
07:15 AM	18	25	19	62	12	35	13	60	5	23	5	33	7	29	4	40	195
07:30 AM	12	40	9	61	11	47	2	60	16	38	4	58	5	30	13	48	227
07:45 AM	16	58	10	84	15	42	7	64	21	44	10	75	9	61	25	95	318
Total	56	144	46	246	40	153	32	225	47	122	20	189	31	131	46	208	868
08:00 AM	40	27	15	82	7	56	14	77	13	54	16	83	14	74	10	98	340
08:15 AM	53	42	16	111	2	69	17	88	1	35	7	43	14	84	2	100	342
08:30 AM	19	29	15	63	0	46	15	61	4	32	3	39	9	32	4	45	208
08:45 AM	7	22	13	42	2	29	7	38	1	26	5	32	12	19	6	37	149
Total	119	120	59	298	11	200	53	264	19	147	31	197	49	209	22	280	1039
Grand Total	175	264	105	544	51	353	85	489	66	269	51	386	80	340	68	488	1907
Apprch %	32.2	48.5	19.3		10.4	72.2	17.4		17.1	69.7	13.2		16.4	69.7	13.9		
Total %	9.2	13.8	5.5	28.5	2.7	18.5	4.5	25.6	3.5	14.1	2.7	20.2	4.2	17.8	3.6	25.6	

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	12	40	9	61	11	47	2	60	16	38	4	58	5	30	13	48	227
07:45 AM	16	**58**	10	84	**15**	42	7	64	**21**	44	10	75	9	61	**25**	95	318
08:00 AM	40	27	15	82	7	56	14	77	13	**54**	**16**	**83**	**14**	74	10	98	340
08:15 AM	**53**	42	**16**	**111**	2	**69**	**17**	**88**	1	35	7	43	14	**84**	2	**100**	**342**
Total Volume	121	167	50	338	35	214	40	289	51	171	37	259	42	249	50	341	1227
% App. Total	35.8	49.4	14.8		12.1	74	13.8		19.7	66	14.3		12.3	73	14.7		
PHF	.571	.720	.781	.761	.583	.775	.588	.821	.607	.792	.578	.780	.750	.741	.500	.853	.897

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	12	40	9	61	11	47	2	60	16	38	4	58	5	30	13	48
+15 mins.	16	**58**	10	84	**15**	42	7	64	**21**	44	10	75	9	61	**25**	95
+30 mins.	40	27	15	82	7	56	14	77	13	**54**	**16**	**83**	**14**	74	10	98
+45 mins.	**53**	42	**16**	**111**	2	**69**	**17**	**88**	1	35	7	43	14	**84**	2	**100**
Total Volume	121	167	50	338	35	214	40	289	51	171	37	259	42	249	50	341
% App. Total	35.8	49.4	14.8		12.1	74	13.8		19.7	66	14.3		12.3	73	14.7	
PHF	.571	.720	.781	.761	.583	.775	.588	.821	.607	.792	.578	.780	.750	.741	.500	.853

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

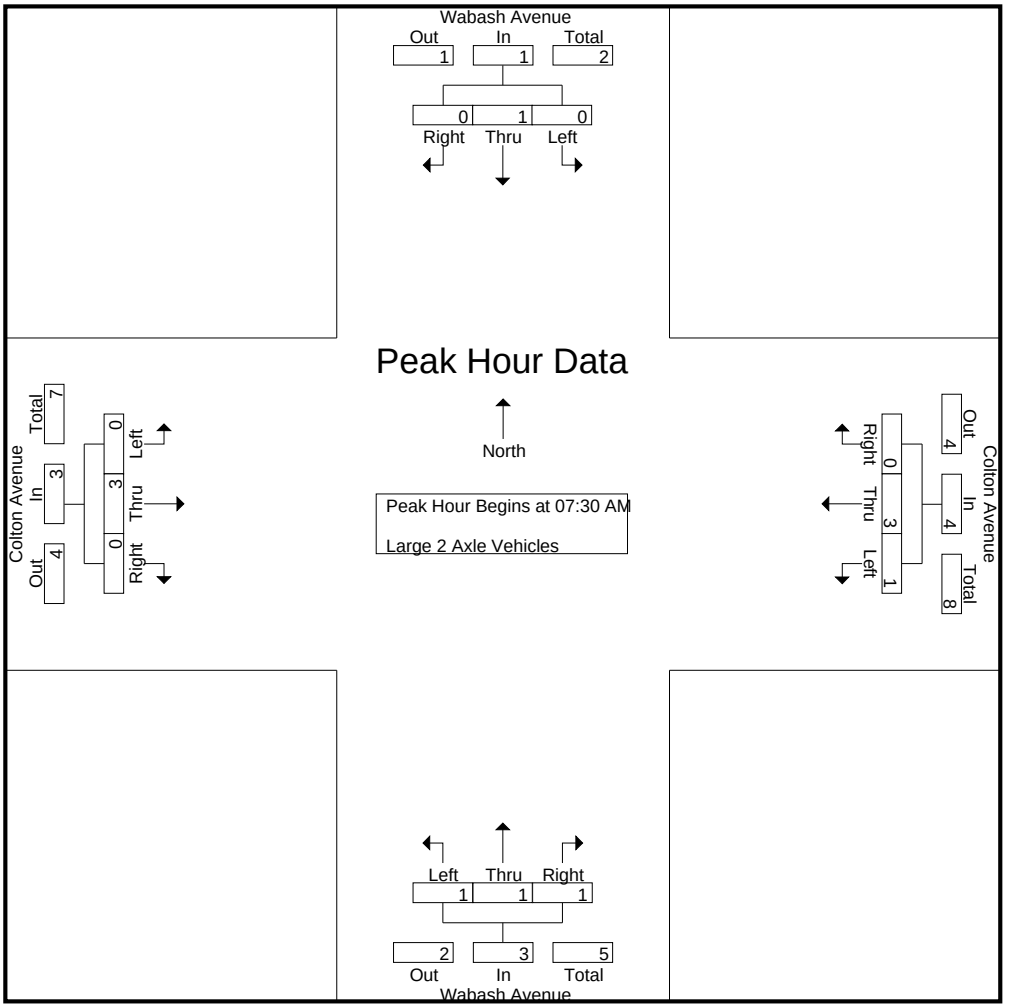
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	1	1	2	1	0	0	1	0	0	0	0	0	1	0	1	4
07:15 AM	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
07:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	1	0	1	2	0	1	0	1	3
Total	0	4	2	6	2	0	0	2	1	0	1	2	0	2	0	2	12
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
08:15 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
08:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
08:45 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	3
Total	0	0	0	0	0	5	0	5	0	1	1	2	0	4	0	4	11
Grand Total	0	4	2	6	2	5	0	7	1	1	2	4	0	6	0	6	23
Apprch %	0	66.7	33.3		28.6	71.4	0		25	25	50		0	100	0		
Total %	0	17.4	8.7	26.1	8.7	21.7	0	30.4	4.3	4.3	8.7	17.4	0	26.1	0	26.1	

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	**1**	0	**1**	**1**	0	0	1	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	**1**	0	**1**	**2**	0	1	0	1	**3**
08:00 AM	0	0	0	0	0	0	0	0	0	**1**	0	1	0	**2**	0	**2**	3
08:15 AM	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0	3
Total Volume	0	1	0	1	1	3	0	4	1	1	1	3	0	3	0	3	11
% App. Total	0	100	0		25	75	0		33.3	33.3	33.3		0	100	0		
PHF	.000	.250	.000	.250	.250	.250	.000	.333	.250	.250	.250	.375	.000	.375	.000	.375	.917

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	**1**	0	**1**	**1**	0	0	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	**1**	0	**1**	**2**	0	1	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	**1**	0	1	0	**2**	0	**2**
+45 mins.	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	1	3	0	4	1	1	1	3	0	3	0	3
% App. Total	0	100	0		25	75	0		33.3	33.3	33.3		0	100	0	
PHF	.000	.250	.000	.250	.250	.250	.000	.333	.250	.250	.250	.375	.000	.375	.000	.375

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

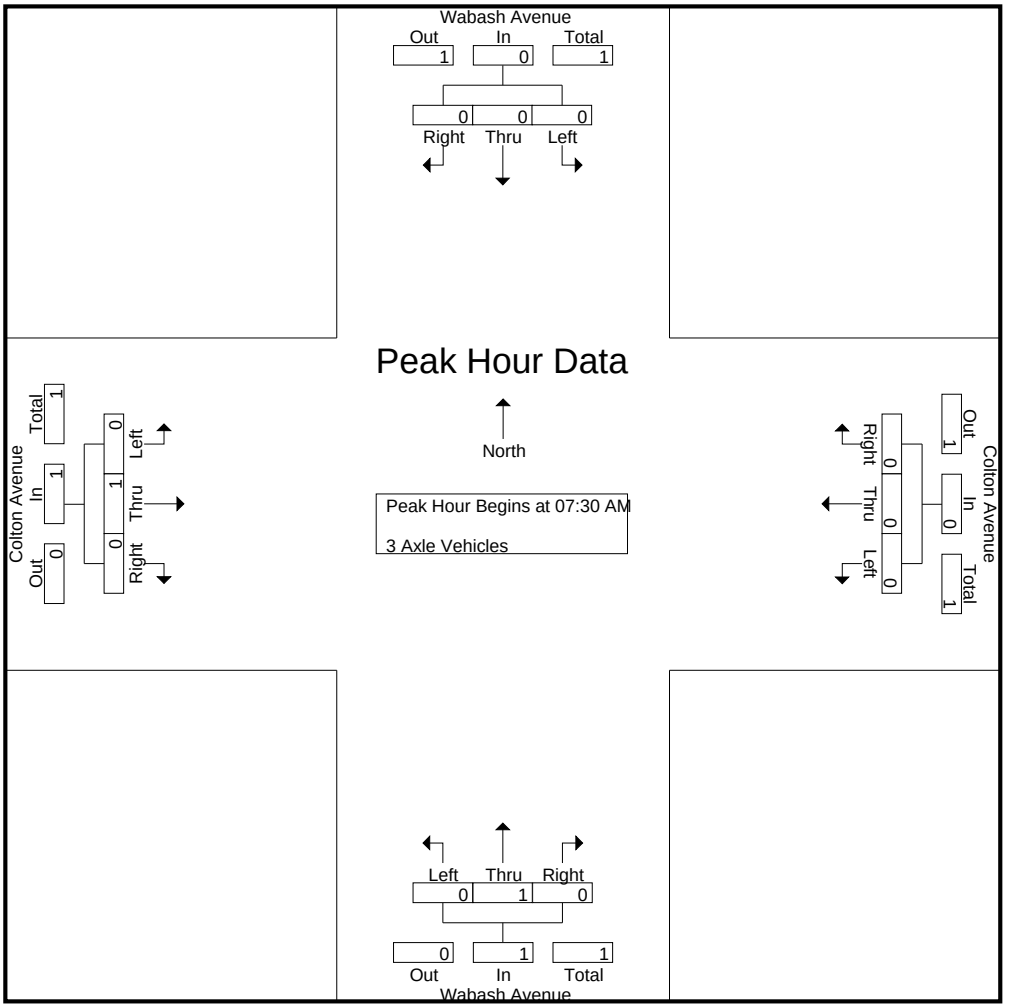
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
Grand Total	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
Apprch %	0	0	0		0	0	0		0	100	0		0	100	0		
Total %	0	0	0	0	0	0	0	0	0	50	0	50	0	50	0	50	

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	**1**	0	**1**	**2**
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
% App. Total	0	0	0		0	0	0		0	100	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250	.250

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	**1**	0	**1**
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
% App. Total	0	0	0		0	0	0		0	100	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

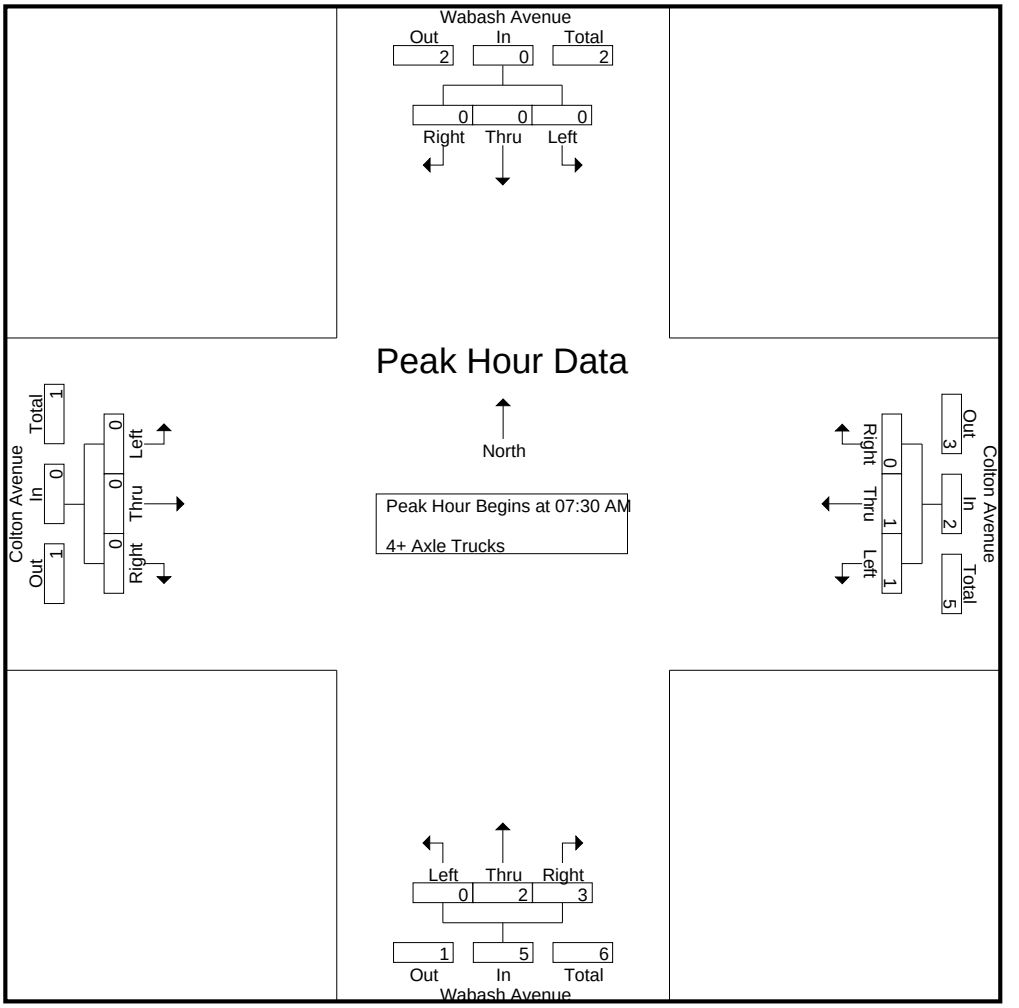
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	1	0	0	1	0	2	1	3	0	0	0	0	4
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Total	1	0	0	1	1	0	0	1	0	2	2	4	0	1	0	1	7
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	2	0	2	0	0	1	1	0	0	0	0	3
Grand Total	1	0	0	1	1	2	0	3	0	2	3	5	0	1	0	1	10
Apprch %	100	0	0		33.3	66.7	0		0	40	60		0	100	0		
Total %	10	0	0	10	10	20	0	30	0	20	30	50	0	10	0	10	

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	**1**	0	0	**1**	0	**2**	**1**	**3**	0	0	0	0	**4**
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	**1**	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	1	1	0	2	0	2	3	5	0	0	0	0	7
% App. Total	0	0	0		50	50	0		0	40	60		0	0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.500	.000	.250	.750	.417	.000	.000	.000	.000	.438

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col AM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	**1**	0	0	**1**	0	**2**	**1**	**3**	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
+45 mins.	0	0	0	0	0	**1**	0	1	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	2	0	2	3	5	0	0	0	0
% App. Total	0	0	0		50	50	0		0	40	60		0	0	0	
PHF	.000	.000	.000	.000	.250	.250	.000	.500	.000	.250	.750	.417	.000	.000	.000	.000

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

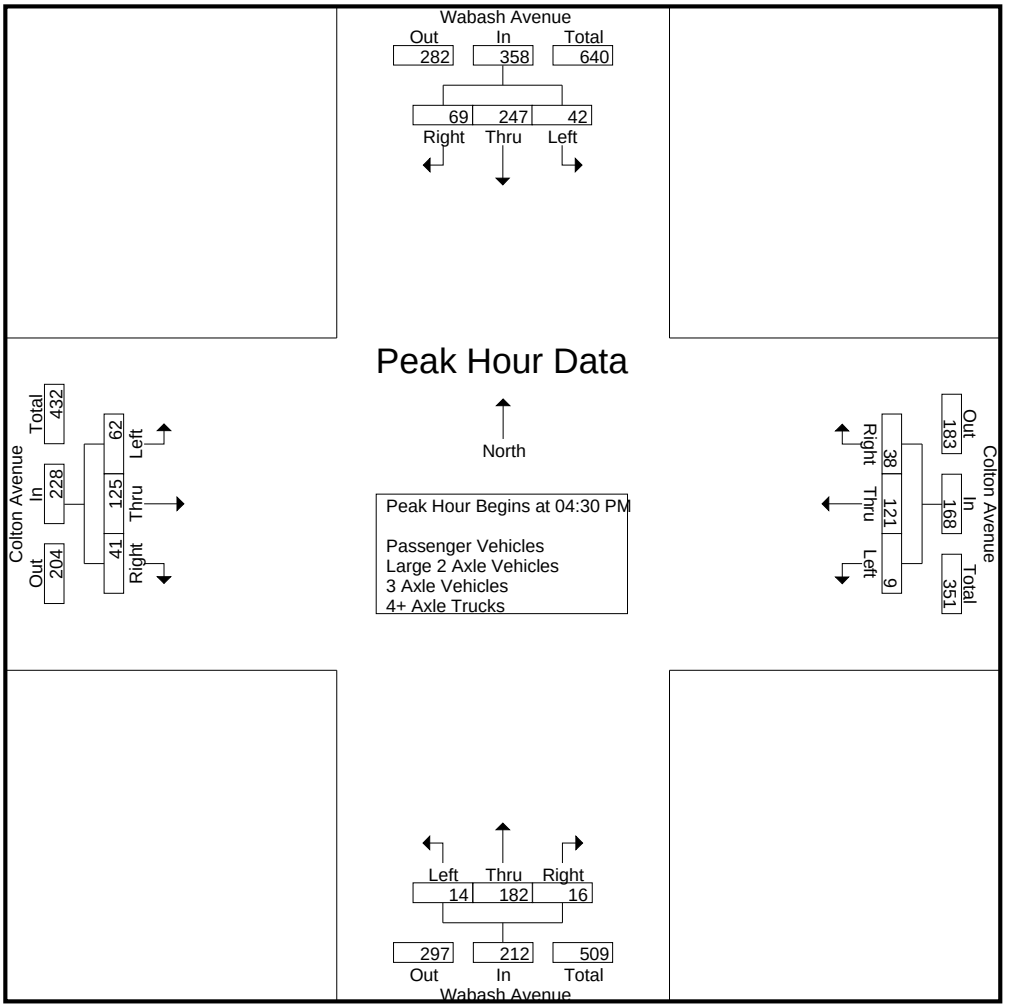
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	5	53	17	75	3	35	9	47	3	40	2	45	18	43	5	66	233
04:15 PM	9	50	13	72	8	30	5	43	3	37	3	43	17	39	6	62	220
04:30 PM	10	58	18	86	3	31	9	43	1	52	4	57	13	35	10	58	244
04:45 PM	7	70	16	93	2	40	4	46	3	45	4	52	15	28	16	59	250
Total	31	231	64	326	16	136	27	179	10	174	13	197	63	145	37	245	947
05:00 PM	11	52	22	85	2	26	12	40	4	48	3	55	19	31	8	58	238
05:15 PM	14	67	13	94	2	24	13	39	6	37	5	48	15	31	7	53	234
05:30 PM	13	53	13	79	1	25	9	35	3	46	6	55	15	30	3	48	217
05:45 PM	8	54	16	78	5	31	7	43	5	38	2	45	18	26	5	49	215
Total	46	226	64	336	10	106	41	157	18	169	16	203	67	118	23	208	904
Grand Total	77	457	128	662	26	242	68	336	28	343	29	400	130	263	60	453	1851
Apprch %	11.6	69	19.3		7.7	72	20.2		7	85.8	7.2		28.7	58.1	13.2		
Total %	4.2	24.7	6.9	35.8	1.4	13.1	3.7	18.2	1.5	18.5	1.6	21.6	7	14.2	3.2	24.5	
Passenger Vehicles	74	455	128	657	25	240	66	331	28	342	28	398	130	260	60	450	1836
% Passenger Vehicles	96.1	99.6	100	99.2	96.2	99.2	97.1	98.5	100	99.7	96.6	99.5	100	98.9	100	99.3	99.2
Large 2 Axle Vehicles	3	2	0	5	0	2	1	3	0	1	1	2	0	3	0	3	13
% Large 2 Axle Vehicles	3.9	0.4	0	0.8	0	0.8	1.5	0.9	0	0.3	3.4	0.5	0	1.1	0	0.7	0.7
3 Axle Vehicles	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
% 3 Axle Vehicles	0	0	0	0	3.8	0	0	0.3	0	0	0	0	0	0	0	0	0.1
4+ Axle Trucks	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
% 4+ Axle Trucks	0	0	0	0	0	0	1.5	0.3	0	0	0	0	0	0	0	0	0.1

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	10	58	18	86	**3**	31	9	43	1	**52**	4	**57**	13	**35**	10	58	244
04:45 PM	7	**70**	16	93	2	**40**	4	**46**	3	45	4	52	15	28	**16**	**59**	**250**
05:00 PM	11	52	**22**	85	2	26	12	40	4	48	3	55	**19**	31	8	58	238
05:15 PM	**14**	67	13	**94**	2	24	**13**	39	**6**	37	**5**	48	15	31	7	53	234
Total Volume	42	247	69	358	9	121	38	168	14	182	16	212	62	125	41	228	966
% App. Total	11.7	69	19.3		5.4	72	22.6		6.6	85.8	7.5		27.2	54.8	18		
PHF	.750	.882	.784	.952	.750	.756	.731	.913	.583	.875	.800	.930	.816	.893	.641	.966	.966

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				04:30 PM				04:00 PM			
+0 mins.	10	58	18	86	3	35	**9**	**47**	1	**52**	4	**57**	**18**	**43**	5	**66**
+15 mins.	7	**70**	16	93	**8**	30	5	43	3	45	4	52	17	39	6	62
+30 mins.	11	52	**22**	85	3	31	9	43	4	48	3	55	13	35	10	58
+45 mins.	**14**	67	13	**94**	2	**40**	4	46	**6**	37	**5**	48	15	28	**16**	59
Total Volume	42	247	69	358	16	136	27	179	14	182	16	212	63	145	37	245
% App. Total	11.7	69	19.3		8.9	76	15.1		6.6	85.8	7.5		25.7	59.2	15.1	
PHF	.750	.882	.784	.952	.500	.850	.750	.952	.583	.875	.800	.930	.875	.843	.578	.928

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Passenger Vehicles

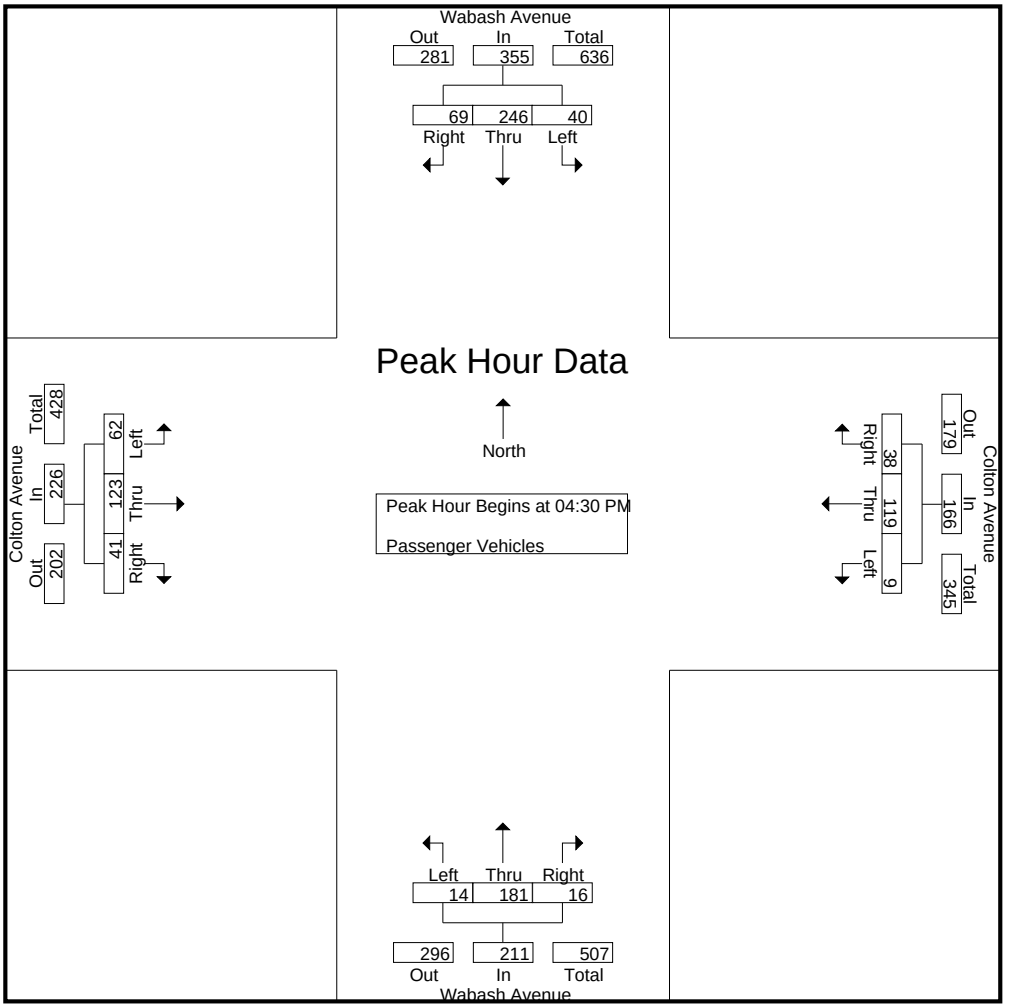
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	5	53	17	75	2	35	7	44	3	40	2	45	18	42	5	65	229
04:15 PM	8	49	13	70	8	30	5	43	3	37	2	42	17	39	6	62	217
04:30 PM	10	57	18	85	3	31	9	43	1	52	4	57	13	34	10	57	242
04:45 PM	6	70	16	92	2	38	4	44	3	45	4	52	15	28	16	59	247
Total	29	229	64	322	15	134	25	174	10	174	12	196	63	143	37	243	935
05:00 PM	10	52	22	84	2	26	12	40	4	48	3	55	19	30	8	57	236
05:15 PM	14	67	13	94	2	24	13	39	6	36	5	47	15	31	7	53	233
05:30 PM	13	53	13	79	1	25	9	35	3	46	6	55	15	30	3	48	217
05:45 PM	8	54	16	78	5	31	7	43	5	38	2	45	18	26	5	49	215
Total	45	226	64	335	10	106	41	157	18	168	16	202	67	117	23	207	901
Grand Total	74	455	128	657	25	240	66	331	28	342	28	398	130	260	60	450	1836
Apprch %	11.3	69.3	19.5		7.6	72.5	19.9		7	85.9	7		28.9	57.8	13.3		
Total %	4	24.8	7	35.8	1.4	13.1	3.6	18	1.5	18.6	1.5	21.7	7.1	14.2	3.3	24.5	

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	10	57	18	85	**3**	31	9	43	1	**52**	4	**57**	13	**34**	10	57	242
04:45 PM	6	**70**	16	92	2	**38**	4	**44**	3	45	4	52	15	28	**16**	**59**	**247**
05:00 PM	10	52	**22**	84	2	26	12	40	4	48	3	55	**19**	30	8	57	236
05:15 PM	**14**	67	13	**94**	2	24	**13**	39	**6**	36	**5**	47	15	31	7	53	233
Total Volume	40	246	69	355	9	119	38	166	14	181	16	211	62	123	41	226	958
% App. Total	11.3	69.3	19.4		5.4	71.7	22.9		6.6	85.8	7.6		27.4	54.4	18.1		
PHF	.714	.879	.784	.944	.750	.783	.731	.943	.583	.870	.800	.925	.816	.904	.641	.958	.970

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City of Redlands
N/S: Wabash Avenue
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Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
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Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	10	57	18	85	**3**	31	9	43	1	**52**	4	**57**	13	**34**	10	57
+15 mins.	6	**70**	16	92	2	**38**	4	**44**	3	45	4	52	15	28	**16**	**59**
+30 mins.	10	52	**22**	84	2	26	12	40	4	48	3	55	**19**	30	8	57
+45 mins.	**14**	67	13	**94**	2	24	**13**	39	**6**	36	**5**	47	15	31	7	53
Total Volume	40	246	69	355	9	119	38	166	14	181	16	211	62	123	41	226
% App. Total	11.3	69.3	19.4		5.4	71.7	22.9		6.6	85.8	7.6		27.4	54.4	18.1	
PHF	.714	.879	.784	.944	.750	.783	.731	.943	.583	.870	.800	.925	.816	.904	.641	.958

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City of Redlands
N/S: Wabash Avenue
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Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

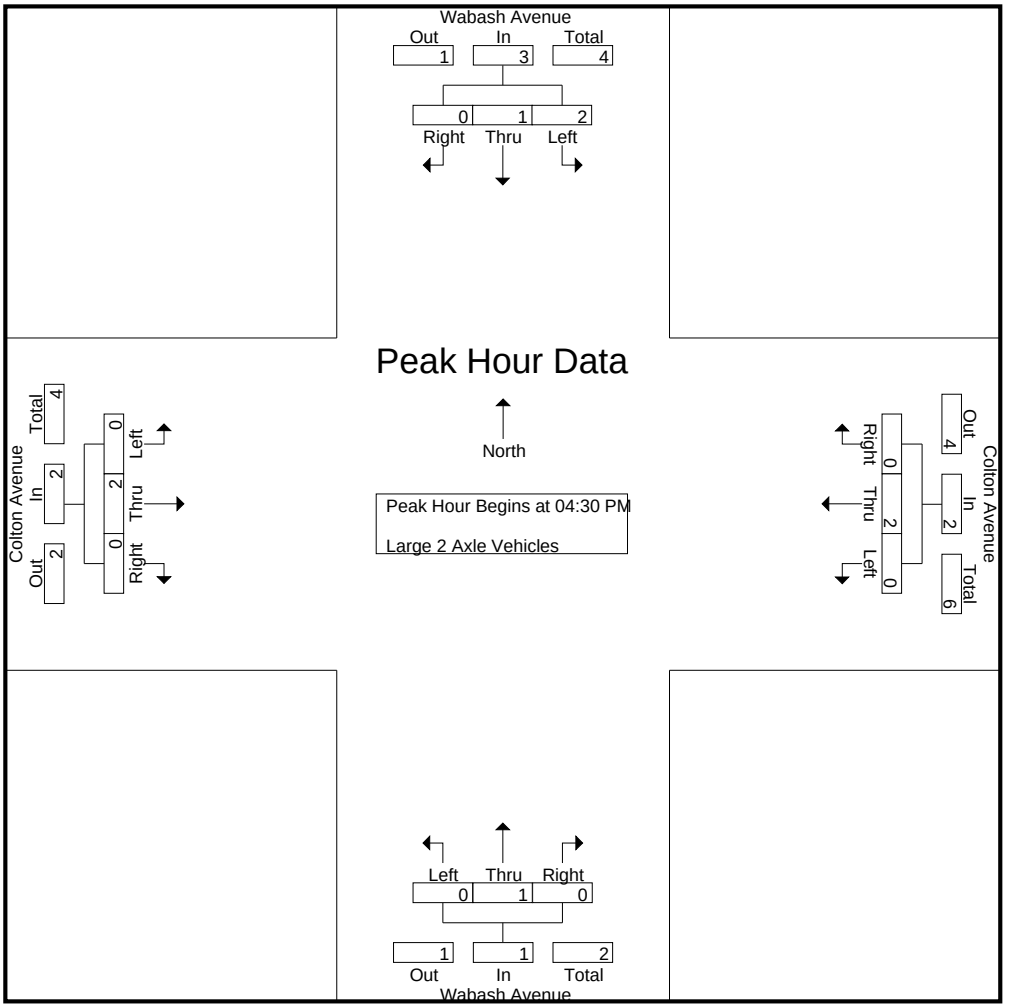
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	2
04:15 PM	1	1	0	2	0	0	0	0	0	0	1	1	0	0	0	0	3
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
04:45 PM	1	0	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
Total	2	2	0	4	0	2	1	3	0	0	1	1	0	2	0	2	10
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	1	0	0	0	0	0	1	0	1	0	1	0	1	3
Grand Total	3	2	0	5	0	2	1	3	0	1	1	2	0	3	0	3	13
Apprch %	60	40	0		0	66.7	33.3		0	50	50		0	100	0		
Total %	23.1	15.4	0	38.5	0	15.4	7.7	23.1	0	7.7	7.7	15.4	0	23.1	0	23.1	

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	**1**	0	**1**	2
04:45 PM	**1**	0	0	1	0	**2**	0	**2**	0	0	0	0	0	0	0	0	**3**
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	1
Total Volume	2	1	0	3	0	2	0	2	0	1	0	1	0	2	0	2	8
% App. Total	66.7	33.3	0		0	100	0		0	100	0		0	100	0		
PHF	.500	.250	.000	.750	.000	.250	.000	.250	.000	.250	.000	.250	.000	.500	.000	.500	.667

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City of Redlands
N/S: Wabash Avenue
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Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	**1**	0	**1**
+15 mins.	**1**	0	0	1	0	**2**	0	**2**	0	0	0	0	0	0	0	0
+30 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
Total Volume	2	1	0	3	0	2	0	2	0	1	0	1	0	2	0	2
% App. Total	66.7	33.3	0		0	100	0		0	100	0		0	100	0	
PHF	.500	.250	.000	.750	.000	.250	.000	.250	.000	.250	.000	.250	.000	.500	.000	.500

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

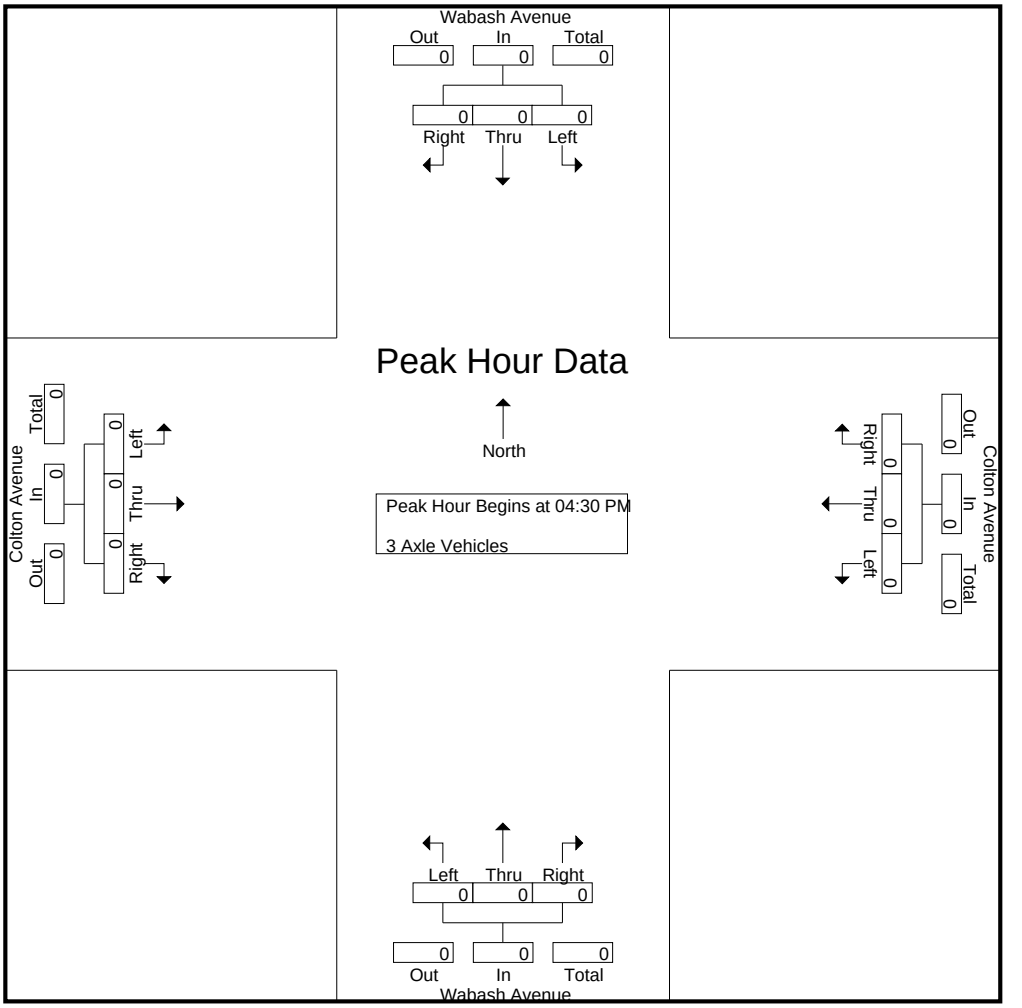
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0		100	0	0		0	0	0		0	0	0		
Total %	0	0	0	0	100	0	0	100	0	0	0	0	0	0	0	0	

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
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Corona, CA 92878
(951)268-6268

City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Wabash Avenue
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File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

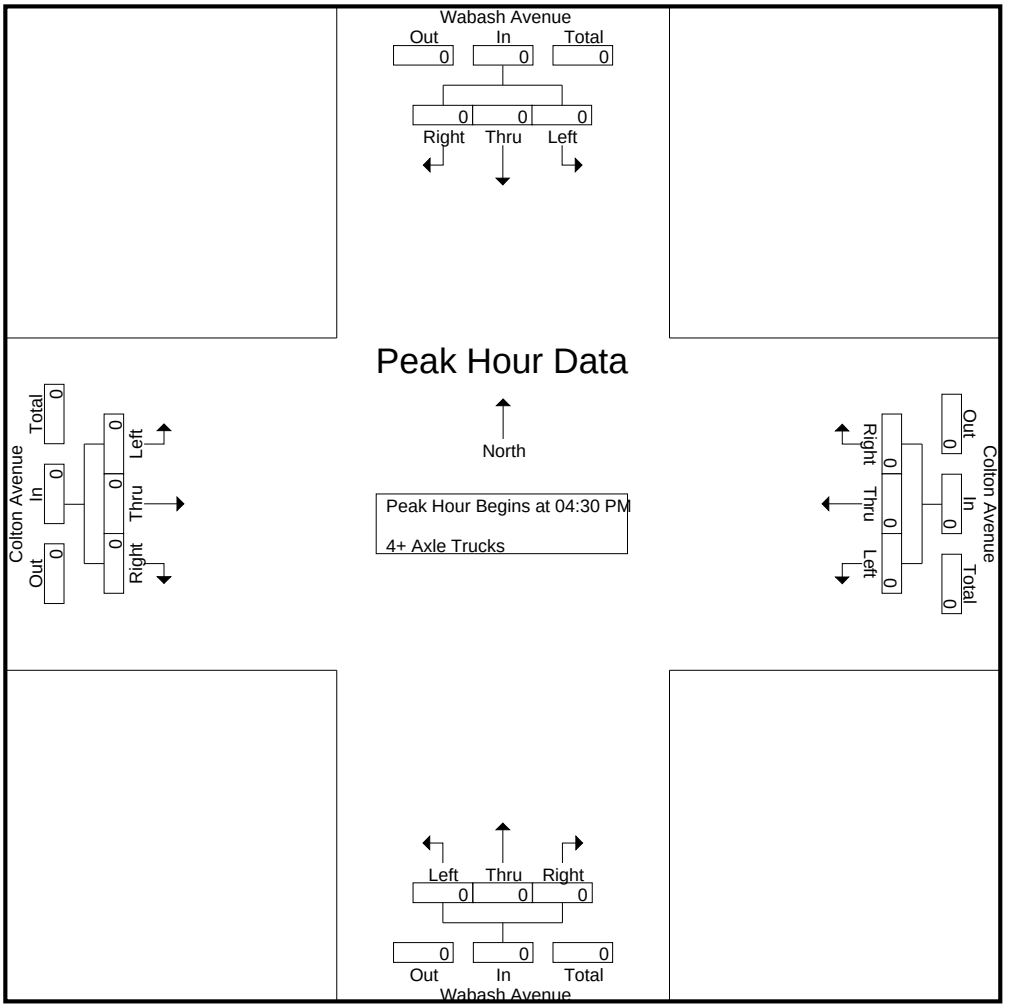
	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0		0	0	100		0	0	0		0	0	0		
Total %	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	

	Wabash Avenue Southbound				Colton Avenue Westbound				Wabash Avenue Northbound				Colton Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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City of Redlands
N/S: Wabash Avenue
E/W: Colton Avenue
Weather: Clear

File Name : 03_RED_Wab_Col PM
Site Code : 22523363
Start Date : 4/18/2023
Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

APPENDIX D

INTERSECTION LEVEL OF SERVICE WORKSHEETS

APPENDIX D

INTERSECTION LEVEL OF SERVICE WORKSHEETS

EXISTING

AM PEAK HOUR

Intersection Level Of Service Report
Intersection 1: Judson St (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	28.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.865

Intersection Setup

Name	Judson St			Judson St			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	62.00	100.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Judson St			Judson St			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	35	189	64	37	208	29	11	234	25	60	319	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	189	64	37	208	29	11	234	25	60	319	43
Peak Hour Factor	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	50	17	10	55	8	3	62	7	16	85	11
Total Analysis Volume [veh/h]	37	201	68	39	221	31	12	248	27	64	339	46
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	452	440	488	445	490	466	520
Degree of Utilization, x	0.68	0.59	0.06	0.58	0.06	0.86	0.09

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.95	3.71	0.20	3.64	0.17	8.97	0.29
95th-Percentile Queue Length [ft]	123.85	92.78	5.07	91.06	4.36	224.27	7.24
Approach Delay [s/veh]	26.13	20.76		20.50		39.39	
Approach LOS	D	C		C		E	
Intersection Delay [s/veh]	28.21						
Intersection LOS	D						

Intersection Level Of Service Report
Intersection 2: Dearborn St (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	19.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.745

Intersection Setup

Name	Dearborn St			Dearborn St			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	40.00	100.00	100.00	35.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			40.00			45.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dearborn St			Dearborn St			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	46	124	48	30	131	36	18	258	29	51	297	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	124	48	30	131	36	18	258	29	51	297	19
Peak Hour Factor	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	34	13	8	36	10	5	71	8	14	82	5
Total Analysis Volume [veh/h]	51	137	53	33	145	40	20	286	32	56	329	21
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	428	455	501	426	454	499	501	557	517	579
Degree of Utilization, x	0.12	0.30	0.11	0.08	0.32	0.08	0.61	0.06	0.74	0.04

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.40	1.25	0.35	0.25	1.36	0.26	4.04	0.18	6.33	0.11
95th-Percentile Queue Length [ft]	10.07	31.28	8.82	6.26	34.00	6.51	100.95	4.56	158.22	2.82
Approach Delay [s/veh]	12.90			13.24			19.48		26.35	
Approach LOS	B			B			C		D	
Intersection Delay [s/veh]	19.35									
Intersection LOS	C									

Intersection Level Of Service Report
Intersection 3: Wabash Ave (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.299

Intersection Setup

Name	Wabash Ave			Wabash Ave			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	108.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	110.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00			40.00			40.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			No		

Volumes

Name	Wabash Ave			Wabash Ave			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	52	180	47	121	168	50	42	255	50	39	221	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	180	47	121	168	50	42	255	50	39	221	40
Peak Hour Factor	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	50	13	34	47	14	12	71	14	11	61	11
Total Analysis Volume [veh/h]	58	200	52	134	186	55	47	283	55	43	245	44
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	522	558	581	520	557	583	528	566	584	527	564	581
Degree of Utilization, x	0.11	0.23	0.22	0.26	0.22	0.21	0.09	0.30	0.29	0.08	0.26	0.25

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.37	0.86	0.82	1.02	0.82	0.77	0.29	1.25	1.19	0.27	1.01	0.98
95th-Percentile Queue Length [ft]	9.33	21.54	20.46	25.53	20.43	19.29	7.30	31.19	29.83	6.64	25.37	24.39
Approach Delay [s/veh]	10.75			11.18			11.39			10.98		
Approach LOS	B			B			B			B		
Intersection Delay [s/veh]	11.09											
Intersection LOS	B											

PM PEAK HOUR

Intersection Level Of Service Report
Intersection 1: Judson St (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	27.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.851

Intersection Setup

Name	Judson St			Judson St			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	62.00	100.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Judson St			Judson St			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	35	189	64	37	208	29	11	234	25	60	319	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	189	64	37	208	29	11	234	25	60	319	43
Peak Hour Factor	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	50	17	10	55	8	3	62	7	16	84	11
Total Analysis Volume [veh/h]	37	199	67	39	219	31	12	247	26	63	336	45
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	455	444	492	449	495	469	524
Degree of Utilization, x	0.67	0.58	0.06	0.58	0.05	0.85	0.09

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.78	3.61	0.20	3.56	0.17	8.61	0.28
95th-Percentile Queue Length [ft]	119.54	90.19	5.03	89.08	4.15	215.36	7.02
Approach Delay [s/veh]	25.33	20.31		20.14		37.48	
Approach LOS	D	C		C		E	
Intersection Delay [s/veh]	27.19						
Intersection LOS	D						

Intersection Level Of Service Report
Intersection 2: Dearborn St (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Dearborn St			Dearborn St			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	40.00	100.00	100.00	35.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			40.00			45.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dearborn St			Dearborn St			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	46	124	48	30	131	36	18	258	29	51	297	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	124	48	30	131	36	18	258	29	51	297	19
Peak Hour Factor	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	32	13	8	34	9	5	67	8	13	78	5
Total Analysis Volume [veh/h]	48	130	50	31	137	38	19	270	30	53	310	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	442	471	519	440	469	517	515	575	529	596
Degree of Utilization, x	0.11	0.28	0.10	0.07	0.29	0.07	0.56	0.05	0.69	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.36	1.12	0.32	0.23	1.20	0.24	3.42	0.16	5.23	0.10
95th-Percentile Queue Length [ft]	9.09	27.90	7.95	5.66	30.07	5.92	85.49	4.12	130.66	2.60
Approach Delay [s/veh]	12.32			12.60			17.41		22.29	
Approach LOS	B			B			C		C	
Intersection Delay [s/veh]	17.16									
Intersection LOS	C									

Intersection Level Of Service Report
Intersection 3: Wabash Ave (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.278

Intersection Setup

Name	Wabash Ave			Wabash Ave			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	108.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	110.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00			40.00			40.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			No		

Volumes

Name	Wabash Ave			Wabash Ave			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	52	180	47	121	168	50	42	255	50	39	221	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	180	47	121	168	50	42	255	50	39	221	40
Peak Hour Factor	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	47	12	31	43	13	11	66	13	10	57	10
Total Analysis Volume [veh/h]	54	186	49	125	174	52	43	264	52	40	229	41
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	524	561	585	523	561	589	530	569	589	528	566	584
Degree of Utilization, x	0.10	0.21	0.20	0.24	0.20	0.19	0.08	0.28	0.27	0.08	0.24	0.23

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.34	0.78	0.74	0.93	0.75	0.71	0.26	1.13	1.08	0.24	0.92	0.89
95th-Percentile Queue Length [ft]	8.58	19.60	18.60	23.13	18.68	17.63	6.59	28.22	26.98	6.12	23.10	22.21
Approach Delay [s/veh]	10.56			10.94			11.11			10.77		
Approach LOS	B			B			B			B		
Intersection Delay [s/veh]	10.86											
Intersection LOS	B											

EXISTING PLUS PROJECT

AM PEAK HOUR

Intersection Level Of Service Report
Intersection 1: Judson St (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	33.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.932

Intersection Setup

Name	Judson St			Judson St			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	62.00	100.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Judson St			Judson St			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	35	189	64	37	208	29	11	234	25	60	319	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	9	0	0	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	189	64	37	208	29	11	243	25	60	343	43
Peak Hour Factor	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417	0.9417
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	50	17	10	55	8	3	65	7	16	91	11
Total Analysis Volume [veh/h]	37	201	68	39	221	31	12	258	27	64	364	46
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	439	428	474	435	479	459	511
Degree of Utilization, x	0.70	0.61	0.07	0.62	0.06	0.93	0.09

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.25	3.90	0.21	4.09	0.18	10.88	0.30
95th-Percentile Queue Length [ft]	131.37	97.62	5.24	102.16	4.47	271.96	7.38
Approach Delay [s/veh]	28.05	21.91		22.36		50.40	
Approach LOS	D	C		C		F	
Intersection Delay [s/veh]	33.25						
Intersection LOS	D						

Intersection Level Of Service Report
Intersection 2: Dearborn St (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	22.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.817

Intersection Setup

Name	Dearborn St			Dearborn St			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	40.00	100.00	100.00	35.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			40.00			45.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dearborn St			Dearborn St			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	46	124	48	30	131	36	18	258	29	51	297	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	9	0	5	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	124	50	30	131	36	18	267	29	56	321	19
Peak Hour Factor	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030	0.9030
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	34	14	8	36	10	5	74	8	16	89	5
Total Analysis Volume [veh/h]	51	137	55	33	145	40	20	296	32	62	355	21
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	417	443	487	415	441	484	490	543	510	571
Degree of Utilization, x	0.12	0.31	0.11	0.08	0.33	0.08	0.65	0.06	0.82	0.04

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.41	1.30	0.38	0.26	1.41	0.27	4.52	0.19	7.96	0.11
95th-Percentile Queue Length [ft]	10.37	32.47	9.50	6.44	35.34	6.72	112.98	4.69	199.07	2.86
Approach Delay [s/veh]	13.26			13.66			21.30		32.87	
Approach LOS	B			B			C		D	
Intersection Delay [s/veh]	22.46									
Intersection LOS	C									

Intersection Level Of Service Report
Intersection 3: Wabash Ave (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.303

Intersection Setup

Name	Wabash Ave			Wabash Ave			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	108.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	110.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00			40.00			40.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			No		

Volumes

Name	Wabash Ave			Wabash Ave			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	52	180	47	121	168	50	42	255	50	39	221	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	3	10	15	0	3	0	0	1	1
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	184	47	124	178	65	42	258	50	39	222	41
Peak Hour Factor	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	51	13	34	49	18	12	72	14	11	62	11
Total Analysis Volume [veh/h]	58	204	52	138	198	72	47	286	55	43	246	46
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	521	556	579	519	555	586	527	564	582	525	562	580
Degree of Utilization, x	0.11	0.23	0.22	0.27	0.24	0.23	0.09	0.30	0.29	0.08	0.26	0.25

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.37	0.88	0.84	1.06	0.95	0.88	0.29	1.27	1.21	0.27	1.03	0.99
95th-Percentile Queue Length [ft]	9.35	22.04	20.96	26.59	23.66	22.09	7.32	31.73	30.37	6.66	25.80	24.78
Approach Delay [s/veh]	10.81			11.36			11.46			11.03		
Approach LOS	B			B			B			B		
Intersection Delay [s/veh]	11.19											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 4: Wabash Ave (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Wabash Ave		Wabash Ave		Project North Dwy	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		40.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wabash Ave		Wabash Ave		Project North Dwy	
Base Volume Input [veh/h]	0	262	339	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	3	1	1	3	15
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	265	340	1	3	15
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	72	92	0	1	4
Total Analysis Volume [veh/h]	3	288	370	1	3	16
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	8.01	0.00	0.00	0.00	12.49	9.46
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.00	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft/ln]	0.19	0.00	0.00	0.00	1.95	1.95
d_A, Approach Delay [s/veh]	0.08		0.00		9.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.31					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Wabash Ave (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Wabash Ave		Wabash Ave		Project South Dwy	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		40.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wabash Ave		Wabash Ave		Project South Dwy	
Base Volume Input [veh/h]	0	262	339	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	3	15	1	3	12
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	265	354	1	3	12
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	72	96	0	1	3
Total Analysis Volume [veh/h]	2	288	385	1	3	13
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	8.05	0.00	0.00	0.00	12.61	9.49
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.01	0.00	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft/ln]	0.13	0.00	0.00	0.00	1.69	1.69
d_A, Approach Delay [s/veh]	0.06		0.00		10.07	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.26					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Project Dwy (NS) at Colton Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Project Dwy		Colton Ave		Colton Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	1	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	120.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Project Dwy		Colton Ave		Colton Ave	
Base Volume Input [veh/h]	0	0	0	347	323	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	14	11	0	15	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	14	11	347	338	1
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	4	3	94	92	0
Total Analysis Volume [veh/h]	3	15	12	377	367	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.02	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.22	9.45	8.01	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.08	0.08	0.02	0.01	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.90	1.90	0.50	0.25	0.00	0.00
d_A, Approach Delay [s/veh]	10.07		0.25		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.36					
Intersection LOS	B					

PM PEAK HOUR

Intersection Level Of Service Report
Intersection 1: Judson St (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	32.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.914

Intersection Setup

Name	Judson St			Judson St			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	62.00	100.00	100.00	50.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Judson St			Judson St			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	35	189	64	37	208	29	11	234	25	60	319	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	28	0	0	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	189	64	37	208	29	11	262	25	60	336	43
Peak Hour Factor	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	50	17	10	55	8	3	69	7	16	89	11
Total Analysis Volume [veh/h]	37	199	67	39	219	31	12	276	26	63	354	45
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	437	427	472	438	482	457	508
Degree of Utilization, x	0.69	0.60	0.07	0.66	0.05	0.91	0.09

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.19	3.87	0.21	4.62	0.17	10.28	0.29
95th-Percentile Queue Length [ft]	129.65	96.69	5.25	115.56	4.27	257.00	7.25
Approach Delay [s/veh]	27.90	21.85		24.14		47.33	
Approach LOS	D	C		C		E	
Intersection Delay [s/veh]	32.32						
Intersection LOS	D						

Intersection Level Of Service Report
Intersection 2: Dearborn St (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	19.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.741

Intersection Setup

Name	Dearborn St			Dearborn St			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	1	0	0	1	0	0	1
Entry Pocket Length [ft]	40.00	100.00	100.00	35.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	35.00			40.00			45.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dearborn St			Dearborn St			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	46	124	48	30	131	36	18	258	29	51	297	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	0	0	0	0	28	0	3	17	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	124	54	30	131	36	18	286	29	54	314	19
Peak Hour Factor	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	32	14	8	34	9	5	75	8	14	82	5
Total Analysis Volume [veh/h]	48	130	56	31	137	38	19	299	30	56	328	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	428	456	501	426	454	499	505	562	518	581
Degree of Utilization, x	0.11	0.29	0.11	0.07	0.30	0.08	0.63	0.05	0.74	0.03

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	1.16	0.37	0.23	1.26	0.25	4.30	0.17	6.26	0.11
95th-Percentile Queue Length [ft]	9.40	29.11	9.37	5.86	31.46	6.16	107.58	4.22	156.54	2.67
Approach Delay [s/veh]	12.70			13.05			20.15		26.12	
Approach LOS	B			B			C		D	
Intersection Delay [s/veh]	19.48									
Intersection LOS	C									

Intersection Level Of Service Report
Intersection 3: Wabash Ave (NS) at Colton Ave (EW)

Control Type:	All-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.281

Intersection Setup

Name	Wabash Ave			Wabash Ave			Colton Ave			Colton Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	108.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	110.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00			40.00			40.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			No		

Volumes

Name	Wabash Ave			Wabash Ave			Colton Ave			Colton Ave		
Base Volume Input [veh/h]	52	180	47	121	168	50	42	255	50	39	221	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	11	0	2	7	10	0	2	0	0	3	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	191	47	123	175	60	42	257	50	39	224	43
Peak Hour Factor	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660	0.9660
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	49	12	32	45	16	11	67	13	10	58	11
Total Analysis Volume [veh/h]	54	198	49	127	181	62	43	266	52	40	232	45
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	523	560	582	521	559	589	529	566	585	527	564	583
Degree of Utilization, x	0.10	0.22	0.21	0.24	0.22	0.21	0.08	0.28	0.27	0.08	0.25	0.24

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.34	0.84	0.80	0.95	0.82	0.77	0.26	1.15	1.10	0.25	0.96	0.92
95th-Percentile Queue Length [ft]	8.60	20.93	19.92	23.71	20.54	19.25	6.62	28.65	27.40	6.14	23.97	22.99
Approach Delay [s/veh]	10.68			11.06			11.18			10.86		
Approach LOS	B			B			B			B		
Intersection Delay [s/veh]	10.96											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 4: Wabash Ave (NS) at Project North Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Wabash Ave		Wabash Ave		Project North Dwy	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		40.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wabash Ave		Wabash Ave		Project North Dwy	
Base Volume Input [veh/h]	0	262	339	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	2	3	3	2	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	264	342	3	2	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	72	93	1	1	3
Total Analysis Volume [veh/h]	10	287	372	3	2	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	8.04	0.00	0.00	0.00	12.67	9.43
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.03	0.00	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft/ln]	0.63	0.00	0.00	0.00	1.33	1.33
d_A, Approach Delay [s/veh]	0.27		0.00		9.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.31					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 5: Wabash Ave (NS) at Project South Dwy (EW)

Control Type:	Two-way stop	Delay (sec / veh):	12.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Wabash Ave		Wabash Ave		Project South Dwy	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		40.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Wabash Ave		Wabash Ave		Project South Dwy	
Base Volume Input [veh/h]	0	262	339	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	9	10	3	2	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	271	349	3	2	9
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	74	95	1	1	2
Total Analysis Volume [veh/h]	7	295	379	3	2	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	8.05	0.00	0.00	0.00	12.70	9.45
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft/ln]	0.44	0.00	0.00	0.00	1.25	1.25
d_A, Approach Delay [s/veh]	0.19		0.00		9.99	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.25					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 6: Project Dwy (NS) at Colton Ave (EW)

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Project Dwy		Colton Ave		Colton Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	1	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	120.00	0.00	0.00
Speed [mph]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Project Dwy		Colton Ave		Colton Ave	
Base Volume Input [veh/h]	0	0	0	347	323	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	10	34	0	10	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	10	34	347	333	3
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	3	9	94	90	1
Total Analysis Volume [veh/h]	2	11	37	377	362	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.03	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.95	9.40	8.03	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.06	0.06	0.06	0.03	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.38	1.38	1.57	0.79	0.00	0.00
d_A, Approach Delay [s/veh]	10.10		0.72		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.54					
Intersection LOS	B					



GANDDINI GROUP INC.

714.795.3100 | ganddini.com

April 7, 2023

Ms. Pam Steele
MIG INC.
1650 Spruce Street, Suite 106
Riverside, California 92507

RE: Madera at Citrus Trail Vehicle Miles Traveled (VMT) Screening Assessment
Project No. 19620

Dear Ms. Steele:

Ganddini Group, Inc. is pleased to provide this Vehicle Miles Traveled (VMT) Screening Assessment for the proposed Madera at Citrus Trail project in the City of Redlands. The purpose of this screening assessment is to provide a preliminary review of the proposed project's potential for vehicle miles traveled (VMT) impacts with respect to California Environmental Quality Act (CEQA) requirements. We trust the findings of this analysis will aid you and the City of Redlands in assessing the project.

PROJECT DESCRIPTION

The 9.0-acre project site (APN 0168-291-02) is located at the northwest corner of Wabash Avenue and Colton Avenue in the City of Redlands, California. The project site is currently zoned residential and undeveloped. The proposed project involves a General Plan Amendment (GPA-0474) associated with the Zoning change (ZC-0474) from Low Density Residential (R1) to Medium Density Residential (R2) for the Tentative Tract Map (TTM20571) and Conditional Use Permit (CUP1171) of the development.

The proposed project includes the construction of a 103-dwelling unit single-family residential development. Vehicle access to the proposed project will be provided by three driveways one on Colton Avenue and two on Wabash Avenue. The proposed site plan is shown in Attachment A.

PROJECT TRIPS

Table 1 shows the proposed project trips based on trip generation rates obtained from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition, 2021) for Land Use Codes 210 (Single-family Detached Housing) and 215 (Single-family Attached Housing).

As shown in Table 1, the proposed project is forecast to generate a total of approximately 918 daily trips, including 67 trips during the AM peak hour and 88 trips during the PM peak hour.

VEHICLE MILES TRAVELED (VMT) SCREENING CRITERIA (CEQA)

The project VMT screening assessment has been prepared in accordance with the City of Redlands *CEQA Assessment VMT Analysis Guidelines*, June 2020 [City VMT Guidelines], which were developed based on guidance from the Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA* (State of California, December 2018) ["OPR Technical Advisory"]. In general terms, VMT quantifies the amount and distance of automobile travel attributable to a project or region. The OPR Technical

Advisory provides technical considerations regarding methodologies and thresholds with a focus on office, residential, and retail developments as these projects tend to have the greatest influence on VMT.

The City VMT Guidelines identify screening criteria for certain types of projects that typically reduce VMT and may be presumed to result in a less than significant VMT impact. To qualify for VMT screening, the project need only satisfy one of the following screening criteria:

- Transit Priority Area (TPA) Screening
  - Projects located within one-half mile radius of major transit stop[1] or high-quality transit corridor[2]
- Low VMT Area Screening
  - Site location can be verified with the web-based or map-based VMT Screening Tool[3]
- Project Type Screening
  - Local serving land use
  - Projects generating less than 3,000 metric ton of carbon-dioxide equivalents per year (MTCO2e/yr)[4]

TRANSIT PRIORITY AREA (TPA) SCREENING

Projects located within a TPA, defined as within one-half mile of a major transit stop or high-quality transit corridor, may be presumed to result in a less than significant VMT impact absent substantial evidence to the contrary. This presumption may not apply, however, if the project:

1. Has a Floor Area Ratio (FAR) of less than 0.75.
2. Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
3. Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the jurisdiction with input from the Metropolitan Planning Organization): or
4. Replaces affordable residential units with a smaller number of moderate or high-income residential units.

Based on a review of the San Bernardino County Transpiration Authority (SBCTA) VMT Screening Tool, the proposed project is not located within a TPA; therefore, the project does not satisfy the TPA screening criteria.

LOW VMT AREA SCREENING

Residential and office projects located within a low VMT generating area may be presumed to have a less than significant impact absent substantial evidence to the contrary. In addition, other employment-related and mixed-use land use projects may qualify for the use of screening if the project can reasonably be expected to generate VMT per resident, per worker, or per service population (residential plus employment) that is similar to the existing land uses in the low VMT area.

As prescribed in the City VMT Guidelines, the San Bernardino County Transpiration Authority (SBCTA) VMT Screening Tool was used to assess low VMT area screening for the project. The SBCTA VMT Screening Tool

[1] A major transit stop is defined as an existing rail transit station, ferry terminal with bus or rail service, or the intersection of two or more major bus routes with less than 15-minute headways during the peak commute hours (Pub. Resources Code, § 21064.3.).

[2] Fixed route bus service with less than 15-minute headways during the peak commute hours (Pub. Resources Code, § 21155).

[3] The SBCTA VMT Screening Tool was developed from the San Bernardino Transportation Analysis Model (SBTAM) travel forecasting model to measure VMT performance for individual jurisdictions and for individual traffic analysis zones (TAZs).

[4] As identified in the City of Redlands VMT Guideline "Attachment 1 *Substantial Evidence for Trip-Based Screening Threshold*'

was developed using the county travel forecasting model to measure VMT performance for individual jurisdictions and for individual traffic analysis zones (TAZs) within the SBCTA region. TAZs are geographic polygons similar to census block groups used to represent areas of homogenous travel behavior. Total daily VMT per service population was estimated for each TAZ. This presumption may not be appropriate if the project land uses would alter the existing built environment in such a way as to increase the rate or length of vehicle trips.

The proposed project is consistent with existing land uses in the project TAZ, and there does not appear to be anything unique about the project that would otherwise be mis-represented utilizing the data from the VMT Screening Tool. Since the proposed project consists of residential uses only, the proposed project would satisfy the low VMT screening criteria if it is located in a TAZ where the average total daily origin-destination VMT per service population is 15 percent (15%) below the County regional average total daily origin-destination VMT per service population.

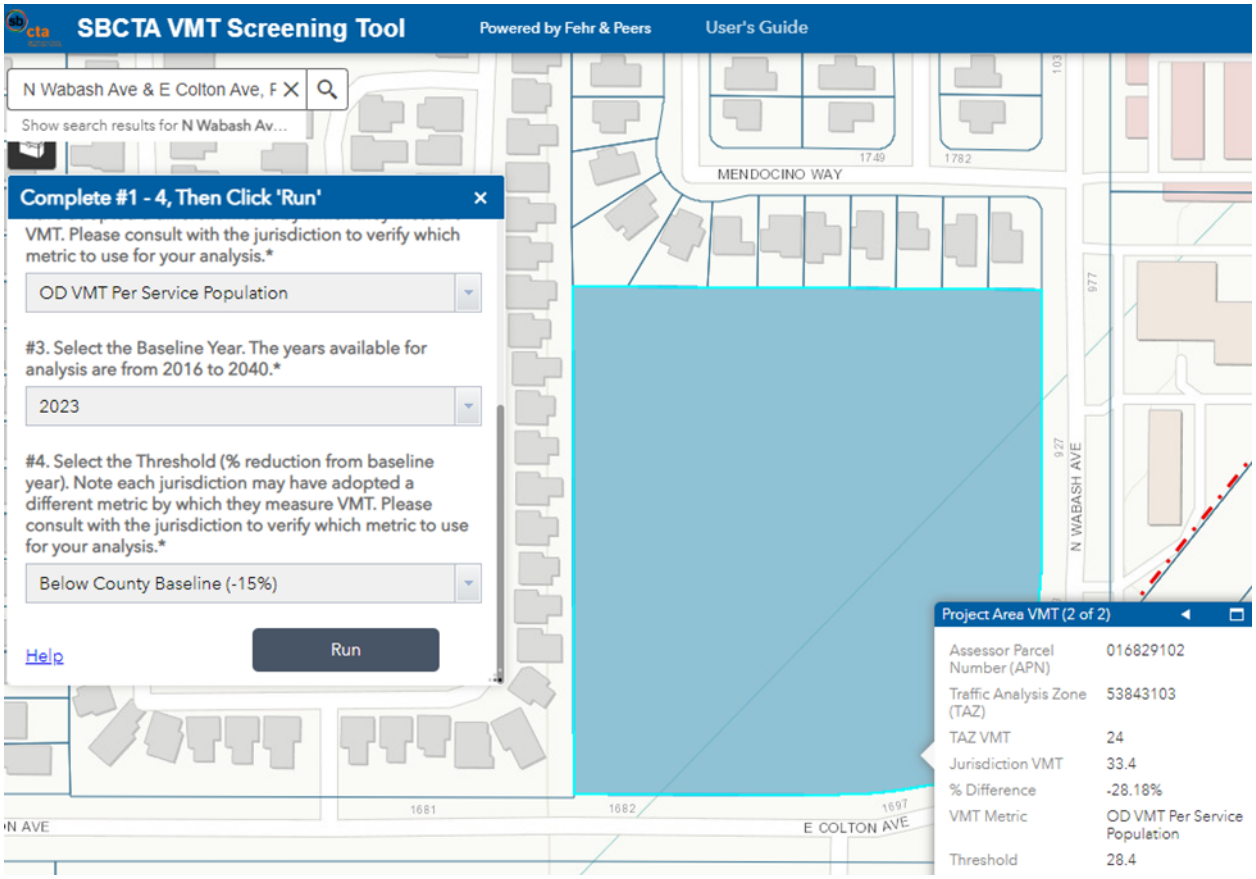


Exhibit A – SBCTA VMT Screening Tool Results

Exhibit A shows the SBCTA VMT Screening Tool results for the project site. which is located in TAZ 53843103. As shown in Exhibit A, the baseline year (2023) origin-destination average daily VMT per service population for the project TAZ is equal to 24.0, which is less than 15 percent (15%) below the County baseline (28.4 VMT per service population). Therefore, the proposed project satisfies the City of Redlands established screening criteria for projects located in a low VMT area, and the project can be presumed to result in a less than significant VMT impact.

PROJECT TYPE SCREENING

Some project types have been identified as having the presumption of a less than significant impact as they are local serving by nature, or they are small enough to not warrant assessment.

Local serving retail projects with stores less than 50,000 square feet may be presumed to have a less than significant impact absent substantial evidence to the contrary. Local serving retail generally improves the convenience of shopping close to home and has the effect of reducing vehicle travel. In addition to local serving retail, the following uses can also be presumed to have a less than significant impact absent substantial evidence to the contrary as their uses are local serving in nature:

- Local-serving K-12 schools
- Local Parks
- Day care centers
- Local-serving gas stations
- Local-serving banks
- Local-serving hotels (e.g., non-destination hotels)
- Student housing projects on or adjacent to a college campus
- Local-serving assembly uses (places of worship, community organizations)
- Community institutions (public libraries, fires stations, local government)
- Local-serving community colleges that are consistent with the assumptions noted in the RTP/SCS
- Affordable or supportive housing
- Assisted living facilities
- Senior housing (as defined by HUD)
- Projects which generate less than 3,000 MTCO2e per year can be presumed to have a less than significant impact on VMT. Projects which generate less than 3,000 MTCO2e per year[5] include the following:
  - Single-family residential – 167 dwelling units or fewer
  - Multi-family residential (1-2 stories) – 232 dwelling units or fewer
  - Multi-family residential (3+ stories) – 299 dwelling units or fewer
  - Office – 59,100 square feet or less
  - Local-serving retail center – 112,400 square feet or less (no stores larger than 50,000 square feet)
  - Warehousing – 463,400 square feet or less
  - Light industrial – 74,600 square feet or less

As previously shown in Table 1, the proposed project consists of less than 167 single-family dwelling units; therefore, the proposed project satisfies the City-established project type screening criteria and may be presumed to result in a less than significant VMT impact.

CONCLUSIONS

The proposed project is forecast to generate a total of approximately 918 daily trips, including 67 trips during the AM peak hour and 88 trips during the PM peak hour.

[5] Based on CALEEMod calculations using ITE trip generation rates and SBTAM trip lengths, project size for a variety of land uses which would generate less than the SCAQMD (South Coast Air Quality Management District) threshold of 3,000 metric tons of CO2 equivalents per year was determined.

Ms. Pam Steele
MIG INC.
April 7, 2023

The proposed project satisfies the City-established for low VMT area screening and project type screening criteria as adopted by the City of Redlands and is presumed to result in a less than significant VMT impact.

It has been a pleasure to assist you with this project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 795-3100 x 103.

Sincerely,
GANDDINI GROUP, INC.

Perrie Ilercil, P.E. (AZ)
Senior Engineer



Giancarlo Ganddini, PE, PTP
Principal

Table 1
Project Trip Generation

Trip Generation Rates									
			AM Peak Hour			PM Peak Hour			
Land Use	Source[1]	Land Use Variable[2]	% In	% Out	Rate	% In	% Out	Rate	Daily Rate
Single-Family Detached Housing	ITE 210	DU	26%	74%	0.70	63%	37%	0.94	9.43
Single-Family Attached Housing	ITE 215	DU	31%	69%	0.48	57%	43%	0.57	7.20

Trips Generated									
			AM Peak Hour			PM Peak Hour			
Land Use	Source	Quantity	In	Out	Total	In	Out	Total	Daily
Single-Family Detached Housing	ITE 210	79 DU	14	41	55	47	27	74	745
Single-Family Attached Housing	ITE 215	24 DU	4	8	12	8	6	14	173
TOTAL TRIPS GENERATED		**103 DU**	**18**	**49**	**67**	**55**	**33**	**88**	**918**

Notes:
1. ITE = Institute of Transportation Engineers *Trip Generation Manual* (11th Edition, 2021); ### = Land Use Code.
   All rates based on General Urban/Suburban setting unless otherwise noted.
2. DU = Dwelling Units

ATTACHMENT A

SITE PLAN



PLANT LIST

SYMBOL	BOTANICAL NAME	COMMON NAME	WUCOLS (Zone 3)	SIZE
	TREES			
	Acacia stenophylla	Shoestring Acacia	L	24" Box
	Magnolia grandiflora 'Alta'	Southern Magnolia	M	24" Box
	Cercidium hyb. 'Desert Museum'	Hybrid Palo Verde	L	24" Box
	Arbutus 'Marina'	Strawberry Tree	L	24" Box
	Bauhinia purpurea	Orchid Tree	M	24" Box
	Lagerstroemia hybrids 'Natchez'	Crape Myrtle (White)	M	24" Box
	Cupressus sempervirens 'Monshel'	Tiny Tower Cypress	L	24" Box
	Strelitzia nicholai	Giant Bird-of-Paradise	M	24" Box
	Cedrus deodara	Deodar Cedar	L	24" Box
	Citrus sinensis	Orange Trees	M	24" Box
	Geijera parviflora	Australian Willow	L	24" Box
	Jacaranda mimosifolia	Jacaranda	M	36" Box
	Schinus molle	California Pepper Tree	L	36" Box
	Ulmus parvifolia 'True Green'	Evergreen Elm	M	24" Box
	PALMS			
	Phoenix dactylifera	Date Palm	L	16' BTH
	Washingtonia robusta	Mexican Fan Palm	L	24" Box
	Brahea armata	Mexican Blue Palm	L	24" Box
	Syagrus romanzoffianum	Queen Palm	M	24" Box
	SHRUBS			
	Agave 'Blue Flame'	Blue Flame Agave	L	5G
	Agave desmettiana ' Variegata'	Dwarf Century Plant	L	5G
	Aloe arborescens	Tree Aloe	L	15G
	Bougainvillea 'La Jolla'	Bougainvillea	L	5G
	Buxus microphylla japonica	Japanese Boxwood	M	1G
	Carex divulsa	Berkeley Sedge	L	5G
	Carissa grandiflora 'Green Carpet'	Natal Plum	L	1G
	Chondropetalum tectorum	Cape Rush	L	5G
	Cordyline australis 'Red Star'	Red Grass Palm	L	15G
	Dianella revoluta 'DR5000'	Little Rev Flax Lily	M	1G
	Dianella tasmanica 'Silver Streak'	Silver Streak Flax Lily	M	5G
	Hesperaloe parviflora	Red Yucca	L	5G
	Ilex crenata 'Sky Pencil'	Sky Pencil Ilex	M	15G
	Juniperus scopulorum 'Skyrocket'	Skyrocket Juniper	M	15G
	Lantana hybrids 'New Gold'	New Gold Lantana	L	5G
	Ligustrum japonicum 'Texanum'	Wax Leaf Privet	M	5G
	Miscanthus sinensis 'Strictus'	Porcupine Grass	M	5G
	Olea europaea 'Montra' P.P.#6266	Little Ollie Dwarf Olive	L	5G
	Podocarpus elongatus 'Monmal'	Icee Blue Yellow-Wood	M	15G
	Rhaphiolepis indica 'Clara'	Dwarf Indian Hawthorne	M	5G
	Rosa f. 'Trumpeter'	Trumpeter Rose	M	5G
	Senecio mandraliscae	Blue Chalk Sticks	L	Root Cut
	Stipa tenuissima	Mexican Feather Grass	L	5G
	Tecoma stans 'Sierra Apricot'	Sierra Apricot	L	5G
	Trachelospermum jasminoides	Star Jasmine	M	5G
	Westringia 'Wynyabbie Gem'	Coast Rosemary	L	5G
	Yucca gloriosa	Spanish Dagger	L	5G
	Yucca recurvifolia	Pendulous Yucca	L	5G

LEGEND

1. COMMUNITY PARK
   - TOT LOT
   - DOG PARK
   - BBQ AREA
   - VINE COVERED SHADE STRUCTURE
2. COMMON AREA LANDSCAPE (TYP.)
3. PRIVATE OPEN SPACE (TYP.)
4. MOTOR COURT (SEE SHEET L2 FOR ENLARGEMENT)
5. COMMUNITY MONUMENTATION
6. ENTRANCE TO "ORANGE-BLOSSOM TRAIL"

MADERA AT CITRUS TRAIL

CONCEPTUAL LANDSCAPE PLAN

L1

0' 15' 30' 60'

SITESCAPES
Landscape Architecture & Planning
3190-B2 Airport Loop Drive
Costa Mesa, CA 92626
Richard Palhamus, License # 3782
(949) 544-9370 FAX (714) 210-3140

JOB# 22-026 DATE: 07-29-22

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Development Services Department
Planning Division

Notice of Project Application (SB 18)

In accordance with Senate Bill 18, Government Code §65352.3 and §65352.4, the City of Redlands is sending this notice to inform California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of avoiding, protecting, and/or mitigating impacts to cultural places when creating or amending General Plans, Specific Plans and Community Plans. Pursuant to Government Code § 65352.3(a)(2) if you wish to initiate consultation on this proposed project, please send a consultation request within ninety (90) days of receiving this notification to me via e-mail at bfoote@cityofredlands.org or by U.S. Postal Service (USPS) to the attention of Brian Foote, City Planner, P.O. Box 3005, Redlands, CA 92373. You may also reach me via phone by calling the Planning Division at (909) 798-7555, ext. 2. If you prefer to meet with the City of Redlands (Lead Agency) in person, please contact me and I will arrange a meeting.

DATE OF NOTICE: November 17, 2022

PROJECT TITLE: Madera at Citrus Trail Project (Tentative Tract Map No. 20571)

PROJECT APPLICANT: Urban Environs

PROJECT DESCRIPTION: A request to subdivide a 9-acre site into a small lot subdivision with 103 single-family residences, a 0.63-acre recreational open space, and associated site improvements.

PROJECT LOCATION: The project is located at the northwest corner of Wabash Avenue and Colton Avenue in the Single-Family Residential (R-1) zone.

ASSESSOR'S PARCEL NUMBER(S): (APN: 0168-291-02-0000)

PROJECT INVOLVES GROUND DISTURBANCE: Yes

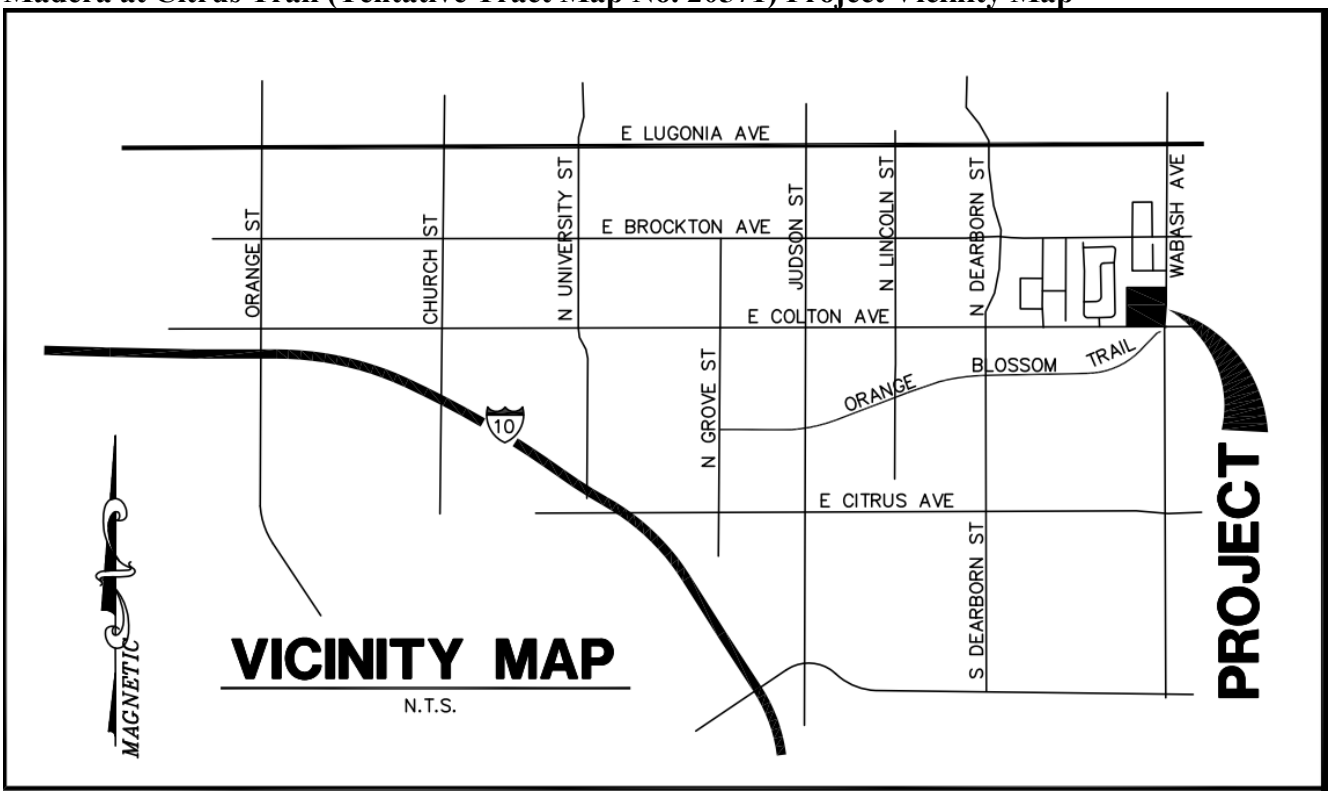
LOCAL GOVERNMENT/LEAD AGENCY:	City of Redlands, Development Services Dept.
CONTACT PERSON:	Brian Foote, Planning Manager
PHONE:	(909) 798-7555, ext. 2
E-MAIL:	bfoote@cityofredlands.org
MAILING ADDRESS:	Development Services Department Planning Division P.O. Box 3005 Redlands, CA 92373

Should you have any questions regarding this case, please do not hesitate to contact the Planner listed above. If you request consultation in accordance with State law, the City will respond to the request for consultation within 30 days of receipt of your request. If no response is received from you, the City may proceed with the entitlement process.

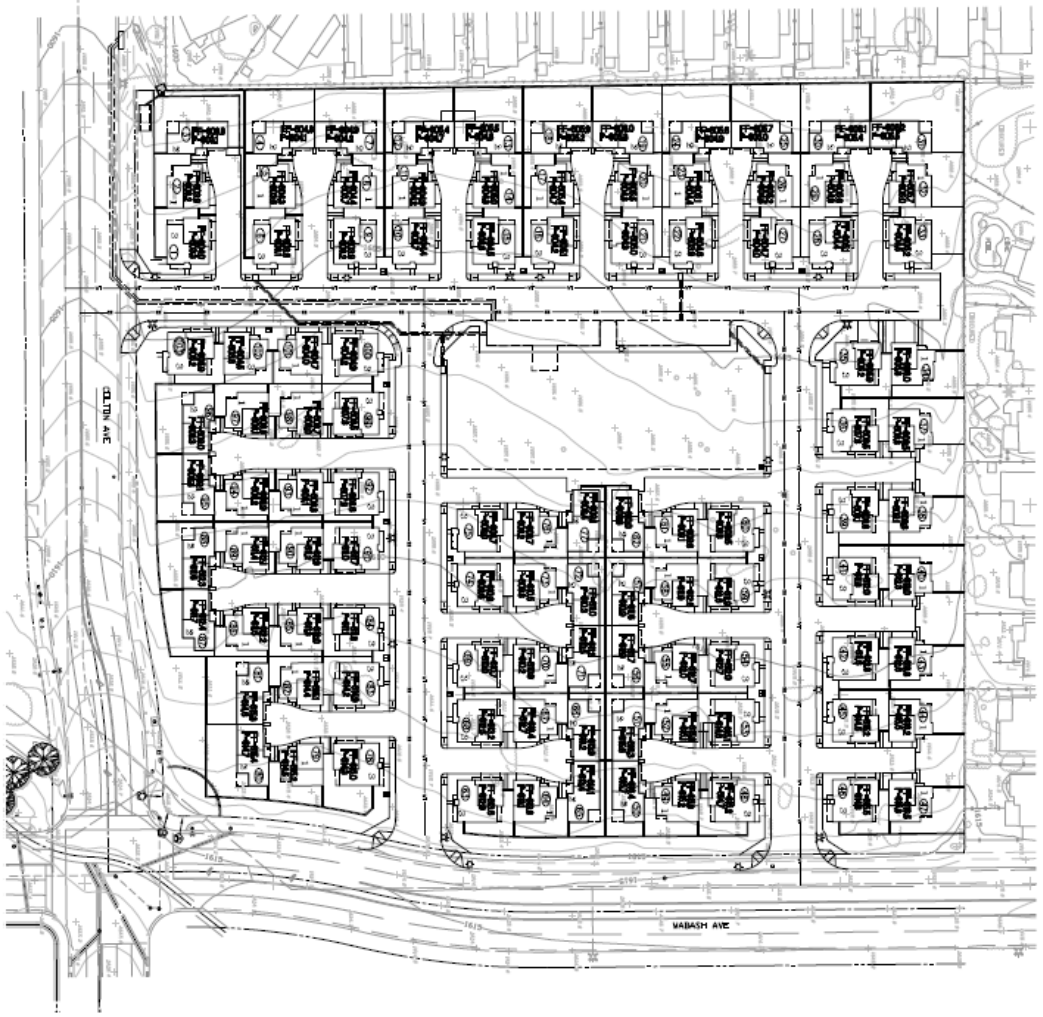
Enclosures:

A. Project Vicinity Map
B. One electronic file transfer link that is valid for the next 30-days (through December 17, 2022) with the following:
    a. Preliminary Water Quality Management Plan – https://eFTP.mbakerintl.com/link/IlREDyt6h0bIgild8oJ5ZG
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    c. Tentative Tract Map and Water Quality Management Plan Site Map – https://eFTP.mbakerintl.com/link/g6PH1Q6DOh0gd1aBzVqxlv
    d. Biological Technical Report – https://eFTP.mbakerintl.com/link/gyJRBJ7sPCYiL5Qgcj9Ogy
    e. Cultural Resources Report – https://eFTP.mbakerintl.com/link/lBGMEaYG5CbFtrD4GDGEXi
    f. Conceptual Design Package – https://eFTP.mbakerintl.com/link/aicFbagHVYby7uN8LuxZre
    g. Conceptual Design Material Board – https://eFTP.mbakerintl.com/link/AskfN7N7iRYUKxiii0YTT1
    h. Conceptual Landscape Plan – https://eFTP.mbakerintl.com/link/6jISGdXDCNr2b2m9fFaQCj
    i. Preliminary Geotechnical Investigation Report – https://eFTP.mbakerintl.com/link/Nd0nVeuUBXC5GeUmZisPyP
    j. Title Report – https://eFTP.mbakerintl.com/link/NfgPUyo7pgQeG2U3AoqUIa

Madera at Citrus Trail (Tentative Tract Map No. 20571) Project Vicinity Map



Madera at Citrus Trail (Tentative Tract Map No. 20571) Site Plan



PROJECT SUMMARY

6.715 ACRES
15.33 DU/ACRE
103 TOTAL UNITS

PRODUCT 1
40 UNITS
1,544 SF

PRODUCT 2
27 UNITS
1,700 SF

PROCUCT 3
36 UNITS
1,858 SF

PARKING SUMMARY
70 GUEST STALLS
206 GARAGE STALLS
276 TOTAL STALLS

MIX SUMMARY
PRODUCT 1 – 40 UNITS 38.8%
PRODUCT 2 – 27 UNITS 26.2%
PRODUCT 3 – 36 UNITS 35.0%

SITE PLAN NOTES

1. THIS ARCHITECTURAL SITE PLAN IS PROVIDED TO SHOW MINIMUM DISTANCE BETWEEN ADJACENT BUILDINGS, ADJACENT PROPERTY LINES OR PROPERTY LINES AS REQUIRED BY THE UNIFORM BUILDING CODE. SEE SA. REFER TO THE CIVIL ENGINEERING DOCUMENTS FOR SPECIFIC BUILDING LOCATIONS.

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4. FINISH GRADE AROUND THE STRUCTURE SHALL SLOPE AWAY FROM THE FOUNDATION A MINIMUM OF 5% FOR A MINIMUM DISTANCE OF 10 FEET PER CBC.

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14. REFER TO LANDSCAPE PLANS FOR PAVED AREA SEALING CALCULATION AND SOLAR REFLECTANCE INFO. AUTOMATIC IRRIGATION CONTROLLER TYPE (WEATHER OR SOIL BASED) TO COMPLY WITH CGBSC 4.106.7 AND 4.304.1.

15. LANDSCAPE CERTIFICATION FORM SHALL BE COMPLETED PRIOR TO FINAL INSPECTION APPROVAL. SEE LANDSCAPE PLANS.

GRAPHIC SCALE

SITE PLAN

Soni 2012 Irrevocable Trusts
1423 Georgina Avenue Santa Monica
Santa Monica, CA 90402
(949) 922-7075
Contact: Vanita Soni Pant

CA ENGINEERING, INC.
Planning · Engineering · Surveying
1001 BONPORT AVE., STE 110
TUSTIN, CA 92782
949-734-5400 949-734-5454 FAX

SHEET C12
JU 00 0000
JOB NO. 816-1
SHEET NO. 1 OF 2 SHTS.

City of REDLANDS "A City That Works"

Development Services Department
Planning Division

Notice of Project Application (AB 52)

In accordance with Assembly Bill 52, the City of Redlands is sending this notice to inform California Native American tribes that have requested such notice of a project application within a geographic area with which the tribe is traditionally and culturally affiliated. California Public Resources Code §21080.3.1 requires this notice within 14 days of the City determining this application is complete and/or after the City has decided to undertake a project. California Native American tribes have 30 days from the date of this notice to request consultation with the City regarding this project.

DATE OF NOTICE: November 17, 2022

PROJECT TITLE: Madera at Citrus Trail Project (Tentative Tract Map No. 20571)

PROJECT APPLICANT: Urban Environs

PROJECT DESCRIPTION: A request to subdivide a 9-acre site into a small lot subdivision with 103 single-family residences, a 0.63-acre recreational open space, and associated site improvements.

PROJECT LOCATION: The project is located at the northwest corner of Wabash Avenue and Colton Avenue in the Single-Family Residential (R-1) zone.

ASSESSOR'S PARCEL NUMBER(S): (APN: 0168-291-02-0000)

PROJECT INVOLVES GROUND DISTURBANCE: Yes

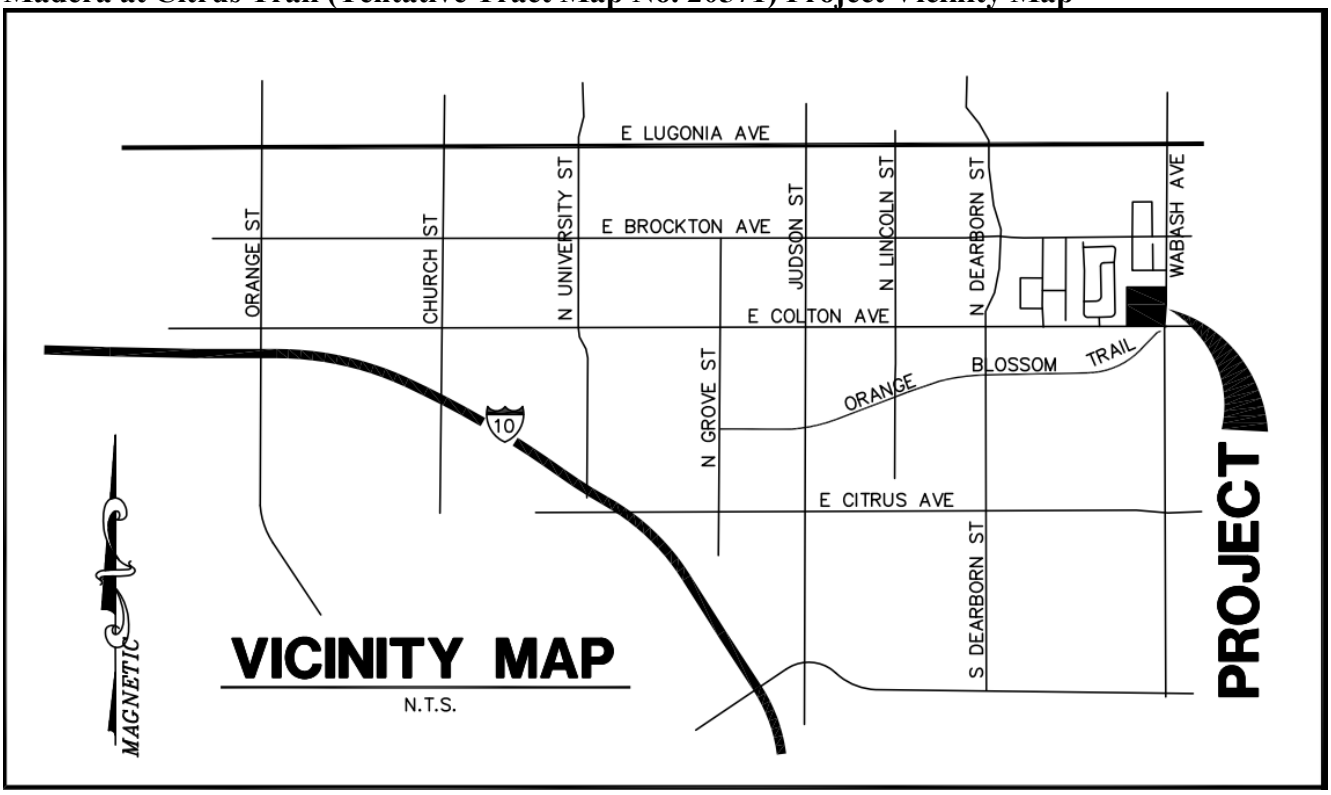
LOCAL GOVERNMENT/LEAD AGENCY: City of Redlands, Development Services Dept.
CONTACT PERSON: Brian Foote, Planning Manager
PHONE: (909) 798 - 7562
E-MAIL: bfoote@cityofredlands.org
MAILING ADDRESS: Development Services Department
Planning Division
P.O. Box 3005
Redlands, CA 92373

Should you have any questions regarding this case, please do not hesitate to contact the Planner listed above. If you request consultation in accordance with State law, the City will respond to the request for consultation within 30 days of receipt of your request. If no response is received from you, the City may proceed with the entitlement process.

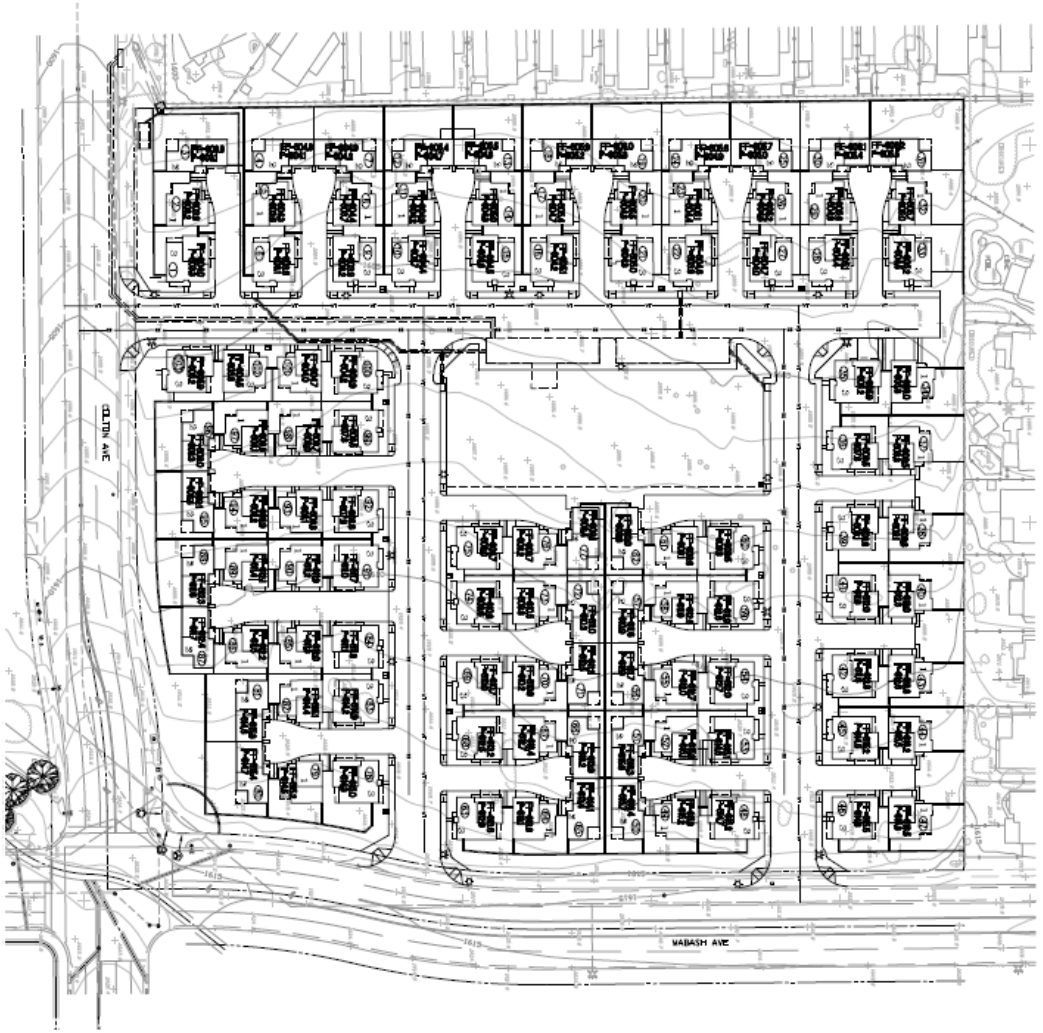
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Madera at Citrus Trail (Tentative Tract Map No. 20571) Project Vicinity Map



Madera at Citrus Trail (Tentative Tract Map No. 20571) Site Plan



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NORTH
CA

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

SITE PLAN

Soni 2012 Irrevocable Trusts
1423 Georgina Avenue Santa Monica
Santa Monica, CA 90402
(949) 922-7075
Contact: Vanita Soni Puri

CA ENGINEERING, INC.
Planning · Engineering · Surveying
18021 SKYPORT AVE., STE 110
YORBA LINDA, CA 92886
949-724-0400 949-724-0404 FAX

SHEET C12
JJ 00 0000
JOB NO. 816-1
SHEET NO. 1 OF 2 SHTS.

City of REDLANDS "A City That Works"

TRIBAL HISTORIC PRESERVATION OFFICE

VIA ELECTRONIC MAIL

rmurphy@cityofredlands.org

August 23, 2023

Ryan Murphy
Development Services Department
Planning Division
City of Redlands
PO Box 3005
Redlands, CA 92373

Re: AB 52 and SB 18 Consultation for "Madera at Citrus Trail" Project (TTM 20571)

Dear Mr. Murphy:

The Morongo Band of Mission Indians (Tribe/MBMI) Tribal Historic Preservation Office is in receipt of the Cultural Resources Inventory and Evaluation Report for the Colton and Wabash Project (Citrus Trail) in the City of Redlands as well as site and grading plans for the project.

THPO staff reviewed the Cultural Resources report (Ecorp Consulting, Inc 2022) and have questions and comments on the report.

- Although this subject property is within the ancestral lands of the Serrano people of Morongo Band of Mission Indians, the report fails to mention this and only reports that Serrano people are associated with San Manuel Band of Mission Indians (pages 3-3 to 3-4). This omission should be corrected.
- The Project Area History has errors. The first Mexican (and indigenous) settlement west of Redlands was the rancheria of Politana (Caballeria 1902) and today's Redlands was the location of the village of Guachama.
- There is no indication of the Sacred Lands File search results.
- There is no description of the methods used in surveying the parcel.
- The recommendations are inadequate.
- Because of the cultural and tribal cultural sensitivities at the location of the Citrus Trails project (known locations include Native American settlement and the proximity to the Zanja which was built with local Native American labor), the geology at the project (Holocene alluvial deposits), and the topography of the parcel (flat), additional Mitigation Measures are called for. Previous citrus agriculture on the project site does not rule out subsurface cultural and tribal cultural resources.

MBMI recommends that its Standard Mitigation Measures be requirements for granting of permitting for this project. In particular:

- a WEAP educational program for all project staff at the beginning of the project should include Native American representation.
- Tribal Monitoring is requested.

- a Cultural Resources Management Plan (CRMP) should be in place in advance of any ground disturbance.

Please note that MBMI has no objection to changing wording in the Mitigation Measures (attached to this letter) to reflect more than one Consulting Tribe (as per your request for Lugonia Village, July 25, 2023).

- the section on inadvertent discovery of Human Remains should reflect the wording in and processes described in the Standard Mitigation Measures. No photography of human remains or associated objects will be permitted.

Tribal cultural resources are non-renewable resources. We look forward to working with the City of Redlands to protect these irreplaceable resources out of respect for ancestors of the Morongo people who left them there, for the people of today, and for generations to come.

MBMI is looking forward to continuing consultation with the City of Redlands for the Citrus Trails project. Please do not hesitate to contact our office should you have any questions or concerns.

Respectfully,

Bernadette Ann Brierty

Bernadette Ann Brierty

Tribal Historic Preservation Officer

Morongo Band of Mission Indians

CC: Morongo THPO

12700 Pumarra Road – Banning, CA 92220 – (951) 755-5259 – Fax (951) 572-6004 – THPO@morongo-nsn.gov

Cultural Resource Mitigation Measures:

CR-1: **Native American Treatment Agreement** Prior to the issuance of grading permits, the applicant shall enter into a Tribal Monitoring Agreement with the Morongo Band of Mission Indians for the project. The Tribal Monitor shall be on-site during all ground-disturbing activities (including, but not limited to, clearing, grubbing, tree and bush removal, grading, trenching, fence post placement and removal, construction excavation, excavation for all utility and irrigation lines, and landscaping phases of any kind). The Tribal Monitor shall have the authority to temporarily divert, redirect, or halt the ground-disturbing activities to allow identification, evaluation, and potential recovery of cultural resources.

CR-2: **Retention of Archaeologist** Prior to any ground-disturbing activities (including, but not limited to, clearing, grubbing, tree and bush removal, grading, trenching, fence post replacement and removal, construction excavation, excavation for all utility and irrigation lines, and landscaping phases of any kind), and prior to the issuance of grading permits, the Applicant shall retain a qualified archaeologist who meets the U.S. Secretary of the Interior Standards (SOI). The archaeologist shall be present during all ground-disturbing activities to identify any known or suspected archaeological and/or cultural resources. The archaeologist will conduct a Cultural Resource Sensitivity Training, in conjunction with the Tribe[s] Tribal Historic Preservation Officer (THPO), and/or designated Tribal Representative. The training session will focus on the archaeological and tribal cultural resources that may be encountered during ground-disturbing activities as well as the procedures to be followed in such an event.

CR-3: **Cultural Resource Management Plan** Prior to any ground-disturbing activities the project archaeologist shall develop a Cultural Resource Management Plan (CRMP) and/or Archaeological Monitoring and Treatment Plan (AMTP) to address the details, timing, and responsibilities of all archaeological and cultural resource activities that occur on the project site. This Plan shall be written in consultation with the consulting Tribe[s] and shall include the following: approved Mitigation Measures (MM)/Conditions of Approval (COA), contact information for all pertinent parties, parties' responsibilities, procedures for each MM or COA, and an overview of the project schedule.

CR-4: Pre-Grade Meeting The retained qualified archeologist and Consulting Tribe[s] representative shall attend the pre-grade meeting with the grading contractors to explain and coordinate the requirements of the monitoring plan.

CR-5: On-site Monitoring During all ground-disturbing activities the qualified archaeologist and the Native American monitor shall be on-site full-time. The frequency of inspections shall depend on the rate of excavation, the materials excavated, and any discoveries of Tribal Cultural Resources as defined in California Public Resources Code Section 21074. Archaeological and Native American monitoring will be discontinued when the depth of grading and the soil conditions no longer retain the potential to contain cultural deposits. The qualified archaeologist, in consultation with the Native American monitor, shall be responsible for determining the duration and frequency of monitoring.

CR-6: Inadvertent Discovery of Cultural Resources In the event that previously unidentified cultural resources are unearthed during construction, the qualified archaeologist and the Native American monitor shall have the authority to temporarily divert and/or temporarily halt ground-disturbance operations in the area of discovery to allow for the evaluation of potentially significant cultural resources. Isolates and clearly non-significant deposits shall be minimally documented in the field and collected so the monitored grading can proceed.

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If a potentially significant cultural resource(s) is discovered, work shall stop within a 60-foot perimeter of the discovery and an Environmentally Sensitive Area (ESA) physical demarcation/barrier constructed. All work shall be diverted away from the vicinity of the find, so that the find can be evaluated by the qualified archaeologist and Tribal Monitor[s]. The archaeologist shall notify the Lead Agency and consulting Tribe[s] of said discovery. The qualified archaeologist, in consultation with the Lead Agency, the consulting Tribe[s], and the Native American monitor, shall determine the significance of the discovered resource. A recommendation for the treatment and disposition of the Tribal Cultural Resource shall be made by the qualified archaeologist in consultation with the Tribe[s] and the Native American monitor[s] and be submitted to the Lead Agency for review and approval. Below are the possible treatments and dispositions of significant cultural resources in order of CEQA preference:

A. Full avoidance.

B. If avoidance is not feasible, Preservation in place.

C. If Preservation in place is not feasible, all items shall be reburied in an area away from any future impacts and reside in a permanent conservation easement or Deed Restriction.

D. If all other options are proven to be infeasible, data recovery through excavation and then curation in a Curation Facility that meets the Federal Curation Standards (CFR 79.1)

CR-7: Inadvertent Discovery of Human Remains The Morongo Band of Mission Indians requests the following specific conditions to be imposed in order to protect Native American human remains and/or cremations. **No photographs are to be taken except by the coroner, with written approval by the consulting Tribe[s].**

A. Should human remains and/or cremations be encountered on the surface or during any and all ground-disturbing activities (i.e., clearing, grubbing, tree and bush removal, grading, trenching, fence post placement and removal, construction excavation, excavation for all water supply, electrical, and irrigation lines, and landscaping phases of any kind), work in the immediate vicinity of the discovery shall immediately stop within a 100-foot perimeter of the discovery. The area shall be protected; project personnel/observers will be restricted. The County Coroner is to be contacted within 24 hours of discovery. The County Coroner has 48 hours to make his/her determination pursuant to State and Safety Code §7050.5. and Public Resources Code (PRC) § 5097.98.

B. In the event that the human remains and/or cremations are identified as Native American, the Coroner shall notify the Native American Heritage Commission within 24 hours of determination pursuant to subdivision (c) of HSC §7050.5.

C. The Native American Heritage Commission shall immediately notify the person or persons it believes to be the Most Likely Descendant (MLD). The MLD has 48 hours, upon being granted access to the Project site, to inspect the site of discovery and make his/her recommendation for final treatment and disposition, with appropriate dignity, of the remains and all associated grave goods pursuant to PRC §5097.98

D. If the Morongo Band of Mission Indians has been named the Most Likely Descendant (MLD), the Tribe may wish to rebury the human remains and/or cremation and sacred

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items in their place of discovery with no further disturbance where they will reside in perpetuity. The place(s) of reburial will not be disclosed by any party and is exempt from the California Public Records Act (California Government Code § 6254[r]). Reburial location of human remains and/or cremations will be determined by the Tribe's Most Likely Descendant (MLD), the landowner, and the City Planning Department.

CR-8: **FINAL REPORT:** The final report[s] created as a part of the project (AMTP, isolate records, site records, survey reports, testing reports, etc.) shall be submitted to the Lead Agency and Consulting Tribe[s] for review and comment. After approval of all parties, the final reports are to be submitted to the Eastern Information Center, and the Consulting Tribe[s].

12700 Pumarra Road – Banning, CA 92220 – (951) 755-5259 – Fax (951) 572-6004 – THPO@morongo-nsn.gov

GABRIELENO BAND OF MISSION INDIANS - KIZH NATION
Historically known as The Gabrielino Tribal Council - San Gabriel Band of Mission Indians
recognized by the State of California as the aboriginal tribe of the Los Angeles basin

November 17, 2022

Project Name: Madera at Citrus Trail project City Redlands

Dear Brian Foote,

Thank you for your letter dated November 17,2022 regarding AB52 consultation. The above proposed project location is within our Ancestral Tribal Territory; therefore, our Tribal Government requests to schedule a consultation with you as the lead agency, to discuss the project and the surrounding location in further detail.

Please contact us at your earliest convenience. ***Please Note:AB 52, "consultation" shall have the same meaning as provided in SB 18 (Govt. Code Section 65352.4).***

Thank you for your time,

Andrew Salas, Chairman
Gabrieleno Band of Mission Indians – Kizh Nation
1(844)390-0787

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Dr. Christina Swindall Martinez, secretary
Albert Perez, treasurer I | Martha Gonzalez Lemos, treasurer II | Richard Gradias, Chairman of the council of Elders

PO Box 393 Covina, CA 91723 admin@gabrielenoindians.org

GABRIELENO BAND OF MISSION INDIANS - KIZH NATION
Historically known as The Gabrielino Tribal Council - San Gabriel Band of Mission Indians
recognized by the State of California as the aboriginal tribe of the Los Angeles basin

November 22, 2022

Project Name: Madera at Citrus Trail Project, Located: northwest corner of Wabash Avenue and Colton Avenue, City of Redlands

Dear Brian Foote,

Thank you for your letter dated November 17, 2022 regarding SB18 consultation. The above proposed project location is within our Ancestral Tribal Territory; therefore, our Tribal Government requests to schedule a consultation with you as the lead agency, to discuss the project and the surrounding location in further detail.

Please contact us at your earliest convenience. ***Please Note :AB 52, "consultation" shall have the same meaning as provided in SB 18 (Govt. Code Section 65352.4).***

Thank you for your time,

Andrew Salas, Chairman
Gabrieleno Band of Mission Indians – Kizh Nation
1(844)390-0787

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Dr. Christina Swindall Martinez, secretary
Albert Perez, treasurer I | Martha Gonzalez Lemos, treasurer II | Richard Gradias, Chairman of the council of Elders

TRIBAL HISTORIC PRESERVATION OFFICE

VIA ELECTRONIC MAIL

bfoote@cityofredlands.org

March 20, 2023

MORONGO BAND OF MISSION INDIANS
A SOVEREIGN NATION

Brian Foote, Planning Manager
City of Redlands Planning Services Department
Planning Division
PO Box 3005
Redlands, CA 92373

Re: SB 18 Consultation, Madera at Citrus Trail Project (TTM 20571) [APN: 0168-291-02-0000]

Dear Mr. Foote:

The Morongo Band of Mission Indians (Tribe/MBMI) Tribal Historic Preservation Office is in receipt of the City of Redlands (City) letter regarding the above referenced project. The proposed Subdivision for Madera at Citrus Trail Project (Project) is located within the ancestral territory and traditional use area of the Cahuilla and Serrano people of the Morongo Band of Mission Indians.

Tribal cultural resources are non-renewable resources and therefore of high importance to the Morongo Tribe. Tribal participation (a.k.a. tribal monitors) is recommended during all ground disturbing activities. We look forward to working with the City of Redlands to protect these irreplaceable resources out of respect for ancestors of the Morongo people who left them there, and for the people of today and for generations to come.

Projects within this particular area are potentially sensitive for cultural resources regardless of the presence or absence of remaining surface artifacts and features. Our office requests to initiate government-to-government consultation under Senate Bill 18 (SB 18) (Government Code § 65352.3 and § 65352.4) and requests the following from the lead agency to ensure meaningful consultation:

- Currently proposed Project design and Mass Grading Maps *(provided; thank you)*
- A records search conducted at the appropriate California Historical Resources Information System (CHRIS) center with at least a 1.0-mile search radius from the project boundary. If this work has already been done, please furnish copies of the cultural resource documentation (reports and site records) generated through this search so that we can compare and review with our records to begin productive consultation *(please provide in hard copy as this is no longer available on line).*
- Tribal participation (a.k.a. tribal monitors) during the pedestrian survey and testing, if this fieldwork has not already taken place. In the event that archaeological crews have

completed this work, our office requests a copy of the current Phase I study or other cultural assessments (including the cultural resources inventory).

- Shapefiles of the Projects area of effect (APE)
- Geotechnical Report

This letter does not conclude consultation. Upon receipt of the requested documents the MBMI THPO may further provide recommendations and/or mitigation measures.

The lead contact for this Project is Bernadette Ann Brierty, Tribal Historic Preservation Officer (THPO). Dr. Joan Schneider, MBMI Archaeologist, will review this project. Please do not hesitate to contact us at ABrierty@morongo-nsn.gov, THPO@morongo-nsn.gov, or (951) 663-2842, should you have any questions. The Tribe looks forward to meaningful government-to-government consultation with the City of Redlands.

Respectfully,



Bernadette Ann Brierty

Tribal Historic Preservation Officer

Morongo Band of Mission Indians

CC: Morongo THPO

12700 Pumarra Road – Banning, CA 92220 – (951) 755-5259 – Fax (951) 572-6004 – THPO@morongo-nsn.gov

From: Deneen Pelton
To: Brian Foote
Cc: Cheryl Madrigal
Subject: Madera at Citrus Trail
Date: Friday, December 9, 2022 9:07:45 AM

[**NOTICE:** This message originated outside of City of Redlands -- **DO NOT CLICK** on **links** or open **attachments** unless you are sure the content is safe.]

Greetings,

This email is written on behalf of Rincon Band of Luiseño Indians, ("Rincon Band" or "Band"), a federally recognized Indian Tribe and sovereign government.

The Band has received the notification for the above referenced project. The location identified within project documents is not within the Band's specific Area of Historic Interest (AHI).

At this time, we have no additional information to provide. We recommend that you directly contact a Tribe that is closer to the project and may have pertinent information.

Thank you for submitting this project for Tribal review. If you have additional questions or concerns, please do not hesitate to contact our office at your convenience at (760) 749-1092 or via electronic mail at crd@rincon-nsn.gov.

Thank you for the opportunity to protect and preserve our cultural assets.

Deneen Pelton
Cultural Resources Department Coordinator
Cultural Resources Department
Rincon Band of Luiseño Indians
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From: Ryan Nordness
To: Brian Foote
Subject: City of Redlands Notice of Project Application (SB 18) for the Madera at Citrus Trails
Date: Thursday, December 15, 2022 2:00:17 PM

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Hello Brian,
Thank you for contacting the Yuhaaviatam of San Manuel Nation (formerly known as the San Manuel Band of Mission Indians) regarding the above referenced project. YSMN appreciates the opportunity to review the project documentation, which was received by our Cultural Resources Management Department on November 17th 2022. The project is located within Serrano ancestral territory, and the area for the project is of interest, but Tribe sees no conflicts with the zoning changes at this time. However, when specific projects are planned and implemented, YSMN might have comments and/or request formal consultation with the Lead Agency pursuant to CEQA (as amended, 2015) and CA PRC 21080.3.1.
This communication concludes YSMN's input on this project, at this time, and no additional consultation under SB18 is required. If you should have any further questions with regard to this matter, please do not hesitate to contact me at your convenience, as I will be your Point of Contact (POC) for YSMN with respect to this project.
Respectfully,
Ryan Nordness

Ryan Nordness
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