THE CITY OF HESPERIA
9700 Seventh Avenue
Hesperia, California 92345
Phone: (760) 947-1000

ENVIRONMENTAL INITIAL STUDY

Project Title:	Pallet Storage Facility
City Project No.:	SPRR23-00005
Lead Agency	The City of Hesperia 9700 Seventh Avenue Hesperia, CA 92345 Phone: (760) 947-1000
Project Sponsor's Name and Address:	PLA Buyer LLC & Care of CIRE Investment Services LLC 530 B Street, Suite 2050 San Diego, CA 92101
Contact Person And Phone Number:	Edgar Gonzalez, Senior Planner 760-947-1330
Project Location:	6730 E. Santa Fe Avenue Hesperia, CA 92345 APN: 0397-113-03 (3.00 acres) APN: 0397-121-03 (2.54 acres) APN: 0397-113-04 (0.6 acres)
Existing Zoning Designation:	I1 – Limited Manufacturing/Industrial
Existing General Plan Designation:	I1 – Limited Manufacturing
Preparer:	Terra Nova Planning & Research, Inc. 42635 Melanie Place, Suite 101 Palm Desert, CA 92211

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PROJECT DESCRIPTION

The Project proposes a wood pallet refurbishment and storage facility on two parcels of a three parcel holding located at the south end of Santa Fe Avenue East of the intersection of Jenny Street in Hesperia, California. Parcel 0397-113-03, located at 6730 Santa Fe Avenue East, is 3.53 acres in size and contains a 21,832 square-foot warehouse where the wood pallets will be refurbished for reuse. The adjacent vacant north parcel (0397-121-03) is 2.54 acres in size and will be the site of the outdoor pallet storage yard. A third parcel, 0397-113-04, consists of 0.6 acres and is under the same ownership, and will be merged with the adjacent parcels, but will remain vacant. On the existing warehouse parcel (referred to as the south parcel in this document), the Project will entail enhancements to the existing warehouse, the addition of a loading dock, construction of a new asphalt concrete parking lot, the addition of a new curb cut and a new driveway. The pallet storage yard on the north parcel will be an asphalt surface and will be accessed via the south parcel; there will be no street access to the north parcel. New road surface along one-half of Santa Fe Avenue East in front of both parcels will be constructed. Stormwater mitigation measures will be implemented on both parcels. Drought-tolerant landscaping will be installed around the perimeter of the pallet yard; vegetated swales will be installed along the front edges of each parcel facing the street. The Project will retain the existing chain link security fencing at the rear of the site. All other fencing will be composed of decorative split-face block to serve as screening for the existing dock doors and the proposed outdoor storage.

Table 1
Project Summary

Use	Square Feet
Existing Warehouse	21,831.9
Warehouse Parking	30 spaces
Fire Lane	42,666
Driveway and Other Asphalt Surface	85,957
Pallet Yard	67,734
Landscaped and Vegetated Area	33,717

Current Conditions

Per the City of Hesperia General Plan 2010, the land use and zoning designation for the three Project parcels is Limited Manufacturing/Industrial (I1), which allows “transportation equipment, building equipment and materials, indoor manufacturing uses, and similar uses”[1] This Project aligns with the city’s Industrial Land Use goals of developing new industrial businesses and services within appropriate zoning designations for these uses. The Project also aligns with the city’s Sustainability Land Use goals of reusing and repurposing existing buildings and construction materials and siting businesses on previously developed and infill lots to reduce impacts to the surrounding environment.

The south parcel with the 21,831.9 square-foot warehouse was recently occupied by the previous business, a truck accessories shop. A chain link security fence runs the perimeter of the parcel. The aged concrete driveway and parking area will be replaced and restriped. Much of the undeveloped portion of the parcel consists of disturbed soil where truck parts and other materials were stored and will be converted to a parking area and fire lane. The north undeveloped vacant parcel which will hold the proposed outdoor pallet storage yard and currently contains a mix of disturbed weedy ground cover vegetation, several small clusters of juniper trees and two Joshua trees. The Joshua tree is a protected species, and the two trees will be subject to the requirements of the Joshua Tree Protection Act (please see Biological Resources in Section 3).

1 City of Hesperia General Plan 2010, Land Use Element, p. LU-49.

Project Location and Limits
The entire Project site occurs on a narrow strip of land along Santa Fe Avenue East and is oriented northeast to southwest. Ranchero Road intersect Santa Fe Avenue East at the north end of the light industrial strip of land and Jenny Street bordering the south edge of the site both run east-west. Immediately east of Santa Fe Avenue East lies the Hesperia Airport, a small privately owned airport that serves single engine aircraft. The Project site faces the airport runway which extends southward parallel to Santa Fe Avenue East and ends at Jenny Street. Immediately west behind the proposed Project is the Burlington North Santa Fe (BNSF) railway. Surrounding land uses are:

- South/Southwest: Industrial-Limited Manufacturing extends across Jenny Street to the Hesperia city boundary.
- Southeast corner: Rural Residential RR (SD)
- East of the Airport: Single-Family Residential R1-18,000
- West of the Railroad: Single-Family Residential R1-18,000

Utilities and Service Providers:
Domestic Water: Hesperia Water District
Wastewater Facility: On-site Septic
Electricity: Southern California Edison
Gas: Southwest Gas Corporation
Solid Waste: Advanced Disposal
Fire: San Bernardino County Fire Department
Police: San Bernardino County Sheriff’s Department

Source: Google Maps, 2023

02.12.24

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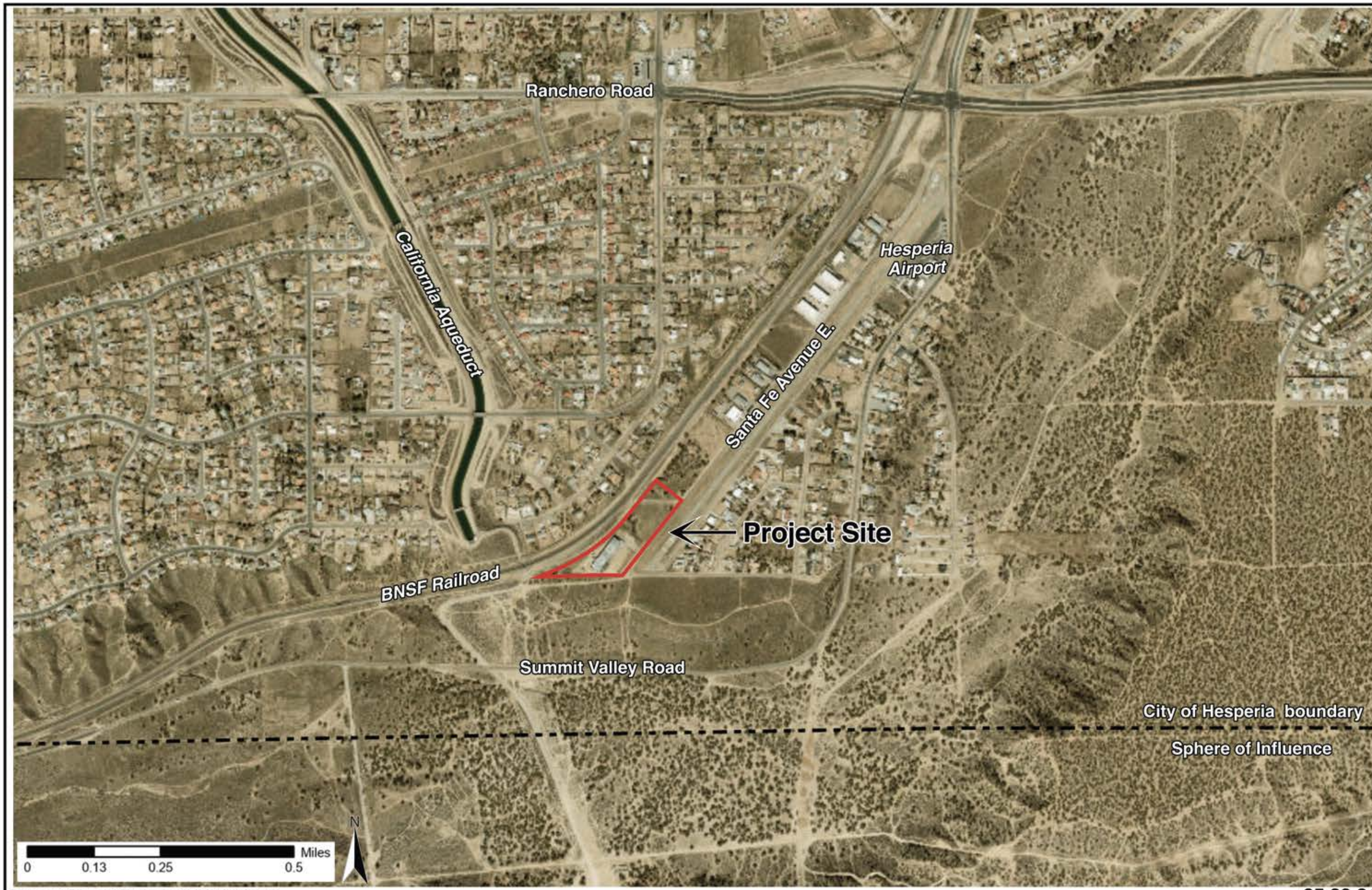
Wood Pallet Recycling and Storage Facility
Regional Location Map
Hesperia, California

Exhibit

1



Source: Google Earth Imagery, 04.2023

05.29.24

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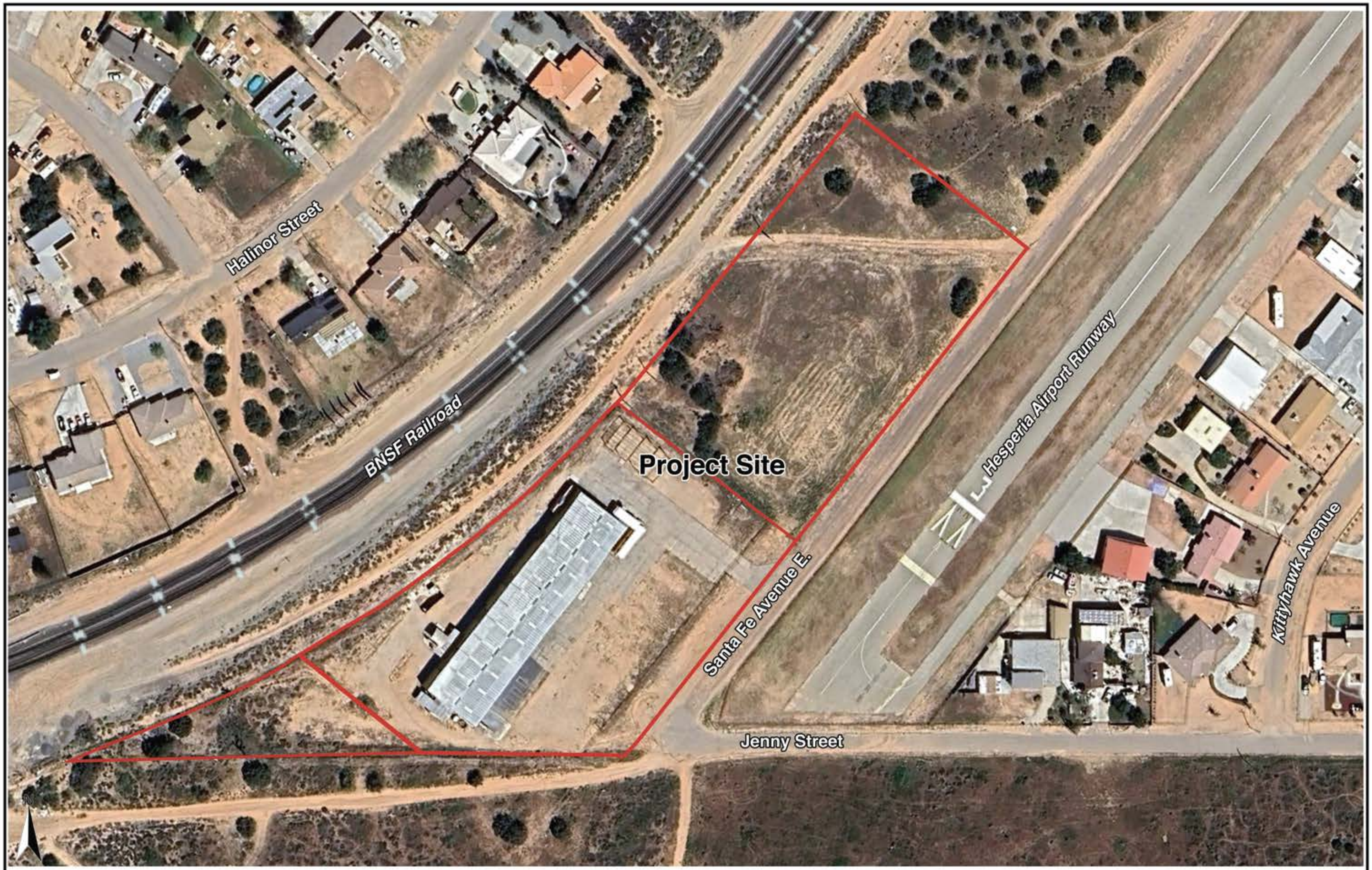
Wood Pallet Recycling and Storage Facility
Project Vicinity Map
Hesperia, California

Exhibit
2



Source: Google Maps, 2023

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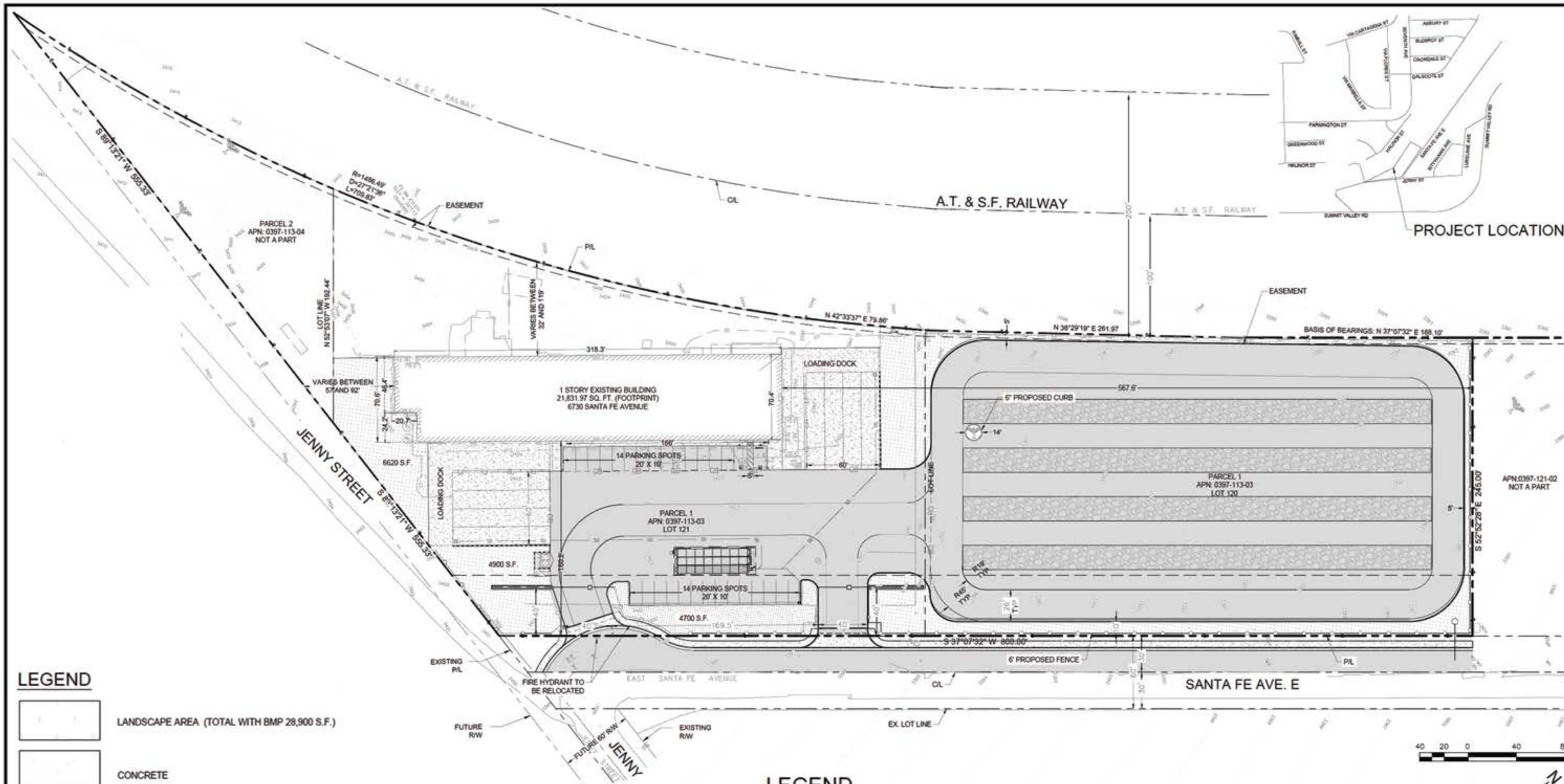
Wood Pallet Recycling and Storage Facility
Project Location
Hesperia, California

Exhibit
3



LEGEND

	LANDSCAPE AREA (TOTAL WITH BMP 28,900 S.F.)
	CONCRETE
	FIRE LANE
	ASPHALT
	DIRT 30,200 S.F.
	BMP 3740 S.F.

TABULAR SUMMARY

AVERAGE GROSS ACREAGE:	4.45 ACRES
AVERAGE NET ACREAGE:	6.11 ACRES
GROSS BUILDING FLOOR AREA:	0.5 ACRES
PROPOSED USE:	INDUSTRIAL
NUMBER OF STORIES:	1
LANDSCAPE COVERAGE RATIO:	0.66
REQUIRED NO. OF PARKING SPACES:	31 STANDARD AND 1 ADA STALLS
PROPOSED NO. OF PARKING SPACES:	X STANDARD AND 2 ADA STALLS

LEGEND

- EX. WATER LINE
- EX. GAS LINE
- EX. UNDERGROUND ELECTRIC LINE
- EX. JOSHUA TREE
- EX. PROPERTY LINE
- PROPOSED FENCE
- PROPOSED WALL
- PROPOSED GUARD RAIL
- PROPOSED CURB
- STORM DRAIN LINE
- PROPOSED CATCH BASIN
- PROPOSED STORM INLET

Source: IMEG Corp., 05.22.2024

05.29.24

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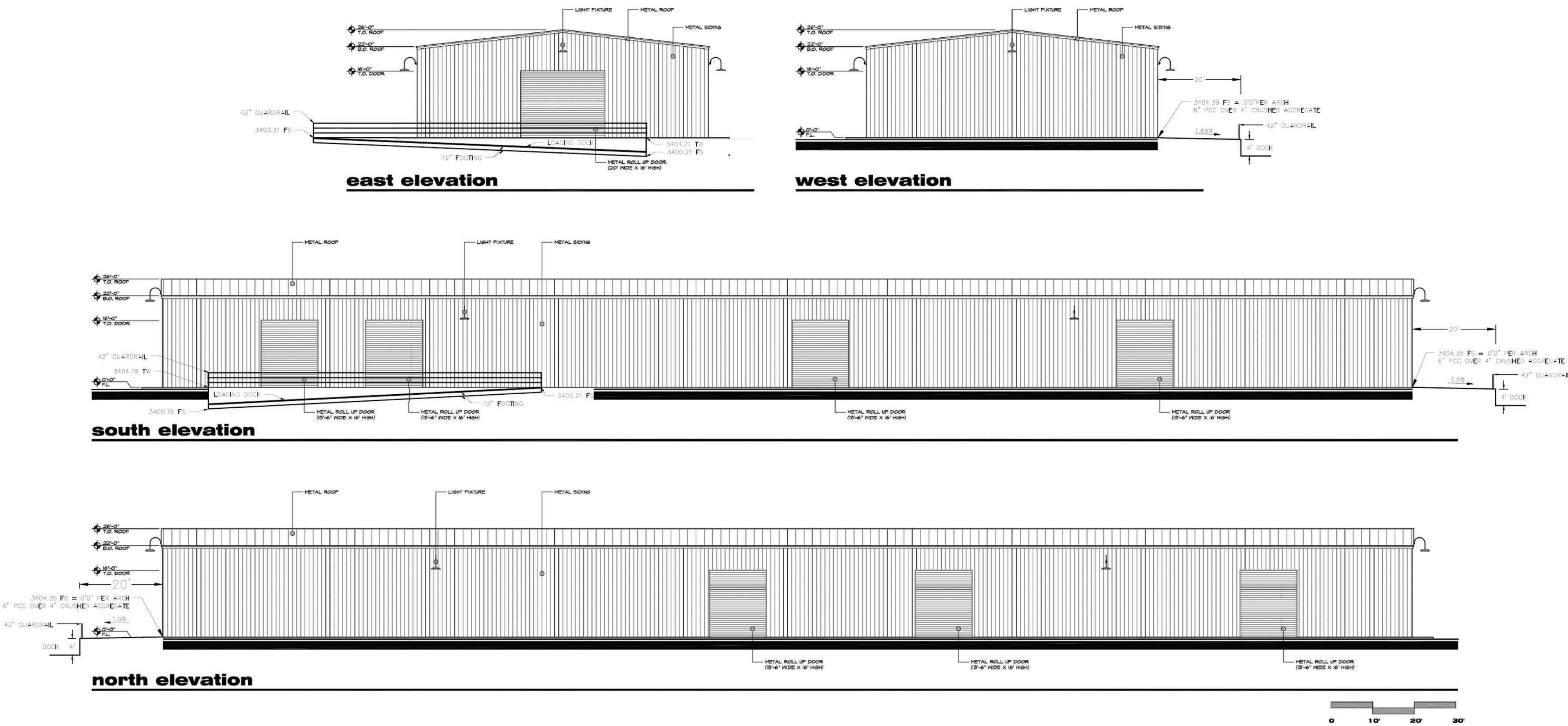
Wood Pallet Recycling and Storage Facility
Site Plan
Hesperia, California

Exhibit
4



Source: IMEG Corp., 06.30.2023

02.12.24

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Wood Pallet Recycling and Storage Facility
Existing Elevations
Hesperia, California

Exhibit

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EVALUATION OF ENVIRONMENTAL IMPACTS:

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

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

DETERMINATION: (To be completed by the Lead Agency)
On the basis of this initial evaluation:

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

[signature]	7/9/24 Date:

1. AESTHETICS – Except as provided in Public Resource Code Section 21099, would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Sources: City of Hesperia General Plan.

Background

The City of Hesperia is located between the Mojave Desert to the north and the foothills of the San Bernardino Mountains to the south. The City is isolated from urban cities including San Bernardino, approximately 35 miles to the south, Los Angeles, approximately 80 miles to the southwest, and Palm Spring, approximately 90 miles to the southeast. The City's incorporated area is approximately 110 square miles of desert landscape and development.

The proposed Project is located on the northwest side of E. Santa Fe Avenue and Jenny Street between the BNSF railroad to the west and the Hesperia Airport to the east. The Project's site includes three parcels oriented northeast to southwest with an elevation of approximately 3,400 to 3,420 feet above mean sea level (AMSL)[2]. Limited Manufacturing (I1) land-use and zoning designation are assigned to all three parcels. The south parcel has an existing 21,831 square-foot warehouse formerly used for the commercial sale of truck accessories. The north parcel is approximately 266,353 square-foot (or 6.11 acres) of undeveloped and vacant land with dense desert vegetation. The Project's intended land-use includes a wood pallet restoration facility and an open-air pallet storage yard. The warehouse will remain a single-story sheet-metal building, only it will be renovated and repurposed to operate as a restoration facility. The existing roadway will be improved with new asphalt concrete. The undeveloped parcel will be cleared and paved to house wood pallets, and fencing will run along the site's perimeter.

The City mandates I1 land-use development to allocate a minimum of 8-feet of front yard and 5-feet of side street yard to landscaping, totaling to 5% of the site's area for landscape coverage (Ordinance Code §16.16.350 and §16.20.630). In addition, under the City's General Plan Implementation Policy OS 2.2, the City requires all developments to preserve natural resources such as scenic vistas that consist of the Mojave River, the surrounding Victor Valley, and the neighboring hillsides. The nearest scenic resource to the site is the San Bernardino Mountains, approximately 5 miles south.

[2] BCR Consulting LLC, Cultural Resources Assessment, 2023.

Discussion of Impacts

a) **No Impact.** Located at 6730 E. Santa Fe Avenue, the Project is in an urbanized area of Hesperia that supports residential and small-scale industrial development. The area consists of industrial facilities to the north and vacant undeveloped land to the south. To the east and west, beyond the railroad and airport, the area consists of moderate to high density single-family residential communities. Currently, the Project area is a mix of developed and undeveloped parcels.

The south parcel is developed and houses an existing 21,831 square-foot warehouse, previously used for the commercial sell of truck accessories. The warehouse, once renovated, will reach a maximum height of 26 feet which is well within the 50-foot height limit for an I1 development (Ordinance Code §16.16.350). The north parcel is undeveloped and vacant.

From the subject property, the scenic view consists of valley hills and the San Bernardino Mountains to the south. The Project site is approximately 5 miles south of the San Bernardino Mountains foothill, and approximately 5 miles east of the Mojave River. The Mojave River is not visible from the site. Nevertheless, the site's scenic landscape consisting of dry desert vegetation to the south and mountain views covering the horizon in all directions, is indicative of the Victor Valley area.

Overall, the Project is located in a narrow and isolated strip of land bound by industrial facilities to the north, undeveloped lands to the south, the Hesperia Airport to the east, and the BNSF railroad to the west. The site does not obstruct the visibility of the San Bernardino Mountains to the south or the Mojave River towards the north. Also, the Project does not disturb or uproot existing Joshua Trees on-site. The scenic vistas and the scenic resources indicative of Hesperia are not expected to be altered or substantially impacted from the Project's development. No impact is anticipated.

b) **No Impact.** A Joshua Tree is located on the northwest corner of the parcel. As a result, the development is required to implement conservation measures to ensure the protection of the Joshua Tree since it is classified as a scenic resource by the City's General Plan and a native plant protected by the State Desert Native Plants Act (Ordinance Code §16.24.150). In accordance with these requirements, the site plan proposes a 6-inch curb around the tree to function as a buffer and thereby reduce potential impacts.

No other scenic resources (rocks or historic structures) occur on the property. The scenic resources indicative of Hesperia are not expected to be altered or substantially impacted from the Project's development. No impact is anticipated.

c) **No Impact.** The Project proposes the development of a wood pallet restoration facility and an outdoor pallet storage yard on two parcels designated as I1. The land-use designation allows for small scale industrial activities such as the one intended by the Project. Under these conditions, the Project is subject to local land use specific policies and regulations and as currently planned, the Project will comply with all standards of the Zone, thereby eliminating potential impacts.

The Project will repurpose the current industrial warehouse located on the south parcel, in a land use district intended for industrial uses. For this reason, the Project is not expected to substantially degrade the visual character or quality of the public view that the warehouse has not already contributed to, if any. Additionally, the outdoor storage yard will remain a flat open space which is unlikely to create a significant obstruction to a scenic resource.

The Project is expected to comply with zoning designations and all regulations regarding scenic resources as required by the City's General Plan and Zoning Ordinance. No impact will occur.

d) **Less Than Significant Impact.** The proposed industrial facility is expected to operate during daytime working hours. The light fixtures on-site are located around the warehouse's perimeter and have shields to focus the light downwards and reduce glare in accordance with the City's Ordinance §16.20.135. Any impact is reduced in compliance with the City's standards and regulations. Impacts will be less than significant.

Mitigation: None required.

Monitoring: None required.

2. AGRICULTURE AND FORESTRY RESOURCES -- In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or forest land to non-forest use?	☐	☐	☐	☒

Sources: City of Hesperia General Plan 2010; Hesperia, California Municipal Code September 2023; California Department of Conservation, Farmland Mapping & Monitoring Program, 2022.

Background

The Hesperia General Plan Land Use Map designates approximately 10% of the City's total acreage as agricultural area. This designation resides in the rural northern sections of Hesperia where the minimum parcel size is one acre to five acres. Agricultural permitted uses include the keeping of larger animals and livestock such as equestrian stables and dairy operations, as well as uses requiring smaller footprints such as dog kennels and veterinary hospitals. The Project site parcels are zoned for Industrial-Limited Manufacturing (I1), a designation that does not include any agricultural uses. The nearest agriculture designation is .63 miles north of the Project site on the north side of Ranchero Road.

Discussion of Impacts

a) **No Impact.** According to the California Department of Conservation's Important Farmland Finder, the Project site sits on Urban and Built-Up Land. There is no Prime Farmland, Farmland of Statewide Importance, or Unique Farmland on or near the Project site. The land south of Jenny Street is labeled as Grazing Land, which means that the vegetation can accommodate livestock grazing. The Project will occur on the north side of Jenny Street and it will not impact any of the Grazing Land on the south side. There will be no impact to Prime Farmland.

b) **No Impact.** The Project site is not under a Williamson Act contract and is not zoned for agricultural uses. There will be no impact.

c) **No Impact.** The Project parcels are zoned for Industrial-Limited Manufacturing (I1), which does not support forest land, timberland, or Timberland Production Zone uses. Hence, the Project will not impact the existing zoning designations.

d) **No Impact.** There are no forestry zones, timberland production zones or lands in forestry production adjacent to the Project site. There will be no loss of forest land to non-forest use.

e) **No Impact.** There are no farmlands or forestry lands adjacent to the Project site. No conversion of existing lands is possible. There will be no impacts to agricultural or forestry production.

Mitigation: None required.

Monitoring: None required.

3. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	☒

Sources: MDAQMD CEQA and Federal Conformity Guidelines, February 2020; MDAQMD Rule Book, 2021; 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy, of Hesperia, November 2023; Table E-5, City and County Population and Housing Estimates, California Department of Finance, May 2023.

Background

The City of Hesperia is within the Mojave Desert Air Basin (MDAB), a large geographic region encompassing the high desert of San Bernardino County, portions of eastern Kern County, northeastern Los Angeles County, and the Palo Verde Valley of eastern Riverside County. In compliance with federal and state air pollution standards, the Mojave Desert Air Quality Management District (MDAQMD) is the agency responsible for monitoring air pollution across the San Bernardino and Riverside County portions of the Mojave Desert Air Basin.

Ambient air quality standards (AAQS) establish emissions thresholds that are designed to protect human health and environmental factors. An ambient air quality standard stipulates the maximum amount of a pollutant that can be present in the air during a specific period of time and not cause harmful effects on the most sensitive members of the community and natural resources. If that pollutant's concentration in the air is at or below the threshold, then the area is said to be in attainment, while non-attainment areas experience pollution levels above the AAQS.

Ambient air quality standards for the MDAB are subject to federal guidelines known as National Ambient Air Quality Standards (NAAQS), as well as state guidelines referred to as California Ambient Air Quality Standards (CAAQS). Each set of AAQS focuses on certain criteria pollutants which together include the following.

Carbon Monoxide (CO) is a colorless and odorless gas emitted from the incomplete combustion of all fossil fuels including oil, coal, and natural gas. It interrupts the delivery of oxygen to the brain and can cause dizziness, headaches, and nausea.

Oxides of Nitrogen and Nitrogen Dioxide (NO_2) is a yellow-brown colored gas that forms when nitric oxide, emitted primarily from burning of petroleum gas, combines with atmospheric oxygen. NO2. This causes lung damage and breathing difficulties.

Reactive Organic Gases (ROG)/Volatile Organic Compounds (VOCs) are primary pollutants that form secondary pollutants, or photochemical smog, when they react with ultraviolet sunlight in the atmosphere.

Sulfur Dioxide (SO_2) is a colorless and pungent gas emitted from coal and oil power plants, refineries, and diesel engines. It can irritate eyes, nose, and airways and cause shortness of breath.

Particulate Matter (PM_{10} and $PM_{2.5}$) refers to suspended air particles with a width of 10 microns down to 2.5 microns. These very small particles may occur as liquid or solid, and when they are inhaled, they cause damage to the respiratory system and aggravate respiratory illnesses.

Lead (Pb) is emitted from metals processing facilities, combustion of leaded fuel, manufacturing of lead-acid batteries. Lead can damage the nervous system, kidneys, and interfere with developmental and reproductive systems.

Ozone (O_3) is a secondary pollutant that forms in the atmosphere when nitrogen oxides and other reactive gases react with ultraviolet sunlight. Ozone can damage the respiratory system and aggravate existing respiratory illnesses and it also damages vegetation.

Sulfate, Hydrogen Sulfide (H_2S) is the rotten egg smelling gas emitted from geothermal power plants, petroleum production and sewer systems. It can cause skin and respiratory damage and lead to headaches.

Vinyl Chloride is a colorless gas with a mild, sweet smell. Vinyl chloride is used in the production of polyvinyl chloride (PVC) and other vinyl products. Long-term occupational exposure is the most concerning risk.

Table 2
MDAQMD Emissions Thresholds

Criteria Pollutant	Annual Threshold (short tons)	Daily Threshold (pounds)
Carbon Monoxide	100	548
Oxides of Nitrogen (NO_x)	25	137
Reactive/Volatile Organic Compounds (ROG/VOC)	25	137
Oxides of Sulfur	25	137
Particulate Matter (PM_{10})	15	82
Fine Particulate Matter ($PM_{2.5}$)	12	65
Hydrogen Sulfide (H_2S)	10	54
Lead (Pb)	0.6	3
Source: MDAQMD CEQA Guidelines (February 2020)		

Discussion of Impacts

a) **No Impact.** The Project is located in the Mojave Desert Air Basin and is under the jurisdiction of the MDAQMD. According to the MDAQMD, projects that are consistent with employment and population forecasts projected by the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (2020 RTP/SCS) prepared by the Southern California Association of Governments (SCAG) are also consistent with the MDAQMD growth projections. The 2020 RTP/SCS was adopted by SCAG in compliance with the Sustainable Community and Climate Protection Act (SB 375) and forms the basis for the MDAQMD air quality standards and plans. As of January 2023, the City's population is 100,041 and 31,020 households.[3] The 2020 RTP/SCS projects that by 2045 Hesperia's the population will increase to 168,100 and 53,200 households.

According to the MDAQMD, if a project is consistent with the land use plan that was used in the analysis of the growth forecast, the project is assumed to conform with the growth forecast. The Project is located on three parcels that have a General Plan land use and zoning designation of Limited Industrial (I1). The proposed use of the Project conforms to the uses permitted under the I1 designation which allows "transportation equipment, building equipment and materials, indoor manufacturing uses, and similar uses."[4] Because the Project conforms to the City's land use designation that was used to calculate MDAQMD growth projections, the Project's use of the site has been included in the growth forecast and is therefore consistent with the MDAQMD air quality plan. Therefore, the Project will not impact the MDAQMD air quality plan.

Finally, if a project applies air quality control measures per the MDAQMD Rule Book, as this Project and all projects within the City must do, then the MDAQMD CEQA Guidelines consider the project to be in conformity. This Project is subject to Rule 201, which requires developments to obtain a permit for the Air Pollution Control Office, and Rule 1300 which ensures that the Project does not interfere with the "attainment and maintenance of Ambient Air Quality Standards."[5]

The Project is consistent with employment and population forecasts prepared by the 2020-2045 RTP/SCS as well as the MDAQMD growth projections. The Project is also consistent with the land use plan that was used in the analysis of the growth forecast. Air quality control measures as required by MDAQMD will be applied. Therefore, compliance with the local, regional, and state guidelines and standards would ensure that the Project will not conflict with or obstruct the implementation of the applicable air quality plan. There will be no impact on the implementation of the applicable air quality plan.

b) **Less Than Significant Impact.** If a project will generate a cumulatively considerable net increase of a criteria pollutant for which the project area is in non-attainment under the federal and state ambient air quality standards, then the project is determined to have a significant impact. The MDAB is designated as an area of non-attainment for PM_{10} and ozone thresholds according to both the NAAQS and CAAQS. In response, the MDAQMD has adopted and updated attainment plans to bring concentration levels of PM_{10} and ozone into federal compliance. The Mojave Desert Planning Area Federal PM_{10} Attainment Plan was adopted in 1995. Most recently, the MDAQMD Federal 8-Hour Ozone Attainment Plan for the Western Mojave Desert Non-attainment Area was adopted January 2023.

Precursors to ozone are nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds/reactive organic gases (VOC/ROG). If the Project's construction and/or operational emissions exceed the MDAQMD thresholds for these pollutants, then the impacts would be significant and out of compliance with NAAQS and CAAQS. Project emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2022.1 for the following land uses: general light industry, parking lot, other asphalt surfaces and other non-asphalt surfaces. The Project site will include an existing warehouse, an outdoor storage area for wooden pallets, improvements to the driveway, fire lane and parking area, and drought tolerant landscaping. Emissions calculations were based on a warehouse area of 21,832 square feet, landscaped area of 33,717 square feet, 30 parking spaces, and other asphalt surfaces of 110,000 square feet.

3 Table E-5, City and County Population and Housing Estimates, California Department of Finance, May 2023.
4 City of Hesperia General Plan 2010, Land Use Element, p. LU-49.
5 Rule 1300, New Source Review General, MDAQMD Rule Book, March 22, 2021.

Construction Impacts

The construction phase is expected to extend over five months and the Project should be operational by early 2025. Table 3 provides the construction maximum daily emissions of each criteria pollutant pertaining to non-attainment that can be expected during construction. The Project would not exceed the MDAQMD thresholds.

Table 3
Maximum Daily Construction-Related Emissions Summary
(pounds per day)

Construction Emissions	CO	NOx	ROG	SO2	PM_{10}	$PM_{2.5}$
Daily Maximum	34.5	36.0	14.9	0.05	21.5	11.6
MDAQMD Threshold	548	137	137	137	82	65
Exceeds?	No	No	No	No	No	No
Source: CalEEMod (2022.1), maximum daily emissions.						

Operational Impacts

Operational emissions refer to ongoing emissions over the Project's lifespan. These emissions come from area source emissions (dust, asphalt surface), energy demand (electricity, natural gas), and mobile sources (vehicular emissions from forklifts, delivery trucks, worker commutes). Table 4 shows the operational daily maximum emissions for non-attainment criteria pollutants, particulate matter, and ozone. The pallet storage yard proposed for the north parcel would be constructed as either a gravel surface or an asphalt surface covering 67,734 square feet. Two different calculations were derived from CalEEMod to analyze the potential difference in emissions between the two surface types. An asphalt surface would emit 1.12 more pounds of reactive organic gases (ROG) per day than a gravel surface. Based on trip rates for the ITE Land Use Code 110 for General Light Industrial, the Project may generate a weekday daily average of 109 trips.[6] Per CalEEMod, the Project may generate 550,487 vehicle miles traveled per year (VMT/yr).

Table 4
Maximum Daily Operational-Related Emissions Summary
(pounds per day)

Operational Emissions	CO	NOx	ROG	SO2	PM_{10}	$PM_{2.5}$
Daily Maximum (gravel yard)[1]	7.68	0.96	0.20	0.02	1.27	0.35
Daily Maximum (asphalt yard)	7.68	0.96	1.32	0.02	1.27	0.35
MDAQMD Threshold	548	137	137	142	82	65
Exceeds?	No	No	No	No	No	No
1. Emissions estimates are provided for both gravel and asphalt surfaces for the pallet storage yard on the north parcel. Source: CalEEMod (2022.1), maximum daily emissions.						

6 Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).

Cumulative Impacts for Non-Attainment Criteria Pollutants

As stated above, the Project is located in a non-attainment area for ozone and PM_{10}, and emissions from the construction and operation will contribute to the regional non-attainment status. Since the MDAQMD does not provide thresholds of significance for cumulative emissions generated by multiple projects, a single project's potential cumulative contributions may be analyzed instead. Using the specific impacts imposed on a project, the method assumes that the project's impacts will be less than significant if the construction and operational emissions are less than the daily and/or annual emissions MDAQMD thresholds. As shown in the above Tables 3 and 4, the Project's potential emissions are below the daily thresholds. The Project would implement the standard best practices per the MDAQMD rules to mitigate emissions such as fugitive dust (Rule 403).

Summary

Potential daily maximum construction and operational emissions from the Project are estimated to be below the thresholds set by the MDAQMD. Despite the incremental increase these emissions would contribute to the region, the Project would not result in a considerable cumulative net increase of non-attainment pollutants. Therefore, the Project's impact would be less than significant.

c) **Less Than Significant Impact.** MDAQMD defines sensitive receptor land uses as residences, daycare centers, playgrounds, and medical facilities. If a project occurs within a specified distance of a sensitive receptor, the District requires an impact analysis based on significance threshold criteria number 4:

"[A project is significant if it] Exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 1."

The significance threshold distances between a project and a sensitive receptor as defined by the District are as follows:

- Any industrial project within 1000 feet;
- A distribution center (40 or more trucks per day) within 1000 feet;
- A major transportation project (50,000 or more vehicle per day) within 1000 feet;
- A dry cleaner using perchloroethylene within 500 feet;
- A gasoline dispensing facility within 300 feet.[7]

The Project would be located within 1000 feet of two residential neighborhoods. The site is bordered by the BNSF Railroad on the west, the Hesperia Airport runway on the east, light industrial business on the north side and undeveloped land on the south. Immediately beyond the railroad tracks to the west, approximately 250 feet from the west boundary of the Project site, lies a residential community. Likewise, approximately 330 feet to the east just beyond the airport runway lies another residential community.

In consideration of the above listed threshold distances, the Project is determined to be neither a distribution center, a major transportation project, a dry cleaner, nor a gasoline dispensing facility. The Project is considered to be a limited industrial (I1) project as opposed to a general industrial project (I2). The proposed use is the recycling and resale of wooden pallets which involves storing, sorting, and either repairing or recycling wood pallets. Pallets would be delivered to the Project site, sorted, then either repaired or sent to a recycling facility where they would be chipped and made into mulch. Refurbished pallets would be picked up and delivered to retailers off site. The proposed use aligns with the City's definition of limited industrial

7 MDAQMD California Environmental Quality Act (CEQA) and Federal Conformity Guidelines, February 2020.

which is, “transportation equipment, building equipment and materials, indoor manufacturing uses, and similar uses.” The City’s definition of general industrial use does not apply to this Project which includes, “the heaviest types of manufacturing and industrial uses...[such as] manufacturing, warehousing, and fabrication.”[8] This distinction is important in determining the scale of potential chemical applications and fossil fuel combustion which would result in potentially significant emissions. Recycling wood pallets is a use that primarily relies upon delivery trucks, forklift vehicles, and tools to either reattach the wood pieces or break apart pallets that are beyond repair. There would be no use of chemicals in this process. There would be fossil fuel emissions from the forklift vehicles, delivery trucks and worker vehicles. Considering the small scale of the pallet yard and the warehouse, the Project would not incur a significant amount of vehicle emissions during the operational phase, as shown in Table 4. The impact would be less than significant.

The construction phase of the Project would generate the highest levels of emissions, but this phase would be complete in five months, and then the subsequent operational phase would generate much lower levels of emissions.

As shown above in Tables 3 and 4, the emissions for both phases are well below the MDAQMD thresholds and will have a less than significant impact on nearby sensitive receptors.

d) **No Impact.** The proposed Project would be a wood pallet storage and refurbishment facility using an existing warehouse on the site. This type of light industrial manufacturing would not require the use of chemicals that emit toxic fumes or odors. There would be no impact.

Mitigation: None required.

Monitoring: None required.

8 Commercial and Industrial Land Use Designations, Municipal Code 16.16.310, City of Hesperia, September 2023.

4. BIOLOGICAL RESOURCES -- Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Sources: City of Hesperia General Plan 2010; Hesperia, California Municipal Code September 2023; California Sensitive Natural Communities, California Department of Fish and Wildlife, June 2023; Biological Resources Assessment, Jurisdictional Delineation, and Native Plant Protection Plan for the Development of APN 0397-121-03, in the City of Hesperia, San Bernardino County, California, prepared by Jennings Environmental, LLC, November 2023.

Background

The City of Hesperia lies at the northern edge of the San Bernardino National Forest within a high desert region known as the Mojave Desert Basin and Range Ecoregion. The City is bounded by the uninhabited national forest to the south, the high desert cities of Victorville and Apple Valley to the north, Interstate 15 along the west side, and the Mojave River along the east side. The ecoregion is characterized by climate extremes, which can be witnessed most fully in Death Valley National Park, where summer temperatures exceed 120 degrees Fahrenheit and rainfall can be less than two inches. Tempered by the national forest mountains to the south, the climate of Hesperia is less extreme. The City sits along the southern edge of the Mojave Desert Basin at an elevation of 3,186 feet and experiences a milder desert climate with an average rainfall between six and seven inches, and daytime temperatures ranging from 56 degrees in the winter to 99 degrees in the summer. At the lower elevations, creosote scrub is the dominate plant community of the Mojave Desert Basin and Range Ecoregion. Hesperia, at a higher elevational transitional zone, supports California junipers and Joshua trees, and a high degree of biological diversity.

The following description of the resources on the Project site and impacts analyses are based on the biological resources assessment for the Project site conducted in November 2023 by Jennings Environmental, LLC. That study included literature searches, database reviews and on-site investigation.

The Project site contains three parcels, two of which are part of the pallet facility, and one, at the far south end of the site, which will remain undeveloped vacant desert land and will be fenced off, but will be merged with the others at the City's request. The following analysis addresses the two developable parcels within the site, consisting of the existing facility on the south parcel, and the new pallet storage area on the north parcel. The south existing building parcel is 3.53 acres in size and is largely developed with the existing warehouse, driveway, and outdoor area where the previous business stored truck parts. There are no biological resources on the south parcel. The undeveloped north parcel is 2.54 acres in size and contains a mix of native and nonnative plant species. The north parcel has been previously disturbed and ruderal groundcover has grown over much of the disturbed soil between the California juniper trees and two Joshua trees. The ruderal vegetation includes native species such as common fiddleneck (*Amsinckia intermedia*), California buckwheat (*Erogonum fasciculatum*), white bursage/common stork's bill (*Ambrosia dumosa*), rubber rabbitbush (*Ericameria nauseosa*), and flat spine burr-ragweed (*Ambrosia acanthicarpa*) as well as and nonnative vegetation such as Schismus grass (*Schimus spp*.).

A small number of mature California junipers (*Juniperus californica*) are scattered at the southwest edge and the north section of the north parcel. The California juniper is a member of the Cypress family. It grows in xeric environments where soils are low in nutrients and is associated with Joshua tree woodlands and single-leaf pinyon pine woodlands. Junipers provide valuable nesting sites and food source for songbirds.

Two Western Joshua trees (*Yucca brevifolia*) occur on the north parcel. Joshua trees are members of the Yucca plant family and grow in the high desert ecosystem of the Mojave Desert between 2,000 feet and 6,000 feet. The provide nesting sites for a range of bird and mammal species from cactus wrens, and Cooper's hawks, to night lizards and desert wood rats. Due to the high level of biological diversity found in a Joshua tree woodland, the CDFW has designated this woodland ecosystem as a sensitive natural community.[9]

The biological resources assessment notes that the Project site and the surrounding area contains suitable habitat for nesting birds. While the on-site investigation took place outside of nesting season in November 2023, several notable native bird species were observed such as cactus wren (*Campylorhynchus brunneicapillus*), verdin (*Auriparus flaviceps*), house finch (*Haemorhous mexicanus*), common raven (*Corvus corax*), and white-crowned sparrow (*Zonotrichia leucophrys*), a winter migrant.

Discussion of Impacts

a) Less Than Significant Impact with Mitigation. According to the literature review for the biological resources assessment, there are 37 species of rare plants and animals and one sensitive habitat (Western Joshua tree woodland) that could potentially occur in the region between Hesperia and Silverwood Lake to the south. Several of these species are described here. The California desert tortoise (*Gopherus agassizii*) is the California State Reptile and is a federal and state listed threatened species that occurs in the region. Burrowing owl (*Athene cunicularia*) is a federal and state Species of Special Concern. The Burrowing owl is also a migratory species and further protected by the Migratory Bird Treaty Act (MBTA). Desert kit fox (*Vulpes macrotis*) is listed as a Species of Local Concern by Los Angeles County. It is native to the arid habitats of southern California and due to the growth of human development and energy production facilities, the population of kit fox continues to decline. The American badger (*Taxidea taxus*) is listed by the CDFW as a Species of Special Concern due to trapping, eradication of their prey base (ground squirrels and other

9 California Sensitive Natural Communities, California Department of Fish and Wildlife, June 2023, https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline.

ground-dwelling rodents) and the loss of habitat. The Mohave ground squirrel (Xerospermophilus mohavensis) is listed as a threatened species by CDFW due to habitat loss. During the site survey, none of these sensitive species nor any signs such as burrows or scat of these sensitive species were observed on the Project site.

Two Western Joshua trees (*Yucca brevifolia*) and a small number of California juniper trees (*Juniperus californica*) found on the Project site are described in more detail in the above description of the Project site. Although the California juniper is considered to be a species of least concern, it provides valuable nesting habitat for resident and migrating birds, and migrating birds are protected by the MBTA. The California Environmental Quality Act (CEQA) considers the Western Joshua tree to be a significant resource and therefore it receives protection from the California Food and Agricultural Code 80001-80006 "California Desert Native Plants," the Western Joshua Tree Conservation Act (WJTCA), and is managed by the California Department of Fish and Wildlife (CDFW). The WJTC provides interim protection while the California Game and Fish Commission considers whether to list the Western Joshua tree as endangered on the California Endangered Species Act.

To mitigate impacts on candidate, sensitive and special status species and to comply with local policies protecting biological resources, two mitigation measures are prescribed and outlined below as BIO-1 and BIO-2.

<u>Western Joshua Tree</u>
Mitigation measure BIO-1 prescribes 12-foot buffer zone around each Western Joshua tree. Joshua trees must be protected on site to the greatest extent possible, or a permit must be obtained from the City to remove and transplant each Joshua tree, and the permittee must ensure that the trees are transplanted appropriately. Per the biological resources assessment, the two Western Joshua trees should remain in place on site and should be protected from construction and operational impacts to the branches and root systems by placing appropriate buffers around the trees.

The following buffer distance guidelines are defined by the CDFW:
Joshua trees that are five meters or taller require a buffer of 40 feet.
Joshua trees that are 1 meter but less than 5 meters in height require a buffer of 12 feet.
Joshua trees that are less than 1 meter in height require a buffer of 6 feet.[10]

The heights of the Western Joshua trees on the Project site are 3.20 meters and 3.81 meters, hence 12-foot buffer zones around each tree are required. As stated above, the buffer zones would protect the Western Joshua tree branches from being broken by construction equipment and operational activity. The buffer zone would also prevent vehicles and other machinery from compacting and damaging the root systems below the soil. A City-approved tree biologist would mark the boundary and approve the barrier. In addition, the applicant is required by law to comply with the WJTCA and secure an incidental take permit, if required. This mitigation measure is outlined below as BIO-1. The incorporation of this mitigation measure would reduce impacts of the Project on the Western Joshua trees to less than significant.

<u>Burrowing Owl</u>
Mitigation measure BIO-2, a nesting bird survey prior to construction, would reduce impacts to less than significant for sensitive and special status bird species. The burrowing owl (*Athene cunicularia*) is not categorized as threatened or endangered by the USFWS or CDFW. However, it is designated as a Bird of

[10] Biological Resources Assessment, Jurisdictional Delineation, and Native Plant Protection Plan for the Development of APN 0397-121-03, in the City of Hesperia, San Bernardino County, California, prepared by Jennings Environmental, LLC, November 2023.

Conservation Concern (BCC) by the USFWS and a Species of Special Concern (SSC) by the CDFW, and it is protected under the MBTA and the California Fish and Game Code. Burrowing owls could potentially occur on the north parcel of Project route due to their attraction to a variety of open dry habitats such as grasslands, desert scrubland, agricultural areas, railroads rights-of-way, margins of highways, culverts, and earthen berms. The on-site biological investigation did not observe any burrowing owls or burrowing owl activity on the Project site. Should burrowing owls move onto the Project site between the time of the investigation and the commencing of construction, they would need to be identified and protected from construction activity. The incorporation of buffer zones around burrowing owl nest sites until the chicks successfully fledge would reduce impacts to this sensitive species to less than significant. In order to assure that burrowing owls have not moved onto the site prior to construction, BIO-4 is provided below, requiring a pre-construction survey for the species, consistent with the requirements of the Staff Report for Burrowing Owl (2012) prepared by CDFW.

<u>Summary</u>
The Western Joshua tree (*Yucca brevifolia*) is currently a candidate species for listing as endangered on the Ct and is therefore afforded protections from disturbance and removal except by permit, at which point, removed Joshua trees must be appropriately transplanted. The biological resources assessment states that the two Western Joshua trees on the Project site should remain in place on the Project site with a permanent 12-foot buffer around each tree. Should protection in place not occur, the applicant would be required to secure an incidental take permit for their removal, as required in the WJTCA and mitigation measure below. Although potentially occurring sensitive animal species were not observed during the site survey, burrowing owls have been known to move into previously unoccupied areas where human disturbance has occurred. To ensure that this sensitive species is protected, a preconstruction survey is required. The mitigation measures would reduce potential impacts to less than significant for these sensitive species and comply with local policies and ordinances.

b) **Less Than Significant Impact with Mitigation.** The Project site contains no riparian habitat, and therefore would not impact any riparian habitat. However, as discussed above, the Western Joshua tree woodland ecosystem is considered to be a sensitive natural community by the CDFW because of the high level of biodiversity the woodland ecosystem supports. While the low numbers of Western Joshua trees and California juniper trees on the north parcel of the Project site may preclude the site from qualifying as a fully intact woodland habitat, the site retains value for nesting birds moving through the southern portion of Hesperia.

To mitigate potential impacts to plant and animal species that occur or may occur on the Project site due to their association with the sensitive Western Joshua tree woodland, three mitigation measures, BIO-1, BIO-2, and BIO-3, are outlined below. BIO-1 prescribes 12-foot buffer zones that should be placed around both Joshua trees to protect the branches and roots from breakage and compactions by machinery during the construction operational phases of the Project. BIO-2 explains that a nesting bird survey (NBS) is required to be conducted immediately prior to scheduled construction by a certified avian biologist. BIO-3 recommends that California junipers (*Juniperus californica*) on the Project site be conserved to the greatest extent possible and incorporated into the drought-tolerant landscaping proposed by the Project to preserve the natural benefits this plant species provides to the natural community. The three mitigation measures would reduce potential impacts to less than significant for the Joshua Tree woodland sensitive natural community.

c) **No Impact.** The Project site contains no wetlands, pools, creeks, marshes, drainages, or any other type of hydrologic feature on the Project site. As a result, there will be no impacts to any state or federally protected wetlands.

d) **Less Than Significant Impact with Mitigation.** The Project site is not located within a known wildlife migratory path or corridor. However, the two Western Joshua trees and the clusters of California junipers attract avian species, albeit in low numbers, searching for cover and nest sites. Species observed during the November 2023 biological survey include common native species such as the white-crowned sparrow (a winter migrant), cactus wren, verdin, common raven, and house finch.

Because the Project site and nearby vicinity provide suitable habitat for nesting birds, the Project site is subject to the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code sections 3503 and 3503.5. The Migratory Bird Treaty Act (MBTA) of 1918 requires cooperation between the United States, Canada, Mexico, Japan and Russia in protecting bird species that migrate through the shared territories. The MBTA prohibits the taking of migratory birds which includes killing, capturing, selling, trading, and transport. "Under the MBTA, it is illegal to destroy a nest that has eggs or chicks in it, or if there are young birds still dependent on the nest for survival.[11] Similarly, California Fish and Game Code section 3503 stipulates that, "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Section 3503.5 states, "It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."[12]

Mitigation measure BIO-2 outlined below requires a pre-construction nesting bird survey to be conducted immediately prior to the commencement of construction. A qualified avian biologist would be contracted to survey the Project site for nesting birds if construction is set to begin during the nesting season. In southern California, the nesting season extends from February 1 through September 15. For migrant nesting bird species, the season extends from March 15 through August 31. If any bird nests are identified, the biologist would mark the locations and establish buffer zones. Construction activity would be restricted from occurring within the buffer zones until the young birds have successfully fledged from the nests. This mitigation measure would allow for the completion of the nesting cycle and would reduce potential impacts to less than significant for nesting birds.

e) **Less Than Significant Impact with Mitigation.** As described above, two Western Joshua trees (*Yucca brevifolia*) occur on the Project site. In addition to the protections afforded the Joshua tree under the WJTCA, San Bernardino County protects Joshua trees from removal except under a permit via the Desert Native Plant Protection § 88.01.060. The City of Hesperia via chapter 16.24, Protected Plants, of its municipal code, complies with San Bernardino County Joshua tree protections. The two Joshua trees are proposed to be protected in place, but impacts to the species would represent a significant impact should protection not be provided. To comply with local policies protecting biological resources, BIO-1 is provided below, which will reduce impacts to Joshua trees to less than significant levels, and BIO-3, which will reduce impacts to California Juniper. With implementation of these measures, impacts associated with local policies will be reduced to less than significant levels.

f) **No Impact.** The Project site does not occur within a Habitat Conservation Plan area, or a Natural Community Conservation Plan area, or within any other federal, state, or local conservation area. Therefore, the Project will have no impact on any such plan.

Mitigation Measures:

BIO-1 The two Western Joshua trees (*Yucca brevifolia*) will remain in place on the Project site and will each require a permanent 12-foot buffer from construction and operational vehicles, machinery and activity.

[11] Bird Nests, US Fish and Wildlife Service, accessed February 22, 2024, https://www.fws.gov/story/bird-nests#:~:text=This%20law%20says%3A%20"No%20person,has%20eggs%20or%20chicks%20in

[12] California Code, Fish and Game Code 3503 and 3503.5, last updated January 1, 2023.

Whether protected in place or removed, the applicant shall secure required incidental take permits prior to any ground disturbance on the Project site. The applicant shall apply for all required incidental take permits from CDFW in accordance with WJTCA and provide approved permits to the City prior to the initiation of any ground disturbing activity.

BIO-2 Bird nesting season occurs between February 1 and September 15 in southern California, and between March 15 and August 31 for migrating bird species. To avoid impacts to resident and migratory nesting birds, all vegetation clearing, ground disturbance, and construction activity should be scheduled between September 16 and January 31 if possible. If construction occurs during the nesting season, a certified avian biologist must conduct a pre-construction nesting bird survey (NBS) immediately prior to scheduled construction activity. Should any active nests be identified, the biologist will demarcate a no-work buffer zone(s) around the active nest(s) and check the nest site(s) weekly until the young birds fledge and the nest(s) become inactive. The buffer zone size would be based on the nesting species, its sensitivity to disturbance, nesting stage and the expected intensity and duration of disturbance. No ground or vegetation disturbance shall occur within the nest site buffer zone(s) until the qualified biologist determines that the young have successfully fledged and the nest is inactive. Per CDFW recommendations, a buffer of 500 feet shall be set for listed species and birds of prey, and a buffer of 100 to 300 feet shall be set for unlisted songbirds.

BIO-3 To help offset the loss of the mature California Juniper trees and their association with the Joshua tree woodland habitat the Junipers on the Project shall be incorporated into the planned drought-tolerant landscaping for the site rather than removed from the site, to the greatest extent possible.

BIO-4 A pre-construction burrowing owl survey will be conducted by a qualified biologist within 30-days prior to any ground disturbing activities. If burrowing owls are documented on-site, the applicant shall prepare and implement a plan for avoidance or passive exclusion, in coordination with CDFW. Methodology for surveys, impact analysis, and reporting shall follow the recommendations and guidelines provided within the California Department of Fish and Game Staff Report on Burrowing Owl Mitigation (2012 Staff Report).

Monitoring:

BIO-A The Project applicant shall provide the City with preconstruction nesting bird surveys, as well as Joshua tree permits prior to the issuance of any ground disturbing permit. **Responsible Parties:** Project Biologist, Planning Department, City Engineer

5. CULTURAL RESOURCES -- Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

Source: BRC Consulting LLC, Cultural Resource Assessment

Background

The City of Hesperia has six documented prehistoric periods: the Paleoindian Period (12,000 to 10,000 BP), the Lake Mojave Period (10,000 to 7,000 BP), the Pinto Period (7,000 to 4,000 BP), the Gypsum Period (4,000 to 1,500 BP), the Saratoga Springs Period (1,500 to 800 BP), and the Shoshonean Period (800 BP to European contact).

The Paleoindian Period is loosely defined by the use of tools including fluted projectile points. The transition from the Paleoindian Period to the Lake Mojave Period was driven by climate warming. Artifacts indicative of the Lake Mojave Period include stemmed points, flake and core scrapers, choppers, hammerstones, and crescentics. The Pinto Period is characterized by the desiccation of the Mojave Desert which explains the sparse occupation of the desert. The Pinto Period sites are rare due to lack of occupants in the region. Nonetheless, artifacts from the era include Pinto projectile points and flake industry similar to the Lake Mojave Period tools.

The Gypsum Period experienced the return of moister conditions and thereby the diversification of tools by the abundance of resources. Artifacts include milling stones, mortars, pestles, and a proliferation of Humboldt Concave Base, Gypsum Cave, Elko Eared, and Elko Corner-notched dart points. Other tools include leaf-shaped projectile points, rectangular-based knives, drills, large scraper planes, choppers, hammer stones, shaft straighteners, incised stone pendants, and drilled slate tubes.

The Saratoga Springs Period witnessed the cultural diversification of the previous period. Obsidian became more commonly used throughout the Mojave Desert and artifacts of the period include milling stones, mortars, pestles, ceramics, and ornamental and ritual objects. Settlement patterns consisted of large villages creating major habitation, temporary camps, and processing stations. The Shoshonean Period is defined by the expansion of ceramics, and the diversification of hunting and gathering. Additionally, trade routes became established across the Mojave River, to the west of the Project. Trade in the western Mojave was related to coastal groups.

The historical era is divided into the Spanish Period (1769 to 1821), the Mexican Period (1821 to 1848) and American Period (1848 to present). The Spanish Period began with Father Francisco Garces who guided Juan Bautista de Anza and his group cross the Mojave Desert from an outpost in Arizona. According to Father Garces's journal, the group camped at the headwaters of the Mojave River. The group would set up the Mission San Gabriel in 1771 near what is today Pasadena. During the Mexican Period, the Mexican government passed the Secularization Act which called for the disestablishment of Spanish missions, causing missions to lose their land holdings. The American Period began with the Treaty of Guadalupe Hidalgo. The economic expansion of California began with the Gold Rush in 1850, and transitioned to livestock farming from 1849 to 1855, and real estate development in the late 19th century.

The following discussion is based on a cultural resources assessment for the Project, conducted in December 2023 by BRC Consulting LLC. The study includes historical background research, on-site investigation, and field survey results.

Discussion of Impacts

a) Less Than Significant Impact. Data from the South-Central Coastal Information Center (SCCIC) indicates that 10 cultural resources have been identified within a 0.5-miles radius of the site.[13] These cultural resources include three Prehistoric Lithic Scatter sites, two Historic Scatter sites, two Prehistoric sites, and one Hesperia Road, one Mojave Trail, and one AT&SF Rail. The majority of these cultural sites are located on undeveloped desert land to the south of the site (See Table 5).

Table 5
Cultural Resources Within One Half Mile of the Project Site

Cultural Resource
P-36-3849: Prehistoric Lithic Scatter (0.4 miles southeast)
P-36-4256: Hesperia Road (0.2 miles south)
P-36-4272: Mojave Trail (0.4 miles east)
P-36-6793: AT&SF Rail Alignment (0.1 miles west)
P-36-12999: Historic-Period Scatter (0.4 miles southwest)
P-36-13007: Prehistoric Lithic Scatter (0.4 miles southwest)
P-36-21352: Prehistoric Lithic Scatter (0.25 miles southwest)
P-36-21354: Historic-Period Scatter (0.3 miles northwest)
P-36-60888: Prehistoric Site (0.4 miles southeast)
P-36-60889: Prehistoric Site (0.5 miles east)

No historical resources have been studied within the site's immediate vicinity and none have been identified within the site's boundary. No historical resource is expected to occur within the Project's area. For this reason, the Project is not expected to significantly change the City's access to or the value of historical resources. Less than significant impact will occur.

b) Less Than Significant Impact with Mitigation. The Project is located on the desert floor, approximately 5 miles south of the San Bernardino Mountains, and 5 miles east of the Mojave River. As mentioned above, 10 cultural resources have been identified within a 0.5-mile radius of the site (See Table 5). These cultural sites are predominantly focused on the southern region which consist of undeveloped, open desert terrain. A cultural field investigation was conducted by walking parallel transects spaced approximately 50 feet apart across the Project's site. The archeologist concluded that no cultural resources of any kind including historic-period or prehistoric archaeological sites, or historic-period architectural resources, were found at the site.[14] The probability of archeological resources occurring on-site is low to very low.

As described in greater detail in Section 18, Tribal Cultural Resources, the Yuhaaviatam of San Manuel responded to the City's request for consultation, and although they did not have any concerns about the Project, they requested the inclusion of mitigation measures as provided below be included to require the monitoring of earth moving activities if resources are uncovered. These mitigation measures will reduce impacts to less than significant levels.

13 BCR Consulting LLC, Cultural Resources Assessment, 2023.
14 BCR Consulting LLC, Cultural Resources Assessment, 2023.

c) **Less Than Significant Impact with Mitigation.** No cemeteries or human remains are known to have occurred at the site. It is unlikely that any human remains will be found during the construction process of the Project. However, in the case that human remains are found, all activities will stop immediate, and the coroner will be notified to determine that nature of the remains and whether Native American consultation is needed as required by California's Government Code §5079.98. As described above and in Section18, the Yuhaaviatam of San Manuel requested, as part of consultation activities under AB 52, that mitigation be included, as provided in CUL-3 below, to cite the requirements of law. With implementation of this mitigation measure, impacts to human remains will be reduced to less than significant levels.

Mitigation:

CUL-1 In the event that cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, the Yuhaaviatam of San Manuel Nation Cultural Resources Department (YSMN) shall be contacted, as detailed within TCR-1, regarding any pre-contact finds and be provided information after the archaeologist makes his/her initial assessment of the nature of the find, so as to provide Tribal input with regards to significance and treatment.

CUL-2 If significant pre-contact cultural resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, the archaeologist shall develop a Monitoring and Treatment Plan, the drafts of which shall be provided to YSMN for review and comment, as detailed within TCR-1. The archaeologist shall monitor the remainder of the project and implement the Plan accordingly.

CUL-3 If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

Monitoring:

CUL-A If an archaeologist is called to the site to investigate a find, they shall provide the City with a report of findings within 30 days of the cessation of monitoring.
Responsible party: Project archaeologist, City Planning Division
Timing: Within 30 days of completion of monitoring.

6. ENERGY -- Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Source: City of Hesperia General Plan 2010; California Energy Commission 2022 Total System Electric Generation; U.S. Energy Information Administration.

Background

Electricity is a secondary form of energy which is generated from primary sources such as fossil fuels, renewable energy sources, and nuclear energy. In California, 45% of the total power generated in-state and imported from out of state includes a mix of renewable sources such as solar, wind, hydroelectricity, geothermal, and biomass. Approximately 9% is derived from nuclear power, and the remaining 46% is generated by natural gas, coal, and oil.[15] Natural gas is also used for heating buildings and water, cooking, industrial processes, and transportation. Southern California Edison (SCE) provides electricity to the City of Hesperia. An overhead electricity transmission line runs along the west edge of the Project site between the parcels and the BNSF railroad tracks. Southwest Gas Corporation (SWG) provides natural gas to Hesperia.

The U.S. Energy Information Administration explains that the transportation sector consumes 27% of all energy consumed in the United States. Petroleum products (including gasoline, distillates/diesel fuel, jet fuel, residual fuel oil and propane), biofuels, natural gas and electricity are the four major transportation energy sources. Of these four energy sources, gasoline supplies 52% of the transportation energy mix, and distillates, or diesel fuel, supply 22%.[16] Since 2008 the California Air Resources Board (CARB) has regulated in-use off-road diesel vehicles, and has amended these regulations several times, with the most recent amendments being approved in October 2023. In-Use Off-Road Diesel-Fueled Fleets Regulation (Off-Road Regulation) governs a range of heavy-duty diesel-powered vehicles from skid steer loaders to excavators, cranes, and mining trucks. Off-Road Regulation defines diesel vehicle engines by their emissions levels and places them into Tiers. Tier 0 and Tier 1 vehicles are the oldest and have the highest emissions while Tier 4 vehicles are newer and have the lowest emissions levels. The regulations set timelines for fleets to phase out Tier 0, 1, 2, and 3. Furthermore, fleets will be restricted in adding Tier 4 vehicles as they will eventually need to use vehicles that run with Renewable Diesel.[17]

15 2022 Total System Electric Generation, California Energy Commission, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation.

16 Energy Use for Transportation, U.S. Energy Information Administration, 2022, https://www.eia.gov/energyexplained/use-of-energy/transportation.php.

17 Overview of Amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation, California Air Resources Board, August 2023, https://ww2.arb.ca.gov/resources/fact-sheets/overview-amendments-use-road-diesel-fueled-fleets-regulation.

Discussion of Impacts

a) Less Than Significant Impact.

Construction Phase

The proposed Project includes the construction of an outdoor pallet yard, a new driveway with two entrances, new parking area and improvements to an existing warehouse. Most of the energy consumed during the construction phase will be in the form of transportation fuels. The heavy-duty construction equipment and heavy-duty hauling trucks would consume diesel fuel. Worker commutes will consume gasoline. During the warehouse renovation, electricity for lighting, heating or cooling, and construction tools and equipment will be consumed. A temporary on-site construction trailer will require electricity for lighting, indoor climate control, and electronic equipment. The energy use during the construction phase will be temporary, not lasting more than five months. The scope of the construction phase is limited to outdoor surface improvements with minor improvements to an existing warehouse, and no additional structures will be built. Due to the short duration of the construction phase and the smaller scale of construction activities, the construction phase will not result in wasteful, inefficient or unnecessary energy consumption. Compliance with CARB's Off-Road Regulation of diesel-fueled equipment further ensures that the Project will have a less than significant impact on energy consumption.

Operational Phase

Once operational, the warehouse will consume electricity for lighting, air conditioning, and powering industrial and office equipment. It will also consume natural gas for the water heater. Diesel and gasoline will be consumed during materials deliveries and pick-ups as well as worker commutes. As discussed in Section 17, Transportation, the Project is expected to generate 106 trips per week which would include passenger vehicles and pallet delivery trucks. The warehouse would be subject to local, county, and state building efficiency regulations.

The Project will have a minimal temporary impact during the construction phase and a minimal impact during the operational phase. The energy use for this Project will not be wasteful or inefficient, and impacts are expected to be less than significant.

b) Less Than Significant Impact. The Project would be subject to California Title 24, Building Energy Efficiency Standards, and the City's Climate Action Plan (CAP). The renovation and reuse of the existing warehouse on the Project site also complies with multiple City Land Use policies that promote the use of previously developed property, reuse, and recycling of building materials, and retrofitting of buildings for higher energy efficiency. As a result of the implementation of these standards and requirements, the Project will have less than significant impacts as it relates to state and local plans.

Mitigation: None required.

Monitoring: None required.

7. **GEOLOGY AND SOILS** -- Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☒	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

Sources: Cultural Resources Assessment, BCR Consulting LLC (2023); City of Hesperia General Plan (2010).

Background

Geological Setting

Hesperia is in the southwestern portion of the Mojave Desert, an arid region with alluvial fans, desert plains, dry lakebeds, and mountain ranges including the Silver Mountains to the north, the San Bernardino Mountains to the south, the Ord Mountains to the southeast, and the flat valley floor to the west. The central and northern portions of the City are located on a moderate to low sloping alluvial fan with an elevation ranging from 2,900 to 4,200 feet. The southern portion encompasses the foothill of the San Bernardino Mountains and the broad valley.

Faults in the Mojave Desert consist of the east-west trending Garlock fault on the northern region and the northwest trending San Andreas fault on the western boundary. Hesperia lies closer to the San Andreas fault and other fault zones including the Helendale Fault to the north, the Cleghorn Fault to the south, the Ord Mountains Fault to the east, and the Mirage Valley Fault to the far northwest.[18] These active earthquake sources have the potential to cause damage. However, the North Frontal Fault, approximately 2 miles east of Hesperia, is likely to result in the greatest impact with a maximum earthquake magnitude of 7.2.[19]

During seismic activity, the combination of loose sediment and shallow groundwater within 50 feet below ground surface is susceptible to liquefaction. In Hesperia, loose, unconsolidated sediments occur throughout but shallow groundwater at depths of less than 30 feet occurs only within the Mojave River floodplain.[20] The Mojave River floodplain is therefore classified as a liquefaction-susceptible zone in the City's General Plan.

In addition, slope failure could occur by the foothills of the San Bernardino Mountains. Ridgetop shattering could occur in the southern part of the City, in the San Bernardino Mountains and in the foothills at the base of the mountains, and to the south and east of Summit Valley Road. Seiches due to seismic shaking could occur in Silverwood Lake, Hesperia Lake, and any recharge basin in the City.[21]

In Hesperia, the dry desert conditions rapidly deposit young and very young alluvial sediments. These soil types are predominantly located in the low-lying portion of the City. The valley and canyon areas of Hesperia are underlain by granular soil such as silty sand, sand, and gravel. Sediment within the floodplain of the Mojave River may consist of fine-grained silts and clays sediments. Granitic and metamorphic basement rocks underlie the mountains[22]. According to a field investigation for the Project, the soil found on-site is composed of unconsolidated, undissected alluvial silt, sand, and gravel.[23]

Paleontological Resources

Paleontological resources are artifacts consisting of, fossils that provide context to life occupying the region before modern society. These artifacts are not easily accessible, since most are hidden underground, and their existence is usually unknown until the area is disturbed. According to the Paleontological Resource Sensitivity Map, the central portion of Hesperia is located on very young sediments which are assigned low paleontological sensitivity. In the southern and northeastern portion where old alluvium types are located, these areas are assigned high sensitivity.[24] No known paleontological resource has been identified in the City or within the City's sphere of influence. However, paleontological resources have occurred in the Cajon Pass region, located to the southwest of the City. Other fossils have also been identified and located at different sites, directly north of the City. Fossils from these sites include the extinct mammoth, horse, llama, and the extinct large camel.[25]

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18 California Department of Conservation Geological Survey, Fault Activity Map, https://maps.conservation.ca.gov/cgs/fam/.
19 City of Hesperia General Plan, Safety, 2010.
20 City of Hesperia General Plan, Safety, 2010.
21 City of Hesperia General Plan, Safety, 2010.
22 Earth Consultant International, Inc., Technical Background Report to the Safety Element of the General Plan for the City of Hesperia, Feb. 2010.
23 BCR Consulting LLC, Cultural Resources Assessment, Dec. 2023.
24 Michael Brandman Associates, Technical Background Report in Support of the Cultural Resource Element: City of Hesperia General Plan Update, Exhibit 8, March 2010.
25 Michael Brandman Associates, Technical Background Report in Support of the Cultural Resource Element: City of Hesperia General Plan Update, March 2010.

Discussion of Impacts

a.i) Less Than Significant Impact. The Project site is on the southern outskirts of the City's development center. According to the California Department of Conservation Geological Survey Fault Activity map, the site is not located near an active fault zone. The Project is also not within or adjacent to an Alquist-Priolo Earthquake Fault Zone. The Ord Mountain Fault segment of the North Frontal Fault is the nearest fault to the Project, approximately 6 miles east. The Ord Mountain Fault runs along the west region of the Ord Mountain, creating a thrust fault moving in a west-east direction. The fault has an estimated earthquake magnitude of 7.0, according to the Southern California Earthquake Data Center.[26]

a.ii) Less Than Significant Impact. The Project will result in the refurbishment of an existing building, and the development of a pallet storage yard. The Project will be required to comply with the California Building Code and the City's Building Codes, which require the incorporation of collapse-resistant design to reduce potential seismic risks. For these reasons, the impact associated with fault zones and seismic ground shaking is expected to be less than significant.

a.iii) Less Than Significant Impact. According to the City's General Plan Seismic Hazards map (Exhibit SF-1), the site is not on or within an area susceptible to liquefaction. In Hesperia, liquefaction zones run along the eastern region of the City's boundary, expanding mostly on the southern end.[27] Close to the City's center, the Mojave River is classified as a liquefaction-susceptible area due to noncompact sediment and shallow underground water at a depth of 30 feet. The distance between the Project's site and the Mojave River is approximately 5 miles. The site is at a distance from the Mojave River where the likelihood of liquidation impact is low to very low.

According to regional groundwater data, the area within the site's vicinity has had historically groundwater depths which are estimated to be greater than 50 feet below ground surface.[28] The soil on-site is not prone to liquefaction during ground shaking conditions due to the absence of shallow groundwater, above 50 feet from the ground surface. Less than significant impacts are anticipated.

a.iv) Less Than Significant Impact. The Project consists of and is surrounded by relatively flat lands apart from the valley hills and the San Bernardino Mountains to the south. According to the City's General Plan Seismic Hazards map, earthquake-induced landslides are focused throughout the San Bernardino Mountains.[29] The Project is approximately 5 miles north of the foothills of the San Bernardino Mountains. In this case, the site's distance from the mountains reduces impacts related to landslides. For this reason, impacts are less than significant.

b) Less Than Significant Impact. The site is currently developed on the south side, and vacant on the north. The site's undeveloped north parcel is composed of unconsolidated alluvial silt, sand, and gravel.[30] The south parcel is developed and has been cleared and paved with asphalt concrete and the foundation of the existing building. Both parcels are relatively flat. As a result, soil erosion on the south side of the site is currently limited and will remain so, while soil erosion on the north side which currently occurs in its native condition will be eliminated with the construction of the pallet storage pads and driveways.

26 Southern California Earthquake Data Center, https://scedc.caltech.edu/earthquake/northfrontal.html.
27 City of Hesperia General Plan, Safety, Exhibit SF-1, 2010.
28 SALEM Engineering Group, Inc., Limited Geotechnical Engineering Investigation, 2023.
29 City of Hesperia General Plan, Safety, Exhibit SF-1, 2010.
30 BRC Consulting LLC, Cultural Resources Assessment, 2023.

The existing drainage system of the south parcel directs water west via natural swales located northwest of the warehouse and sheet flows across the site southeast of the warehouse.[31] The Project proposes the development of a drainage system connecting both parcels in which rainwater is collected and disposed of according to the best management practices and City's Code. Best management practices enforce adequate maintenance and function of the Project's proposed drainage system to ensure runoff is being properly redirected away from potable water sources at all times. The City's Construction Site Stormwater Runoff Control Program and Water Quality Management Plan mandate all new development and redevelopment projects to submit a drainage plan for the project's construction and operation phase to reduce runoff resulting from the implementation of the site (Ordinance Code §8.30.200 and §8.30.220). These requirements will reduce the potential for soil erosion and degradation and therefore reduce impacts to less than significant levels.

c) **No Impact.** The site consists of a developed and undeveloped parcel, both of which are relatively flat and located along Santa Fe Avenue East. The south parcel is developed and houses an existing single-story sheet-metal warehouse. The north parcel is undeveloped and vacant. The construction of the Project includes minor improvements to the warehouse and the clearing and asphalt paving of both parcels. The proposed construction is unlikely to disturb the property to the extent of causing on- and off-site landslides, lateral spreading, subsidence, or collapse because shallow excavation will take place in order to clear the both parcels for pavement. No impact is anticipated.

d) **No Impact.** Unconsolidated alluvial silt, sand, and gravel are found on-site. Silty sand is the predominant soil type with an infiltration rate of 1.12 inch per hour which is inconsistent with expansive soil's high water absorbability.[32] The Project will not be constructed on expansive soil. No impact will occur.

e) **Less Than Significant Impact.** The Hesperia Water District (HWD) and Victor Wastewater Reclamation Authority (VVWRA) provide wastewater services to the City of Hesperia. The HWD operates the City's sewer system and the VVWRA treats wastewater in their facility located at 20111 Shay Road in the City of Victorville. According to the City's Wastewater Master Plan map, the site is not part of the City's existing sewer system or within consideration for an improved sewer collection system by 2032.[33]

Currently, an underground septic tank is located on the site's south parcel, underneath the loading zone. The wastewater generated on site is not expected to exceed the septic tank capacity because the industrial facility will be occupied by a few employees during working hours. An additional septic tank or an alternative wastewater disposal system is not required. No soil impacts related to the support of septic tanks and alternative systems is expected. Less than significant impacts will occur.

f) **Less Than Significant Impact.** After the cultural field investigation, the archeologist concluded that the Project's area is comprised of Quaternary alluvial from the late Holocene Epoch. These younger sediments are assigned low paleontological sensitivity due to their age and likelihood of containing a fossil.[34] No fossils were discovered at the site or within a one mile radius. The potential for paleontological resources being found on-site is low to very low.

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31 IMEG Corp, Hydrology Report, 2023.
32 IMEG Corp, Hydrology Report, 2023.
33 City of Hesperia Wastewater Master Plan, Waste System CIP, Figure ES.2-ES.3, 2008.
34 Paleo Solution, Paleontological Technical Study, Jan. 2018.

The Project proposes the renovation of the existing developed parcel (south) and construction on a currently undeveloped parcel (north). The Project's construction will consist predominantly of minimal excavation to allow for the site to be paved with asphalt concrete. The construction phase is unlikely to disturb the ground to the extent of potentially uncovering and significantly impacting older alluvium. Less than significant impacts are anticipated.

Mitigation: None required.
Monitoring: None required.

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

Sources: City of Hesperia General Plan 2010; City of Hesperia Climate Action Plan, 2010; MDAQMD CEQA and Federal Conformity Guidelines, February 2020; San Bernardino County Regional Greenhouse Gas Reduction Plan, March 2021.

Background

The lower troposphere of the Earth's atmosphere contains a mix of gases that sustain life. Greenhouse gases (GHGs) comprise a small percentage, 0.04%, of the tropospheric gases and trap just enough heat to maintain a relatively constant and livable air temperature. Even small alterations in this composition are well documented via ancient and current climate measurements.

Human activities including the burning of fossil fuels, clearing native vegetation, altering landscapes to accommodate hardscapes and built environments reduce the Earth's ability to cycle and sequester carbon, and further increases the level of greenhouse gas concentration in the atmosphere. While no one development project can have a globally significant impact on greenhouse gas increases, the cumulative impacts of regional development can result in locally significant environmental changes, which in turn contribute to wider climatic changes. Hence, the state and local jurisdictions have adopted policies and thresholds that cap GHG emissions and mandate mitigations when needed to ensure new land uses minimize their impacts.

The 2016 Senate Bill 32 (SB 32) requires California to reduce overall greenhouse gas emissions by 40% below 1990 levels by the year 2030. This bill furthers the mandates of the prior 2006 Assembly Bill 32 which required the state the reduce GHG emissions to 1990 levels by 2020. Going beyond SB 32 is the 2022 Scoping Plan proposed by the California Air Resources Board (CARB) which sets forth a plan to achieve statewide 100% carbon neutrality by 2045. In 2010 the City of Hesperia adopted a Climate Action Plan (CAP) to ensure that its General Plan and future development would comply with the original 2006 AB 32 goals.

Hesperia is under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD), the local agency that sets emissions guidelines and monitors air pollutants per state and federal standards.

The major greenhouse gases present in the atmosphere and increased by human activities are as follows:

- Carbon Dioxide (CO_2): Next to water vapor, which cycles quickly in and out of the atmosphere, carbon dioxide is the most abundant GHG and remains in the atmosphere well over 300 years. Human activities emit CO_2 when burning fossil fuels and burning and removing forests and other vegetation. Looking back 800,000 years prior to the Industrial Revolution, the level of CO_2 in the atmosphere never climbed above 300 parts per million. Today we measure CO_2 at 419.81 parts per million. Because CO_2 is the most prevalent and longest lasting GHG, measurements of CO_2 equivalents (CO2E) are often used as the basis of GHG comparative analyses.

- Methane (CH_4): Methane is the third most abundant GHG in the atmosphere. It is released during the extraction, refining, and burning of fossil fuels, and the burning and clearing of native vegetation. Livestock, decay of organic waste, and landfills also emit methane. Methane remains in the atmosphere for approximately 10-12 years, but pound for pound, methane traps 28 times more heat than carbon dioxide.

- Nitrous Oxide (N_20): Like carbon dioxide and methane, nitrous oxide naturally occurs in the atmosphere. It is also released by agricultural activities and agricultural chemicals, fossil fuel combustion, wastewater treatment and industrial processes. It remains in the atmosphere for approximately 120 years and pound for pound, it is 265 times more effective at trapping heat than carbon dioxide.

- Fluorinated Greenhouse Gases: Chlorofluorocarbons (CFCs), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF_6) Together these gases are referred to as fluorinated GHGs. F-GHGs are solely emitted as by-products of industrial processes such as aluminum and semi-conductor manufacturing and used as refrigerants and aerosol propellants. Depending on the gas, they can remain in the atmosphere for a very short time span of a few weeks or thousands of years. Compared to carbon dioxide, the global warming potential (GWP) of fluorinated GHGs is thousands to tens of thousands of times higher.

The Mojave Desert Air Quality Management District (MDAQMD) outlines GHG emissions thresholds for the entire Mojave Desert Air Basin (MDAB). Emissions from the Project site were estimated using the California Emissions Estimator Model (CalEEMod) Version 2022.1 and compared against the MDAQMD thresholds.

MDAQMD states that a project has a significant impact on the environment if it directly and indirectly generates total emissions in excess of the District's thresholds outlined in Table 6. In general, the District maintains that the carbon dioxide equivalent (CO_2e) threshold of 100,000 tons per year or 548 pounds per day is a sufficient baseline for GHG comparison. Note that the MDAQMD measures annual emissions in short tons while CEQA and CalEEMod measure annual emissions in metric tons.

Table 6
MDAQMD GHG Significance Threshold

Criteria Pollutant	Annual Threshold
Greenhouse Gases (CO_2e)	**100,000 short tons** **90,718 metric tons**
Source: MDAQMD CEQA Guidelines (February 2020).	

Discussion of Impacts

a) **Less Than Significant Impact.** Project emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2022.1. The Project site will include an existing warehouse, an outdoor storage area for wooden pallets, improvements to the driveway, fire lane and parking area, and drought tolerant landscaping. GHG emissions calculations were based on a warehouse area of 21,832 square feet, landscaped area of 33,717 square feet, 30 parking spaces, and other asphalt surfaces of 110,000 square feet.

Construction:
Construction of the Project is expected to last five months and would result in temporary GHG emissions due to the operation of construction equipment and vehicle emissions from hauling materials and worker commutes. As shown in Table 7, the construction phase would generate a total of 171 metric tons of CO_2e

emissions. Because there are no stated construction emissions thresholds issued by the District, the Project's total construction emissions are amortized over a 30-year period and added to the total annual operational emissions. The combined amortized construction emissions and operational emissions are compared to the MDAQMD significance threshold for CO_2e to determine whether the construction emissions would result in a cumulatively significant impact.

Operation:
Five categories of emissions would contribute to the Project's annual GHG emissions over the operational lifetime: area emissions (off-gassing from pavement and architectural coating), energy use, mobile (vehicle emissions), solid waste, and water use. Table 7 lists the Project's estimated annual emissions by category in addition to the amortized construction emissions. The total annual emissions from the Project are well below the MDAQMD annual CO_2e threshold, therefore, the Project would have a less than significant impact on the environment.

Table 7
Projected GHG Emissions Summary (Metric Tons)

Construction	**Total Metric Tons**
Five Months	171
Operation	**CO_2e (MT/YR)**
Area	0.32
Energy	114
Mobile	205
Waste	8.45
Water	14.7
Refrigeration	0.94
Construction:30-year amortized[1]	5.7
Total Operational	349.11
MDAQMD Annual Threshold	90,718
Exceeds?	No

1. Buildout construction GHG emissions were amortized over 30 years then added to buildout operational GHG emissions.

b) **Less Than Significant Impact.** In 2010 the city adopted a Climate Action Plan to set guidelines for achieving a reduction of GHG emissions. The goal was to reach 1990 emissions levels by 2020, or a 29% reduction from 2010 emissions by 2020. According to the San Bernardino County Regional Greenhouse Gas Reduction Plan, the city has updated its emissions reduction target to a level that is 40% below its 2020 level by 2030.

According to the CAP, the city can meet this target via diverse measures such as California Air Resource Board vehicle emissions standards, California Green Building Standards, solid waste reduction standards, and land use planning. The Project will be required to comply with CAP measures, including Building Code standards which are more stringent than when the CAP was prepared.

Per the San Bernardino County GHG Reduction Plan, projects that are exempt from CEQA are those that do not exceed 3,000 metric tons CO_2e per year conform with the Plan and have a less than significant impact for GHG emissions.[35] As stated above, the Project's annual CO2e emissions is estimated to be 349.11 metric tons, well below the Reduction Plan's threshold.

MDAQMD CEQA Guidelines stipulate that a project is in conformity if it is consistent with the land use plan that was used to generate the growth forecast for the jurisdiction. This Project site has a land use and zoning designation of Limited Industrial (I1) which is consistent with the Project's intended use of an existing warehouse and outdoor storage yard to facilitate the refurbishment and storage of wooden pallets.

Based on the above-described thresholds and guidelines, the Project will have a less than significant impact on plans and policies designed to reduce GHG emissions.

Mitigation: None required.

Monitoring: None required.

[35] Greenhouse Gas Emissions Development Review Process Screening Tables, County of San Bernardino, revised September 2021, https://www.sbcounty.gov/uploads/LUS/GreenhouseGas/GHG_2021/GHG%20Revised%20Screening%20Tables%20-%20Adopted%209-20-2021.pdf.

9. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

Sources: City of Hesperia General Plan (2010).

Background

A hazardous material is an item or agent (biological, chemical, radiological, and/or physical) that by itself or in contact with other materials can cause harm to human health and the environment.[36] The threat hazardous material pose is regulated by federal, state, and local agencies and laws to manage the use, storage, transportation, and disposal of hazardous material/waste.

The City of Hesperia requires all new development to comply with the San Bernardino Hazardous Waste Management Plan and the California Health and Safety Code Chapter 6.

Discussion of Impacts

a) **Less Than Significant Impact.** The proposed development consists of a wood pallet restoration facility and an open-air pallet storage yard. During construction, the Project will require the use of gasoline fueled construction machinery and equipment. Other hazardous materials which could be used during construction

[36] MLI Environmental, https://mlienvironmental.com/blog/defining-hazardous-materials/.

include, but are not limited to, solvents, architectural coatings, and equipment lubricants. The exposure of these hazardous materials can have serious health and environmental consequences since the chemicals used are highly toxic and can become airborne, affecting the surrounding population and area. To reduce the probability of a chemical spill, the Project will properly store diesel in tanks and other hazards materials in secure areas to limit exposure.

During operation, the site will not store or use hazardous materials in significant quantities to pose a health or environmental risk because given the nature of the Project as a wooden pallet storage facility, these materials are not necessary in high quantities. However, the hazardous materials in use will be transported in container and secured against shifting as required by the California Code of Regulation Title 13, Section 1160-1167, in alignment with the Material Transportation Act. The storage of these materials will be located in an area where physical damage or deterioration of the container will not occur as required by the California Code of Regulation Article 109, Section 5164 and enforced by the City's Code §8.04.200. With the implementation of these control measures and the minimal exposure to hazardous materials, the Project's potential hazard with the use, storage, and transportation of hazardous material is reduced. Therefore, impacts will be less than significant.

b) **Less Than Significant Impact.** The operation of the Project will involve the transport of wood pallets to and from the site. These activities will involve minor risks associated with traffic accidents with Project vehicles, but no more than would be expected from a commercial or industrial development, because the use is of low intensity and does not require special equipment for transport. Therefore, operation of the facility would not significantly increase risks associated with accidents and hazardous materials, and impacts would be less than significant.

c) **No Impact.** The Krystal School of Science Math and Technology is the nearest school to the site, approximately 2.6 miles to the east of the Project site. The Project does not occur near a school, and no impact will occur.

d) **No Impact.** No cleanup sites are found on or within the vicinity of the Project's site[37]. The nearest is a LUST Cleanup site designated as complete and located at 969 Santa Fe, approximately 3.4 miles north of the site. The construction of the Project at 6730 Santa Fe Avenue East, does not represent a significant hazard to the public or environment. No impact will occur.

e) **Less Than Significant Impact.** The Hesperia Airport is located at 7070 Summit Valley Road, immediately east across Santa Fe Avenue East of the site. The airport provides aviation services to small non-commercial aircraft, and emergency air services such as air ambulances, California Highway Patrol, and fire control aircraft. The facility occupies approximately 26 acres and consists of a 3,950-foot paved runway, three private hangars, one maintenance hangar, an air lodge, and a restaurant. Approximately, 12 single engine aircraft are based at the airport[38]. Under the National Plan of Integrated Airport System, the Hesperia Airport is classified as a General Aviation[39]. No commercial flights are offered at the airport.

Hesperia Airport is surrounded by industrial facilities to the west and residential communities to the east. The airport is in compliance with the California PUC Section 21669 regarding acceptable level of aircraft noise for residents living within the vicinity of airports. The standard noise level is 65 CNEL which the airport has remained within.

[37] State Water Resource Control Board, GeoTracker, https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=6730+e+santa+fe+avenue+hesperia+CA.
[38] City of Hesperia General Plan, Circulation, 2010.
[39] San Bernardino County, Comprehensive Land Use Plan Hesperia Airport, 1991.

The airport's operation of single engine aircraft and location within a sparsely populated area reduces safety concerns. Nonetheless, safety zones are established to regulate land-use development within the vicinity of the airport. The Project is located within Safety Zone 3. Land use guidelines for Safety Zone 3 consist of a population density limit of no more than 50 people over an extended period[40]. The Project proposes the development of a storage warehouse and outdoor storage yard. By nature, the facility will have a few employees during working hours on weekdays. No residential facilities will occur on the site, and no residential population will result from the Project. The Project's is in compliance with the safety zone guidelines, thereby reducing safety hazards to less than significant levels.

Overall, Hesperia Airport noise level and safety hazard is not expected to significantly impact employees working at the Project's site. For this reason, impacts will be less than significant.

f) **No Impact.** In the case of an emergency, the City of Hesperia has adopted an Emergency Operations Plan (EOP) that complements the San Bernardino County EOP, the Cal EMA State Emergency Plan, and the Federal Emergency Management Agency's National Response Framework.

The plan denotes several evacuation routes throughout the City. The nearest to the site are Santa Fe Avenue East and Summit Valley Road. In the City's General Plan Potential Evacuation Routes map, the intersection of Santa Fe Avenue East and Summit Valley Road directs traffic towards State Highway 138. The Project site is less than a mile southwest the intersection. The construction and operation of the Project at the site is not expected to change or block the access to any evacuation route because the development is not directly adjacent to the intersection; therefore, the Project should not interfere with the intersection in any capacity. No impact will occur.

g) **Less Than Significant Impact.** The Project's operation of a wood pallet restoration facility and an open-air pallet storage yard has the potential for urban fire related hazards, but not wildfire hazards. According to the City's General Plan High Fire Hazard Map, local high fire hazard zones are located at the southeast corner of the City's boundary.[41] The Project is located at the central-southern portion of the City, and is not on or near a high fire hazard zone. Nonetheless, to reduce the potential risk, the Project is required to comply with the state's safety standards for an outdoor storage pallet facility (California Fire Code §2810.1-10) and the City's Code regarding fire safety. These standard requirements and measures reduce impacts to less than significant levels.

Mitigation: None required.

Monitoring: None required.

[40] San Bernardino County, Comprehensive Land Use Plan Hesperia Airport, Figure III-8, 1991.
[41] City of Hesperia General Plan, Safety Element Exhibit SF-2, 2010.

10. HYDROLOGY AND WATER QUALITY -- Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would: i) Result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?	☐	☐	☒	☐
iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
iv) Impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

Source: City of Hesperia General Plan, Conservation Element (2010)

Background

Domestic Water Supply

The Hesperia Water District (HWD) provides water services to the City's residential, commercial, industrial, and agricultural facilities. The HWD collects water primarily from the Upper Mojave River Basin (referred as the Mojave Basin) through its network of pipelines and 15 active wells. The Mojave Basin has a capacity of approximately 28 million acre-foot (af),[42] from which the HWD withdraws 14,000 af annually to meet water demands for a population size greater than 97,000.[43]

The HWD adopted its Urban Water Management Plan (UWMP), a local water management plan intended to conserve groundwater as required by the California Urban Water Management Planning Act (UWMPA). The UWMP set a water usage of 184 gallons per capita per day (GPCD) which the City met with a usage of 129 GPCD.[44] With current and projected land use development, the City is expected to continue reducing water consumption and increase water reliability through 2045.

42 California Department of Water Resources, Upper Mojave River Valley Groundwater Basin, Updated 2004.
43 Hesperia Water District, 2020 Urban Water Management Plan, 2021.
44 California Department of Water Resources, Upper Mojave River Valley Groundwater Basin, Updated 2004.

Hesperia's Water Shortage Contingency Plan (WSCP) in compliance with the UWMPA, addresses potential water shortages. In this regard, the HWD manages 14 storage reservoirs with a capacity of 64 million gallons (or 200 AF) within its distribution area.[45] The Mojave Water Agency (MWA), on the other hand, manages the inflow of water from the Alto Subbasin to recharge the Mojave Basin. The Alto Subbasin has a capacity of approximately 2 million af.[46] Maintaining constant groundwater levels as required under the California Sustainable Groundwater Management Act.

Wastewater Treatment

The Hesperia Water District operates the City's sewer system and Victor Wastewater Reclamation Authority (VVWRA) provides the treatment and distribution of recycled wastewater for the cities of Hesperia and Victorville, Town of Apple Valley, and San Bernardino County Service Area 42 (Oro Grande) and 64 (Spring Valley Lake). The VVWRA's facility operates a 12.5 million gallons per day wastewater treatment plant, located at 2011 Shay Road in the City of Victorville, approximately 20 miles north of the site.

The treatment plant works by processing wastewater through a series of chambers, clarifiers, and basins to remove all waste materials and contaminants. The reclaimed water is distributed for irrigation purposes during peak demand. And during low water demand, the reclaimed water is distributed to retention basins where it seeps and recharges the Mojave Basin groundwater aquifer. The City has developed a Wastewater Master Plan (WMP) to outline the City's future wastewater treatment plan which includes new wastewater facilities, improved collection and treatment system, and an increased capacity.

According to the City's WMP maps, the site is not part of the City's existing sewer system or within consideration for an improved sewer collection system by 2032.[47] No sewer system currently exists on-site. A septic tank is located on the south parcel below the loading zone.

Flood Control

The San Bernardino County Department of Public Works Flood Control District is responsible for regional flood control services throughout the County, including the City of Hesperia. The District has developed a system of dams, conservation basins, channels, and storm drains to redirect flood away from the City's developed areas. These prevention measures are necessary during severe weather and rainfall when the Mojave River overflows due to runoff from the San Bernardino Mountains.[48] In addition, the City's Master Plan of Drainage (MPD) addresses local flood issues and proposes the addition of flood control infrastructure. According to the City's General Plan FEMA Flood map, areas likely to experience 100-year floods are located along the Antelope Valley branch of the Mojave River to the north.[49]

Discussion of Impacts

a) **Less Than Significant Impact.** The Project site is located at the northwest intersection of Santa Fe Avenue East and Jenny Street. Currently the site consists of a south developed parcel and a north undeveloped parcel. According to the Project's hydrology report, the south parcel drains west through the natural swale located to the northwest of the warehouse. Sheet flows located across the site drain southeast of the warehouse. And natural dirt swales are located to the east. The north parcel has sheet flows southeast across the entire lot. No drainage system or water quality features exist on the north parcel.

45 Hesperia Water District, 2020 Urban Water Management Plan, 2021.
46 City of Hesperia General Plan, Water Supply Appendix, 2009.
47 City of Hesperia Wastewater Master Plan, Waste System CIP, Figure ES.2-ES.3, 2008.
48 City of Hesperia General Plan, Conservation, 2010.
49 City of Hesperia General Plan, Hazard Appendix, FEMA Flood Map, Plate 3-1, 2010.

The Project proposes an on-site drainage system consisting of trench drains, drywells, catch basins, and an infiltration basin located throughout designated drainage areas including the loading, parking, and outdoor storage yard.[50] The new drainage system is designed to catch and treat stormwater runoff to meet the City's standards, thereby reducing runoff related impacts.

Regarding wastewater, a septic tank is located on-site. The Project must remain in compliance with the City's Code §14.08.040 and the City's Local Agency Management Program to properly manage private sewage disposal systems and reduce the potential for related impacts. With compliance to state and local regulations, the Project is not expected to degrade water quality or violate water standards. Less than significant impact is anticipated.

b) **Less Than Significant Impact.** The proposed industrial facility includes a 21,831 square foot warehouse and an outdoor storage yard. The water consumption for the warehouse area is based on water consumption factors in the U.S. Energy Information Administration 2021 Commercial Buildings Energy Survey. The Project, classified as a "warehouse," has the potential to generate a demand of 0.23 acre-feet per year (See Table 8).

Table 8
Project Indoor Industrial Water Demand

Use	Indoor Area (SF)	Water Demand Factor (gal/SF/year)*	Water Demand (gpd)	Water Demand (AFY)
Warehouse	**21,831.9**	**3.4**	**203.36**	**0.23**
*Warehouse water demand factor from U.S. Energy Information Administration 2021 Commercial Buildings Energy Consumption Survey.				

The use of potable water for irrigation purposes will increase the facility's water demand. For an industrial development, 5% of the site's acreage is required for landscaping (Ordinance Code §16.20.630). Using the City's water budget calculation, the Project's Maximum Applied Water Allowance (MAWA) for irrigation is approximately 2,888 gallons per year (or 0.0089 AFY). The use of portable water for irrigation would increase the annual water demand by approximately 4%. To reduce water consumption related to irrigation, the Project will comply with the City's Code §16.20.160 to use drought-tolerate plants for landscaping and minimal irrigation. The percentage increase is not expected to conflict with the City's Water Conservation and Water Shortage Plan.

The City's main water source is derived from the Mojave Basin. The Mojave Water Agency manages the recharging process of the Mojave Basin to ensure constant underground water levels and secure utility service reliability. The basin has a water capacity of approximately 28 million af from which the HWD withdraws 14,000 af annually to service all facilities include residential, commercial, industrial, and agricultural development.

The Project is consistent with the site's Limited Manufacturing (I1) designation, under the City's General Plan Land Use and Zoning map. The Hesperia Water District Urban Water Management Plan accounts for the City's industrial growth and estimates a total water demand of 18,420 AFY by 2045.[51] The Project

[50] IMEG Corps, Hydrology Report for Hesperia Industrial, 2023.
[51] City of Hesperia Water District Urban Water Management Plan, Table 4-5, 2020.

would contribute less than one percent of the City's overall water consumption for 2045. It is not expected that the Project will exceed HWD's water service capacity now or in the foreseeable future. Therefore, the Project does not require new wells or additional water infrastructure to adequately service the facility. Impacts associated with domestic water demand are expected to be less than significant.

c.i) **Less Than Significant Impact.** The Project proposes a drainage system where both development parcels will be connected through a system of catch basins, trench drains, drywells, and an infiltration basin to properly drain stormwater. These design measures will reduce erosion, flood, and stormwater runoff by controlling flows and releasing them into a basin for infiltration, as required by City requirements (see response c.ii below. These standard requirements control siltation and erosion, and assure that impacts remain less than significant, both on- and off- site.

c.ii) **Less Than Significant Impact.** The City requires all new and existing development to comply with flood and stormwater runoff regulations. These regulations mandate all drainage systems be in accordance with the San Bernardino County Flood Control District Hydrology Manual (Code §16.40.050), and control on-site flows to prevent the release of storm flows to off-site properties.

In addition, the proposed industrial warehouse and storage yard is not located within or near a flood zone. The nearest is a 100-year flood area along the Antelope Valley branch of the Mojave River, approximately 3 miles northeast of the site.

Although flash floods are not a major concern, localized floods occur throughout the City and could potentially affect the Project's site. In this regard, the City has adopted the San Bernardino County Flood Control District MPD. The MPD provides a regional roadmap to build flood control infrastructure including storm-drain pipelines, culverts, small bridges, and basins. The Project's proposed on-site drainage system addresses flood concerns and reduces the risk of surface runoff resulting in on- and off-site flooding to less than significant levels.

c.iii) **Less Than Significant Impact.** The Hesperia Storm Water Management Program (SWMP) enforces stormwater control measures during the Project's construction and operation phase to reduce pollutant runoff related to these activities. In conjunction, the National Pollutant Discharge Elimination System (NPDES) regulates stormwater discharge from storm sewer systems, construction activities, and industrial activities and requires the Operator of these resources to obtain an NPDES permit to ensure stormwater discharge is not carrying harmful pollutants into the local surface water. And similarly, the Stormwater Pollution Prevention Plan (SWPPP) regulates stormwater pollutants by identifying pollution control practices that will reduce pollutants from reaching stormwater runoff. In all, this regulatory framework to which the Project is required to adhere to will reduce impacts related to erosion, flood, and polluted runoff to less than significant levels.

c.iv) **No Impact.** No stream, river, or body of water is located within the Project's vicinity. The nearest is the Mojave River, located approximately 5 miles east of the site. The Mojave River is such a distance away that the Project's construction and operation will not result in the redirection of water flow. No impact will occur.

d) **No Impact.** The site is not located near an ocean or body of water where tsunamis or seiche zones are a concern. The site is not in a flood zone. No impact will occur.

e) **Less Than Significant Impact.** The proposed development consists of a warehouse and an outdoor wooden pallet storage yard. The Project is not expected to use or store hazardous materials in a significant quantity to be potentially out of compliance with the National Pollutant Discharge Elimination System (NPDES) or the Comprehensive Environmental Response, Compensation and Liability Act. The Project will adhere to all water quality control plans and sustainable ground management plans as required by law. Impacts are expected to be less than significant.

Mitigation: None required.
Monitoring: None required.

11. LAND USE AND PLANNING - Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Sources: City of Hesperia General Plan 2010; Apple Valley Development Code.

Background
Per the City of Hesperia General Plan 2010, the land use and zoning designations for these two parcels are Limited Manufacturing/Industrial (I1), which allow for light industrial, manufacturing, and industrial support uses. These uses include the manufacturing of lumber and wood products and the storage of contractor and construction equipment.

a) **No Impact.** The proposed Project will not divide an established community. The Project site consists of three parcels, two of which will be developed. The site is bordered by the BNSF railroad tracks along the west side, the Hesperia Airport runway along the east side, vacant undeveloped land to the south, and several I1 designated parcels to the north. Residential areas lie west of the railroad tracks and east of the airport and airport runway. These communities are not contiguous and have been separated for several decades by the railroad tracks, airport and the I1 land uses. Prior to this proposed Project, the south parcel and the existing warehouse had been used for light industrial activity.

b) **No Impact.** This Project aligns with the city's Industrial Land Use goals of developing new industrial businesses and services within appropriate zoning designations for these uses. The Project also aligns with the city's Sustainability Land Use goals of reusing and repurposing existing buildings and construction materials as well as siting business on previously developed and infill lots to reduce impacts to the surrounding environment.

Mitigation: None required.

Monitoring: None required.

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

Sources: City of Hesperia General Plan (2010).

Background

In the City of Hesperia, mineral resources consist of sand, gravel, and stone. According to the City's General Plan, the Department of Conservation Division of Mines and Geology has identified potential concrete aggregate resources in the City but mainly in the Barstow and Victorville areas. These deposits can be potentially used for construction materials including concrete, plaster, stucco, road base and fill. According to the California Department of Conservation SMARA mineral land classification map, the Project site is not located within a significant mineral resource area[52].

Discussion of Impacts

a) **No Impact.** The site consists of three parcels: the southern-most vacant parcel which will be fenced off and remain undeveloped; a south developed parcel and a north undeveloped parcel. The south parcel is paved with asphalt concrete. The north parcel is undeveloped, and consists of unconsolidated alluvial silt, sand, and gravel. The USMIN Mineral Deposit Database identifies a variety of significant mineral deposits, processing plants, and mineral prospects. No significant mineral resources have been identified within the Project's vicinity.[53] No impact will occur.

b) **No Impact.** The site is designated for industrial development, and not for mineral resource extraction. The construction of the Project at the site will not affect any parcel designated for mineral extraction or recovery. No impact will occur.

Mitigation: None required.

Monitoring: None required.

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52 California Geological Survey, Significant Mineral Aggregate Resources Areas, https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=mlc.

53 USMIN Mineral Deposit Database, https://mrdata.usgs.gov/deposit/map-us.html#home.

13. NOISE -- Would the project result in:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Source: City of Hesperia General Plan 2010; Hesperia Municipal Code, September 2023; FTA Transit Noise and Vibration Impact Assessment Manual, September 2018; Hesperia Airport Comprehensive Land Use Plan, January 1991.

Background

Noise is defined as any undesired sound in the environment and can impair the quality of life by impeding rest, sleep, work, and communication. While motor vehicles are the most prevalent sources of noise, other sources contribute to urban noise such as aircraft, railroads, construction equipment, motorized landscaping tools, and home appliances. Sensitive receptors such as residences, schools, libraries, nursing homes, hospitals and parks experience particularly acute effects of noise disturbances. The City of Hesperia sets standards, uses site planning, and noise mitigation methods to control and abate the effects of noise. The Project would be subject the city's noise mitigation measures as outlined in the General Plan.

a) **Less Than Significant Impact.** According to Hesperia Municipal Code §16.20.125, the Industrial-Limited Manufacturing (I1) land use designation for the Project site is permitted to emit a 24-hour noise level of 70 dBA, which is similar to the noise level of a vacuum cleaner ten feet away. During the operational phase of the Project, the combined noise levels from the worker vehicles, the pallet delivery trucks, and the HVAC system would not exceed the permitted noise level. Furthermore, there are no sensitive receptors near the Project site as the site is bordered by undeveloped vacant land to the south, a vacant lot to the north and I1 land uses north of the vacant lot, the BNSF railroad to the west and the Hesperia Airport runway to the east. Residences west of the railroad and east of the airport are at least 350 feet away from the Project site. Project activities will occur within the existing building, which will provide noise attenuation for the residential areas.

During the construction phase, the Project will emit noise levels averaging 90 dBA at a 50-foot distance depending on the various construction activities.[54] Equipment such as utility trucks, dozers, graders, water trucks, compactors, front-end loaders, concrete and asphalt paving equipment will temporarily increase the noise level coming from the Project site. Given the smaller scale of this Project, the increased noise level would not be present for longer than six months. The city exempts temporary demolition and construction projects between 7:00am and 7:00pm from its noise mitigation standards. The combination of distance and the City's exemption will assure that noise levels will remain less than significant.

b) **Less Than Significant Impact.** The construction of the Project is expected to generate a temporary, intermittent, and localized ground-borne vibration. Per the Hesperia Municipal Code §16.20.130, ground vibration which can be felt without instruments at or beyond the lot line is not allowed, and vibration producing particle velocity equal or greater than 0.2 inches per second is also not allowed. The vibration source levels for construction equipment on the Proposed site may range from 0.003 PPV (in/sec) for a small bulldozer to 0.21 PPV (in/sec) for a vibratory roller.[55] Hesperia exempts temporary demolition and construction activities between 7:00am and 7:00pm this code. As stated above, the nearest sensitive receptors are 350 feet away from the Project site. Ground vibration impacts during construction are expected to be less than significant.

c) **Less Than Significant Impact.** Noise levels associated with airports emanate from engine noise while aircraft take off, land, and idle on the ground. The Hesperia Airport runway runs parallel to Santa Fe Avenue along the east side of the road approximately 190 feet from the Project site. The airport is a privately owned public use general aviation basic utility airport which functions as an airpark and lodge. There are 29 single engine airplanes, two multi engine airplanes, one helicopter and one ultralight based on the field. There are an average of 115 flight operations at the airport per week.[56]

The State of California developed a noise rating method for noise called the Community Noise Equivalent Level (CNEL). The CNEL is a decibel sound measurement over a 24-hour period that has been adjusted to account for sensitive receptors. 65 CNEL is the standard acceptable airport noise level for people living near airports. For Hesperia Airport, the 65 CNEL contour line remains within the existing airport boundary and indicates a very minor impact on adjacent land uses. A 60 CNEL contour line for the airport extends less than 250 feet from the runway, whereas the Project site lot line is 190 feet from the south end of the runway leaving an overlap of about 60 feet.[57] Industrial land use is not considered to be a sensitive receptor, and the City has established acceptable noise levels for these uses at 70 dBA CNEL. Since the noise levels emanating from the airport are lower than this limit, noise from the airport will result in a less than significant impact.

Mitigation: None required.

Monitoring: None required.

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54 Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

55 Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

56 Hesperia Airport, AirNav.com, retrieved January 31, 2024, https://www.airnav.com/airport/L26.

57 Hesperia Airport Comprehensive Land Use Plan, January 1991, https://www.sbcounty.gov/Uploads/lus/Airports/Hesperia.pdf.

14. POPULATION AND HOUSING – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Sources: City of Hesperia General Plan 2010; Table E-5: City/County Population and Housing Estimates, California Department of Finance, May 2023; 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy, Demographics & Growth Forecast Technical Report, Southern California Association of Governments.

Background
The City of Hesperia and its sphere of influence encompass 110 square miles in the Victor Valley region of San Bernardino County. As of January 2023, 100,041 people live in Hesperia, an increase of 37,451 people since 2000. There are approximately 31,020 housing units and an average of 3.36 people per household. As of 2045, the city is projected to have a population of 168,100 and 53,200 households. Per the city's General Plan, the projected population size at buildout will be approximately 243,000.[58]

Discussion of Impacts

a) **No Impact.** While the Project will provide a limited number of jobs, these jobs would likely be filled by people currently living in or near Hesperia and thus the Project would not result in unplanned population growth. Furthermore, as the Project's land use is consistent with the city's General Plan and zoning designations, any potential population growth would also be consistent with the city's General Plan. The Project proposes a half-width road improvement for E. Santa Fe Avenue and will connect to existing utility infrastructure, therefore, extensions to the road or other infrastructure are not necessary.

b) **No Impact.** The Project site is located in an industrial land use zone that does not currently contain residences. The north parcel is vacant land, and the south parcel has previously accommodated light industrial use. The Project will not displace any people or housing and it will not necessitate the construction of replacement housing elsewhere. There will be no impact.

Mitigation: None required.

Monitoring: None required.

[58] Table E-5, City and County Population and Housing Estimates, California Department of Finance, May 2023.

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

Source: City of Hesperia General Plan (2010); Google Earth.

Background

Fire Department
The San Bernardino County Fire Protection Department (SBCFPD) provides fire protection services to San Bernardino County, encompassing approximately 20,160 square miles from the Los Angeles County lines on the west, to the Colorado River on the east, to the Nevada State line and Kern and Inyo counties on the north. The SBCFPD services more than 60 communities and cities, totaling a population size greater than 2 million[59].

The Country Fire Protection Department operates 48 fire stations throughout its service area, and has a staff of approximately 1,064 consisting of, but not limited to, Capitan, Fire Fighters, Engineers, and Duty Fire Marshals[60]. In Hesperia, there are four fire stations: Station 302, 303, 304, and Station 305. The nearest to the site is the San Bernardino Fire Station 302 located at 17288 Olive Street, approximately 4.3 miles to the northeast.

Police Protection
The City contracts the San Bernardino County Sheriff's Department for police services including traffic enforcement, vandalism investigation, and marked-unit patrol. The Hesperia Police Department is comprised of 58 sworn law enforcement personnel including a Captain, a Lieutenant, 7 Sergeants, 5 Detectives, and 44 Deputy Sheriffs[61]. The Department is located at 15840 Smoke Tree Street, approximately 4.4 miles north of the site.

Schools
The Hesperia Unified School District serves the City of Hesperia. Currently the school district has thirteen elementary schools, two middle schools, two sixth grade academies, and five high schools. The Krystal School of Science Math and Technology is the nearest school, approximately 2.6 miles northwest of the site.

59 San Bernardino County Fire Protection District, https://sbcfire.org/about/.
60 San Bernardino County Fire Protection District, Annual Report (FY21-22), 2022.
61 City of Hesperia, https://www.cityofhesperia.us/306/Police.

Parks
The Hesperia Recreation and Park District (HRPD) owns, manages, and operates a total of 14 parks and recreation facilities throughout the City. The Maple Park located approximately 3.6 miles northwest is the nearest outdoor facility to the Project.

Discussion of Impacts

a) The Project is expected to have the follow impact on public services.

Fire Protection: Less Than Significant Impact. The Project is required to comply with the most recent California Fire Code provisions and the City's General Plan and Zoning Ordinance regarding fire safety standards to reduce potential risks. The San Bernardino County Fire Department will review the Project for compliance with the California Fire Code and the City's amendments to the code.

Due to the increased population of the City, the Fire Department has experienced an increase of 3 to 5% each year in emergency calls. The average response time by the Department is approximately 7 minutes and 16 seconds. The Insurance Service Office (ISO) ranks fire stations in terms of community's fire protection needs and services. The ranking ranges from Class 1 (best) to Class 10 (worst). The Hesperia Fire Department is currently classified as a Class 5 ISO in the developed portion and a Class 9 in the outlying areas.[62]

In relation to the Project, the nearest fire station is the San Bernardino Fire Station 302, located at 17288 Olive Street, approximately 4.3 miles northeast of the site. Station 302 is staffed by 7 personnel daily. The development of the Project is likely to increase the San Bernardino County Fire Station demand for fire protection services due to the increase of occupants in the area. As a result, the Project will be charged a development impact fee (Code §16.12.076). The increase demand for fire protection services is not expected to surpass the San Bernardino Fire Station 302 service capacity. Impact will be less than significant.

Police Protection: Less Than Significant Impact. The Project is likely to increase the demand for police protection services by the local Police Department. The increase in demand is unlikely to surpass the service capacity. Therefore, the new construction or expansion of an existing facility is not required. The Project will be obligated to pay development impact fees in accordance with Code §16.12.075.

The police and emergency personnel will be able to access the site via existing roads. Project related impacts are expected to be less than significant.

Schools: No Impact. The Project proposes the development of an industrial facility for the restoration and outdoor storage of wooden pallets. The facility will offer new job opportunity to the local community. The operation of the industrial facility is therefore not expected to increase Hesperia's permanent residential population. The Hesperia Unified School District is unlikely to experience a change or impact as a result. No impact is anticipated.

Parks/ Other Facilities: No Impact. The Project is unlikely to increase the City's population size. The opportunity for new employment offered by the Project is expected to be fulfilled by the local community which already makes use of open spaces, parks, and other public facilities. The Project is not expected to significantly degrade the quality or accessibility of public service facilities. No impact will occur.

Mitigation: None required.
Monitoring: None required.

[62] City of Hesperia General Plan, Safety, 2012.

16. RECREATION –	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Source: City of Hesperia General Plan (2010); Google Earth.

Background

The Hesperia Recreation and Parks Department (HRPD) encompasses approximately 110 square miles, including the City of Hesperia and portions of Oak Hills, Summit Valley, and Phelan. HRHD owns, operates, and manages a total of 14 parks and recreational facilities. The nearest public park to the site is Maple Park, located approximately 3.6 miles to the northwest. Lime Street Community Center is the nearest recreational facility, approximately 3.6 miles northeast of the site.

Other parks and recreational facilities include the Lime Street Park, City Hall, the Hesperia Branch Library, and the Hesperia Senior Center, which are at least 4 miles north or northeast of the site. Besides recreational facilities, the City offers passive recreational activities including horseback riding and hiking along the Mojave River, washes adjacent to the Interstate 15 Freeway, and within the Southern California Edison easements.

Discussion of Impacts

a) **No Impact.** The Project proposes the development of an industrial warehouse and an outdoor storage yard for wooden pallets. The Project will offer new job opportunities which are expected to be fulfilled by the local community. The prospects of new residents coming to work at the industrial facility and settle in Hesperia is very unlikely. For this reason, the Project is not expected to increase the use of existing local parks or other recreational facilities, and will therefore not result in the deterioration of any existing facility. No impact will occur.

b) **No Impact.** The Project will not require the construction or expansion of recreational facilities because existing residents will be employed at the site, and the Project is . Overall, the Project is not anticipated to substantially increase the population size or physically impact recreational facilities.

Mitigation: None required.

Monitoring: None required.

17. TRANSPORTATION – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

Sources: City of Hesperia General Plan (2010).

Background

In the City of Hesperia, roadway classifications are determined based on the road's role in the overall circulation system and relationship to surrounding uses. Roads within the Project area include Santa Fe Avenue East to the east, and Jenny Street to the south. Under the City's General Plan Circulation Element, Santa Fe Avenue East is divided into different roadway classification segments consisting of Arterial, Major Arterial, and Rural Collector. Summit Valley Road which provides access to Jenny Street is divided into segments consisting of Arterial and Major Arterial.[63] Jenny Street is a local road and does not have a roadway classification.

Discussion of Impacts

a) **Less Than Significant Impact.** Hesperia's General Plan establishes that roadways and intersections are required to operate at a vehicle Level of Service (LOS) D or better.

<u>Existing Traffic Conditions</u>
The Project was previously occupied by an industrial land use on the south parcel, and as a result there were historic trips generated at the site. However, the building has been vacant for an extended period, and the following discussion assumes all new trips. The north parcel is undeveloped and vacant.

<u>Project Trip Generation</u>
The Project proposes the operation of a wood pallet restoration facility and an open-air pallet storage yard, on a partially developed site. The site's total area is approximately 6.11 acres where approximately 0.50 acres (or 21, 832 square feet) will be used for general industrial use. During working hours employees will commute and access the site. The number of recurring employees is expected to be low given the nature of the facility's operation. According to the Institute of Transportation Engineers (ITE) Trip Generator, the Project's "General Light Industrial" land use is anticipated to generate approximately 106 daily weekday trips (See Table 9).

63 City of Hesperia General Plan, Traffic Circulation Plan, Exhibit CI-1, 2010.

Table 9
Project Trip Generation

Land Use	Trips/Weekday	Trips/Year	AM Peak Hours	PM Peak Hours
Project (General Light Industrial, ITE #110)	**106**	**34,197**	**20**	**17**
*Daily rate trip generation from the Institute of Transportation Engineers Trip Generation (ITE Trip Gen).				

At buildout, the Project is forecast to generate approximately 106 trips on average, in any given weekday. Of these trips, approximately 20 trips occur during AM peak hour and approximately 17 occur during PM peak hour.

According to the City's General Plan, the Santa Fe Avenue-Ranchero Road intersection has a LOS B for AM and PM peak hours.[64] Indicating that the intersection maintains consistent operational levels that adequately meet traffic volumes during all hours of the day. Given the Project's trip generation, the increase traffic as a result of the development is not expected to significantly affect the LOS. All roadways and intersections will continue to operate at acceptable LOS levels, and thereby satisfy intersection requirements under the County of San Bernardino Transportation Impact Study Guidelines and the City's General Plan.[65] The Project's impact to the City's traffic circulation system is expected to be less than significant.

<u>Active Transportation Plan</u>
According to the City's General Plan, there are no bus routes or bike lanes that service the Project site.

The Victor Valley Transit Authority (VVTA) provides public transport services to the cities of Hesperia, Adelanto, Victorville, the Town of Apple Valley, and the County of San Bernardino. The VVTA operate five bus routes in the City. These routes are distributed between the City's center, eastern and northern regions and provide accessibility to shopping centers, public facilities, schools, hospitals, and colleges.[66] The nearest bus stop to the site is located approximately 2 miles to the northeast. No bus route services the Project's vicinity.

There are no existing bikeways in the Project's immediate vicinity. A portion of Santa Fe Avenue is classified as Class II Bike Path which changes into Summit Valley Road with a Class III Bike Path.[67] The portion of Santa Fe Avenue East that provides access to the site does not have a bike path classification.

The Project is expected to generate low demand on the City's public transportation system given that employees will be based within the local area. The Project will not conflict with the City's traffic circulation system or degrade non-vehicular transit. Impacts will be less than significant.

b) **No Impact.** CEQA Guideline §15064.3 subsection (b)(1) focus on impacts related to the surpassing vehicle milage threshold. The Project is located in a moderate to high density residential community with single family homes to the west and east, beyond the Hesperia Airport and the BNSF railroad. The Project is expected to provide new job opportunities to the local community, in which case, the commute distance ranges between 0.50 miles to 2 miles. The San Bernardino County Transportation Authority (SBTA)

64 City of Hesperia General Plan, Circulation, Exhibit CI-20 and CI-21, 2010.
65 San Bernardino County, Transportation Impact Study Guidelines, 2019.
66 City of Hesperia General Plan, Circulation, Exhibit CI-22, 2010.
67 City of Hesperia General Plan, Circulation, Exhibit CI-23, 2010.

Recommended Traffic Impact Analysis Guidelines for Vehicle Mileage Traveled and Level of Service Assessment determines land use projects with a probability of increasing the average vehicle mileage traveled (VMT) per service population which includes the population plus employment. The County's VMT Guideline concludes that an industrial warehouse project that is 63,000 square feet in size, will generate less than 110 daily vehicle trips. The project's low trip generation is presumed to be less than significant impact. The proposed Project will operate an industrial warehouse on approximately 21,832 square-foot and will generate 106 daily vehicle trips. For these reasons, the Project is not expected to increase Hesperia's population VMT. Less than significant impact will occur.

Overall, the Project is not expected to conflict or be inconsistent with CEQA Guideline §15064.3 subsection (b). No impact will occur.

c) **No Impact.** The construction of the Project will result in a warehouse and an outdoor storage yard. The Project is consistent with the City's General Plan Limited Manufacturing (I1) land use designation. The site will not conflict with the intended City's General Plan Land-Use, nor will it operate a facility that may be incompatible with the surrounding industrial area. The Project proposes an access point from Santa Fe Avenue East and a secondary access point at the northwest corner of Santa Fe Avenue East and Jenny Street. Both access points lead directly to the facility's loading zone and an on-site driveway leads to the outdoor storage yard located to the north. The outdoor storage yard will consist of 36 designated pallet storage areas. A total of 30 parking spaces are located on site in which 14 spaces are located between the two access points and the remaining 16 spaces are located along the industrial warehouse. The site plan does not include geometric design features that could otherwise increase on-site hazards. In all, the Project is in accordance with the City's General Plan Land Use and City's Zoning regarding industrial design standards. For these reasons, no impact is expected.

d) **No Impact.** The Project is located at the northwest corner of Santa Fe Avenue East and Jenny Street. Santa Fe Avenue East will provide primary access to the site when traveling north to south. Jenny Street provides a secondary access point. In case of an emergency, Hesperia Police Department and the San Bernardino County Fire Protection Department can access the site by means of either route. During the construction of the Project, no permanent changes preventing access to the site are expected. No obstruction during the Project's operation is planned. No impact is anticipated.

Mitigation: None required.

Monitoring: None required.

18. TRIBAL CULTURAL RESOURCES – Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section5020.1(k), or	☐	☐	☐	☒
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Source: Michael Brandman Associates, Technical Background Report (2010).

Background

Hesperia is located at the southwestern portion of the Mojave Desert. The region may have been utilized by the Serrano tribes and the Vanyume tribes.

The Serrano tribe (Tribe) was located in and expanded east of the Cajon Pass area of the San Bernardino Mountains, north of Yucaipa, west of Twentynine Palms and south of Victorville. The Tribe were hunters and gathers, who used tools to hunt small animals and gather roots, tubers, and seeds of various kinds. Their population size at the time of European contact was approximately 2,000. The Serrano spoke the same language as the Cupan group of the Takic subfamily of the Uto-Aztecan language family. The Vanyume tribe, on the other hand, settled at the southern edge, along the Mojave River in the Victorville region and spoke a language similar to the Serrano. During European contact, Spanish settlers decimated the indigenous groups over an extended period. Some Serrano tribe members survived by the ruggedness of the terrain and their dispersed population in the far eastern portions of the San Bernardino Mountains. Nowadays, descendants of the Serrano tribe are found mostly on the Morongo and San Manuel reservations.[68]

Discussion of Impacts

i) **No Impact.** There are no tribal cultural resources listed or eligible for listing in the California Register of Historic Resources, or in a local register, and as confirmed by the Yuhaaviatam San Manuel Nation (see below), the Tribe has no known resources in or adjacent to the Project site. No impact will occur.

ii) **Less Than Significant Impact with Mitigation.** As discussed in Section 5, no cultural resources have been identified within the Project's area. No cemetery or human remains are expected to occur at the site. The City undertook Tribal Consultation under the requirements of AB 52. The City received one response from the

68 Michael Brandman Associates, Technical Background Report in Support of the Cultural Resource Element: City of Hesperia General Plan Update, 2010.

Yuhaaviatam San Manuel Nation, who provided an email to the City on March 25, 2024. In that email, the Tribe indicated that the site and surrounding region occur within the ancestral territory of the Serrano people. The Tribe also indicated that they have no records that any resources occur on the Project site, and that they have no concerns about the Project. However, the Tribe requested the inclusion of three mitigation measures in Section 5 above, and of the two mitigation measures provided below. With implementation of these mitigation measures, impacts to tribal cultural resources will be reduced to less than significant levels.

Mitigation:

TCR-1 The Yuhaaviatam of San Manuel Nation Cultural Resources Management Department (YSMN) shall be contacted, as detailed in CUL-1, of any pre-contact cultural resources discovered during project implementation, and be provided information regarding the nature of the find, so as to provide Tribal input with regards to significance and treatment. Should the find be deemed significant, as defined by CEQA (as amended, 2015), a Cultural Resources Monitoring and Treatment Plan shall be created by the archaeologist, in coordination with YSMN, and all subsequent finds shall be subject to this Plan. This Plan shall allow for a monitor to be present that represents YSMN for the remainder of the project, should YSMN elect to place a monitor on-site.

TCR-2 Any and all archaeological/cultural documents created as a part of the project (isolate records, site records, survey reports, testing reports, etc.) shall be supplied to the applicant and Lead Agency for dissemination to YSMN. The Lead Agency and/or applicant shall, in good faith, consult with YSMN throughout the life of the project.

Monitoring:

TCR-2 Should resources be identified during earth moving activities, the City will immediately contact the Tribe and coordinate activities to assure compliance with the Tribe's requests.
Responsible Party: City Planning Division
Timing: During earth moving activities

19. UTILITIES AND SERVICE SYSTEMS – Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statues and regulations related to solid waste?	☐	☐	☐	☒

Source: City of Hesperia General Plan 2010; Hesperia Water District 2020 Urban Water Management Plan, 2021; City of Hesperia Water Master Plan Final Report, July 2008; City of Hesperia Wastewater Master Plan Final Report, July 2008; Victor Valley Water Reclamation Authority, June 2021; City of Hesperia Construction Waste Management Plan Procedures.

Background

Domestic Water:
Hesperia Water District provides domestic water service to the City and the Project site. The District pumps groundwater from the Alto Subarea subbasin, one of five subbasins within the Mojave River Groundwater Basin, and delivers domestic water via 15 active wells, 14 storage reservoirs and a pipeline distribution system. The District manages a total of 200 acre feet (af) or 64 million gallons.[69] The groundwater basins are recharged by rainfall, snowmelt from local mountains, imported water from the State Water Project (SWP), and wastewater reclamation. The Hesperia Water District is a member agency of the Mohave Water Agency, which manages the use and replenishment of the entire Mohave River Groundwater Basin.

In 2020 the Hesperia Water District adopted an Urban Water Management Plan (UWMP) in compliance with the California Urban Water Management Planning Act (UWMPA). The UWMP sets forth guidelines to protect water supplies and meet demands over the next 25 years. When setting water usage targets for all residential and non-residential consumers, the City calculates water consumption by dividing the total annual water production by the City's population. Water use per capita was set at 184 gallons per day (gpcd), and the city's actual per capita usage is 129 gpcd.[70] The City exceeds the per capita water usage target.

[69] Hesperia Water District, 2020 Urban Water Management Plan, 2021
[70] Hesperia Water District, 2020 Urban Water Management Plan, 2021

Wastewater Facilities:
Currently, only certain eastern, central, and northern portions of Hesperia are served by sewer infrastructure. The remaining portions of the city are either undeveloped or served by on-site septic systems. The Project site is within an area that does not have sewer access, and therefore has its own septic system. The City of Hesperia Wastewater Master Plan shows that sewer expansion plans do not include the area where the Project site is located. The Project will continue to use an on-site septic tank for wastewater collection and disposal.

Electricity:
Southern California Edison provides electricity to Hesperia. The local office address is 12353 Hesperia Road, Victorville, California.

Natural Gas:
Southwest Gas Corporation provides natural gas to Hesperia. The local office address is 13471 Mariposa Road, Victorville, California.

Solid Waste:
Advance Disposal serves as the sanitation service provider for Hesperia. The main office is located at 17105 Mesa Street, Hesperia, California. Advance Disposal operates a Materials Recovery Facility where recyclable materials are extracted from the solid waste. The Victorville Sanitary Landfill, 18600 Stoddard Wells Road, Victorville, California, accepts the waste from Advance Disposal.

Advance Disposal utilizes a single stream method of waste management which means that instead of separating their own waste into separate bins for recyclable and non-recyclable materials, customers put all waste into a single curbside bin that is collected by Advance Disposal and sorted at a Materials Recovery Facility. The City views this as the most efficient method of recovering recyclable materials and tracking the city's compliance with state mandated diversion rates.

a) **No Impact.** On the south parcel the proposed Project involves the reuse of an existing light industrial warehouse as well as site improvements including a new concrete pavement driveway, new asphalt parking area, new concrete loading docks, and the construction of an asphalt outdoor pallet storage yard on the north parcel. The Project will protect in place the existing electrical, communications, and domestic water utility infrastructure on the site. The site will continue to utilize the existing septic wastewater system. Water valves located at the front of the site will be moved a short distance to the west and will remain either on site or in the right of way along Santa Fe Avenue East. Infrastructure extensions to the northern parcel are unlikely as it will be only a storage yard. There will be no environmental damage as all infrastructure will remain on the previously developed area. There will be no impacts.

b) **Less Than Significant Impact.** During construction, the Project may use water to control dust emissions. This use is limited to the short construction time. During operations, the Project will require water for indoor use and landscaping. Per the city's Urban Water Management Plan (UWMP), targeted non-residential gallons-per-capita-per-day use is 35 gpcd. According to the 2021 U.S. Energy Information Administration Commercial Buildings Energy Survey, the Project's warehouse can be expected to use 203.36 gallons of water per day (gpd), which would accommodate the limited number of employees who may use up to 35 gpcd. (See Project Indoor Industrial Water Demand in the Hydrology and Water Quality section). The Project will comply with the City's Code §16.20.160 to use drought-tolerate plants for landscaping and minimal irrigation. Overall, while the Project will have a small water demand, the demand will not exceed the water use targets for the Hesperia Water District's supply.

c) **No Impact.** The Project site will continue to use the on-site septic system. There will be no impacts on the city's wastewater treatment system.

d) **Less Than Significant Impact.**

Construction Waste: In 2010, the city adopted the California Green Building Standards Code which stipulates that 65% of waste generated at a demolition and construction site must be diverted from landfills. Commercial entities can opt to recycle certain materials, but they must contract with Advance Disposal, the waste hauler for Hesperia, to have construction waste removed from the site. In 2014, the city adopted a Construction and Demolition Debris Diversion Program which lays out a Construction Waste Management Plan (CWMP). Every building permit application is required to remit a CWMP. The Project will comply with the city's construction waste reduction and diversion standards, thereby reducing the impacts of construction waste to less than significant levels.

Operations Waste: The city complies with the state's AB 341 mandatory commercial recycling legislation which states that 50% of the waste from commercial businesses must be diverted away from landfills via reduction, recycling, and reuse programs. Commercial businesses may sort their own recyclable materials on-site and self-haul to a recycling facility, or contract with Advance Disposal who can haul and sort all waste generated during operations.

The Project will generate waste and will thus add to the city's tonnage of solid waste. However, the Project proposes to refurbish and store wood pallets, a product that yields recyclable material, therefore the amount of solid waste generated will consist mostly of office and kitchen waste, which also contains a percentage of recyclable materials.

Table 10
Projected Solid Waste Generation

Project Element	Generation Rate	Project Generation
Manufacturing Warehouse (21,831.9 sf)	**1.42 lbs./100sf/day**	**310 lbs. per day or 40.3 tons per year**
Estimated solid waste generation rate from CalRecycle.gov provides the daily rate used in this estimate.		

According to CalRecycle, the Victorville Sanitary Landfill is permitted to process 3,000 tons of solid waste per day and has a remaining capacity of 79,400,000 cubic yards. Per the CalRecycle industrial sector generation rates for a manufacturing warehouse, the Project's waste generation represents 1.34% of the daily tonnage permitted at the Victorville Sanitary Landfill. The amount of waste potentially generated by the Project A percentage of the of the solid waste generated by the Project is likely to consist of wood waste from pallets, and the wood can be recycled rather than sent to a landfill. The Project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. The impact of the Project's solid waste generation would be less than significant and would not impair the waste reduction attainment goals of the city.

e) **No Impact.** Advance Disposal Company is required to follow city, county, state and federal policies regarding the reduction and proper disposal of solid waste. There will be no impacts from the Project.

Mitigation: None required

Monitoring: None required.

20. WILDFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

Sources: City of Hesperia General Plan 2010; City of Hesperia Local Hazard Mitigation Plan, 2017 Plan Update; Fire and Resources Assessment Program (FRAP) Fire Hazard Severity Zone Viewer, California Department of Forestry and Fire Protection, September 2023; FEMA National Flood Hazard Layer map viewer.

Background

Wildfires are natural events that promote ecosystem regeneration, however, they become hazards when they spread into human development areas. Wilderness areas that have not burned for 30+ years pose higher risks of burning in the near future due to the buildup of vegetative fuels. Areas where wilderness and urban land uses meet are referred to as the wildland-urban interface (WUI), and these areas impose elevated risks of fire hazards to human health and property. Wildfire events are a serious concern for Hesperia as the city has experienced a number of wildfires both in the city and surrounding region since 1999, and the south portion of the city abuts undeveloped transitional wilderness.

The Project site is located within the city's boundary and within the city's Local Responsibility Area (LRA), which is designated as a high severity zone according to the Cal Fire – Fire Hazard Severity Zone (FHSZ) map of 2016.[71] West, north and east of the Project site are developed city areas with lower risks of wildfire. However, the Project site, according to the Cal Fire FHSZ map of 2023, is approximately one-quarter mile north of a State Responsibility Area (SRA) that is designated as a very high fire hazard severity zone. The Project site is subject to the city's Local Hazard Mitigation Plan 2017 Update, California Building and Fire Codes and local amendments adopted by the city, and the city's Emergency Operations Plan, which complements San Bernardino County's OEP.

[71] City of Hesperia Local Hazard Mitigation Plan 2017 Plan Update, 2022, https://www.cityofhesperia.us/DocumentCenter/View/14830/2017-Hazard-Mitigation-Plan?bidId=.

Additionally, there are two Local Responsibility Areas (LRAs) at the far southwest and southeast edges of the city that are designated as very high fire hazard severity zones, however, these two zones are approximately five miles south of the Project site pose very minor threats.

a) **No Impact.** The proposed Project is accessed by Santa Fe Avenue East, a local street with a limited number of other light industrial businesses. Santa Fe Avenue East meets Jenny Street, an unpaved road at the south end, and Summit Valley Road, a designated evacuation route at the north end. The Project site, being at the south end of the Santa Fe Avenue East, will not impede others from accessing evacuation routes nor will it impair the city's emergency response and evacuation plans. The San Bernardino County Fire Department will assess emergency access to the Project site and make a final determination regarding access issues. No impact is expected.

b) **Less Than Significant Impact.** The Project site is flat and surrounded on three sides by urban developed land. The undeveloped swath south of the site to Summit Valley Road contains very sparse desert scrub vegetation. Jenny Street, an unpaved road running along the south boundary of the Project site, and Summit Valley Road, a paved two-lane road which jogs parallel to Jenny Street a little further south, both provide firebreaks between the Project site and the SRA FHSZ one-quarter mile south. The San Bernardino County Fire Department is responsible for administering fire hazard assessments and mitigation for the city and will have the final determination regarding exposure to wildfire risk for the Project site. Less than significant impacts are expected.

c) **No Impact.** The Project site has been in prior use by a light industrial business and will be able to access previously existing infrastructure. This proposed warehouse and outdoor pallet storage yard will not increase the need for additional infrastructure beyond the requirements of city's Local Hazard Mitigation Plan 2017 Update, California Building and Fire Codes and local amendments adopted by the city, and the city's Emergency Operations Plan. There will be no impacts.

d) **No Impact.** The city's Local Hazard Mitigation 2017 Plan Update indicates that the Project site is not located within either a 100-year or 500-year flood zone. The FEMA National Flood Hazard Layer shows the site as lying on the inside edge of an area designated as Zone D. Zone D areas have not been analyzed for flood hazards, and thus flood risks are undetermined. As stated above, the Project site is flat and has been previously developed on the south parcel while the north parcel contains sparse vegetation that will largely be cleared for an outdoor pallet storage yard. The site is located at the end of the street where development surrounds three sides of the site and very sparsely vegetated vacant land lies on the south side. The Project site does not impose post-fire flooding risks to other structures or people in the vicinity. No impact is expected.

Mitigation Measures: None required.

Monitoring: None required.

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

a) Less Than Significant Impact with Mitigation Incorporated

Biological Resources

As discussed in Section 4, a biological resources assessment was conducted on the Project which identified two Western Joshua trees (*Yucca brevifolia*) and multiple California Juniper trees (*Juniperus californica*) on the north parcel. The low numbers of California Junipers and Western Joshua trees currently on the Project site are not dense or extensive enough to represent high desert intact woodland habitat, hence the Project will not substantially reduce viable habitat, or substantially reduce the number or restrict the range of a rare or endangered plant or animal species. As the Joshua trees are protected under the Western Joshua Tree Protection Act and managed by the California Department of Fish and Wildlife (CDFW), San Bernardino County and the City of Hesperia, the required mitigation measure (BIO-1) will require that the two Joshua trees remain in place with a 12-foot buffer around each tree, and/or that the applicant secure an incidental take permit from CDFW under the provisions of the WJTCA. Secondly, the Juniper trees and Joshua trees on the site provide potential nesting habitat for birds. Therefore, per the Migratory Bird Treaty Act (MBTA) a pre-construction survey is required in order to avoid impacts (BIO-2). To help offset alteration to the mature California Juniper trees and Western Joshua trees, the third mitigation measure (BIO-3) recommends that, as much as possible, the Junipers be incorporated into the planned drought-tolerant landscaping for the site. Finally, mitigation measure BIO-4 requires that a preconstruction survey be completed to assure that burrowing owls do not locate on the property prior to ground disturbance. With implementation of these measures, impacts to biological resources will be reduced to less than significant levels.

Cultural and Tribal Cultural Resources

The cultural resources assessment found that no cultural artifacts of any kind were identified on the Project site. Likewise, no cemeteries or human remains are known or likely to have been placed on the Project site.

In the case that human remains are found, all activities will stop and the coroner will be notified to determine that nature of the remains and whether Native American consultation is needed as required by California's Government Code §5079.98. Through the Tribal consultation process, the Yuhaaviatam of San Manuel Nation requested the inclusion of mitigation measures to assure that if resources are identified, the Tribe is notified and monitoring is implemented by an archaeologist and a Tribal monitor. These requests are contained in mitigation measures CUL-1 through CUL-3, and TCR-1 and TCR-2. The implementation of the requested mitigation measures will assure that impacts to both cultural and Tribal cultural resources are reduced to less than significant levels.

b) **Less Than Significant Impact.** As described throughout this document, this proposed Project will occur on a site that is designated for limited industrial use and is sequestered from nearby non-industrial uses by a railroad to the west, an airport and runway to the east, vast undeveloped land to the south and other limited industrial sites to the north. The Project's impacts are largely limited to the site itself and will have very insignificant impacts beyond the site boundaries. When viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects, this Project's impacts will not be cumulatively significant.

c) **Less Than Significant Impact.** This Project is not expected to impose any environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly. The city's Municipal Code will be implemented to the fullest extent along with other standard requirements which will contain potential impacts to less than significant levels.

Mitigation Monitoring and Reporting Program				
Mitigation Measure		**Responsible Agency**	**Timing**	**Verification (Date and Initials)**
BIOLOGICAL RESOURCES				
BIO-1	The two Western Joshua trees (*Yucca brevifolia*) will remain in place on the Project site and will each require a permanent 12-foot buffer from construction and operational vehicles, machinery and activity. Whether protected in place or removed, the applicant shall secure required incidental take permits prior to any ground disturbance on the Project site. The applicant shall apply for all required incidental take permits from CDFW in accordance with WJTCA and provide approved permits to the City prior to the initiation of any ground disturbing activity.	Project Biologist, Planning Division	Prior to ground disturbance	
BIO-2	Bird nesting season occurs between February 1 and September 15 in southern California, and between March 15 and August 31 for migrating bird species. To avoid impacts to resident and migratory nesting birds, all vegetation clearing, ground disturbance, and construction activity should be scheduled between September 16 and January 31 if possible. If construction occurs during the nesting season, a certified avian biologist must conduct a pre-construction nesting bird survey (NBS) immediately prior to scheduled construction activity. Should any active nests be identified, the biologist will demarcate a no-work buffer zone(s) around the active nest(s) and check the nest site(s) weekly until the young birds fledge and the nest(s) become inactive. The buffer zone size would be based on the nesting species, its sensitivity to disturbance, nesting stage and the expected intensity and duration of disturbance. No ground or vegetation disturbance shall occur within the nest site buffer zone(s) until the qualified biologist determines that the young have successfully fledged and the nest is inactive. Per CDFW recommendations, a buffer of 500 feet shall be set for listed species and birds of prey, and a buffer of 100 to 300 feet shall be set for unlisted songbirds.			
BIO-3	To help offset the loss of the mature California Juniper trees and their association with the Joshua tree woodland habitat the Junipers on the Project shall be incorporated into the planned drought-tolerant landscaping for the site rather than removed from the site, to the greatest extent possible.			
BIO-4	A pre-construction burrowing owl survey will be conducted by a qualified biologist within 30-days prior to any ground disturbing activities. If burrowing owls are documented on-site, the applicant shall prepare and implement a plan for avoidance or passive exclusion, in coordination with CDFW. Methodology for surveys, impact analysis, and reporting shall follow the recommendations and guidelines provided within the California Department of Fish and Game Staff Report on Burrowing Owl Mitigation (2012 Staff Report).			
CULTURAL & TRIBAL CULTURAL RESOURCES				
CUL-1	In the event that cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, the Yuhaaviatam of San Manuel Nation Cultural Resources Department (YSMN) shall be contacted, as detailed within TCR-1, regarding any pre-contact finds and be provided information after the archaeologist makes his/her initial assessment of the nature of the find, so as to provide Tribal input with regards to significance and treatment.	Project archaeologist, Tribal monitor, Planning Department	During ground disturbing activities	

Mitigation Monitoring and Reporting Program				
Mitigation Measure		**Responsible Agency**	**Timing**	**Verification (Date and Initials)**
CUL-2	If significant pre-contact cultural resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, the archaeologist shall develop a Monitoring and Treatment Plan, the drafts of which shall be provided to YSMN for review and comment, as detailed within TCR-1. The archaeologist shall monitor the remainder of the project and implement the Plan accordingly.			
CUL-3	If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.			
TCR-1	The Yuhaaviatam of San Manuel Nation Cultural Resources Management Department (YSMN) shall be contacted, as detailed in CUL-1, of any pre-contact cultural resources discovered during project implementation, and be provided information regarding the nature of the find, so as to provide Tribal input with regards to significance and treatment. Should the find be deemed significant, as defined by CEQA (as amended, 2015), a Cultural Resources Monitoring and Treatment Plan shall be created by the archaeologist, in coordination with YSMN, and all subsequent finds shall be subject to this Plan. This Plan shall allow for a monitor to be present that represents YSMN for the remainder of the project, should YSMN elect to place a monitor on-site.			
TCR-2	Any and all archaeological/cultural documents created as a part of the project (isolate records, site records, survey reports, testing reports, etc.) shall be supplied to the applicant and Lead Agency for dissemination to YSMN. The Lead Agency and/or applicant shall, in good faith, consult with YSMN throughout the life of the project.			

Appendix A

Air Quality

CREDE Hesperia Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	CREDE Hesperia
Construction Start Date	08/01/2024
Operational Year	2025
Lead Agency	City of Hesperia
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.80
Precipitation (days)	12.8
Location	34.374307078858834, -117.3199288790241
County	San Bernardino-Mojave Desert
City	Hesperia
Air District	Mojave Desert AQMD
Air Basin	Mojave Desert
TAZ	5135
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southwest Gas Corp.
App Version	2022.1.1.21

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

Other Asphalt Surfaces	215	1000sqft	5.50	0.00	33,717	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.45	3.75	36.0	34.5	0.05	1.60	19.9	21.5	1.47	10.2	11.6	—	5,556	5,556	0.23	0.22	3.48	5,579
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.38	6.20	19.8	20.0	0.04	0.86	7.61	8.47	0.79	3.55	4.35	—	4,381	4,381	0.13	0.22	0.09	4,451
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.73	0.84	5.90	6.02	0.01	0.26	2.60	2.87	0.24	1.30	1.54	—	1,061	1,061	0.04	0.03	0.20	1,069
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.13	0.15	1.08	1.10	< 0.005	0.05	0.48	0.52	0.04	0.24	0.28	—	176	176	0.01	< 0.005	0.03	177
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	137	137	548	137	—	—	82.0	—	—	65.0	—	—	—	—	—	—	—
Unmit.	Yes	No	No	No	No	Yes	—	No	—	—	No	—	—	—	—	—	—	—

Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	137	137	548	137	—	—	82.0	—	—	65.0	—	—	—	—	—	—	—
Unmit.	Yes	No	No	No	No	Yes	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Annual)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100,000
Unmit.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No

2.2. Construction Emissions by Year, Unmitigated

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

Year	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	4.45	3.75	36.0	34.5	0.05	1.60	19.9	21.5	1.47	10.2	11.6	—	5,556	5,556	0.23	0.22	3.48	5,579
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.38	6.20	19.8	20.0	0.04	0.86	7.61	8.47	0.79	3.55	4.35	—	4,381	4,381	0.13	0.22	0.09	4,451
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.73	0.84	5.90	6.02	0.01	0.26	2.60	2.87	0.24	1.30	1.54	—	1,061	1,061	0.04	0.03	0.20	1,069
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.13	0.15	1.08	1.10	< 0.005	0.05	0.48	0.52	0.04	0.24	0.28	—	176	176	0.01	< 0.005	0.03	177

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.	0.75	0.73	0.77	7.18	0.02	0.01	1.37	1.38	0.01	0.35	0.36	0.00	1,679	1,679	0.05	0.07	6.27	1,707
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.67	0.64	0.83	5.43	0.01	0.01	1.37	1.38	0.01	0.35	0.36	0.00	1,531	1,531	0.05	0.07	0.16	1,553
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.57	0.55	0.72	4.96	0.01	0.01	1.14	1.15	0.01	0.29	0.30	0.00	1,314	1,314	0.05	0.06	2.27	1,335
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.10	0.10	0.13	0.91	< 0.005	< 0.005	0.21	0.21	< 0.005	0.05	0.05	0.00	217	217	0.01	0.01	0.38	221
Exceeds (Daily Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	137	137	548	142	—	—	82.0	—	—	65.0	—	—	—	—	—	—	—
Unmit.	—	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Average Daily)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	137	137	548	142	—	—	82.0	—	—	65.0	—	—	—	—	—	—	—
Unmit.	—	No	No	No	No	—	—	No	—	—	No	—	—	—	—	—	—	—
Exceeds (Annual)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Threshold	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100,000

Unmit.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	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	0.75	0.69	0.77	7.18	0.02	0.01	1.37	1.38	0.01	0.35	0.36	—	1,674	1,674	0.05	0.07	6.27	1,702
Area	0.00	0.04	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	4.61	4.61	< 0.005	< 0.005	—	4.63
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.75	0.73	0.77	7.18	0.02	0.01	1.37	1.38	0.01	0.35	0.36	0.00	1,679	1,679	0.05	0.07	6.27	1,707
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.67	0.61	0.83	5.43	0.01	0.01	1.37	1.38	0.01	0.35	0.36	—	1,526	1,526	0.05	0.07	0.16	1,549
Area	—	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	4.61	4.61	< 0.005	< 0.005	—	4.63
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.67	0.64	0.83	5.43	0.01	0.01	1.37	1.38	0.01	0.35	0.36	0.00	1,531	1,531	0.05	0.07	0.16	1,553
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.57	0.51	0.72	4.96	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,309	1,309	0.05	0.06	2.27	1,331
Area	0.00	0.04	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	4.61	4.61	< 0.005	< 0.005	—	4.63

Waste	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.57	0.55	0.72	4.96	0.01	0.01	1.14	1.15	0.01	0.29	0.30	0.00	1,314	1,314	0.05	0.06	2.27	1,335
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.10	0.09	0.13	0.91	< 0.005	< 0.005	0.21	0.21	< 0.005	0.05	0.05	—	217	217	0.01	0.01	0.38	220
Area	0.00	0.01	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	—	—	—	0.00	0.76	0.76	< 0.005	< 0.005	—	0.77
Waste	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	0.10	0.10	0.13	0.91	< 0.005	< 0.005	0.21	0.21	< 0.005	0.05	0.05	0.00	217	217	0.01	0.01	0.38	221

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.55	3.25	< 0.005	0.16	—	0.16	0.15	—	0.15	—	522	522	0.02	< 0.005	—	524
Dust From Material Movement	—	—	—	—	—	—	1.94	1.94	—	1.00	1.00	—	—	—	—	—	—	—
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	0.08	0.07	0.65	0.59	< 0.005	0.03	—	0.03	0.03	—	0.03	—	86.5	86.5	< 0.005	< 0.005	—	86.8
Dust From Material Movement	—	—	—	—	—	—	0.35	0.35	—	0.18	0.18	—	—	—	—	—	—	—
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	0.11	0.10	0.09	1.58	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	261	261	0.01	0.01	1.02	265
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	23.4	23.4	< 0.005	< 0.005	0.04	23.8
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	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.88	3.88	< 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

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	—	—	—	—	—	7.09	7.09	—	3.43	3.43	—	—	—	—	—	—	—
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	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	—	—	—	—	—	—	7.09	7.09	—	3.43	3.43	—	—	—	—	—	—	—
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	0.19	0.16	1.50	1.55	< 0.005	0.07	—	0.07	0.06	—	0.06	—	243	243	0.01	< 0.005	—	244
Dust From Material Movement	—	—	—	—	—	—	0.58	0.58	—	0.28	0.28	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.27	0.28	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.3	40.3	< 0.005	< 0.005	—	40.4
Dust From Material Movement	—	—	—	—	—	—	0.11	0.11	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	0.08	1.35	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	224	224	0.01	0.01	0.87	227
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	0.04	0.03	1.38	0.30	0.01	0.02	0.32	0.34	0.02	0.08	0.10	—	1,223	1,223	< 0.005	0.19	2.60	1,283
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.09	0.91	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	198	198	0.01	0.01	0.02	200
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	0.03	0.02	1.46	0.31	0.01	0.02	0.32	0.34	0.02	0.08	0.10	—	1,225	1,225	< 0.005	0.19	0.07	1,282

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.08	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.03	17.0
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	0.12	0.03	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	101	101	< 0.005	0.02	0.09	105
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.77	2.77	< 0.005	< 0.005	0.01	2.81
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	< 0.005	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	—	16.7	16.7	< 0.005	< 0.005	0.02	17.5

3.5. 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	—	0.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.09	0.07	0.68	0.88	< 0.005	0.03	—	0.03	0.03	—	0.03	—	133	133	0.01	< 0.005	—	133
Paving	—	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.13	0.16	< 0.005	0.01	—	0.01	0.01	—	0.01	—	21.9	21.9	< 0.005	< 0.005	—	22.0
Paving	—	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	0.08	0.08	0.09	0.91	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	198	198	0.01	0.01	0.02	200
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	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.9	17.9	< 0.005	< 0.005	0.03	18.1
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	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.96	2.96	< 0.005	< 0.005	0.01	3.00
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

3.7. Architectural Coating (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	0.17	0.14	0.91	1.15	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	6.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.02	4.02	< 0.005	< 0.005	—	4.04
Architectural Coatings	—	0.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.67	0.67	< 0.005	< 0.005	—	0.67
Architectural Coatings	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Asphalt Surfaces	0.75	0.69	0.77	7.18	0.02	0.01	1.37	1.38	0.01	0.35	0.36	—	1,674	1,674	0.05	0.07	6.27	1,702
Total	0.75	0.69	0.77	7.18	0.02	0.01	1.37	1.38	0.01	0.35	0.36	—	1,674	1,674	0.05	0.07	6.27	1,702
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Asphalt Surfaces	0.67	0.61	0.83	5.43	0.01	0.01	1.37	1.38	0.01	0.35	0.36	—	1,526	1,526	0.05	0.07	0.16	1,549
Total	0.67	0.61	0.83	5.43	0.01	0.01	1.37	1.38	0.01	0.35	0.36	—	1,526	1,526	0.05	0.07	0.16	1,549
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Asphalt Surfaces	0.10	0.09	0.13	0.91	< 0.005	< 0.005	0.21	0.21	< 0.005	0.05	0.05	—	217	217	0.01	0.01	0.38	220
Total	0.10	0.09	0.13	0.91	< 0.005	< 0.005	0.21	0.21	< 0.005	0.05	0.05	—	217	217	0.01	0.01	0.38	220

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00	0.00	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00	0.00	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00	0.00	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	0.00	0.04	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.00	0.00	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	0.00	0.01	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	4.61	4.61	< 0.005	< 0.005	—	4.63
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	4.61	4.61	< 0.005	< 0.005	—	4.63
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	4.61	4.61	< 0.005	< 0.005	—	4.63
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	4.61	4.61	< 0.005	< 0.005	—	4.63
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.76	0.76	< 0.005	< 0.005	—	0.77
Total	—	—	—	—	—	—	—	—	—	—	—	0.00	0.76	0.76	< 0.005	< 0.005	—	0.77

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

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

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

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

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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

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

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

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

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

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

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

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

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

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

Species	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	8/1/2024	9/19/2024	5.00	36.0	—
Grading	Grading	9/20/2024	10/31/2024	5.00	30.0	—
Paving	Paving	11/1/2024	12/16/2024	5.00	32.0	—
Architectural Coating	Architectural Coating	12/17/2024	12/31/2024	5.00	11.0	—

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	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	17.6	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT

Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	0.00	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	0.00	0.00	14,375

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	54.0	0.00	—
Grading	—	4,212	30.0	0.00	—
Paving	0.00	0.00	0.00	0.00	5.50

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Other Asphalt Surfaces	5.50	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	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Other Asphalt Surfaces	96.6	120	103	36,832	1,555	1,935	1,659	592,901

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

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)
0	0.00	0.00	0.00	14,375

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO_2 and CH_4 and N_2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO_2	CH_4	N_2O	Natural Gas (kBTU/yr)
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)
Other Asphalt Surfaces	0.00	746,445

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
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

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

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

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

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

5.16.2. Process Boilers

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

5.17. User Defined

Equipment Type	Fuel Type

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. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

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

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	31.6	annual days of extreme heat
Extreme Precipitation	6.50	annual days with precipitation above 20 mm
Sea Level Rise	—	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 (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	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	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	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	N/A	N/A	N/A	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 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	98.7
AQ-PM	43.1
AQ-DPM	13.4
Drinking Water	15.6
Lead Risk Housing	23.3
Pesticides	0.00
Toxic Releases	34.7
Traffic	5.89
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	14.3
Haz Waste Facilities/Generators	0.00
Impaired Water Bodies	51.2
Solid Waste	52.9
Sensitive Population	—
Asthma	74.5
Cardio-vascular	99.0

Low Birth Weights	64.8
Socioeconomic Factor Indicators	—
Education	55.5
Housing	48.1
Linguistic	18.1
Poverty	60.2
Unemployment	70.9

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	50.55819325
Employed	27.51186963
Median HI	47.52983447
Education	—
Bachelor's or higher	35.41639933
High school enrollment	12.22892339
Preschool enrollment	6.762479148
Transportation	—
Auto Access	53.75336841
Active commuting	3.47747979
Social	—
2-parent households	96.77916079
Voting	57.29500834
Neighborhood	—
Alcohol availability	83.39535481

Park access	8.456306942
Retail density	4.478378032
Supermarket access	2.399589375
Tree canopy	1.398691133
Housing	—
Homeownership	88.14320544
Housing habitability	56.64057487
Low-inc homeowner severe housing cost burden	46.0284871
Low-inc renter severe housing cost burden	9.854998075
Uncrowded housing	63.4800462
Health Outcomes	—
Insured adults	41.5629411
Arthritis	7.9
Asthma ER Admissions	25.7
High Blood Pressure	18.7
Cancer (excluding skin)	24.3
Asthma	21.6
Coronary Heart Disease	9.8
Chronic Obstructive Pulmonary Disease	7.7
Diagnosed Diabetes	33.2
Life Expectancy at Birth	6.6
Cognitively Disabled	32.0
Physically Disabled	42.3
Heart Attack ER Admissions	11.8
Mental Health Not Good	30.2
Chronic Kidney Disease	27.1
Obesity	30.7

Pedestrian Injuries	19.6
Physical Health Not Good	27.6
Stroke	19.7
Health Risk Behaviors	—
Binge Drinking	47.1
Current Smoker	24.8
No Leisure Time for Physical Activity	44.6
Climate Change Exposures	—
Wildfire Risk	0.4
SLR Inundation Area	0.0
Children	31.0
Elderly	38.5
English Speaking	82.0
Foreign-born	4.4
Outdoor Workers	10.7
Climate Change Adaptive Capacity	—
Impervious Surface Cover	91.7
Traffic Density	1.8
Traffic Access	23.0
Other Indices	—
Hardship	49.4
Other Decision Support	—
2016 Voting	72.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	43.0

Healthy Places Index Score for Project Location (b)	35.0
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	Per project site plan, development will be on a 5.5 acre site and will include 67,734 sq ft of pallet yard and 146,973 sq ft of other asphalt concrete surfaces.
Construction: Construction Phases	Per project engineers, construction is expected to begin August 1, 2024 and end December 31, 2024.
Construction: Paving	—
Operations: Vehicle Data	Per ITE 151 (mini-warehouse) for 67,734 sq feet of pallet yard: 98 weekday trips, 120 Saturday trips, 102 Sunday trips.

Appendix B

Biological Resources Assessment

BIOLOGICAL RESOURCES ASSESSMENT, JURISDICTIONAL DELINEATION, AND NATIVE PLANT PROTECTION PLAN FOR THE DEVELOPMENT OF APN 0397-121-03, IN THE CITY OF HESPERIA, SAN BERNARDINO COUNTY, CALIFORNIA

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SECTION 1.0 – INTRODUCTION

Jennings Environmental, LLC (Jennings) was retained by CREDE Group (CREDE) to conduct a literature review and reconnaissance-level survey for the proposed development within Assessor Parcel Number (APN) 0397-121-03 in the City of Hesperia, California (Project). The survey identified vegetation communities, the potential for the occurrence of special status species, or habitats that could support special status wildlife species, and recorded all plants and animals observed or detected within the Project boundary. This biological resources assessment is designed to address the potential effects of the proposed project on designated critical habitats and/or any species currently listed or formally proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA) or species designated as sensitive by the California Department of Fish and Wildlife (CDFW) or the California Native Plant Society (CNPS).

Information contained in this document is in accordance with accepted scientific and technical standards that are consistent with the requirements of the United States Fish and Wildlife Service (USFWS) and (CDFW). Additionally, the site was surveyed for any drainage features that would meet the definition of the Waters of the US (WOUS), Waters of the State (WOS), or CDFW jurisdiction. Also, the project is located within the desert of San Bernardino County. As such, this report also contains the results of the Native Plant Protection Plan in accordance with San Bernardino County Development Code Section 88.01.060.

1.1 PROJECT LOCATION

The Project site is generally located in Section 5, Township 3 North, Range 4 West, and is depicted on the *Hesperia and Silverwood Lake* U.S. Geological Survey's (USGS) 7.5-minute topographic maps. More specifically the project is located within APN 0397-121-03, within the city of Hesperia, San Bernardino County, California. The Project site is located approximately 345 feet northwest of the Santa Fe Ave E. and Jenny Street intersection. The site is surrounded by a mix of developed rural residences, commercial developments, a private airstrip, undeveloped parcels, and the BNSF Railroad. (Figures 1 and 2, in Attachment A).

1.2 PROJECT DESCRIPTION

The Proposed Project is to construct an approximately 21,831-square-foot building on parcel 0397-121-03. The proposed Project site is 6.11 acres. The Project would consist of the building with tractor-trailer docking sites, employee and visitor parking, and an open space yard area.

SECTION 2.0 – METHODOLOGY

2.1 LITERATURE REVIEW

Prior to performing the field survey, existing documentation relevant to the Project site was reviewed. The most recent records of the California Natural Diversity Database (CNDDB) managed by CDFW (CDFW 2023), the USFWS Critical Habitat Mapper (USFWS 2023), and the California Native Plant Society's Electronic Inventory (CNPSEI) of Rare and Endangered Vascular Plants of California (CNPS 2023) were reviewed for the following quadrangle containing and surrounding the Project site: *Hesperia and*

Silverwood Lake, USGS 7.5-minute quadrangle. These databases contain records of reported occurrences of federal- or state-listed endangered or threatened species, California Species of Concern (SSC), or otherwise special status species or habitats that may occur within or in the immediate vicinity of the Project site. These sources include:

- California Natural Diversity Database (CNDDB) managed by CDFW (CDFW 2023)
- USFWS Critical Habitat Mapper (USFWS 2023)
- California Native Plant Society's Electronic Inventory (CNPSEI) of Rare and Endangered Vascular Plants of California (CNPS 2023)
- U.S. Fish and Wildlife (USFWS) threatened and endangered species occurrence GIS overlay;
- USGS National Map;
- Calwater Watershed Maps
- USFWS Designated Critical Habitat Maps
- San Bernardino County Biotic Recourses Overlay
- San Bernardino County Development Code, 88.01.060 Desert Native Plant Protection
- Western Joshua Tree Conservation Act 2023

2.2 SOILS

Before conducting the surveys, soil maps for Los Angeles County were referenced online to determine the types of soil found within the Project site. Soils were determined in accordance with categories set forth by the United States Department of Agriculture (USDA) Soil Conservation Service and by referencing the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2023).

2.3 BIOLOGICAL RECONNAISSANCE-LEVEL SURVEY

Jennings biologist, Gene Jennings, conducted the general reconnaissance survey within the Project site to identify the potential for the occurrence of special status species, vegetation communities, or habitats that could support special status wildlife species. The survey was conducted on foot, throughout the Project site between 0850 and 1050 hours on October 29, 2023. Weather conditions during the survey included temperatures ranging from 53 to 64 degrees Fahrenheit, with no cloud cover, no precipitation, and 3.3 to 6.2 mile-per-hour winds. Photographs of the Project site were taken to document existing conditions (Appendix B).

2.4 JURISDICTIONAL FEATURES

A general assessment of jurisdictional waters regulated by the United States Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CDFW was conducted for the proposed Project area. Pursuant to Section 404 of the Clean Water Act, USACE regulates the discharge of dredged and/or fill material into waters of the United States. The State of California (State) regulates the discharge of material into waters of the State pursuant to Section 401 of the Clean Water Act and the California Porter- Cologne Water Quality Control Act (California Water Code, Division 7, §13000 et seq.). Pursuant to Division 2, Chapter 6, Sections 1600-1602 of the California Fish and Game Code, CDFW regulates all substantial diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife. The initial assessment was conducted by a desktop survey through the USGS National Hydrography Dataset for hydrological connectivity. Additional assessment findings are discussed in Sections 3.1.2 and 3.2.5. A discussion of the regulatory framework is provided in Appendix C.

2.5 VEGETATION

All plant species observed within the Project site were recorded. Vegetation communities within the Project site were identified and qualitatively described. Plant communities were determined in accordance with the *Manual of California Vegetation*, *Second Edition* (Sawyer et al. 2009). Plant nomenclature follows that of *The Jepson Manual, Second Edition* (Baldwin et al. 2012). A comprehensive list of the plant species observed during the survey is provided in Appendix D.

2.6 WILDLIFE

All wildlife and wildlife signs observed and detected, including tracks, scat, carcasses, burrows, excavations, and vocalizations, were recorded. Additional survey time was spent in those habitats most likely to be utilized by wildlife (native vegetation, wildlife trails, etc.) or in habitats with the potential to support state- and/or federally listed or otherwise special-status species. Notes were made on the general habitat types, species observed, and the conditions of the Project site. A comprehensive list of the wildlife species observed during the survey is provided in Appendix D.

2.7 WILDLIFE CORRIDORS AND HABITAT CONSERVATION PLAN

According to the California Essential Habitat Connectivity Project, the Project Site is not mapped within an area for wildlife movement and is not within a habitat conservation plan. Additionally, the site is not within a wildlife linkage as mapped by Mojave Desert Land Trust. Therefore, the proposed Project will have a less than significant impact on any current wildlife corridors or habitat conservation plans.

SECTION 3.0 – RESULTS

3.1 LITERATURE REVIEW RESULTS

According to the CNDDB, CNPSEI, and other relevant literature and databases, 37 sensitive species including 11 listed species, and 1 sensitive habitats have been documented in the *Hesperia and Silverwood Lake* quads. This list of sensitive species and habitats includes any State and/or federally-listed threatened or endangered species, CDFW-designated Species of Special Concern (SSC), and otherwise Special Animals. “Special Animals” is a general term that refers to all of the taxa the CNDDB is interested in tracking, regardless of their legal or protection status. This list is also referred to as the list of “species at risk” or “special status species.” The CDFW considers the taxa on this list to be those of greatest conservation need.

An analysis of the likelihood of the occurrence of all CNDDB-sensitive species documented in the *Hesperia and Silverwood Lake* quads is provided in Table 2, in Appendix D. This analysis takes into account species range as well as documentation within the vicinity of the project area and includes the habitat requirements for each species and the potential for their occurrence on the site, based on required habitat elements and range relative to the current site conditions. According to the databases, no USFWS-designated critical habitat occurs within or adjacent to the project site.

3.1.1 SOILS

After a review of the USDA Soil Conservation Service and by referencing the USDA NRCS Web Soil Survey (USDA 2023), it was determined that the Project site is located within the Mojave River Area, California area CA671. Based on the results of the database search, one (1) soil type was documented in the area:

Helendale loamy sand, 2 to 5 percent slopes (132). This soil is well drained with a high capacity to transmit water. This soil consists of alluvium derived from granite sources, typically ranges in elevation from 2,500 to 3,800 feet above mean sea level (amsl), and is considered prime farmland if irrigated.

3.1.2 SPECIAL STATUS SPECIES

Desert Tortoise (Gopherus agassizii) (Fedal/State Threatened)

The desert tortoise is a State and federally-listed threatened species. Throughout its range, it is threatened by habitat loss, domestic grazing, predation, collections, and increased mortality rates. The desert tortoise is typically found in creosote bush scrub. They are most often found on level or sloped ground where the substrate is firm but not too rocky. Tortoise burrows are typically found at the base of shrubs, in the sides of washes and hillsides. Because a single tortoise may have many burrows distributed throughout its home range, it is not possible to predict the exact numbers of individuals on a site based upon burrow numbers.

In 1992 the US Bureau of Land Management issued the *California Statewide Desert Tortoise Management Policy* which included categorizing habitat into three levels of classification. The management goal for Category I areas is to maintain stable, viable populations and to increase the population where possible. The management goal for Category II areas is to maintain stable, viable populations. The management goal for Category III areas is to limit population declines to the extent feasible. In April 1993, the BLM amended the CDCA plan to delineate these three categories of desert tortoise habitat on public lands. Although habitat categories apply only to public lands administered by the BLM, regulatory agencies typically determine habitat compensation ratios based on the nearest BLM habitat categories. With the adoption of the West Mojave Plan all lands that are outside Desert Wildlife Management Areas, including the subject parcel, are characterized as Category 3 Habitat, which is the lowest priority management area for viable populations of the desert tortoise.

Burrowing Owl (Athene cunicularia) – Species of Species Concern (SSC)

The burrowing owl (BUOW) is a state and federal SSC. This owl is a mottled, brownish and sand-colored, dove-sized raptor, with large, yellow eyes, a rounded head lacking ear tufts, white eyebrows, and long legs compared to other owl species. It is a ground-dwelling owl typically found in arid prairies, fields, and open areas where vegetation is sparse and low to the ground. The BUOW is heavily dependent upon the presence of mammal burrows, with ground squirrel burrows being a common choice, in its habitat to provide shelter from predators, inclement weather, and to provide a nesting place. They are also known to make use of human-created structures, such as cement culverts and pipes, for burrows.

BUOW spends a great deal of time standing on dirt mounds at the entrance to a burrow or perched on a fence post or other low to the ground perch from which they hunt for prey. BUOW frequently hunt by hovering in place above the ground and dropping on their prey from above. They feed primarily on insects such as grasshoppers, June beetles, and moths, but will also take small rodents, birds, and reptiles. They are active during the day and night but are considered a crepuscular owl; generally observed in the early morning hours or at twilight. The breeding season for BUOW is February 1 through August 31. Up to 11, but typically 7 to 9, eggs are laid in a burrow, abandoned pipe, or other subterranean hollows where incubation is complete in 28-30 days. Young BUOW fledges in 44 days. The BUOW is considered a migratory species in portions of its range, which includes western North America from Canada to Mexico, and east to Texas and Louisiana. BUOW populations in California are considered to be sedentary or locally migratory.

Throughout its range, the BUOW is vulnerable to habitat loss, predation, vehicular collisions, and destruction of burrow sites, and the poisoning of ground squirrels. BUOW has disappeared from significant portions of their range in the last 15 years and, overall, nearly 60% of the breeding groups of owls known to have existed in California during the 1980s had disappeared by the early 1990s. The BUOW is not listed under the state or federal Endangered Species Act but is considered both a federal and state Species of Special Concern. The BUOW is a migratory bird protected by the international treaty under the Migratory Bird Treaty Act of 1918 and by State law under the California Fish and Game Code (CDFG Code #3513 & #3503.5).

<u>Desert Kit Fox (*Vulpes macrotis*)</u>

The desert kit fox is not federally- or state-listed, but is considered a species of local concern by the County of Los Angeles. It is an uncommon to rare permanent resident in arid habitats within southern California. Kit foxes are threatened by a number of human activities, including poaching, pesticide and rodenticide use, and direct poisoning, as well as heavy agricultural and urban development. Desert kit foxes occur in the desert and other arid habitats, including sagebrush flats, creosote scrub, and annual grassland habitats, and other areas with scattered brush, scrub, and shrubs. They are an important predator of small mammals, preying on black-tailed jackrabbits (*Lepus californicus*), desert cottontails (*Sylvilagus audubonii*), kangaroo rats, ground squirrels, and other rodents, insects, reptiles, birds, and bird eggs. Limited vegetation may be taken. Desert kit foxes excavate burrows in loose-textured sandy or loamy soils for shelter, pupping, and as an escape from extreme heat and cold. Open, level areas are preferred for burrowing. Man-made structures and infrastructure, including culverts and pipes, also may be used for denning where suitable friable soils are not present.

<u>American Badger (*Taxidea taxus*)</u>

The American badger is a CDFW Species of Special Concern. Badgers are uncommon, permanent residents throughout California, and occur most commonly in open stages of shrub, woodland, and herbaceous habitats. They are tenacious diggers and occur where friable soils support denning and burrowing activities. They are active year-round, and most often nocturnal, although they may be active during the day. They prey upon fossorial rodents, especially California ground squirrels and pocket gophers; rats and mice, some reptiles, insects, eggs, birds, and carrion also may be taken. Breeding typically occurs in the summer and early fall, with pups being born the following March or April in burrows dug in relatively dry, often sandy soil. American badgers are threatened primarily by indiscriminate trapping, agricultural conversion, and the eradication of ground squirrels and other fossorial rodents that comprise the majority of their prey base.

Mohave Ground Squirrel (Xerospermophilus mohavensis) (State – Threatened)

The Mohave ground squirrel (MGS) is a State listed threatened species. Mohave ground squirrel is endemic to 2 million hectares in the western Mojave Desert. It typically inhabits sandy soils of alkali sink and creosote bush scrub habitat. In much of this region, the geographic range of the species is considered to lie west of the Mojave River. However, in the Victorville and Barstow areas, there are records of Mohave ground squirrel occurrence on the east side of the Mojave River. Mohave ground squirrel is listed as threatened by CDFW due to habitat loss, fragmentation, and deterioration. CDFW does not designate critical habitat for this species.

MGS is small, grayish, diurnal squirrel measuring about 9 inches from nose to tip of tail. They forage on leaves and seeds and aestivate/hibernate for long periods of the year. Plants documented as forage for MGS include: fiddleneck (*Amsinckia tessellata*), wolfberry (*Lycium andersonii*), Joshua tree (*Yucca brevifolia*), winterfat (*Krascheninnikovia lanata*), spiny hopsage (*Grayia spinosa*), allscale (*Atriplex canescens* and *A. polycarpa*), desert holly (*A. hymenelytra*), coreopsis (*Coreopsis* sp.), and the seeds of Joshua tree. It is suspected that Mohave ground squirrel forage on the plant species with the highest water content available at the time. The project site falls within the historic range of the MGS but is located outside, to the south, of the Mohave ground squirrel Conservation Area set forth in the West Mojave Plan.

Western Joshua Tree (*Yucca brevifolia*) (State Candidate for Listing)

Western Joshua trees occur throughout the Mojave Desert in Southern California and are typically found at an elevation of 400 to 1,800 meters (~1,200 to ~5,400 feet). Western Joshua trees within the western portion of the Mojave Desert typically receive more annual precipitation during "normal" years; consequently, cloning occurs more often resulting in numerous trunks sprouting from the same root system. Western Joshua tree habitats provide habitat for a variety of wildlife species including desert woodrats *(Neotoma* sp.) and night lizards *(Xantusia* sp.) both of which utilize the base of the trees. A variety of birds also utilize Western Joshua trees for nesting such as hawks, common ravens, and cactus wrens. CDFW consider Western Joshua tree woodlands as areas that support relatively high species diversity and as such are considered to be a sensitive desert community. Western Joshua trees are also considered a significant resource under the California Environmental Quality Act (CEQA) and are included in the Desert Plant Protection Act, Food and Agricultural Code (80001 - 80006).

Additionally, pursuant to the provisions of Section 2074.2 of the Fish and Game Code, the California Fish and Game Commission (Commission), at its September 22, 2020, meeting, accepted for consideration the petition submitted to list the western Joshua tree (Yucca brevifolia) as threatened or endangered under the California Endangered Species Act. Based on that finding and the acceptance of the petition, the Commission also provided notice that the western Joshua tree is a candidate species as defined by Section 2068 of the Fish and Game Code.

3.1.3 JURISDICTIONAL WATERS

Aerial imagery of the site was examined and compared with the surrounding USGS 7.5-minute topographic quadrangle maps to identify drainage features within the survey area as indicated from topographic changes, blue-line features, or visible drainage patterns. The U.S. Fish and Wildlife Service National Wetland Inventory and Environmental Protection Agency (EPA) Water Program "My Waters" data layers were also reviewed to determine whether any hydrologic features and wetland areas had been documented within the vicinity of the site. Similarly, the Soil maps from the U.S. Department of Agriculture (USDA) - Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2023) were reviewed to identify the soil series on-site and to check if they have been identified regionally as hydric soils. Upstream and downstream connectivity of waterways (if present) was reviewed in the field, on aerial imagery, and topographic maps to determine jurisdictional status.

3.1.4 DESIGNATED CRITICAL HABITAT

The site is not located within or adjacent to any USFWS-designated Critical Habitat. No further action is required.

3.1.5 HYDROLOGY AND HYDROLOGIC CONNECTIVITY

Hydrologically, the project site is located within an undefined Hydrologic Sub-Area (HSA 628.20), as identified on the Calwater Watershed maps. This undefined area comprises a 556,821-acre drainage area within the larger Bell Mountain Wash-Mojave River Hydrologic Area (Hydrologic Unit Code [HUC10] 1809020807) (CalTrans, 2023). The Bell Mountain Wash-Mojave River watershed in Hesperia is bordered to the north by the Buckthorn Wash-Mojave River and Wild Wash watersheds, to the east by the Apple Valley Dry Lake watershed, to the south by the West Fork Mojave River watershed, and to the west by the Upper Fremont Wash and Lower Fremont Wash watersheds. (Figure 3 in Appendix A).

3.1.6 SAN BERNARDINO COUNTY DEVELOPMENT CODE

§ 88.01.060 Desert Native Plant Protection.

This Section provides regulations for the removal or harvesting of specified desert native plants in order to preserve and protect the plants and to provide for the conservation and wise use of desert resources. The provisions are intended to augment and coordinate with the Desert Native Plants Act (Food and Agricultural Code §§ 80001 *et seq.*) and the efforts of the State Department of Food and Agriculture to implement and enforce the Act.

(a) *Definitions.* Terms and phrases used within this Section shall be defined in Division 10 (Definitions) and/or defined by the California Food and Agricultural Code. The California Food and Agricultural Code definition, if one exists, shall prevail over a conflicting definition in this Development Code.

(b) *Applicability.* The provisions of this Section shall apply to desert native plants specified in Subdivision (c) (Regulated Desert Native Plants) that are growing on any of the following lands, unless exempt in compliance with § 88.01.030 (Exempt Activities):

(1) Privately owned or publicly owned land in the Desert Region.

(2) Privately owned or publicly owned land in any parts of the Mountain Region in which desert native plants naturally grow in a transitional habitat.

(c) *Regulated Desert Native Plants.* The following desert native plants or any part of them, except the fruit, shall not be removed except under a Tree or Plant Removal Permit in compliance with § 88.01.050 (Tree or Plant Removal Permits). In all cases the botanical names shall govern the interpretation of this Section.

(1) The following desert native plants with stems two inches or greater in diameter or six feet or greater in height:

(A) Dalea spinosa (smoketree).

(B) All species of the genus Prosopis (mesquites).

(2) All species of the family Agavaceae (century plants, nolinas, yuccas).

(3) Creosote Rings, ten feet or greater in diameter.

(4) All Western Joshua trees.

(5) Any part of any of the following species, whether living or dead:

(A) Olneya tesota (desert ironwood).

(B) All species of the genus Prosopis (mesquites).

(C) All species of the genus Cercidium (palos verdes).

(d) *Compliance with Desert Native Plants Act.* Removal actions of all plants protected or regulated by the Desert Native Plants Act (Food and Agricultural Code §§ 80001 *et seq.*) shall comply with the provisions of the Act before the issuance of a development permit or approval of a land use application.

3.2 FIELD STUDY RESULTS

3.2.1 HABITAT

The habitat on-site consists of disturbed ruderal vegetation. Within the ruderal vegetation was California junipers (*Juniperus californica*) and western Joshua trees (*Yucca brevifolia*). These species were not at a sufficient density to qualify their respective habitat types as present within the parcel. The site did show signs of disturbance in the form of vehicle and pedestrian traffic. Table 1 in Appendix D contains a list of all plants found on-site. Surrounding land uses include undeveloped parcels and rural residential developments.

3.2.2 WILDLIFE

Species observed or otherwise detected on or in the vicinity of the project site during the surveys included; white-crowned sparrow (*Zonotrichia leucophrys*), house sparrow (*Passer domesticus*), and house finch (*Haemorhous mexicanus*). Table 1 in Appendix D contains a list of all wildlife observed on-site.

3.2.3 SPECIAL STATUS SPECIES

No State and/or federally listed threatened or endangered species or other sensitive species were observed on-site during surveys.

Desert Tortoise

The habitat on site is not suitable for desert tortoise. No sign of desert tortoise (i.e. burrows, tracks, or pellets) was observed during the survey. Additionally, no desert tortoise individuals were observed. The Project site is located within a developed portion of the City of Hesperia and is bordered by the railroad tracks.

> ***Findings***: This species is considered absent from the project site and no further surveys are required.

Burrowing Owl

Based on the October 2023 field survey, the site does not contain suitable habitat for this species. No burrowing owls were observed during the site visit. No burrows of any kind were located within the Project site. No portion of the Project site showed any evidence of past or present BUOW activity. No feathers, whitewash, or castings were found and no suitable burrow surrogate species are present on-site.

> ***Findings***: This species is considered absent from the project site and no further surveys are required.

Desert Kit Fox

The site is not suitable for this species. However, this species was not observed during the survey. No burrows or suitable size or shape were observed, and no evidence of this species was observed either (scat, predation remains, tracks, etc.).

> ***Findings***: This species is considered absent from the project site and no further surveys are required.

American Badger

The site is not suitable for this species. This species was not observed during the survey. No burrows or suitable size or shape we observed, and no evidence of this species were observed either (scat, predation remains, tracks, etc.).

> ***Findings***: This species is considered absent from the project site and no further surveys are required.

Mohave Ground Squirrel

The site is not suitable for MGS. No burrows of any kind were present within the Project boundary. Additionally, the Project site is located within a developed portion of the City of Hesperia and is bordered by the railroad tracks. Furthermore, MGS has one possibly extriptated occurrence documented within the Project vicinity from 1921. MGS have not been documented this far south and east of Interstate 15 within the last 25 years. The Project site does not contain the habitat requirements that this species prefers and is isolated from populated areas by Interstate 15, railroad tracks, and housing developments.

Findings: This species is considered absent from the project site and no further surveys are required.

Western Joshua Tree

There are currently 2 western Joshua trees within the subject parcel. Current guidance from the Department of Fish and Wildlife (CDFW), the City of Hesperia, and San Bernardino County regarding the appropriate buffers around western Joshua trees during ground-disturbing activities are described below:

All western Joshua trees should be avoided on-site and the appropriate buffers should be installed.

- 40 feet for western Joshua trees five meters or greater in height.
- 12 feet for western Joshua trees one meter or greater but less than five meters in height.
- 6 feet for western Joshua trees less than one meter in height.

Tree ID	Tree Latitude	Tree Longitude	Size Class	Height of Tree (meters)	Live or Dead?	Mature Tree (branched)?	Flowering or Fruiting Stage? (flowers, fruits, or none)	Impact to Tree (removal, trim, relocation, other, or none)	Activities be within 15 meters of tree?	Relocation Site
JT01	34.373733	-117.320334	B	3.20	L	Y	None	None	Y	N/A
JT02	34.373640	-117.320423	B	3.81	L	Y	None	None	Y	N/A

Based on current site conditions and proposed development plans, no western Joshua trees will be impacted. Figure 4 in Attachment A shows the location of the western Joshua trees as it relates to the proposed development with the appropriate buffers as detailed above.

3.2.4 NESTING BIRDS

The Project site and immediate surrounding area does contain habitat suitable for nesting birds. As such the Project is subject to the following nesting bird regulations. Recommendations for avoidance and minimization are in section 4.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918. This Act implements four international conservation treaties that the U.S. entered into with Canada in 1916, Mexico in 1936, Japan in 1972, and Russia in 1976. It is intended to ensure the sustainability of populations of all protected migratory bird species. The Act has been amended with the signing of each treaty, as well as when any of the treaties were amended, such as with Mexico in 1976 and Canada in 1995. The Act prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service.

California Fish and Game Code

The Project site is also subject to Sections 3503 and 3503.5 of the Fish and Game Code. Section 3503 states, "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto". And Section 3503.5 states, "It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto".

3.2.5 JURISDICTIONAL WATERS

Waters of the United States and Waters of the State

The USACE has the authority to permit the discharge of dredged or fill material in Waters of the U.S. (WOUS) under Section 404 CWA. While the Regional Water Quality Board has authority over the discharge of dredged or fill material in Waters of the State under Section 401 CWA as well as the Porter-Cologne Water Quality Control Act. The Project area was surveyed with 100 percent visual coverage and no drainage features were present on site that met the definition for WOUS. As such, the subject parcel does not contain any wetlands, Waters of the U.S., or Waters of the State.

Fish and Game Code Section 1602 - State Lake and/or Streambed

The CDFW asserts jurisdiction over any drainage feature that contains a definable bed and bank or associated riparian vegetation. The Project area was surveyed with 100 percent visual coverage and no definable bed or bank features exist on the project site. As such, the subject parcel does not contain any areas under CDFW jurisdiction.

3.2.6 WETLANDS AND BLUE LINE STREAM

NWI maps did not identify portions within the Project site as a Riverine/Riparian system. Additionally, none of the requirements for wetland designation (hydric vegetation, hydric soils, and/or wetland hydrology) were present on site. As such, there are no wetlands currently present on site.

3.2.7 NATIVE PLANT PROTECTION PLAN

The Proposed Project Site does not contain any other species (other than western Joshua tree) that are protected species under San Bernardino County Development Code § 88.01.060 and the California Desert

Native Plant Act. Because protections for the western Joshua tree are covered under the Western Joshua Tree Act, the Project is considered in compliance with the San Bernardino County Development Code and the Desert Native Plant Act.

SECTION 4.0 – CONCLUSIONS AND RECOMMENDATIONS

Based on the literature review and personal observations made in the immediate vicinity, no State and/or federally-listed threatened or endangered species are documented/or expected to occur within the Project site. Additionally, no plant species with the California Rare Plant Rank (CRPR) of 1 or 2 were observed on-site or documented to occur on-site in the relevant databases. No other sensitive species were observed within the project area or buffer area.

4.1 JURISDICTIONAL AREAS

There are no streams, channels, washes, or swales that meet the definitions of Section 1600 of the State of California Fish and Game Code (FGC) under the jurisdiction of the CDFW, Section 401 ("Waters of the State") of the Clean Water Act (CWA) under the jurisdiction of the Regional Water Quality Control Board (RWQCB), or "Waters of the United States" (WoUS) as defined by Section 404 of the CWA under the jurisdiction of the U.S. Army Corps of Engineers (Corps) within the subject parcel. Therefore, no permit from any regulatory agency will be required.

4.2 NESTING BIRDS

Nesting Birds

Since there is some habitat within the Project site and adjacent area that is suitable for nesting birds in general, the following mitigation measure should be implemented.

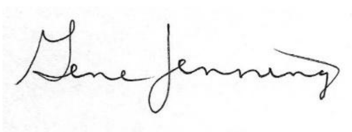
> Nesting bird nesting season generally extends from February 1 through September 15 in southern California and specifically, March 15 through August 31 for migratory passerine birds. To avoid impacts to nesting birds (common and special status) during the nesting season, a qualified Avian Biologist will conduct pre-construction Nesting Bird Surveys (NBS) prior to Project-related disturbance to nestable vegetation to identify any active nests. If no active nests are found, no further action will be required. If an active nest is found, the biologist will set appropriate no-work buffers around the nest which will be based upon the nesting species, its sensitivity to disturbance, nesting stage, and expected types, intensity, and duration of the disturbance. The nests and buffer zones shall be field-checked weekly by a qualified biological monitor. The approved no-work buffer zone shall be clearly marked in the field, within which no disturbance activity shall commence until the qualified biologist has determined the young birds have successfully fledged and the nest is inactive.

4.3 CERTIFICATION

I hereby certify that the statements furnished herein, and in the attached exhibits present data and information required for this analysis to the best of my ability, and the facts, statements, and information presented are true and correct to the best of my knowledge and belief. This report was prepared in accordance with professional requirements and standards. Fieldwork conducted for this assessment was performed by me. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the project proponent and that I have no financial interest in the project.

Please do not hesitate to contact me at 909-534-4547 should you have any questions or require further information.

Sincerely,



Gene Jennings
Principal/Regulatory Specialist

Appendices:

- Appendix A – Figures
- Appendix B – Site Photos
- Appendix C – Regulatory Framework
- Appendix D – Tables

Section 5 – REFERENCES

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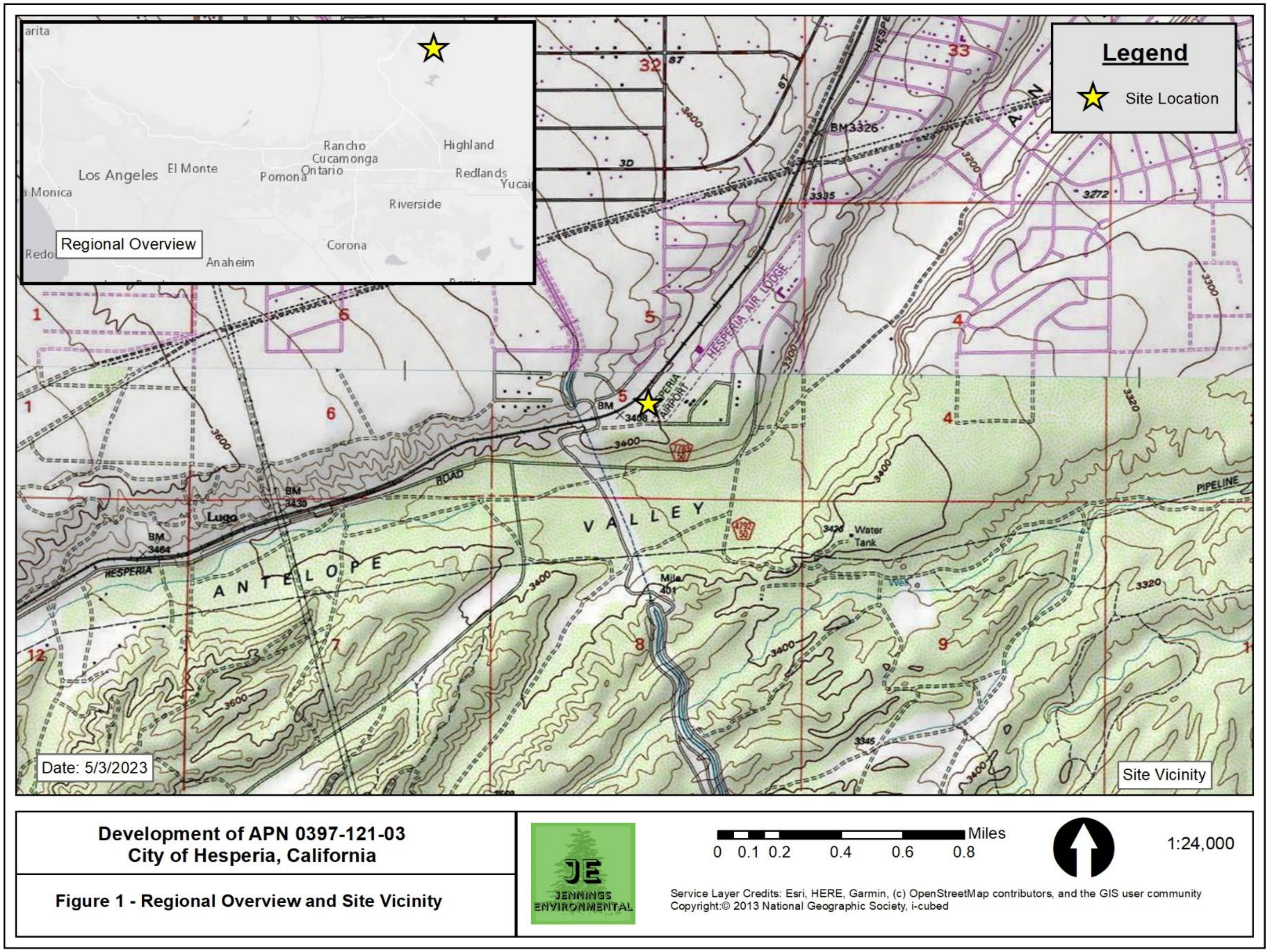
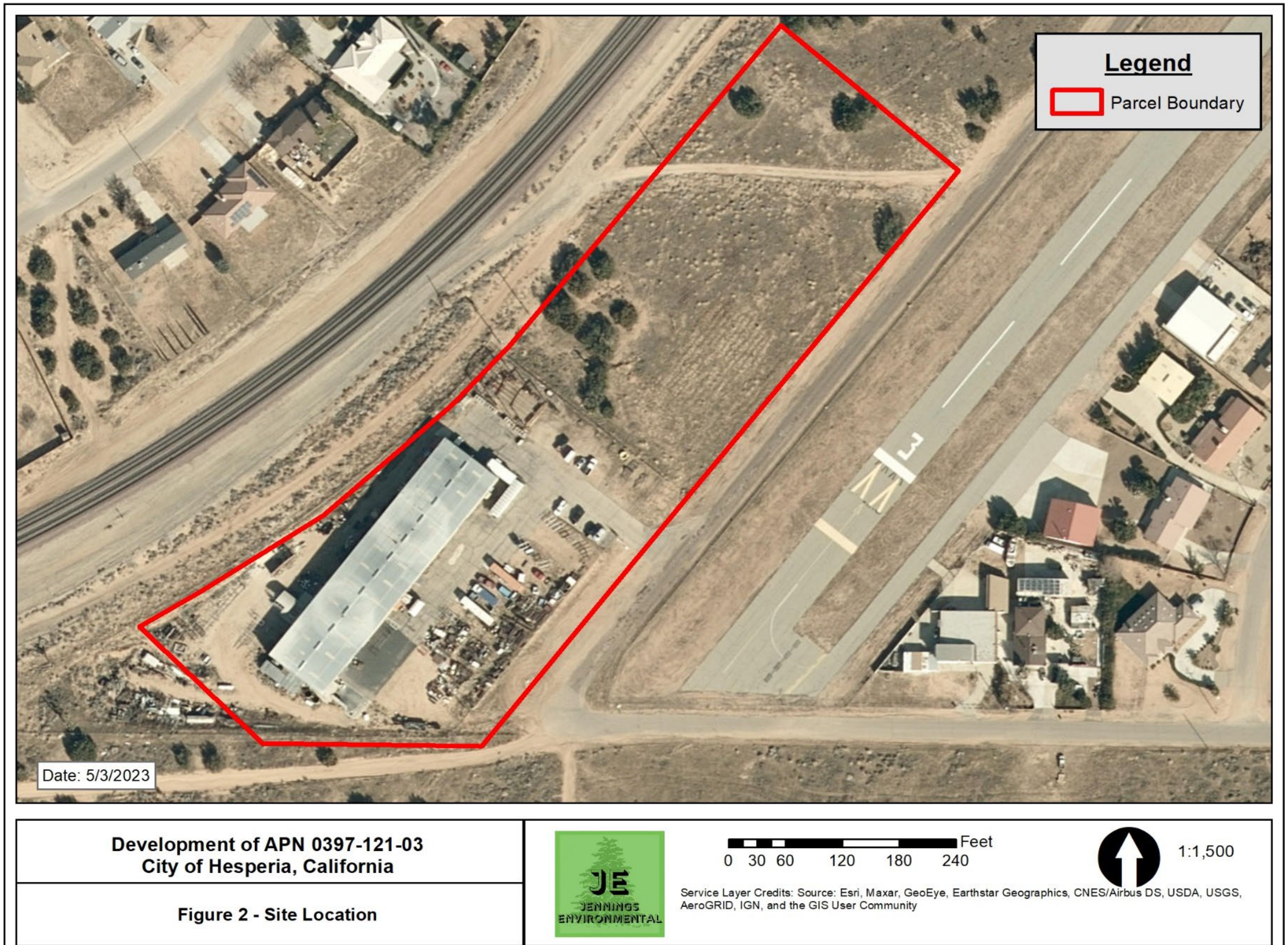
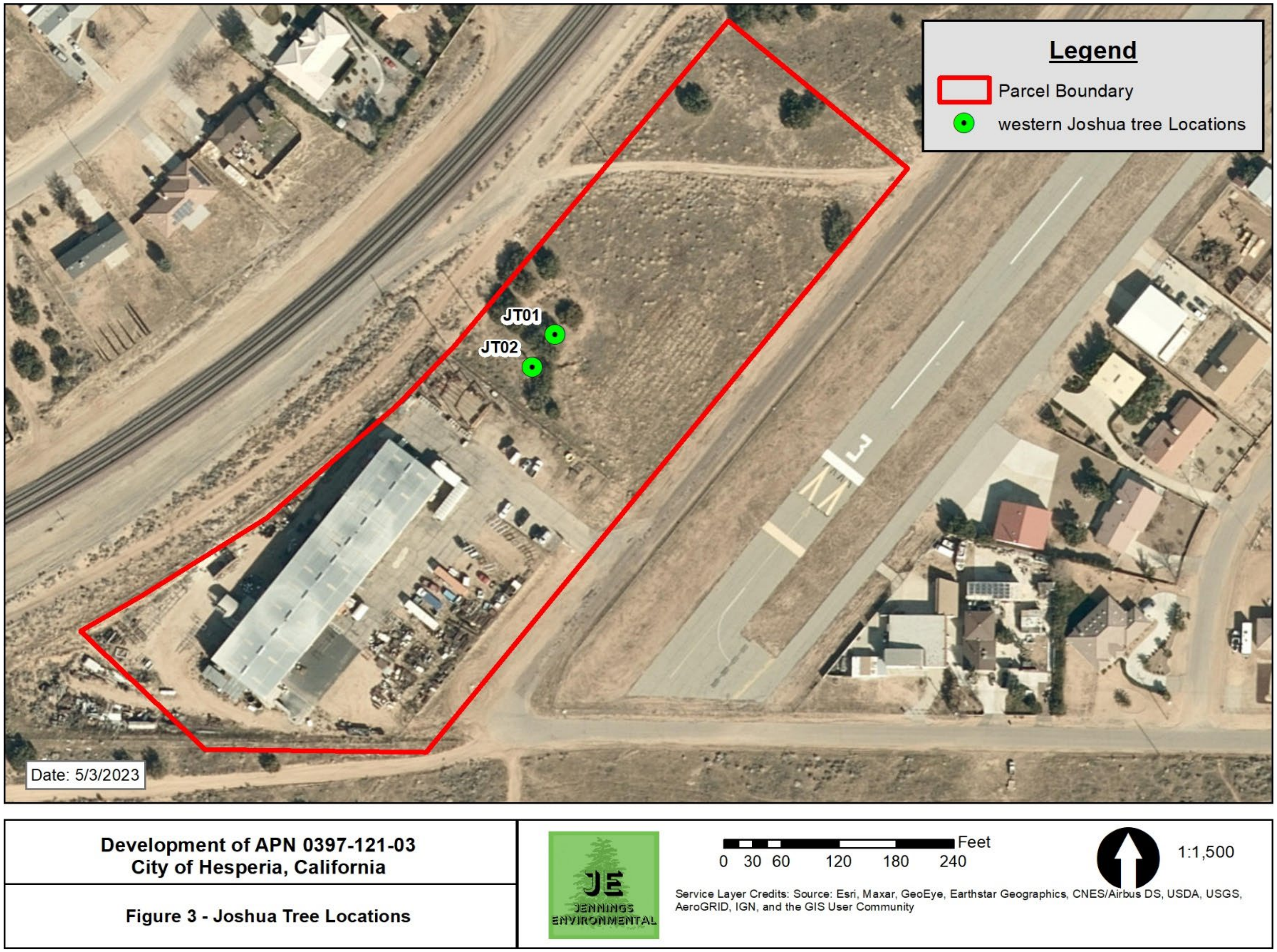
Appendix A – Figures


Legend
Site Location
Regional Overview
Los Angeles
El Monte
Pomona
Rancho Cucamonga
Ontario
Highland
Redlands
Riverside
Corona
Anaheim
Date: 5/3/2023
Site Vicinity
HESPERIA AIR LODGE
ANTELOPE
VALLEY
Lugo
Water Tank
PIPELINE
Development of APN 0397-121-03
City of Hesperia, California
Figure 1 - Regional Overview and Site Vicinity
JE JENNINGS ENVIRONMENTAL
Miles
0 0.1 0.2 0.4 0.6 0.8
1:24,000
Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Copyright:© 2013 National Geographic Society, i-cubed



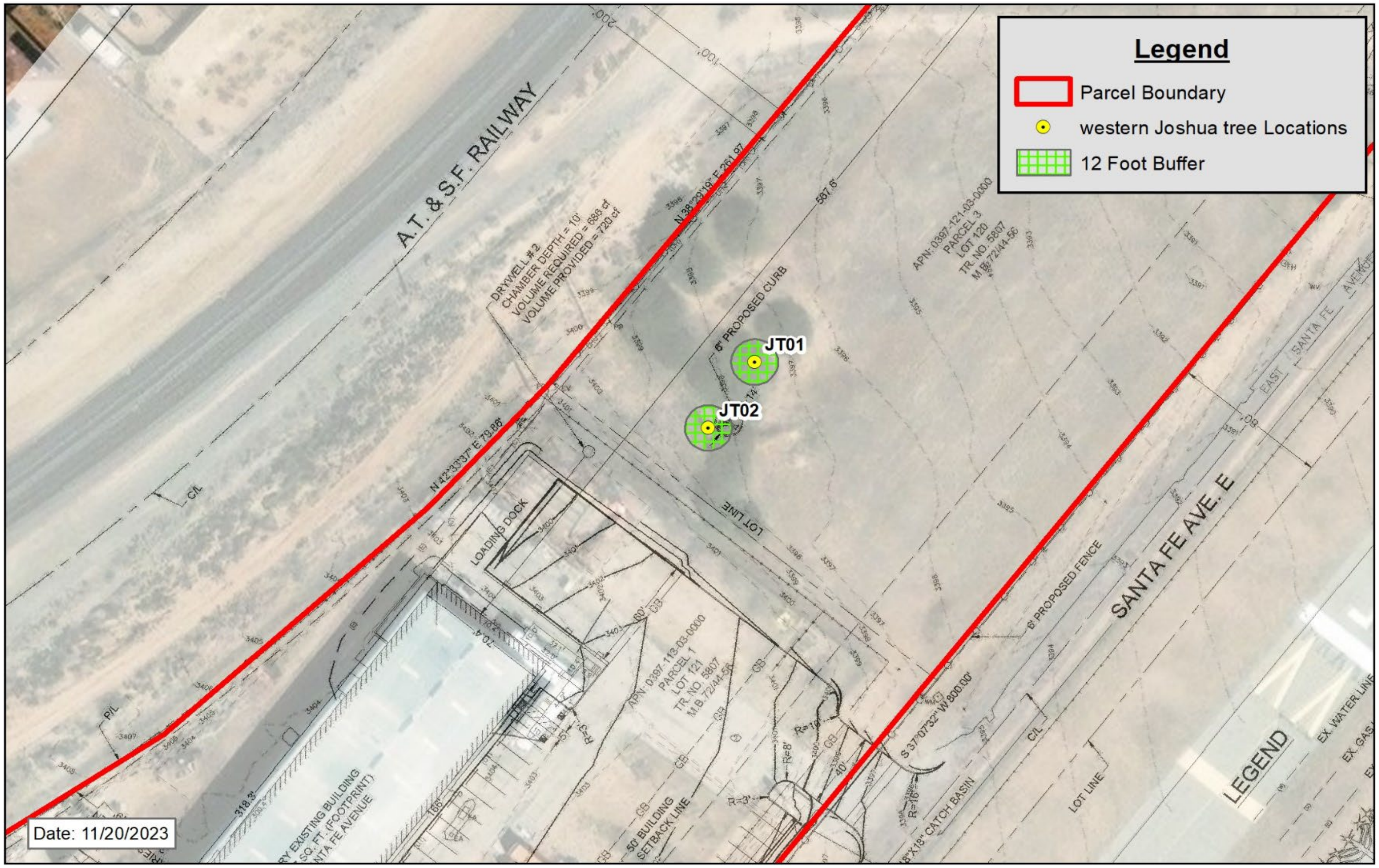
Development of APN 0397-121-03
City of Hesperia, California

Figure 2 - Site Location



Development of APN 0397-121-03
City of Hesperia, California

Figure 3 - Joshua Tree Locations



Development of APN 0397-121-03
City of Hesperia, California

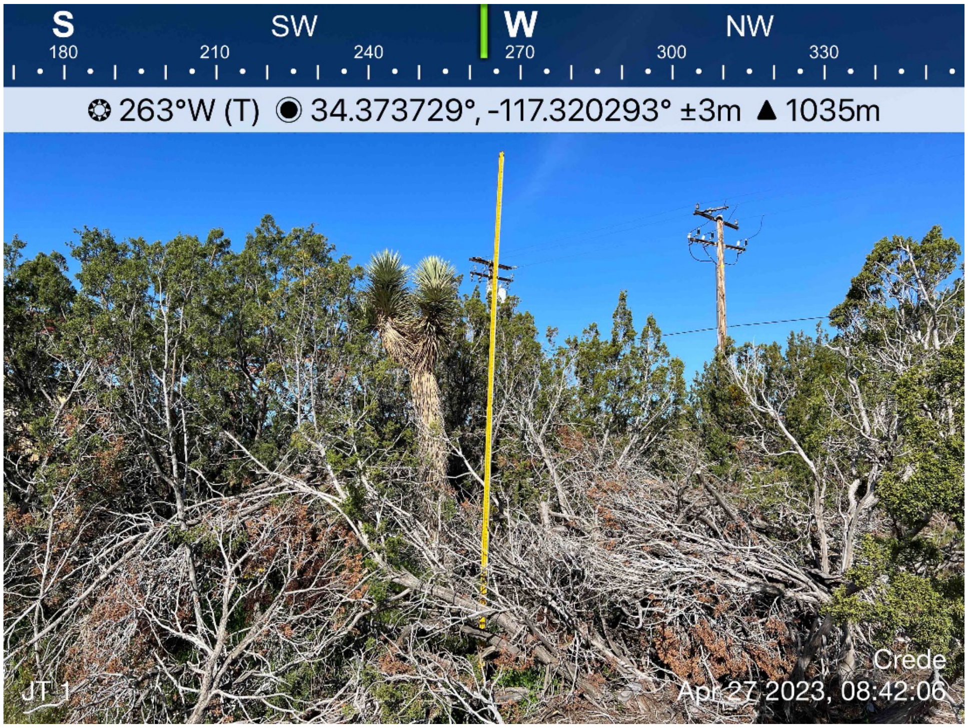
Figure 4 - Joshua Tree Locations and Site Plan

Feet
0 15 30 60 90 120

1:792

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix B – Photos

	Western Joshua tree JT01
	Western Joshua tree JT02

	Northwest corner of parcel, facing east.
	Southwest corner of parcel, facing northwest.

Appendix C – Regulatory Framework

1.1 FEDERAL JURISDICTION

1.1.1 United States Army Corps of Engineers

Activities within inland streams, wetlands, and riparian areas in California are regulated by agencies at the federal, state, and regional levels. At the federal level, the U.S. Army Corps of Engineers (USACE) Regulatory Program regulates activities within wetlands and waters of the US pursuant to Section 404 of the Federal Clean Water Act (CWA).

At the state level, the California Department of Fish and Wildlife (CDFW) regulates activities within the bed, bank, and associated habitat of a stream under the Fish and Game Code §§ 1600–1616. The California State Water Resources Board (SWRB) delegates authority at the regional level to Regional Water Quality Control Boards (RWQCB) that are responsible for regulating discharge into waters of the US under Section 401 of the federal CWA and waters of the State under the California Porter-Cologne Water Quality Act.

The CWA was implemented to maintain and restore the chemical, physical, and biological integrity of the Waters of the United States (33 Code of Federal Regulations [CFR] Part 328 Section 328.3). “Waters of the US” are defined as follows:

> **§ 328.3 Definitions.**
> For the purpose of this regulation these terms are defined as follows:
> (a) *Waters of the United States* means:
> (1) Waters which are:
> (i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
> (ii) The territorial seas; or
> (iii) Interstate waters, including interstate wetlands;
> (2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;
> (3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section:
> (i) That are relatively permanent, standing or continuously flowing bodies of water; or
> (ii) That either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section;
> (4) Wetlands adjacent to the following waters:
> (i) Waters identified in paragraph (a)(1) of this section; or
> (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3)(i) of this section and with a continuous surface connection to those waters; or

(iii) Waters identified in paragraph (a)(2) or (3) of this section when the wetlands either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section;

(5) Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) of this section:

(i) That are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3)(i) of this section; or

(ii) That either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section.

(b) The following are not ''waters of the United States'' even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

(1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;

(2) Prior converted cropland designated by the Secretary of Agriculture The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

(3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

(4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;

(5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;

(6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

(7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

(8) Swales and erosional features (*e.g.,* gullies, small washes) characterized by low volume, infrequent, or short duration flow.

(c) In this section, the following definitions apply:

(1) *Wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically
adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(2) *Adjacent* means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes, and the like are ''adjacent wetlands.''

(3) *High tide line* means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such at those accompanying a hurricane or other intense storm.

(4) *Ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(5) *Tidal waters* means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

(6) *Significantly affect* means a material influence on the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section. To determine whether waters, either alone or in combination with similarly situated waters in the region, have a material influence on the chemical, physical, or biological integrity of waters identified in paragraph (a)(1) of this section, the

functions identified in paragraph (c)(6)(i) of this section will be assessed and the factors identified in paragraph (c)(6)(ii) of this section will be considered:

(i) Functions to be assessed:

(A) Contribution of flow;

(B) Trapping, transformation, filtering, and transport of materials (including nutrients, sediment, and other pollutants);

(C) Retention and attenuation of floodwaters and runoff;

(D) Modulation of temperature in waters identified in paragraph (a)(1) of this section; or

(E) Provision of habitat and food resources for aquatic species located in waters identified in paragraph (a)(1) of this section;

(ii) Factors to be considered:

(A) The distance from a water identified in paragraph (a)(1) of this section;

(B) Hydrologic factors, such as the frequency, duration, magnitude, timing, and rate of hydrologic connections, including shallow subsurface flow;

(C) The size, density, or number of waters that have been determined to be similarly situated;

(D) Landscape position and geomorphology; an

(E) Climatological variables such as temperature, rainfall, and snowpack.

1.2 STATE JURISDICTION

The State of California (State) regulates discharge of material into waters of the State pursuant to Section 401 of the CWA as well as the California Porter-Cologne Water Quality Control Act (Porter-Cologne; California Water Code, Division 7, §13000 et seq.). Waters of the State are defined by Porter-Cologne as “any surface water or groundwater, including saline waters, within the boundaries of the state” (Water Code Section 13050(e)). Waters of the State broadly includes all waters within the State’s boundaries (public or private), including waters in both natural and artificial channels.

1.2.1 Regional Water Quality Control Board

Under Porter-Cologne, the State Water Resources Control Board (SWRCB) and the local Regional Water Quality Control Boards (RWQCB) regulate the discharge of waste into waters of the State. Discharges of waste include “fill, any material resulting from human activity, or any other ‘discharge’ that may directly or indirectly impact ‘waters of the state.’” Porter-Cologne reserves the right for the State to regulate activities that could affect the quantity and/or quality of surface and/or groundwaters, including isolated wetlands, within the State. Wetlands were defined as waters of the State if they demonstrated both wetland hydrology and hydric soils. Waters of the State determined to be jurisdictional for these purposes require, if impacted, waste discharge requirements (WDRs).

When an activity results in fill or discharge directly below the OHWM of jurisdictional waters of the United States (federal jurisdiction), including wetlands, a CWA Section 401 Water Quality Certification is required. If a proposed project is not subject to CWA Section 401 certification but involves activities that may result in a discharge to waters of the State, the project may still be regulated under Porter-Cologne and may be subject to waste discharge requirements. In cases where waters apply to both CWA and Porter-Cologne, RWQCB may consolidate permitting requirements to one permit.

1.2.2 California Department of Fish and Wildlife

Pursuant to Division 2, Chapter 6, Sections 1600-1602 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake, which supports fish or wildlife.

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 surface or subsurface flow that supports or has supported riparian vegetation” (California Code of Regulations, Title 14, Section 1.72). The jurisdiction of CDFW may include areas in or near intermittent streams, ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams that are indicated on USGS maps, watercourses that may contain subsurface flows, or within the flood plain of a water body. CDFW’s definition of “lake” includes “natural lakes or man-made reservoirs.” CDFW limits of jurisdiction typically include the maximum extents of the uppermost bank-to-bank distance and/or the outermost extent of riparian vegetation dripline, whichever measurement is greater.

In a CDFW guidance of stream processes and forms in dryland watersheds (Vyverberg 2010), streams are identified as having one or more channels that may all be active or receive water only during some high flow event. Subordinate features, such as low flow channels, active channels, banks associated with secondary channels, floodplains, and stream-associated vegetation, may occur within the bounds of a single, larger channel. The water course is defined by the topography or elevations of land that confine a stream to a definite course when its waters rise to their highest level. A watercourse is defined as a stream with boundaries defined by the maximal extent or expression on the landscape even though flow may otherwise be intermittent or ephemeral.

Artificial waterways such as ditches (including roadside ditches), canals, aqueducts, irrigation ditches, and other artificially created water conveyance systems also may be under the jurisdiction of CDFW. CDFW may claim jurisdiction over these features based on the presence of habitat characteristics suitable to support aquatic life, riparian vegetation, and/or stream-dependent terrestrial wildlife. As with natural waterways, the limit of CDFW jurisdiction of artificial waterways includes the uppermost bank-to-bank distance and/or the outermost extent of riparian vegetation dripline, whichever measurement is greater.

CDFW does not have jurisdiction over wetlands but has jurisdiction to protect against a net loss of wetlands. CDFW supports the wetland criteria recognized by USFWS; one or more indicators of wetland conditions must exist for wetlands conditions to be considered present. The following is the USFWS accepted definition of a wetland:

> Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes:
> (1) at least periodically, the lands supports hydrophytes, (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated withwater or covered by shallow water at some time during the growing season of each year (Cowardin et al. 1979).

In A Clarification of the U.S. Fish and Wildlife Service's Wetland Definition (Tiner 1989), the USFWS definition was further clarified "that in order for any area to be classified as wetland by the Service, the area must be periodically saturated or covered by shallow water, whether wetland vegetation and/or hydric soils are present or not; this hydrologic requirement is addressed in the first sentence of the definition." When considering whether an action would result in a net loss of wetlands, CDFW will extend jurisdiction to USFWS-defined wetland conditions where such conditions exist within the riparian vegetation that is associated with a stream or lake and does not depend on whether those features meet the three-parameter USACE methodology of wetland determination. If impacts to wetlands under the jurisdiction of CDFW are unavoidable, a mitigation plan will be implemented in coordination with CDFW to support the CDFW policy of "no net loss" of wetland habitat.

Appendix D – Tables

Table 1. Species Observed On-Site

Common Name	**Scientific Name**
Plants	
Common fiddleneck	*Amsinckia intermedia*
Western Joshua tree	*Yucca brevifolia*
Western juniper	*Juniperus occidentalis*
Schismus grass	*Shicsmus spp.*
Common Stork's bill	*Ambrosia dumosa*
California buckwheat	*Eriogonum fasciculatum*
Rubber rabbitbush	*Ericameria nauseosa*
Flat spine burr-ragweed	*Ambrosia acanthicarpa*
Birds	
White-crown sparrow	*Zonotrichia leucophrys*
Cactus wren	*Campylorhynchus brunneicapillus*
House finch	*Haemorhous mexicanus*
Common raven	*Corvus corax*
Verdin	*Auriparus flaviceps*

Table 2 – CNDDB Potential to Occur for the *Hesperia and Silverwood Lake* Quadrangles

Scientific Name	Common Name	Federal/State Status	Other Status	Habitat	Potential to Occur
Accipiter cooperii	Cooper's hawk	None, None	G5, S4, CDFW-WL	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Anaxyrus californicus	arroyo toad	Endangered, None	G2G3, S2, CDFW-SSC	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Antrozous pallidus	pallid bat	None, None	G4, S3, CDFW-SSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Asio otus	long-eared owl	None, None	G5, S3?, CDFW-SSC	Riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land, productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.

Scientific Name	Common Name	Federal/State Status	Other Status	Habitat	Potential to Occur
Athene cunicularia	burrowing owl	None, None	G4, S2, CDFW-SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Bombus crotchii	Crotch bumble bee	None, Candidate Endangered	G2, S2	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Calochortus palmeri var. palmeri	Palmer's mariposa-lily	None, None	G3T2, S2, 1B.2	Meadows and seeps, chaparral, lower montane coniferous forest. Vernally moist places in yellow-pine forest, chaparral. 195-2530 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Calochortus plummerae	Plummer's mariposa-lily	None, None	G4, S4, 4.2	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Occurs on rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. 60-2500 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Canbya candida	white pygmy-poppy	None, None	G3G4, S3S4, 4.2	Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland. Gravelly, sandy, granitic places. 600-1460 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.

Scientific Name	Common Name	Federal/State Status	Other Status	Habitat	Potential to Occur
Castilleja lasiorhyncha	San Bernardino Mountains owl's-clover	None, None	G2?, S2?, 1B.2	Meadows and seeps, pebble plain, upper montane coniferous forest, chaparral, riparian woodland. Mesic to drying soils in open areas of stream and meadow margins or in vernally wet areas. 1140-2320 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Charina umbratica	southern rubber boa	None, Threatened	G2G3, S2	Found in a variety of montane forest habitats. Previously considered morphologically intermediate, recent (2022) genomic analysis clarifies individuals from Mt Pinos, Tehachapi Mts, and southern Sierra Nevada are southern rubber boa. Found in vicinity of streams or wet meadows; requires loose, moist soil for burrowing; seeks cover in rotting logs, rock outcrops, and under surface litter.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Deinandra mohavensis	Mojave tarplant	None, Endangered	G3, S3, 1B.3	Riparian scrub, coastal scrub, chaparral. Low sand bars in river bed; mostly in riparian areas or in ephemeral grassy areas. 640-1645 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Diadophis punctatus modestus	San Bernardino ringneck snake	None, None	G5T2T3, S2?	Most common in open, relatively rocky areas. Often in somewhat moist microhabitats near intermittent streams. Avoids moving through open or barren areas by restricting movements to areas of surface litter or herbaceous veg.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.

Scientific Name	Common Name	Federal/State Status	Other Status	Habitat	Potential to Occur
Emys marmorata	western pond turtle	Proposed Threatened, None	G3G4, S3, CDFW-SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Eremothera boothii ssp. boothii	Booth's evening-primrose	None, None	G5T4, S3, 2B.3	Joshua tree woodland, pinyon and juniper woodland. 285-2290 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Euchloe hyantis andrewsi	Andrew's marble butterfly	None, None	G4G5T1, S2	Inhabits yellow pine forest near Lake Arrowhead and Big Bear Lake, San Bernardino Mtns, San Bernardino Co, 5000-6000 ft. Hostplants are Streptanthus bernardinus and Arabis holboellii var pinetorum; larval foodplant is Descurainia richardsonii.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Euphydryas editha quino	quino checkerspot butterfly	Endangered, None	G4G5T1T2, S1S2	Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties. Hills and mesas near the coast. Need high densities of food plants Plantago erecta, P. insularis, and Orthocarpus purpurescens.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.

Scientific Name	Common Name	Federal/State Status	Other Status	Habitat	Potential to Occur
Glaucomys oregonensis californicus	San Bernardino flying squirrel	None, None	G5T1T2, S1S2, CDFW-SSC	Known from black oak or white fir dominated woodlands between 5200 - 8500 ft in the San Bernardino and San Jacinto ranges. May be extirpated from San Jacinto range. Needs cavities in trees/snags for nests and cover. Needs nearby water.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Haliaeetus leucocephalus	bald eagle	Delisted, Endangered	G5, S3, CDFW-FP	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Helminthoglypta taylori	westfork shoulderband	None, None	G1, S1	Vicinity of the Mojave River. Under logs and leaves.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Lycium parishii	Parish's desert-thorn	None, None	G4, S1, 2B.3	Coastal scrub, Sonoran desert scrub. - 3-570 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Opuntia basilaris var. brachyclada	short-joint beavertail	None, None	G5T3, S3, 1B.2	Chaparral, Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland. Sandy soil or coarse, granitic loam. 425-2015 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Pandion haliaetus	osprey	None, None	G5, S4, CDFWWL	Ocean shore, bays, freshwater lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Pediomelum castoreum	Beaver Dam breadroot	None, None	G3, S2, 1B.2	Joshua tree woodland, Mojavean desert scrub. Sandy soils; washes and roadcuts. 605-1485 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.

Scientific Name	Common Name	Federal/State Status	Other Status	Habitat	Potential to Occur
Phrynosoma blainvillii	coast horned lizard	None, None	G4, S4, CDFW-SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Rana draytonii	California red-legged frog	Threatened, None	G2G3, S2S3, CDFW-SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Rana muscosa	southern mountain yellow-legged frog	Endangered, Endangered	G1, S2, CDFW-WL	Disjunct populations known from southern Sierras (northern DPS) and San Gabriel, San Bernardino, and San Jacinto Mtns (southern DPS). Found at 1,000 to 12,000 ft in lakes and creeks that stem from springs and snowmelt. May overwinter under frozen lakes. Often encountered within a few feet of water. Tadpoles may require 2 - 4 yrs to complete their aquatic development.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Scutellaria bolanderi ssp. austromontana	southern mountains skullcap	None, None	G4T3, S3, 1B.2	Chaparral, cismontane woodland, lower montane coniferous forest. In gravelly soils on streambanks or in mesic sites in oak or pine woodland. 425-2000 m.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.

Scientific Name	Common Name	Federal/State Status	Other Status	Habitat	Potential to Occur
Setophaga petechia	yellow warbler	None, None	G5, S3, CDFW-SSC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Siphateles bicolor mohavensis	Mohave tui chub	Endangered, Endangered	G4T1, S1, CDFW-FP	Endemic to the Mojave River basin, adapted to alkaline, mineralized waters. Needs deep pools, ponds, or slough-like areas. Needs vegetation for spawning.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	None, None	G4, S4	Riparian woodland	This habitat type is **absent** from the Proejct area.
Taxidea taxus	American badger	None, None	G5, S3, CDFW-SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Thamnophis hammondii	two-striped gartersnake	None, None	G4, S3S4, CDFW-SSC	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.

Scientific Name	Common Name	Federal/State Status	Other Status	Habitat	Potential to Occur
Toxostoma lecontei	Le Conte's thrasher	None, None	G4, S3, CDFW-SSC	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats. Commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Vireo vicinior	gray vireo	None, None	G5, S2, CDFW-SSC	Dry chaparral; west of desert, in chamise-dominated habitat; mountains of Mojave Desert, associated with juniper and Artemisia. Forage, nest, and sing in areas formed by a continuous growth of twigs, 1-5 ft above ground.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.
Xerospermophilus mohavensis	Mohave ground squirrel	None, Threatened	G3, S2	Open desert scrub, alkali scrub and Joshua tree woodland. Also feeds in annual grasslands. Restricted to Mojave Desert. Prefers sandy to gravelly soils, avoids rocky areas. Uses burrows at base of shrubs for cover. Nests are in burrows.	Suitable habitat for this species does not occur on site. As such, this species is considered **absent** from the Project site.

Coding and Terms

E = Endangered T = Threatened C = Candidate FP = Fully Protected SSC = Species of Special Concern R = Rare

State Species of Special Concern: An administrative designation given to vertebrate species that appear to be vulnerable to extinction because of declining populations, limited acreages, and/or continuing threats. Raptor and owls are protected under section 3502.5 of the California Fish and Game code: “It is unlawful to take, possess or destroy any birds in the orders Falconiformes or Strigiformes or to take, possess or destroy the nest or eggs of any such bird.”

State Fully Protected: The classification of Fully Protected was the State's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians and reptiles. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

Global Rankings (Species or Natural Community Level):

G1 = Critically Imperiled – At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2 = Imperiled – At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3 = Vulnerable – At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure – Common; widespread and abundant.
? = Uncertainty in the exact status of an element (could move up or down one direction from current rank)

Subspecies Level: Taxa which are subspecies or varieties receive a taxon rank (T-rank**)** attached to their G-rank. Where the G-rank reflects the condition of the entire species, the T-rank reflects the global situation of just the subspecies. For example: the Point Reyes mountain beaver, *Aplodontia rufa* ssp. *phaea* is ranked G5T2. The G-rank refers to the whole species range i.e., *Aplodontia rufa.* The T-rank refers only to the global condition of ssp. *phaea*.

State Ranking:

S1 = Critically Imperiled – Critically imperiled in the State because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the State.
S2 = Imperiled – Imperiled in the State because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the State.
S3 = Vulnerable – Vulnerable in the State due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the State.
S4 = Apparently Secure – Uncommon but not rare in the State; some cause for long-term concern due to declines or other factors.
S5 = Secure – Common, widespread, and abundant in the State.

California Rare Plant Rankings (CNPS List):

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.

Threat Ranks:

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

Appendix C

Cultural Resources Assessment

CULTURAL RESOURCES ASSESSMENT

6730 Santa Fe Avenue Project

Hesperia, San Bernardino County, California

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Project No. CRD2301

Data Base Information:
Type of Study: Intensive Survey
Resources: None
Keywords: None
USGS Quadrangle: 7.5-minute *Silverwood Lake*, *California* (1988)

BCRCONSULTING LLC

December 20, 2023

MANAGEMENT SUMMARY

BCR Consulting LLC (BCR Consulting) is under contract to Crede to complete a Cultural Resources Assessment of the 6730 Santa Fe Avenue Project (the project) located in Hesperia, San Bernardino County, California. A cultural resources records search, intensive-level pedestrian field survey, Native American Heritage Commission (NAHC) Sacred Lands File Search, and vertebrate paleontological resources overview were conducted for the project in partial fulfillment of the California Environmental Quality Act (CEQA). The records search results revealed that 15 previous cultural resource studies have taken place, and 10 cultural resources have been identified within the 0.5-mile research radius of the project site. None of the previous studies have assessed the project site and no cultural resources have been identified within its boundaries. No cultural resources of any kind (including historic-period or prehistoric archaeological resources, or historic-period architectural resources) were identified during the field survey. Therefore, no significant impact related to historical resources is anticipated and no further investigations are recommended for the proposed project unless:

- The proposed project is changed to include areas that have not been subject to this cultural resource assessment;
- Cultural materials are encountered during project activities.

The current study attempted to determine whether significant archaeological deposits were present on the proposed project site. Although none were yielded during the records search and field survey, ground-disturbing activities have the potential to reveal buried deposits not observed on the surface. Prior to the initiation of ground-disturbing activities, field personnel should be alerted to the possibility of buried prehistoric or historic cultural deposits. In the event that field personnel encounter buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the significance of the find. The qualified archaeologist shall have the authority to stop or divert construction excavation as necessary. If the qualified archaeologist finds that any cultural resources present meet eligibility requirements for listing on the California Register or the National Register of Historic Places (National Register), plans for the treatment, evaluation, and mitigation of impacts to the find will need to be developed. Prehistoric or historic cultural materials that may be encountered during ground-disturbing activities include:

- historic-period artifacts such as glass bottles and fragments, cans, nails, ceramic and pottery fragments, and other metal objects;
- historic-period structural or building foundations, walkways, cisterns, pipes, privies, and other structural elements;
- prehistoric flaked-stone artifacts and debitage (waste material), consisting of obsidian, basalt, and or cryptocrystalline silicates;
- groundstone artifacts, including mortars, pestles, and grinding slabs;
- dark, greasy soil that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire affected rocks;
- human remains.

Results of Sacred Lands File search with the NAHC were positive. The NAHC has recommending contacting the Chemehuevi Indian Tribe and San Manuel Band of Mission Indians for more information. The Legislature added requirements regarding tribal cultural resources for CEQA in Assembly Bill 52 (AB 52) that took effect July 1, 2015. AB 52 requires consultation with California Native American tribes and consideration of tribal cultural resources in the CEQA process. By including tribal cultural resources early in the CEQA process, the legislature intended to ensure that local and Tribal governments, public agencies, and project proponents would have information available, early in the project planning process, to identify and address potential adverse impacts to tribal cultural resources. By taking this proactive approach, the legislature also intended to reduce the potential for delay and conflicts in the environmental review process. To help determine whether a project may have such an effect, the Public Resources Code requires a lead agency to consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a Proposed Project. Since the County will initiate and carry out the required AB52 Native American Consultation, the results of the consultation are not provided in this report. However, this report may be used during the consultation process, and BCR Consulting staff is available to answer questions and address concerns as necessary..

According to CEQA Guidelines, projects subject to CEQA must determine whether the project would "directly or indirectly destroy a unique paleontological resource". The Paleontological Overview provided in Appendix A has recommended that:

> The geologic units underlying the project area are mapped as alluvial deposits, mainly terrace gravel, dating from the Quaternary (Dibblee 1965, *Geologic map of the 15-minute Hesperia quadrangle, San Bernardino County, California*). Quaternary alluvial units are considered to be fossiliferous and highly paleontologically sensitive. The Western Science Center does not have any fossil localities within the project area nor within a one-mile radius. However, Quaternary alluvial units throughout Southern California have produced large quantities of fossils, such as the extensive collection from Diamond Valley Lake housed at the Western Science Center.
>
> It is likely that fossils will be found during the Santa Fe Avenue Project, and any fossil specimens recovered from the project would be scientifically significant. Excavation activity associated with the development of the project would impact the paleontologically sensitive Quaternary units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from the study area.

If human remains are encountered during any project activities, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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INTRODUCTION

BCR Consulting LLC (BCR Consulting) is under contract to Crede to complete a Cultural Resources Assessment of the 6730 Santa Fe Avenue Project (the project) located in Hesperia, San Bernardino County, California. A cultural resources records search, intensive-level pedestrian field survey, Native American Heritage Commission (NAHC) Sacred Lands File Search, and vertebrate paleontological resources overview were conducted for the project in partial fulfillment of the California Environmental Quality Act (CEQA). The project site, as identified in this report, will occupy a portion of Section 5, Township 3 North, Range 4 West, San Bernardino Baseline and Meridian. It is depicted on the United States Geological Survey (USGS) *Silverwood Lake, California* (1988) 7.5-minute topographic quadrangle (Figure 1).

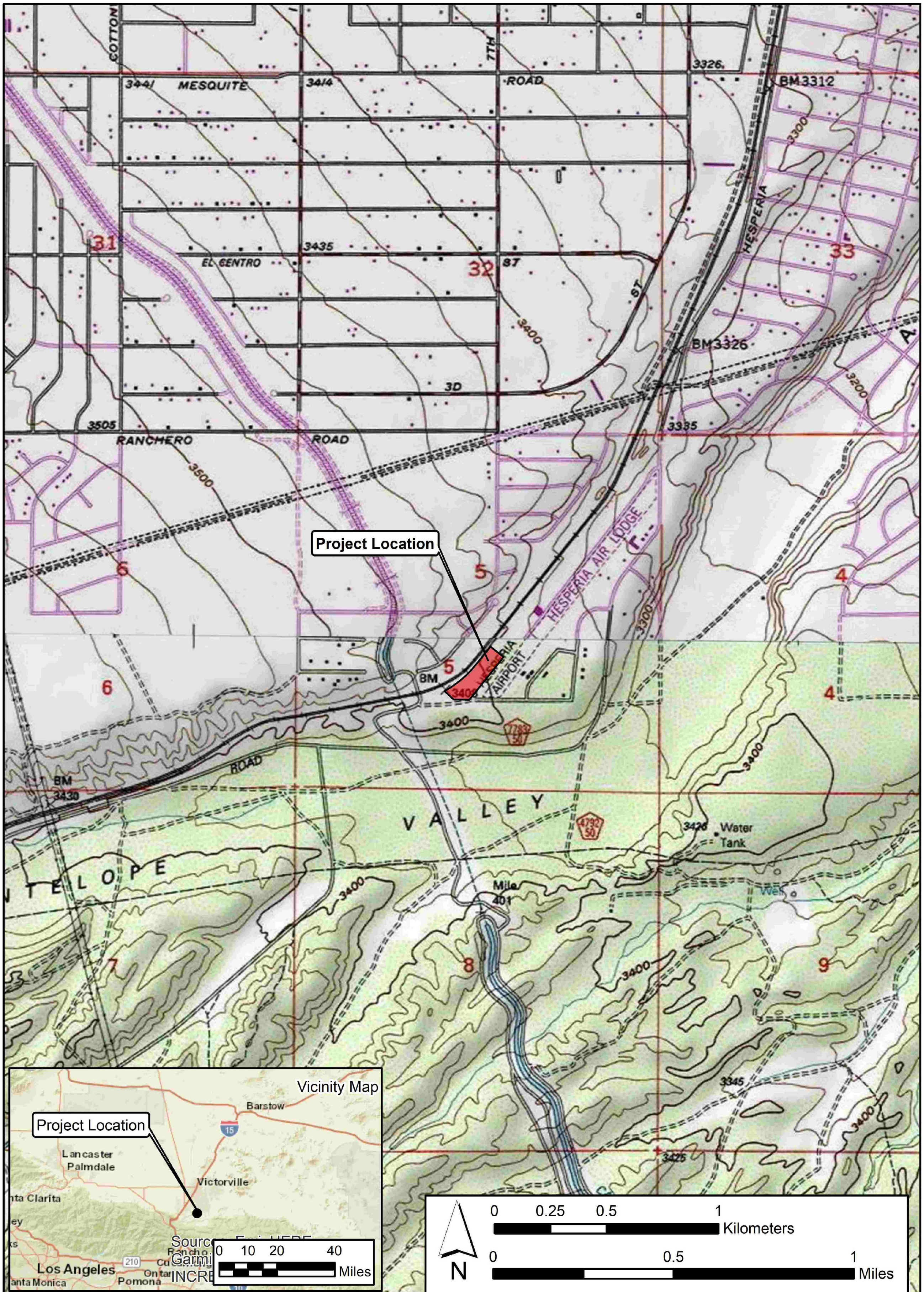
Regulatory Setting

The California Environmental Quality Act. CEQA applies to all discretionary projects undertaken or subject to approval by the state's public agencies (California Code of Regulations 14(3), § 15002(i)). Under CEQA, "A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (Cal. Code Regs. tit. 14(3), § 15064.5(b)). State CEQA Guidelines section 15064.5(a) defines a "historical resource" as a resource that meets one or more of the following criteria:

- Listed in, or eligible for listing in, the California Register of Historical Resources (California Register)
- Listed in a local register of historical resources (as defined at Cal. Public Res. Code § 5020.1(k))
- Identified as significant in a historical resource survey meeting the requirements of § 5024.1(g) of the Cal. Public Res. Code
- Determined to be a historical resource by a project's lead agency (Cal. Code Regs. tit. 14(3), § 15064.5(a))

A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California…Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources" (Cal. Code Regs. tit. 14(3), § 15064.5(a)(3)).

The significance of a historical resource is impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for the California Register. If an impact on a historical or archaeological resource is significant, CEQA requires feasible measures to minimize the impact (State CEQA Guidelines § 15126.4 (a)(1)). Mitigation of significant impacts must lessen or eliminate the physical impact that the project will have on the resource. Section 5024.1 of the Cal. Public Res. Code established the California Register. Generally, a resource is considered by the lead agency to be "historically significant" if the resource meets



BCRCONSULTING LLC

Project Location Site
6730 Santa Fe Avenue Project

Figure 1

Crede

Reference: ESRI; USGS Quad: Silverwood Lake (1988), California the criteria for listing in the California Register (Cal. Code Regs. tit. 14(3), § 15064.5(a)(3)). The eligibility criteria for the California Register are similar to those of the National Register of Historic Places (National Register), and a resource that meets one or more of the eligibility criteria of the National Register will be eligible for the California Register.

The California Register program encourages public recognition and protection of resources of architectural, historical, archaeological, and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for state historic preservation grant funding and affords certain protections under CEQA. Criteria for Designation:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
2. Associated with the lives of persons important to local, California or national history.
3. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values.
4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time has passed since a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resources." (CCR 4852 [d][2]). Fifty years is normally considered sufficient time for a potential historical resource, and in order that the evaluation remain valid for a minimum of five years after the date of this report, all resources older than 45 years (i.e. resources from the "historic-period") will be evaluated for California Register listing eligibility, or CEQA significance. The California Register also requires that a resource possess integrity. This is defined as the ability for the resource to convey its significance through seven aspects: location, setting, design, materials, workmanship, feeling, and association.

Finally, CEQA requires that significant effects on unique archaeological resources be considered and addressed. CEQA defines a unique archaeological resource as any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

CEQA Guidelines Section 15064.5 Appendix G includes significance criteria relative to archaeological and historical resources. These have been utilized as thresholds of significance here, and a project would have a significant environmental impact if it would:

a) cause a substantial adverse change in the significance of a historical resource as defined in section 10564.5;
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 10564.5;
c) Disturb any human remains, including those interred outside of formal cemeteries.

Tribal Cultural Resources. The Legislature added requirements regarding tribal cultural resources for CEQA in Assembly Bill 52 (AB 52) that took effect July 1, 2015. AB 52 requires consultation with California Native American tribes and consideration of tribal cultural resources in the CEQA process. By including tribal cultural resources early in the CEQA process, the legislature intended to ensure that local and Tribal governments, public agencies, and project proponents would have information available, early in the project planning process, to identify and address potential adverse impacts to tribal cultural resources. By taking this proactive approach, the legislature also intended to reduce the potential for delay and conflicts in the environmental review process. To help determine whether a project may have such an effect, the Public Resources Code requires a lead agency to consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a Proposed Project. Since the City will initiate and carry out the required AB52 Native American Consultation, the results of the consultation are not provided in this report. However, this report may be used during the consultation process, and BCR Consulting staff are available to answer questions and address comments as necessary.

Paleontological Resources. CEQA provides guidance relative to significant impacts on paleontological resources, indicating that a project would have a significant impact on paleontological resources if it disturbs or destroys a unique paleontological resource or site or unique geologic feature. Section 5097.5 of the California Public Resources Code specifies that any unauthorized removal of paleontological remains is a misdemeanor. Further, California Penal Code Section 622.5 sets the penalties for damage or removal of paleontological resources. CEQA documentation prepared for projects would be required to analyze paleontological resources as a condition of the CEQA process to disclose potential impacts. Please note that as of January 2018 paleontological resources are considered in the geological rather than cultural category. Therefore, paleontological resources are not summarized in the body of this report. A paleontological overview completed by the Western Science Center is provided as Appendix A.

NATURAL SETTING

Geology

The project is located in the southwestern portion of the Mojave Desert. Sediments within the project boundaries include a geologic unit composed of unconsolidated, undissected alluvial silt, sand, and gravel of valley areas derived from adjacent higher ground deposited in the late Holocene Epoch of the Quaternary Period (Dibblee 2008). Field observations during the current study are basically consistent with these descriptions, and are described further in Results, below.

Hydrology

The project elevation is approximately 3,400 to 3,420 feet above mean sea level (AMSL). Sheetwashing and some rilling occur generally from the southwest to the northeast. The project site drains to the northeast into an unnamed wash at the intersection of Santa Fe Avenue and Summit Valley Road. Ultimately, the wash drains into the Mojave River at a point approximately five miles to the northeast. To the south, the peaks of the San Gabriel Mountains rise above 10,000 feet and are often capped with snow until late spring or early summer. The area currently exhibits a relatively arid climate, with dry, hot summers and cool winters. Rainfall ranges from five to 15 inches annually (Jaeger and Smith 1971:36-37). Precipitation usually occurs in the form of winter and spring rain or snow at high elevations, with occasional warm monsoonal showers in late summer.

Biology

The mild climate of the late Pleistocene allowed piñon-juniper woodland to thrive throughout most of the Mojave (Van Devender et al. 1987). The vegetation and climate during this epoch attracted significant numbers of Rancholabrean fauna, including dire wolf, saber toothed cat, short-faced bear, horse, camel, antelope, mammoth, as well as birds which included pelican, goose, duck, cormorant, and eagle (Reynolds 1988). The drier climate of the middle Holocene resulted in the local development of complementary flora and fauna, which remain largely intact to this day. Common native plants include creosote, cacti, rabbit bush, interior golden bush, cheese bush, species of sage, buckwheat at higher elevations and near drainages, Joshua tree, and various grasses. Common native animals include include coyotes, cottontail and jackrabbits, rats, mice, desert tortoises, roadrunners, raptors, turkey vultures, and other bird species (see Williams et al. 2008).

CULTURAL SETTING

Prehistory

The prehistoric cultural setting of the Mojave Desert has been organized into many chronological frameworks (see Warren and Crabtree 1986; Bettinger and Taylor 1974; Lanning 1963; Hunt 1960; Wallace 1958, 1962, 1977; Wallace and Taylor 1978; Campbell and Campbell 1935), although there is no definitive sequence for the region. The difficulties in establishing cultural chronologies for the Mojave are a function of its enormous size and the small amount of archaeological excavations conducted there. Moreover, throughout prehistory many groups have occupied the Mojave and their territories often overlap spatially and chronologically resulting in mixed artifact deposits. Due to dry climate and capricious geological processes, these artifacts rarely become integrated in-situ. Lacking a milieu hospitable to the preservation of cultural midden, Mojave chronologies have relied upon temporally diagnostic artifacts, such as projectile points, or upon the presence/absence of other temporal indicators, such as groundstone. Such methods are instructive, but can be limited by prehistoric occupants' concurrent use of different artifact styles, or by artifact re-use or re-sharpening, as well as researchers' mistaken diagnosis, and other factors (see Flenniken 1985; Flenniken and Raymond 1986; Flenniken and Wilke 1989). Recognizing the shortcomings of comparative temporal indicators, this study synthesizes Warren and Crabree

(1986), who have drawn upon this method to produce a commonly cited and relatively comprehensive chronology.

Paleoindian (12,000 to 10,000 BP) and Lake Mojave (10,000 to 7,000 BP) Periods. Climatic warming characterizes the transition from the Paleoindian Period to the Lake Mojave Period. This transition also marks the end of Pleistocene Epoch and ushers in the Holocene. The Paleoindian Period has been loosely defined by isolated fluted (such as Clovis) projectile points, dated by their association with similar artifacts discovered in-situ in the Great Plains (Sutton 1996:227-228). Some fluted bifaces have been associated with fossil remains of Rancholabrean mammals approximately dated to ca. 13,300-10,800 BP near China Lake in the northern Mojave Desert. The Lake Mojave Period has been associated with cultural adaptations to moist conditions, and resource allocation pointing to more lacustrine environments than previously (Bedwell 1973; Hester 1973). Artifacts that characterize this period include stemmed points, flake and core scrapers, choppers, hammerstones, and crescentics (Warren and Crabtree 1986:184). Projectile points associated with the period include the Silver Lake and Lake Mojave styles. Lake Mojave sites commonly occur on shorelines of Pleistocene lakes and streams, where geological surfaces of that epoch have been identified (Basgall and Hall 1994:69).

Pinto Period (7,000 to 4,000 BP). The Pinto Period has been largely characterized by desiccation of the Mojave. As formerly rich lacustrine environments began to disappear, the artifact record reveals more sporadic occupation of the Mojave, indicating occupants' recession to the more hospitable fringes (Warren 1984). Pinto Period sites are rare, and are characterized by surface manifestations that usually lack significant in-situ remains. Artifacts from this era include Pinto projectile points and a flake industry similar to the Lake Mojave tool complex (Warren 1984), though use of Pinto projectile points as an index artifact for the era has been disputed (see Schroth 1994). Milling stones have also occasionally been associated with sites of this period (Warren 1984).

Gypsum Period. (4,000 to 1,500 BP). A temporary return to moister conditions during the Gypsum Period is postulated to have encouraged technological diversification afforded by the relative abundance of resources (Warren 1984:419-420; Warren and Crabtree 1986:189). Lacustrine environments reappear and begin to be exploited during this era (Shutler 1961, 1968). Concurrently a more diverse artifact assemblage reflects intensified reliance on plant resources. The new artifacts include milling stones, mortars, pestles, and a proliferation of Humboldt Concave Base, Gypsum Cave, Elko Eared, and Elko Corner-notched dart points (Warren 1984; Warren and Crabtree 1986). Other artifacts include leaf-shaped projectile points, rectangular-based knives, drills, large scraper planes, choppers, hammer stones, shaft straighteners, incised stone pendants, and drilled slate tubes. The bow and arrow appears around 2,000 BP, evidenced by the presence of a smaller type of projectile point, the Rose Spring point (Rogers 1939; Shutler 1961).

Saratoga Springs Period (1,500 to 800 BP). During the Saratoga Springs Period regional cultural diversifications of Gypsum Period developments are evident within the Mojave. Basketmaker III (Anasazi) pottery appears during this period, and has been associated with turquoise mining in the eastern Mojave Desert (Warren and Crabtree 1986:191). Influences from Patayan/Yuman assemblages are apparent in the southern Mojave, and include buff and brown wares often associated with Cottonwood and Desert Side-notched projectile points (Warren 1984:423). Obsidian becomes more commonly used throughout the Mojave and characteristic artifacts of the period include milling stones, mortars, pestles, ceramics, and ornamental and ritual objects. More structured settlement patterns are evidenced by the presence of large villages, and three types of identifiable archaeological sites (major habitation, temporary camps, and processing stations) emerge (McGuire and Hall 1988). Diversity of resource exploitation continues to expand, indicating a much more generalized, somewhat less mobile subsistence strategy.

Shoshonean Period (800 BP to Contact). The Shoshonean period is the first to benefit from contact-era ethnography –as well as be subject to its inherent biases. Interviews of living informants allowed anthropologists to match artifact assemblages and particular traditions with linguistic groups, and plot them geographically (see Kroeber 1925; Gifford 1918; Strong 1929). During the Shoshonean Period continued diversification of site assemblages, and reduced Anasazi influence both coincide with the expansion of Numic (Uto-Aztecan language family) speakers across the Great Basin, Takic (Uto-Aztecan language family) speakers into southern California, and the Hopi across the Southwest (Sutton 1996). Hunting and gathering continued to diversify, and the diagnostic arrow points include desert side-notch and cottonwood triangular. Ceramics continue to proliferate, though are more common in the southern Mojave during this period (Warren and Crabtree 1986). Trade routes have become well established across the Mojave, particularly the Mojave Trail, which transported goods and news across the desert via the Mojave River, to the west of the current project. Trade in the western Mojave was more closely related to coastal groups than others.

Ethnography

The Uto-Aztecan “Serrano” people occupied the western Mojave Desert periphery. Kroeber (1925) applied the generic term “Serrano” to four groups, each with distinct territories: the Kitanemuk, Tataviam, Vanyume, and Serrano. Only one group, in the San Bernardino Mountains and West-Central Mojave Desert, ethnically claims the term Serrano. Bean and Smith (1978) indicate that the Vanyume, an obscure Takic population, was found along the Mojave River at the time of Spanish contact. The Kitanemuk lived to the north and west, while the Tataviam lived to the west. The Serrano lived mainly to the south (Bean and Smith 1978). All may have used the western Mojave area seasonally. Historical records are unclear concerning precise territory and village locations. It is doubtful that any group, except the Vanyume, actually lived in the region for several seasons yearly.

History

Historic-era California is generally divided into three periods: the Spanish or Mission Period (1769 to 1821), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present).

Spanish Period. The first European to pass through the project area is thought to be a Spaniard called Father Francisco Garces. Having become familiar with the area, Garces acted as a guide to Juan Bautista de Anza, who had been commissioned to lead a group across the desert from a Spanish outpost in Arizona to set up quarters at the Mission San Gabriel in 1771 near what today is Pasadena (Beck and Haase 1974). This is the first recorded group crossing of the Mojave Desert and, according to Father Garces’ journal, they camped at the headwaters of the Mojave River, one night less than a day’s march from the mountains. Today, this is estimated to have been approximately 11 miles southeast of Victorville (Marenczuk 1962). Garces was followed by Alta California Governor Pedro Fages, who briefly explored the western Mojave region in 1772. Searching for San Diego Presidio deserters, Fages had traveled north through Riverside to San Bernardino, crossed over the mountains into the

Mojave Desert, and then journeyed westward to the San Joaquin Valley (Beck and Haase 1974).

Mexican Period. In 1821, Mexico overthrew Spanish rule and the missions began to decline. By 1833, the Mexican government passed the Secularization Act, and the missions, reorganized as parish churches, lost their vast land holdings, and released their neophytes (Beattie and Beattie 1974).

American Period. The American Period, 1848–Present, began with the Treaty of Guadalupe Hidalgo. The Gold Rush had attracted huge numbers of American settlers and in 1850, California was accepted into the Union. The cattle industry reached its greatest prosperity during the first years of the American Period. Mexican Period land grants had created large pastoral estates in California, and demand for beef during the Gold Rush led to a cattle boom that lasted from 1849–1855. However, beginning about 1855, the demand for beef began to decline due to imports of sheep and cattle from the eastern U.S. When the beef market collapsed, many California ranchers lost their ranchos. A series of disastrous floods in 1861–1862, followed by a significant drought diminished the economic impact of local ranching. This decline combined with ubiquitous agricultural and real estate developments of the late 19^{th} century, set the stage for diversified economic pursuits that have continued to proliferate to this day (Beattie and Beattie 1974; Cleland 1941).

PERSONNEL

David Brunzell, M.A., RPA acted as the Principal Investigator for the current study, and Joseph Orozco, M.A., RPA acted as Project Manager. Mr. Orozco authored the technical report and performed the records search through the South Central Coastal Information Center (SCCIC) at California State University, Fullerton. BCR Consulting Archaeological Field Director, Nicholas Shepetuk, B.A., carried out the pedestrian field survey and provided contributions to the technical report.

METHODS

Research

Mr. Orozco completed an archaeological records search using SCCIC records of California State University, Fullerton for the current project. This archival research reviewed the status of all recorded historic and prehistoric cultural resources, and survey and excavation reports completed within the project site boundaries and within a 0.5-mile radius of it. Additional resources reviewed included the National Register of Historic Places (National Register), the California Register, the Built Environmental Resource Directory (BERD), and documents and inventories published by the California Office of Historic Preservation. These include the lists of California Historical Landmarks, California Points of Historical Interest, Listing of National Register Properties, and the Inventory of Historic Structures.

Field Survey

An intensive-level cultural resources field survey of the project site was conducted on November 17, 2023. The survey was conducted by walking parallel transects spaced approximately 15 meters apart across the project site. Digital photographs were taken at various points within the project site.

RESULTS

Research

Data from the South Central Coastal Information Center (SCCIC) revealed that 15 previous cultural resource studies have taken place, and 10 cultural resources have been identified within the 0.5-mile research radius of the project site. None of the previous studies have assessed the project site and no cultural resources have been identified within its boundaries. The records search is summarized in Table A, and a bibliography is provided as Appendix C.

Table A. Cultural Resources and Reports Within One Half-Mile of the Project Site

USGS Quad	Cultural Resources	Studies
Silverwood Lake, California (1988)	P-36-3849: Prehistoric Lithic Scatter (0.4 Miles SE) P-36-4256: Hesperia Road (0.2 Miles S) P-36-4272: Mojave Trail (0.4 Miles E) P-36-6793: AT&SF Rail Alignment (0.1 Miles W) P-36-12999: Historic-Period Scatter (0.4 Miles SW) P-36-13007: Prehistoric Lithic Scatter (0.4 Miles SW) P-36-21352: Prehistoric Lithic Scatter (0.25 Miles SW) P-36-21354: Historic-Period Scatter (0.3 Miles NW) P-36-60888: Prehistoric Site (0.4 Miles SE) P-36-60889: Prehistoric Site (0.5 Miles E)	SB-46, 213, 900, 901, 2082, 2515, 4272, 4787, 4987, 5207, 5780, 6332, 6333, 6652, 7406

Field Survey

During the field survey, BCR Consulting archaeologists identified no cultural resources (including historic-period or prehistoric archaeological sites, or historic-period architectural resources) of any kind within the project site boundaries. The project has been subject to severe artificial disturbances associated with modern dumping, offroad vehicle activity, and the construction and use of a modern industrial property that occupies the project area's southern half. Vegetation consisted of dry seasonal grasses, yellow rabbitbrush, various species of invasive weeds, and sparse juniper trees which afforded surface visibility of approximately 75 percent. Surficial sediments observed were chiefly composed of slightly moist, brown sandy loam, with relatively low levels of gravel.

RECOMMENDATIONS

BCR Consulting conducted a cultural resources assessment of the 6730 Santa Fe Avenue Project in the City of Hesperia, San Bernardino County, California. No cultural resources of any kind (including historic-period or prehistoric archaeological resources, or historic-period architectural resources) were identified. Therefore, no significant impact related to historical resources is anticipated and no further investigations are recommended unless:

- The proposed project is changed to include areas that have not been subject to this cultural resource assessment;
- Cultural materials are encountered during project activities.

The current study attempted to determine whether significant archaeological deposits were present on the proposed project site. Although none were yielded during the records search and field survey, ground-disturbing activities have the potential to reveal buried deposits not observed on the surface. Prior to the initiation of ground-disturbing activities, field personnel should be alerted to the possibility of buried prehistoric or historic cultural deposits. In the event that field personnel encounter buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the significance of the find. The qualified archaeologist shall have the authority to stop or divert construction excavation as necessary. If the qualified archaeologist finds that any cultural resources present meet eligibility requirements for listing on the California Register or the National Register of Historic Places (National Register), plans for the treatment, evaluation, and mitigation of impacts to the find will need to be developed. Prehistoric or historic cultural materials that may be encountered during ground-disturbing activities include:

- historic-period artifacts such as glass bottles and fragments, cans, nails, ceramic and pottery fragments, and other metal objects;
- historic-period structural or building foundations, walkways, cisterns, pipes, privies, and other structural elements;
- prehistoric flaked-stone artifacts and debitage (waste material), consisting of obsidian, basalt, and or cryptocrystalline silicates;
- groundstone artifacts, including mortars, pestles, and grinding slabs;
- dark, greasy soil that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire affected rocks;
- human remains.

Results of Sacred Lands File search with the NAHC were positive. The NAHC has recommending contacting the Chemehuevi Indian Tribe and San Manuel Band of Mission Indians for more information. Results of the Sacred Lands File search are provided in Appendix D. The Legislature added requirements regarding tribal cultural resources for CEQA in Assembly Bill 52 (AB 52) that took effect July 1, 2015. AB52 requires consultation with California Native American tribes and consideration of tribal cultural resources in the CEQA process. By including tribal cultural resources early in the CEQA process, the legislature intended to ensure that local and Tribal governments, public agencies, and project proponents would have information available, early in the project planning process, to identify and address potential adverse impacts to tribal cultural resources. By taking this proactive approach, the legislature also intended to reduce the potential for delay and conflicts in the environmental review process. To help determine whether a project may have such an effect, the Public Resources Code requires a lead agency to consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a Proposed Project. Since the County will initiate and carry out the required AB52 Native American Consultation, the results of the consultation are not provided in this report. However, this report may be used during the consultation process, and BCR Consulting staff is available to answer questions and address concerns as necessary.

According to CEQA Guidelines, projects subject to CEQA must determine whether the project would "directly or indirectly destroy a unique paleontological resource". The Paleontological Overview provided in Appendix A has recommended that:

> The geologic units underlying the project area are mapped as alluvial deposits, mainly terrace gravel, dating from the Quaternary (Dibblee 1965, *Geologic map of the 15-minute Hesperia quadrangle, San Bernardino County, California*). Quaternary

> alluvial units are considered to be fossiliferous and highly paleontologically sensitive. The Western Science Center does not have any fossil localities within the project area nor within a one-mile radius. However, Quaternary alluvial units throughout Southern California have produced large quantities of fossils, such as the extensive collection from Diamond Valley Lake housed at the Western Science Center.
>
> It is likely that fossils will be found during the Santa Fe Avenue Project, and any fossil specimens recovered from the project would be scientifically significant. Excavation activity associated with the development of the project would impact the paleontologically sensitive Quaternary units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from the study area.

If human remains are encountered during any project activities, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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APPENDIX A

PALEONTOLOGICAL RESOURCES OVERVIEW

WESTERN SCIENCE CENTER

November 19, 2023

BCR Consulting LLC
Joseph Orozco
909-525-7078

Dear Mr. Orozco,

This letter presents the results of a record search conducted for the 6730 Santa Fe Avenue Project (CRD2301) in Hesperia, San Bernardino County, California. The project site is located in Section 5, T3N, R4W on the *Silverwood Lake* USGS 7.5 minute quadrangle.

The geologic units underlying the project area are mapped as alluvial deposits, mainly terrace gravel, dating from the Quaternary (Dibblee 1965, *Geologic map of the 15-minute Hesperia quadrangle, San Bernardino County, California*). Quaternary alluvial units are considered to be fossiliferous and highly paleontologically sensitive. The Western Science Center does not have any fossil localities within the project area nor within a one-mile radius. However, Quaternary alluvial units throughout Southern California have produced large quantities of fossils, such as the extensive collection from Diamond Valley Lake housed at Western Science Center.

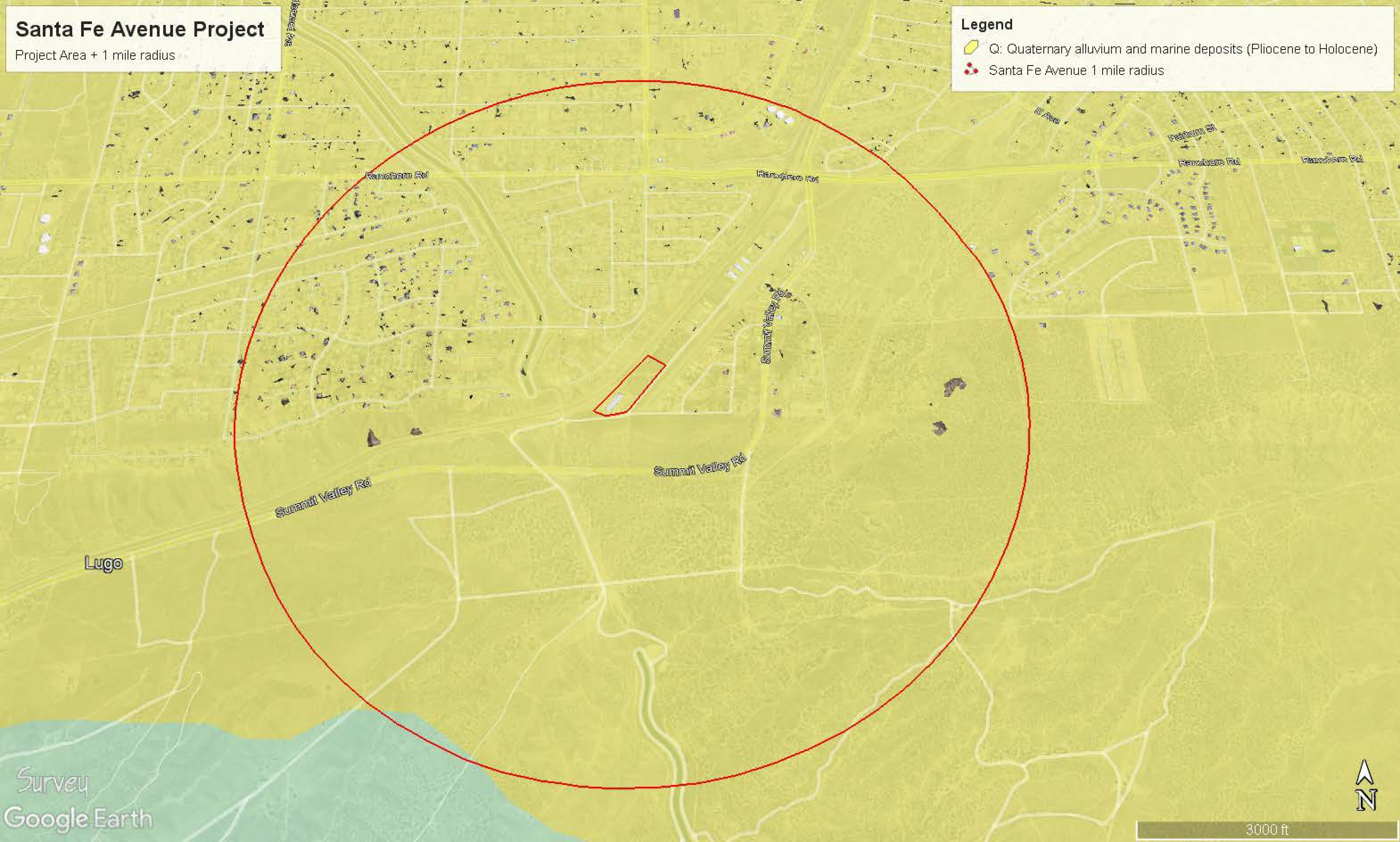
It is likely that fossils will be found during the Santa Fe Avenue Project, and any fossil specimens recovered from the project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Quaternary units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils from the study area.

If you have any questions, or would like further information, please feel free to contact me at amcdonald@westerncentermuseum.org

Sincerely,

Andrew McDonald

Andrew McDonald, PhD
Curator



Santa Fe Avenue Project
Project Area + 1 mile radius
Legend
Q: Quaternary alluvium and marine deposits (Pliocene to Holocene)
Santa Fe Avenue 1 mile radius
Ranchero Rd
Ranchero Rd
Ranchero Rd
Ranchero Rd
Summit Valley Rd
Summit Valley Rd
Summit Valley Rd
Lugo
Google Earth
N
3000 ft

APPENDIX B

PROJECT PHOTOGRAPHS

Photo 1

Photo 2

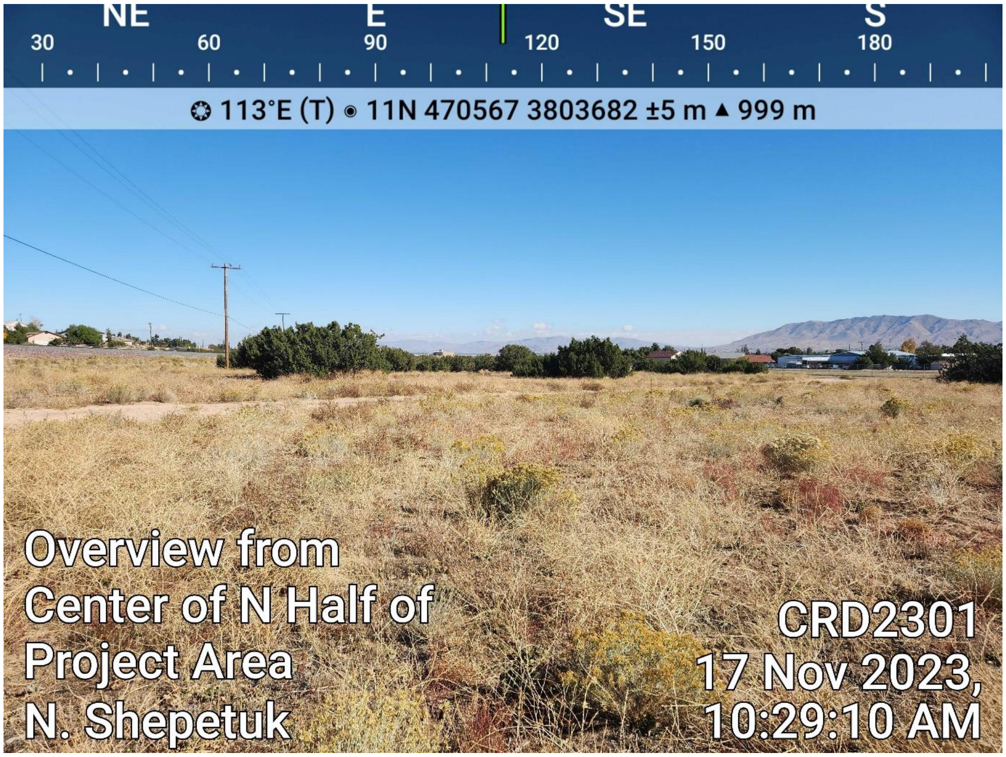


Photo 3

Photo 4

Photo 5

Photo 6

APPENDIX C

RECORDS SEARCH BIBLIOGRAPHY

Report List

CRD2301

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-00046	NADB-R - 1060046; Voided - 60-0.2	1960	GROSSCUP, GORDON L. and JACK E. SMITH	MOHAVE DESERT PIPELINE SURVEY		36-000113, 36-000114, 36-000122, 36-000123, 36-000124, 36-000126, 36-000127, 36-000128, 36-000129, 36-000130, 36-000131, 36-000132, 36-000133, 36-000134, 36-000208, 36-000261, 36-000267
SB-00213	NADB-R - 1060213; Voided - 74-4.3	1974		Archaeological Analysis Summit Valley Road From State Highway #138 To Ranchero Street	San Bernardino County Museum Association	36-000173, 36-004119, 36-004132
SB-00900	NADB-R - 1060900; Voided - 80-1.4A	1979	WEIL, EDWARD B.	PREHISTORIC CULTURAL RESOURCE INVESTIGATIONS: SOUTHERN CALIFORNIA EDISON LUCERNE VALLEY PROJECT, SUMMARY REPORT	CALIFORNIA STATE UNIVERSITY DOMINGUEZ HILLS	36-000123, 36-000124, 36-000145, 36-000178, 36-000179, 36-000181, 36-000195, 36-000269, 36-000940, 36-000945, 36-001460, 36-002073, 36-002204, 36-002780, 36-003169, 36-003312, 36-003404, 36-003636, 36-003684, 36-003685, 36-003687, 36-003720, 36-003780, 36-003781, 36-003782, 36-003783, 36-003784, 36-003785, 36-003813, 36-003814, 36-003819, 36-003821, 36-003822, 36-003823, 36-003843, 36-003844, 36-003845, 36-003849, 36-003850, 36-003853, 36-060733, 36-061176, 36-061177, 36-061178, 36-061179, 36-061180, 36-061181, 36-061182, 36-061183, 36-061184, 36-061185, 36-061186, 36-061187, 36-061188, 36-061189
SB-00901	NADB-R - 1060901; Voided - 80-1.4B	1980	WEIL, EDWARD B.	PREHISTORIC CULTURAL RESOURCE INVESTIGATIONS FOR THE LUCERNE VALLEY PROJECT, SAN BERNARDINO COUNTY, CALIFORNIA	CALIFORNIA STATE UNIVERSITY DOMINGUEZ HILLS	36-000178, 36-000179, 36-000945, 36-001460, 36-002204, 36-002868, 36-002869, 36-002870, 36-003684, 36-003685, 36-003686, 36-003687, 36-003720, 36-003780, 36-003781, 36-003782, 36-003783, 36-003785, 36-003811, 36-003812, 36-003813, 36-003814, 36-003815, 36-003816, 36-003819, 36-003820, 36-003822, 36-003823, 36-003843, 36-003844, 36-003845, 36-003849, 36-003850, 36-003853, 36-060733, 36-061176, 36-061177, 36-061178, 36-061179, 36-061180, 36-061181, 36-061182, 36-061183, 36-061184, 36-061185, 36-061186, 36-061187, 36-061188, 36-061189

Report List

CRD2301

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-02082	NADB-R - 1062082; Voided - 90-3.7	1990	LOVE, BRUCE	CULTURAL RESOURCES INVESTIGATION OF PROJECT V-89-2; 15758 JENNY STREET, HESPERIA, SAN BERNARDINO COUNTY	PYRAMID ARCHAEOLOGY	
SB-02515	NADB-R - 1062515; Voided - 92-2.16	1992	LERCH, MICHAEL K.	CLASS III CULTURAL RESOURCES INVENTORY OF THE MORONGO BASIN PIPELINE PROJECT, HESPERIA TO LANDERS, SAN BERNARDINO COUNTY, CALIFORNIA	MICHAEL K. LERCH & ASSOCIATES	36-003849, 36-007070, 36-007071, 36-007072, 36-060840, 36-060886, 36-060887, 36-060888, 36-060889
SB-04272	NADB-R - 1064272	1997	LERCH,MICHAEL K.	CULTURAL RESOURCES INVENTORY & EVALUATION OF THE P&V ENTERPRISES PHASE V LAND EXCHANGE, BARSTOW, SAN BERNARDINO COUNTY, CA. 53PP	M.K. LERCH & ASSOCIATES	36-003683, 36-008699, 36-008700, 36-008701, 36-008702, 36-008703, 36-008704, 36-008705, 36-008706, 36-008707, 36-008708, 36-008709, 36-008710, 36-008711, 36-008712, 36-008713, 36-008714, 36-008715, 36-010316
SB-04787	NADB-R - 1064787	2005	ARON, MARIA G.	CULTURAL RESOURCE ASSESSMENT OF A 20-ACRE PARCEL IN HESPERIA, CITY OF HESPERIA, SAN BERNARDINO COUNTY, CALIFORNIA		
SB-04987	NADB-R - 1064987; Other - SCE	2004	Wise, Michael J. and K. Ross Way	Final Cultural Resource Survey of Pole 84742S on the Lockhart 12kV Circuit, Southern California Edison Deterioarted Pole Replacement Program, San Bernardino County, California.	Mooney/Hayes Associates, LLC	
SB-05207	NADB-R - 1065207	2005	BONNER, WAYNE H.	CULTURAL RESOUCE RECORDS SEARCH AND SITE VISIT RESULTS FOR CINGULAR TELELCOMMUNICATIONS FACILITY LOCATED BEHIND 7463 3RD AVENUE, HESPERIA, SAN BERNARDINO COUNTY, CALIFORNIA		
SB-05780	NADB-R - 1065780	2005	Bonner, Wayne H. and Kathleen A. Crawford	Direct APE Historic Architectural Assessment for Cingular Telecommunications Facility Candidate ES-0093-02 (Collocation 3rd Ave SCE), located behind 7463 3rd Avenue, Hesperia, San Bernardino County, California.	Michael Brandman Associates	
SB-06332	NADB-R - 1066332	2006	DEUR, DOUGLAS	JOSHUA TREE NATIONAL PARK TRADITIONAL USE STUDY: THE ROCK ART OF JOSHUA TREE NATIONAL PARK		

Report List

CRD2301

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-06333	NADB-R - 1066333	2005	HORNE, MELINDA C.	CULTURAL RESOURCES SURVEY FOR THE MOJAVE WATER AGENCY WATER BANKING PROJECT		36-000176
SB-06652	NADB-R - 1066652	2010	ESA	PRELIMINARY ARCHAEOLOGICAL SURVEY REPORT FOR 98 LINEAR MILES OF THE EAST BRANCH EXTENSION OF THE CALIFORNIA AQUEDUCT FOR THE DWR EAST BRNACH ENLARGEMENT PROJECT LOS ANGELES AND SAN BERNARDINO COUNTIES (CA)		36-002910, 36-021351, 36-021352, 36-021353, 36-021354, 36-021355, 36-021359, 36-021360, 36-021361, 36-021362, 36-021370, 36-021371, 36-021372
SB-07406		2012	Brewster, Brad	Finding of No Adverse Effect for the Seismic Retrofit of Six Bridges over the California Aqueduct, San Bernardino County and Kern County, California	Cultural Resources Group	

Resource List

CRD2301

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-36-003849	CA-SBR-003849	Resource Name - Antelope Valley; ANTELOPE VALLEY; SBCM-4151; UCR-V; MKLA-9026-3	Site	Prehistoric	AP02	1973 (Decker et al.); 1991 (Michael K. Lerch, Michaei K. Lerch & Associates)	SB-00240, SB-00900, SB-00901, SB-02158, SB-02515
P-36-004256	CA-SBR-004256H	Resource Name - Hesperia Road; Other - SBCM-4646	Structure	Historic	AH07	1980 (R.Reynolds, SBCM); 2006 (Josh Smallwood, CRM TECH.); 2009 (Katherine Anderson, ESA); 2011 (Joshua Trampie, SRI)	SB-01027, SB-07936

Resource List

CRD2301

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-36-004272	CA-SBR-004272H	Resource Name - Old Spanish Trail; Resource Name - Salt Lake - Santa Fe Trail; Resource Name - Mojave Trail; CHL - 576; Other - SRI-496; Other - ARU 1184-2; Other - HJ-33; Other - SBCM #4662H	Structure, Site	Historic	AH07; HP37	1979 (Jim Arbuckle, California Registered Historical Landmarks); 1980 (Robert E. Reynolds, SBCM); 1987 (James S. Benton, SBCM, ASA, ARARA); 1990 (E. Henry James, SBCM, ASA, MRVM); 1990 (E. Henry James); 1992 (Ayse Taskiran, Archaeological Research Unit, UCR); 1992 (B. Love and M. Hogan, Archaeological Research Unit); 1992 (Barbie S. Laney, C.A. Singer and Assoc.); 1993 (Jeanette McKenna, McKenna et al.); 1993 (M. Macko, Macko Archaeological Consulting); 1993 (M. Macko, Macko Archaeological Consulting); 1993 (Kenneth Becker, RMW Paleo Associates); 1993 (Kenneth Becker, RMW Paleo Associates); 1997 (Neal Neuenschwander, Peak & Associates); 1997 (Philip de Barros, Caltrans); 2002 (Nathan Fleming, TRC Mariah Associates, Inc); 2003 (J. Sander); 2005 (Brian Byrd, Far Western); 2005 (Katherine Pollock, SRI); 2006 (D. McDougall, Applied Earthworks, Inc); 2007 (Daniel Ballester, CRM Tech); 2009 (Katherine Anderson, ESA); 2010 (Molly Valask); 2011 (S. Wilson, T. Contreras, and S. Bietz, AECOM); 2011 (S. Wilson, T. Contreras, and S. Bietz, AECOM); 2011 (D. Winslow and S. Andrews, ASM); 2011 (Joshua Trampier, SRI); 2011 (R. Hoffman, ICF);	SB-00078, SB-01027, SB-01139, SB-01670, SB-01734, SB-02032, SB-02233, SB-02268, SB-02285, SB-02482, SB-02571, SB-02639, SB-02674, SB-02731, SB-02795, SB-02796, SB-03020, SB-03069, SB-03071, SB-03110, SB-03415, SB-03418, SB-03539, SB-03799, SB-04278, SB-04427, SB-04927, SB-05698, SB-07081, SB-07170, SB-07355, SB-07358, SB-07363, SB-07495, SB-07987, SB-08166, SB-08167

Resource List

CRD2301

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
						2011 (Joshua Trampier, SRI); 2012 (G. Granger, Chambers Group, Inc); 2013 (J. Jaynes, Chambers); 2014 (Tadhg Kirwan, Cogstone); 2020 (None, Urbana)	
P-36-006793	CA-SBR-006793H	Other - ATSF RR; Resource Name - Cajon Rail Alignment; Resource Name - AT&SF; Other - BNSF MP 22.I; Other - BNSF MP 23.3; Other - BNSF MP 51.4; Other - MKLA-9027-5; Other - California Southern Railroad; Resource Name - Atchison, Topeka & Santa Fe Railroad	Building, Structure, Object, Site	Historic	AH02; AH04; AH05; AH07; AH11; AH16; HP18; HP19; HP20; HP22; HP39	1990 (M.K. Lerch & Associates); 1992 (J. McKenna); 1993 (J. McKenna); 2003 (Daniel Ballester); 2007 (Statistical Research); 2009 (J. George, Applied Earthworks); 2009 (Katherine Anderson, ESA); 2010 (Josh Smallwood, Applied Earthworks); 2010 (S. Jow, AECOM); 2011 (C. Higgins, Far Western); 2011 (Statistical Research); 2012 (TRC); 2012 (S. Underbrink, TRC); 2013 (D. Martinez, Far Western); 2020 (None, Urbana)	SB-02543, SB-02795, SB-02796, SB-03062, SB-03187, SB-03539, SB-03725, SB-03728, SB-03854, SB-04427, SB-04551, SB-04861, SB-05372, SB-05890, SB-06291, SB-06310, SB-07156, SB-07283, SB-07381, SB-07495, SB-07543, SB-07734, SB-08031, SB-08043, SB-08221, SB-08224, SB-08343, SB-08443
P-36-012999	CA-SBR-012465H	Resource Name - LSA-SUC533-H-1	Site	Historic	AH04	2006 (David Brunzell, LSA Associates, Inc.)	
P-36-013007		Resource Name - LSA-SUC533-I-1	Site, Other	Prehistoric	AP02	2006 (David Brunzell, LSA)	
P-36-021352		Resource Name - C-55	Other	Prehistoric	AP02	2009 (D. Tietjen, ESA)	SB-06652
P-36-021354	CA-SBR-013713H	Resource Name - D-22	Site	Historic	AH04	2009 (M. Bray, ESA)	SB-06652
P-36-060888		FORM MISSING; flakes; Resource Name - IA-3	Other	Prehistoric	AP16	1992 (MICHAEL K. LERCH, MICHAEL K. LERCH & ASSOCIATES)	SB-02515
P-36-060889		FORM MISSING; flake; Resource Name - IA-4	Other	Prehistoric	AP16		SB-02515

APPENDIX D

NATIVE AMERICAN HERITAGE COMMISSION SACRED LANDS FILE SEARCH

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

December 4, 2023

David Brunzell
BCR Consulting LLC

Via Email to: bcrllc2008@gmail.com

Re: 6730 Santa Fe Avenue Project (CRD2301), San Bernardino County

Dear Mr. Brunzell:

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 Chemehuevi Indian Tribe and 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: Cameron.vela@nahc.ca.gov.

Sincerely,

Cameron Vela

Cameron Vela
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
12/4/2023

County	Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
San Bernardino	Agua Caliente Band of Cahuilla Indians	F	Patricia Garcia, Director of Historic Preservation	5401 Dinah Shore Drive Palm Springs, CA, 92264	(760) 699-6907	(760) 699-6919	pagarcia@aguacaliente.net	Cahuilla	Imperial,Riverside,San Bernardino,San Diego	7/20/2023
	Chemehuevi Indian Tribe	F	Kaitlyn Snodgrass, Cultural Director	PO Box 1976 Havasu Lake, CA, 92363	(760) 858-4219		cultural@cit-nsn.gov	Chemehuevi	Imperial,Riverside,San Bernardino	9/29/2023
	Chemehuevi Indian Tribe	F	Glenn Lodge, Chairman	PO Box 1976 Havasu Lake, CA, 92363	(760) 858-4219		chairman@cit-nsn.gov	Chemehuevi	Imperial,Riverside,San Bernardino	9/29/2023
	Gabrieleno Band of Mission Indians - Kizh Nation	N	Andrew Salas, Chairperson	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
	Gabrieleno Band of Mission Indians - Kizh Nation	N	Christina Swindall Martinez, Secretary	P.O. Box 393 Covina, CA, 91723	(844) 390-0787		admin@gabrielenoindians.org	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	8/18/2023
	Gabrieleno/Tongva San Gabriel Band of Mission Indians	N	Anthony Morales, Chairperson	P.O. Box 693 San Gabriel, CA, 91778	(626) 483-3564	(626) 286-1262	GTTribalcouncil@aol.com	Gabrieleno	Los Angeles,Orange,Riverside,San Bernardino,Ventura	12/4/2023
	Gabrielino /Tongva Nation	N	Sandonne Goad, Chairperson	106 1/2 Judge John Aiso St., #231 Los Angeles, CA, 90012	(951) 807-0479		sgoad@gabrielino-tongva.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	3/28/2023
	Gabrielino Tongva Indians of California Tribal Council	N	Robert Dorame, Chairperson	P.O. Box 490 Bellflower, CA, 90707	(562) 761-6417	(562) 761-6417	gtongva@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
	Gabrielino Tongva Indians of California Tribal Council	N	Christina Conley, Cultural Resource Administrator	P.O. Box 941078 Simi Valley, CA, 93094	(626) 407-8761		christina.marsden@alumni.usc.edu	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Santa Barbara,Ventura	3/16/2023
	Gabrielino-Tongva Tribe	N	Charles Alvarez, Chairperson	23454 Vanowen Street West Hills, CA, 91307	(310) 403-6048		Chavez1956metro@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	5/30/2023
	Gabrielino-Tongva Tribe	N	Sam Dunlap, Cultural Resource Director	P.O. Box 3919 Seal Beach, CA, 90740	(909) 262-9351		tongvatcr@gmail.com	Gabrielino	Los Angeles,Orange,Riverside,San Bernardino,Ventura	5/30/2023
	Morongo Band of Mission Indians	F	Ann Brierty, THPO	12700 Pumarra Road Banning, CA, 92220	(951) 755-5259	(951) 572-6004	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego	
	Morongo Band of Mission Indians	F	Robert Martin, Chairperson	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110	(951) 755-5177	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego	
	Quechan Tribe of the Fort Yuma Reservation	F	Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ, 85366	(928) 261-0254		historicpreservation@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
	Quechan Tribe of the Fort Yuma Reservation	F	Jordan Joaquin, President, Quechan Tribal Council	P.O.Box 1899 Yuma, AZ, 85366	(760) 919-3600		executivesecretary@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
	Quechan Tribe of the Fort Yuma Reservation	F	Manfred Scott, Acting Chairman - Kw'ts'an Cultural Committee	P.O. Box 1899 Yuma, AZ, 85366	(928) 210-8739		culturalcommittee@quechantribe.com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
	San Fernando Band of Mission Indians	N	Donna Yocum, Chairperson	P.O. Box 221838 Newhall, CA, 91322	(503) 539-0933	(503) 574-3308	dyocum@sfbmi.org	Kitanemuk Vanyume Tataviam	Kern,Los Angeles,San Bernardino,Ventura	5/8/2023
	San Manuel Band of Mission Indians	F	Alexandra McCleary, Cultural Lands Manager	26569 Community Center Drive Highland, CA, 92346	(909) 633-0054		alexandra.mccleary@sanmanuel-nsn.gov	Serrano	Kern,Los Angeles,Riverside,San Bernardino	3/27/2023
	Santa Rosa Band of Cahuilla Indians	F	Lovina Redner, Tribal Chair	P.O. Box 391820 Anza, CA, 92539	(951) 659-2700	(951) 659-2228	lsaul@santarosa-nsn.gov	Cahuilla	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	
	Serrano Nation of Mission Indians	N	Mark Cochrane, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(909) 578-2598		serranonation1@gmail.com	Serrano	Los Angeles,Riverside,San Bernardino	10/10/2023
	Serrano Nation of Mission Indians	N	Wayne Walker, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(253) 370-0167		serranonation1@gmail.com	Serrano	Los Angeles,Riverside,San Bernardino	10/10/2023
	Soboba Band of Luiseno Indians	F	Jessica Valdez, Cultural Resource Specialist	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-6261	(951) 654-4198	jvaldez@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
	Soboba Band of Luiseno Indians	F	Joseph Ontiveros, Tribal Historic Preservation Officer	P.O. Box 487 San Jacinto, CA, 92581	(951) 663-5279	(951) 654-4198	jontiveros@soboba-nsn.gov	Cahuilla Luiseno	Imperial,Los Angeles,Orange,Riverside,San Bernardino,San Diego	7/14/2023
	Twenty-Nine Palms Band of Mission Indians	F	Christopher Nicosia, Cultural Resources Manager/THPO Manager	46-200 Harrison Place Coachella, CA, 92236	(760) 863-3972		christopher.nicosia@29palmsbomi-nsn.gov	Chemehuevi	Imperial,Inyo,Riverside,San Bernardino	11/15/2023
	Twenty-Nine Palms Band of Mission Indians	F	Sarah O'Brien, Tribal Archivist	46-200 Harrison Place Coachella, CA, 92236	(760) 863-2460		sobrien@29palmsbomi-nsn.gov	Chemehuevi	Imperial,Inyo,Riverside,San Bernardino	11/15/2023
	Twenty-Nine Palms Band of Mission Indians	F	Nicolas Garza, Cultural Resources Specialist	46-200 Harrison Place Coachella, CA, 92236	(760) 863-2486		nicolas.garza@29palmsbomi-nsn.gov	Chemehuevi	Imperial,Inyo,Riverside,San Bernardino	11/15/2023

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 6730 Santa Fe Avenue Project (CRD2301), San Bernardino County.

Record: PROJ-2023-005922
Report Type: List of Tribes
Counties: San Bernardino
NAHC Group: All

Appendix D

Hydrology Report

Hydrology Report
For
Hesperia Industrial

6730 Santa Fe Ave E, Hesperia, CA
Project No. 23002420.00
May 30, 2023

Prepared for:

Cire Equity
530 B St. Suite 2050
San Diego, CA 92101
Contact: Steve Russell
Phone: (520)370-2571
Email: srussell@cireequity.com

Prepared by:

IMEG Corp

Engineer: John Mark Thompson, PE
Registration No. 82557
901 Via Piemonte, Suite 400
Ontario, CA 91764
909-942-5540

Prepared: May 30th, 2023

05-30-2023

John M. Thompson, P.E.

Table of Contents

Introduction and Purpose

This drainage report provides an analysis of the proposed hydrology characteristic for the improvements of the Hesperia Industrial warehouse. The project is located at the northwest side of Santa Fe Avenue and Jenny Street and South of the A&T & S.F. Railway in Hesperia, California. The site address is 6730 Santa Fe Avenue E. Refer to Figure 1 in the report for project location and Figure 2 for the site coordinates. The project site is approximately 6.11 acres but the northern half of the site is vacant and will not be developed. The southern half of the site is occupied for industrial warehouse use which is made up of landscaping and ac pavement. The purpose of this report is to analyze the various storm events in accordance with the San Bernadino Hydrology Manual and compare peak flow values between existing and proposed development conditions.

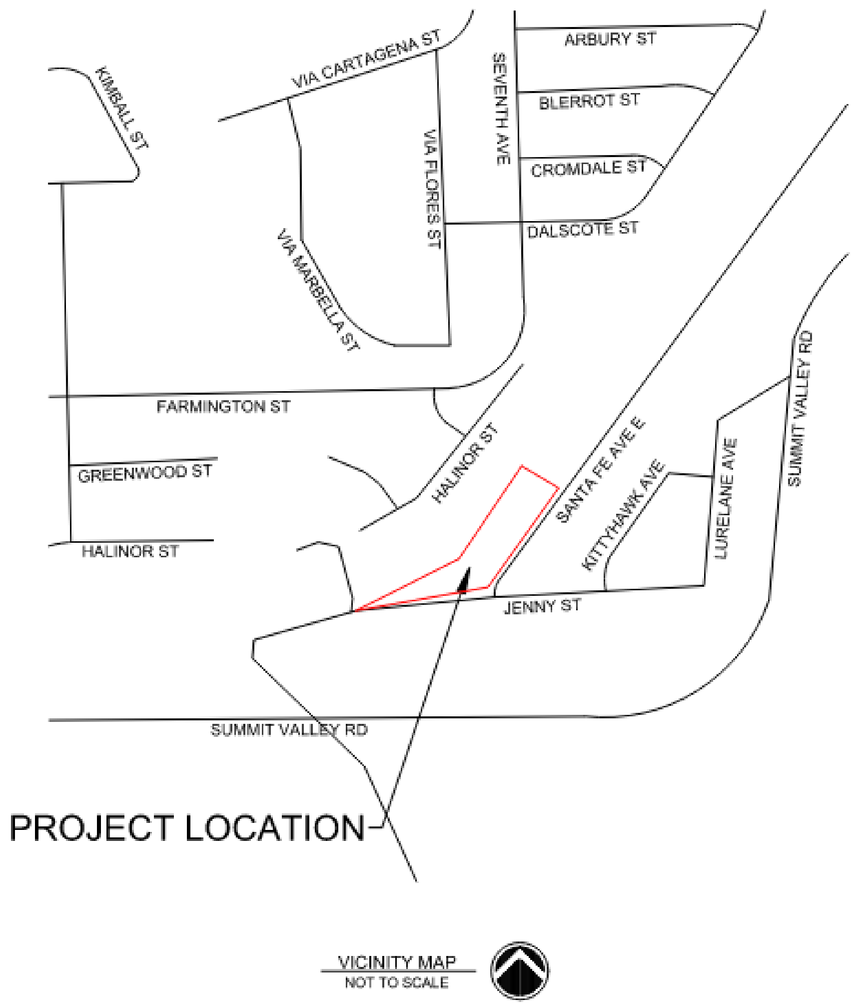


Figure 1: Vicinity Map

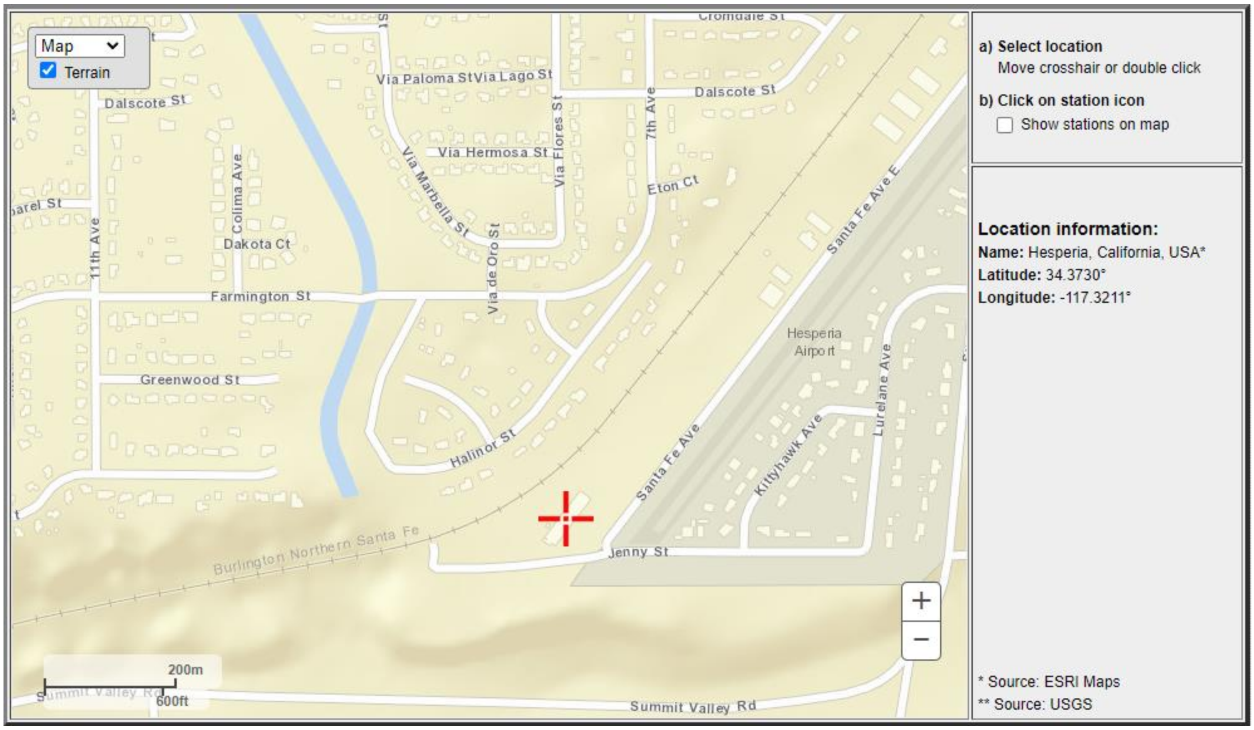


Figure 2: Site Coordinates

(Source USGS)

Existing Hydrologic Conditions

The project site has an existing warehouse steel frame structure with a building area of 21,831 s.f. Only about 8.2% of the site including the building and pavement is developed. Most of the site consists of dirt and landscaping. A chain-linked fence surrounds the site along the property line. In Parcel 1, lot 121, the existing site generally drains west via the natural swale northwest of the existing building and sheet flows across the site southeast of the existing building. The only existing drainage feature on the east side of the site is the existing natural dirt swale. In Paracel 3, lot 120, the existing site sheet flows southeast across the entire lot. There is currently no drainage systems or water quality features in Paracel 3.

The boring done by the Salem geotechnical engineer yielded that the soils on site are predominately of silty sand with an infiltration rate of 1.12 in/hr. In addition, it was determined the highest groundwater depth per the boring results is estimated to be greater than 50 feet below the ground surface.

Developed Hydrologic Conditions

The proposed improvements include adding two concrete loading decks for the trailers, an AC paved parking lot, and utility coordination to assist with drainage on-site. Each loading dock will have 4 depressed loading bays and will cover a square footage of 8,000-8500 s.f. The site area is relatively flat and won't require major changes in grade. The minor changes in grade will be to provide adequate drainage.

The proposed site has 3 drainage areas, DA-A, B, and C, and each of these will have its own BMP to catch and treat the stormwater runoff. Drainage area DA-A and DA-B each contain a loading zone and each loading zone will have a trench drain which will catch the runoff. The runoff at both trailer loading docks will be piped to the nearest of two proposed drywells. In the parking area there will also be a proposed 18"x18" catch basin east of the existing warehouse which will be piped to the proposed drywell in DA-A adjacent to Jenny Street. The last drainage area DA-C, is located north of the existing building and proposed improvements, and is completely pervious but has an infiltration rate that is greater than 0.3 in/hr which means it requires a BMP as well. The BMP for drainage area C will be an infiltration basin sized to capture the runoff as it sheet flows northeast. The basin will be able to retain 470 s.f. and will be one foot deep. The drywells and infiltration basin were sized based on the LID BMP design handbook, and with regard to geotechnical data and recommendations. These BMPs will act both as retention and infiltration BMPs.

When placing new utilities on site, the trenches should be backfilled using the excavated material in loose lifts not exceeding 8 inches and compacted to 95% relative compaction. In addition, the impervious surfaces within 10 feet of the building foundation are required to be sloped at a minimum of two percent away from the building. The roof drains should fall onto splash blocks to direct the water a minimum of 5 feet away from structures or connect to the storm drain system.

Methodology

The peak flow rate of each drainage area was calculated using the Rational Method consistent with the San Bernadino County Hydrology Manual. Peak flows were calculated for the 1-hour, 10-year, and 100-year storm events. The manual provides isohyet maps for the rainfall intensity values which were used and are provided in Appendix B. The runoff coefficient (C) was determined using the equations provided in the hydrology manual and the geotechnical report was used to decide which of the two equations to solve based on the design infiltration rates. See the percolation test results and locations in appendix D. Autodesk Hydra flow Express, an extension of Civil 3D, was utilized to analyze the hydrology of the site.

The site was split into three different designated areas to compare the pre- and post- conditions with respect to the volume retention needed for each area. The San Bernadino County Hydrology Manual was utilized to determine the peak runoff and volume retained per drainage area.

<u>Report Summary</u>

The rational method was used to calculate the peak flows for the 1-hour, 10-year and 100-year storm events. The following tables summarize the results found for each drainage area and storm event.

Total Site Area: 4.45 acres

DA A: 1.502 acres

DA B: 0.183 acres

DA C: 2.769 acres

Flowrate Equation: $Q_n = CiA$

Runoff Volume: $V_n = Qn * Tc * \left(\frac{60\ sec}{1\ \text{min}}\right)$

The total runoff of the existing development given a 100-year; 1-hour storm event is 4.69 cfs. A summary of the existing condition hydrology results is provided in Table 1 below.

Table 1: Existing Hydrology Summary

	Area (ac)	10-yr Q1-hr (cfs)	100-yr Q1-hr (cfs)
DA A	4.45	2.07	4.69
Total (cfs)	4.45	2.07	4.69

* Intensity values from figure D-2.

*C value from Hydrology Manual/Geotech report

The total runoff of the proposed development given a 100-year; 1-hour storm event is 6.35 cfs. A summary of the developed condition hydrology results is provided in Table 2 below.

Table 2: Proposed Hydrology Summary

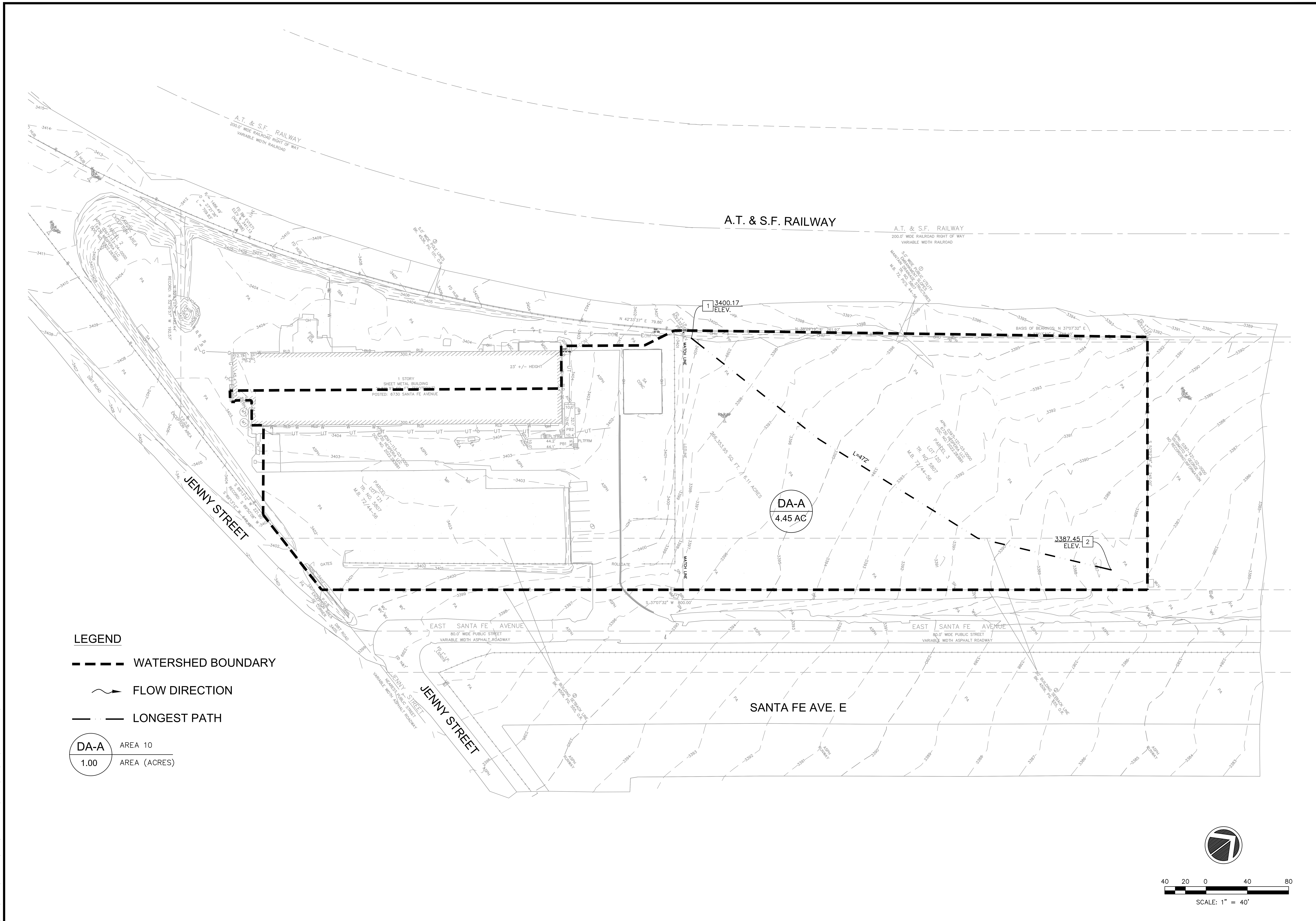
	Area (ac)	10-yr Q1-hr (cfs)	100-yr Q1-hr (cfs)
DA A	1.502	1.12	2.06
DA B	1.083	0.92	1.55
DA C	2.769	1.13	2.74
Total (cfs)	4.45	3.25	6.35

* Intensity values from figure D-2.

*C value from Hydrology Manual/Geotech report

A comparison of the pre- and post- development conditions show there is a 1.66 cfs increase in peak flow under the post-development conditions. Although the site will see an increase in peak runoff, the proposed BMPs are designed to capture this increase preventing offsite flow.

Appendix A-Hydrology Maps



No.	DESCRIPTION	DATE
	REVISIONS	

IMEG

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PRE-DEVELOPMENT HYDROLOGY EXHIBIT

IMEG Project No: 23002420

File Name: Existing Hydrology Exhibit.dwg

Field Book No: ####

Drawn By: AF

Checked By: RH

Date: 5/26/2023

EXH

Friday, May 26, 2023 8:27:15 AM
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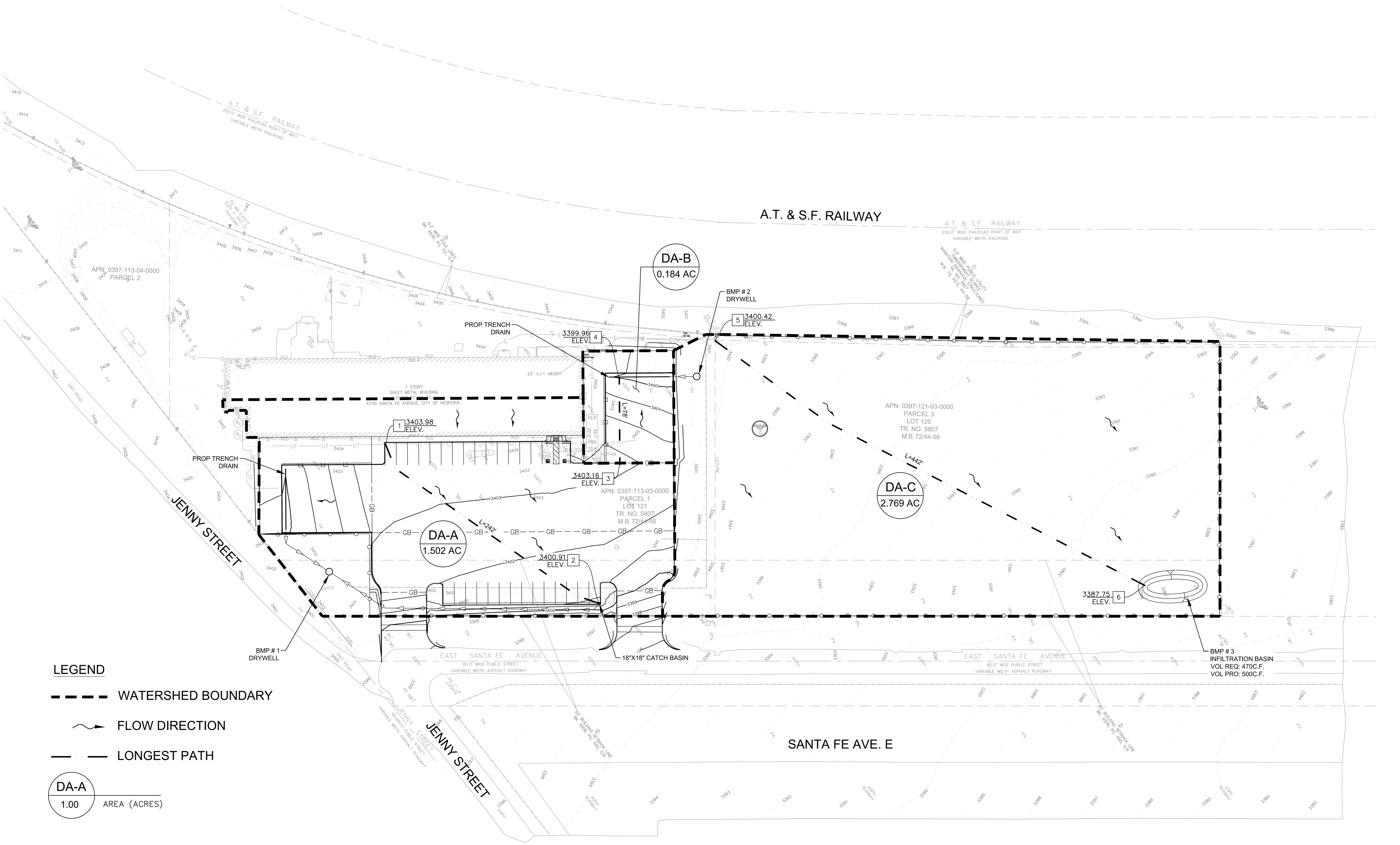

REVISIONS

No.	DESCRIPTION	DATE

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POST-DEVELOPMENT HYDROLOGY EXHIBIT

IMEG Project No: 23002420
File Name: Proposed Hydrology Exhibit.dwg

Field Book No: ####
Drawn By: AF
Checked By: RH
Date: 5/30/2023

EXH

Sheet 2 of 2

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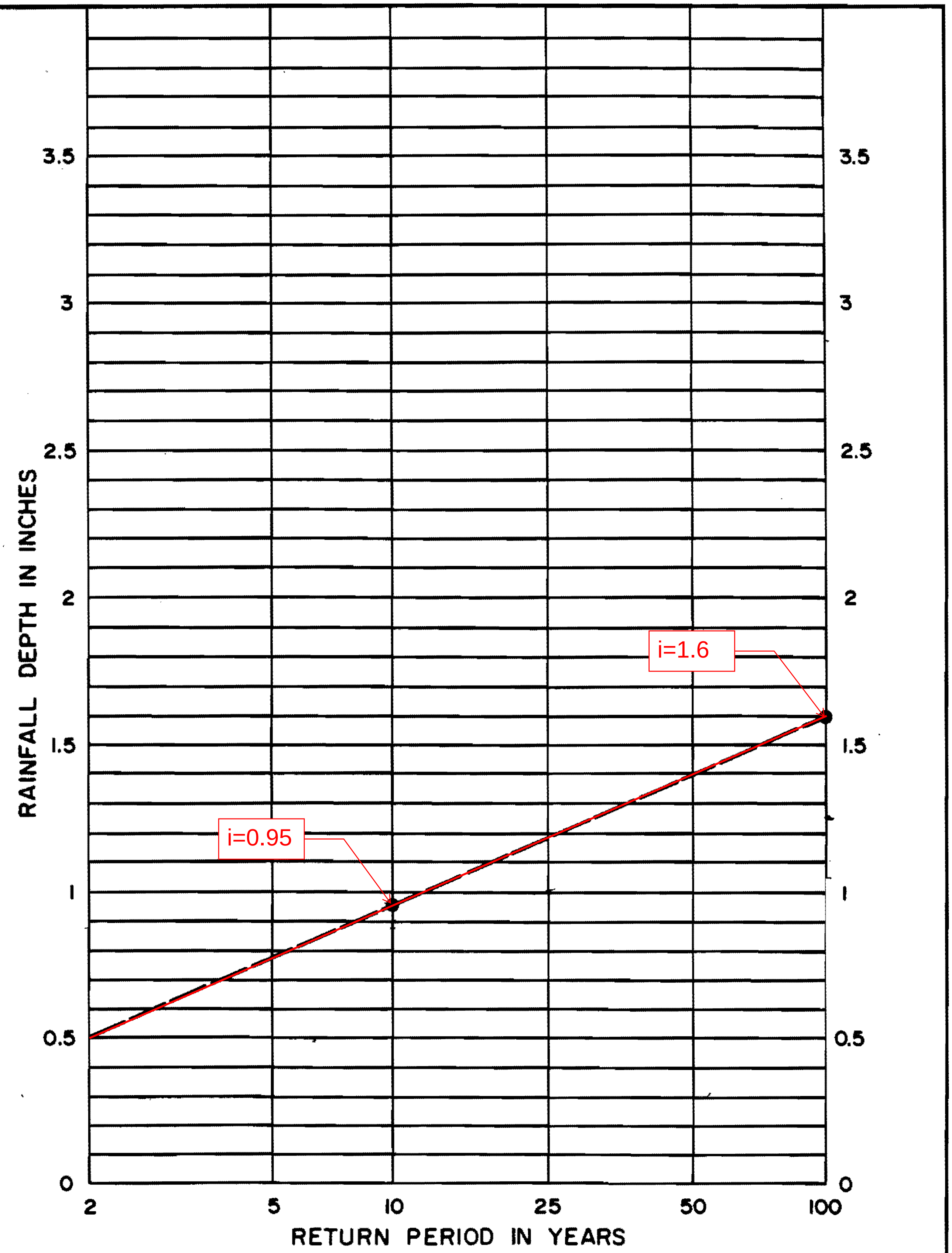
Appendix B- Intensity



NOTE:
1. FOR INTERMEDIATE RETURN PERIODS PLOT 10-YEAR AND 100-YEAR ONE HOUR VALUES FROM MAPS, THEN CONNECT POINTS AND READ VALUE FOR DESIRED RETURN PERIOD. FOR EXAMPLE GIVEN 10-YEAR ONE HOUR = 0.95" AND 100-YEAR ONE HOUR = 1.60", 25-YEAR ONE HOUR = 1.18".

REFERENCE: NOAA ATLAS 2, VOLUME XI - CAL., 1973

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

Appendix C- Calculations

Calculations

Flowrate Equation: $Q_n = C\text{i}A$

Runoff Volume: $V_n = Qn * Tc * \left(\frac{60\ sec}{1\ \text{min}}\right)$

Runoff Coefficient: $c = \begin{cases} 0.90(a_i + \frac{(I-Fp)ap}{I}, for\ I\ greater\ than\ Fpi \\ 0.90ai, for\ I\ less\ than\ or\ equal\ to\ Fp \end{cases}$

Rainfall intensity- per Figure D-2 in Hydrology Manual

<u>Pre-Development Condition</u>

$DA - A = 4.45\ acres$

$I_{10yr,1hour} = 0.95\ in/hr$

$I_{10yr,1hour} = 1.6\ in/hr$

$$C = \begin{cases} 0.90(a_i + \dfrac{(I-Fp)ap}{I}, for\ I\ greater\ than\ Fpi \\ 0.90ai, for\ I\ less\ than\ or\ equal\ to\ Fp \end{cases}$$

Ai (ratio of impervious): 0.14779

Ap (ratio of pervious): 0.8522

I 10yr (intensity): 0.95 in/hr

I 100yr (intensity): 1.6 in/hr

Fp(per P-1 in Geotech report): 0.5 in/hr

$$C_{10yr} = 0.90(0.14779 + \frac{(0.95-0.5)0.8522}{0.95} = 0.49$$

$$C_{100yr} = 0.90(0.14779 + \frac{(1.6-0.5)0.8522}{1.6} = 0.66$$

Peak Flows:

DA-A

$$Q_{10yr,1hour} = CiA = (0.49) * \left(0.95\frac{in}{hr}\right) * (4.45) = 2.07\ cfs$$

$$Q_{100\ yr,1\ hour} = CiA = (0.66) * \left(1.6\frac{in}{hr}\right) * (4.45) = 4.69\ cfs$$

Time of Concentration: Tc= 13 min

See plate D-3 for Time of Concentration results.

Runoff Volume:

Runoff Volume: $V_n = Qn * Tc * \left(\frac{60\ sec}{1\ \text{min}}\right)$

$$V_{10year,1hour} = 2.07 * 13 * \left(\frac{60\ sec}{1\ \text{min}}\right) =$$

$$V_{100year,1hour} = 4.69 * 13 * \left(\frac{60\ sec}{1\ \text{min}}\right) =$$

Post-Development Condition

$DA - A = 1.502 acres$

$DA - B = 1.083\ acres$

$DA - C = 2.769\ acres$

DA-A

$$C = \begin{cases} 0.90(a_i + \dfrac{(I - Fp)ap}{I}, for\ I\ greater\ than\ Fpi \\ 0.90ai, for\ I\ less\ than\ or\ equal\ to\ Fp \end{cases}$$

Ai (ratio of impervious): 0.881

Ap (ratio of pervious): 0.119

I (intensity): 0.95 in/hr

I 100yr (intensity): 1.6 in/hr

Fp(per P-2 in Geotech report): 1.03 in/hr

$$C_{10yr} = 0.90(0.881) = 0.79$$

$$C_{100yr} = 0.90(0.881 + \frac{(1.6 - 0.5)0.119}{1.6} = 0.86$$

Peak Flows:

$$Q_{10yr,1hour} = CiA = (0.79) * \left(0.95\frac{in}{hr}\right) * (1.502) = 1.12\ cfs$$

$$Q_{100\ yr,1hour} = CiA = (0.86) * \left(1.6\frac{in}{hr}\right) * (1.502) = 2.06\ cfs$$

Time of Concentration: Tc= 6.5 min

See plate D-3 for Time of Concentration results.

Runoff Volume:

Runoff Volume:$V_n = Qn * Tc * \left(\frac{60\ sec}{1\ \text{min}}\right)$

$$V_{10year,1hour} = 1.19 * 6.5 * \left(\frac{60\ sec}{1\ \text{min}}\right) = 464.1\ cf$$

$$V_{100year,1hour} = 2.06 * 6.5 * \left(\frac{60\ sec}{1\ \text{min}}\right) = 803.4\ cf$$

DA-B

$$C = \begin{cases} 0.90(a_i + \frac{(I - Fp)ap}{I}, for\ I\ greater\ than\ Fpi \\ 0.90ai, for\ I\ less\ than\ or\ equal\ to\ Fp \end{cases}$$

Ai (ratio of impervious): 1.0

Ap (ratio of pervious): 0

I (intensity): 0.95 in/hr

I 100yr (intensity): 1.6 in/hr

Fp(per P-2 in Geotech report): 1.03 in/hr

$C_{10yr} = 0.90(1) = 0.9$

$$C_{100yr} = 0.90(1 + \frac{(1.6 - 0.5)0}{1.6} = 0.9$$

Peak Flows:

$$Q_{10yr,1hour} = CiA = (0.9) * \left(0.95 \frac{in}{hr}\right) * (1.083) = 0.92\ cfs$$

$$Q_{100\ yr,1\ hour} = CiA = (0.9) * \left(1.6 \frac{in}{hr}\right) * (1.083) = 1.55\ cfs$$

Time of Concentration: Tc= 4 min

See plate D-3 for Time of Concentration results.

Runoff Volume:

Runoff Volume:$V_n = Qn * Tc * \left(\frac{60\ sec}{1\ \text{min}}\right)$

$$V_{10year,1hour} = 0.92 * 4 * \left(\frac{60\ sec}{1\ \text{min}}\right) = 220.8\ cf$$

$$V_{100year,1hour} = 1.55 * 4 * \left(\frac{60\ sec}{1\ \text{min}}\right) = 372\ cf$$

DA-C

$$C = \begin{cases} 0.90(a_i + \frac{(I - Fp)ap}{I}, for\ I\ greater\ than\ Fpi \\ 0.90ai, for\ I\ less\ than\ or\ equal\ to\ Fp \end{cases}$$

Ai (ratio of impervious): 0

Ap (ratio of pervious): 1

I (intensity): 0.95 in/hr

I 100yr (intensity): 1.6 in/hr

Fp(per P-1 in Geotech report): 0.5 in/hr

$$C_{10yr} = 0.90(0 + \frac{(0.95 - 0.5)1}{0.95} = 0.43$$

$$C_{100yr} = 0.90(0 + \frac{(1.6 - 0.5)1}{1.6} = 0.62$$

Peak Flows:

$$Q_{10yr,1hour} = CiA = (0.43) * \left(0.95 \frac{in}{hr}\right) * (2.769) = 1.13\ \ cfs$$

$$Q_{100\ yr,1\ hour} = CiA = (0.62) * \left(1.6 \frac{in}{hr}\right) * (2.769) = 2.74\ cfs$$

Time of Concentration: Tc= 12.5 min

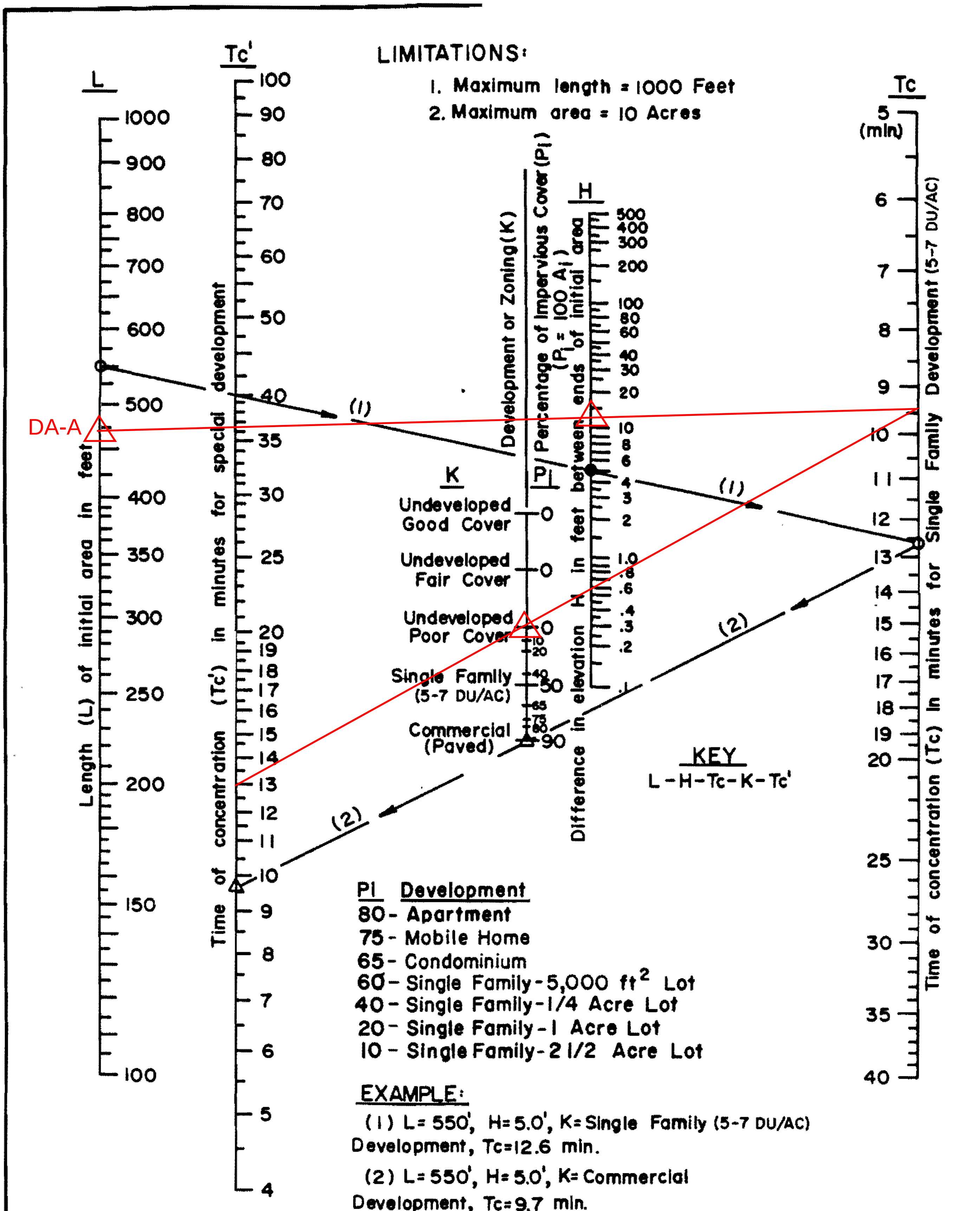
See plate D-3 for Time of Concentration results.

Runoff Volume:

Runoff Volume:$V_n = Qn * Tc * \left(\frac{60\ sec}{1\ \mathrm{min}}\right)$

$$V_{10year,1hour} = 1.13 * 12.5 * \left(\frac{60\ sec}{1\ \mathrm{min}}\right) = 847.5\ cf$$

$$V_{100year,1hour} = 2.74 * 12.5 * \left(\frac{60\ sec}{1\ \mathrm{min}}\right) = 2{,}055\ cf$$

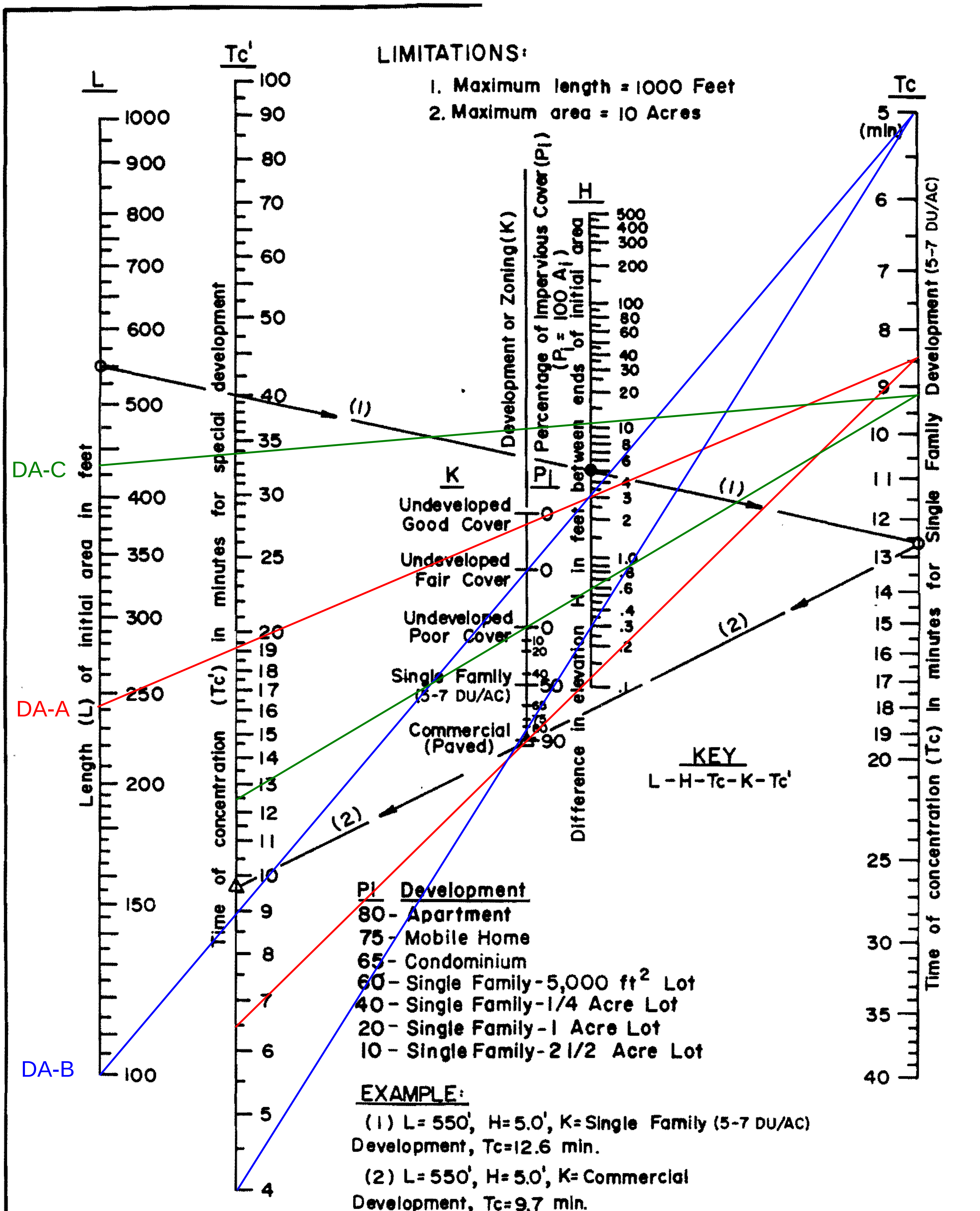


SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1



SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

Appendix D-References

SECTION D

RATIONAL METHOD

D.1. RATIONAL METHOD EQUATION

The rational method was originally developed to estimate peak discharges from small (less then one square mile) urban and developed areas and its use should normally be limited to those conditions. The rational method equation relates rainfall intensity, a runoff coefficient, and drainage area size to the peak runoff from the drainage area. This relationship is expressed by the equation:

$$Q = CIA \qquad \text{(D.1)}$$

where

Q	=	the peak discharge in cubic feet per second (cfs)
C	=	a runoff coefficient representing the ratio of runoff depth to rainfall depth (dimensionless)
I	=	the time-averaged rainfall intensity for a storm duration equal to the time of concentration (inches/hr)
A	=	drainage area (acres)

The values of the runoff coefficient (C) and the rainfall intensity (I) are based on a study of drainage area characteristics such as type and condition of the runoff surfaces and the time of concentration. These factors and the limitations of the rational method equation are discussed in the following sections. Drainage area (A) may be determined by planimetering a suitable topographic map of the project area.

Data required for the computation of peak discharge by the rational method are: (i) rainfall intensity (I) for a storm of specified duration and selected design frequency; (ii) drainage area characteristics of size (A), shape, slope; and (iii) a runoff coefficient (C).

D.2. LIMITATIONS OF THE RATIONAL METHOD

The validity of the relationship expressed by the rational method equation holds true only if certain assumptions are reasonably correct and limitations of the method are observed. Two basic assumptions are that (i) the frequency of a storm runoff is the same as the frequency of the rainfall producing this runoff; i.e., a 25-year recurrence interval rainfall will provide a 25-year recurrence interval storm runoff, and (ii) that the peak runoff occurs when all parts of the drainage area are contributing to the runoff.

The rational method equation is only applicable where the rainfall intensity (I) can be assumed to be uniformly distributed over the drainage area at a uniform rate throughout the duration of the storm. This condition is generally assumed to reasonably apply to small areas of less than 640 acres. Beyond this limit, the rainfall distribution may vary considerably from the point values given in rainfall isohyetal maps and the rational method equation may be inappropriate.

The selection of the runoff coefficient (C) is another major limitation for the rational method equation. For small urban and developed areas the runoff coefficient can be reasonably well estimated from field and aerial photo studies. For larger areas where the determination of the runoff coefficient is to be based on vegetation type, cover density, the infiltration capacity of the ground surface, and the slope of the drainage area, an estimate of the runoff coefficient may be subject to a much greater error due to the variability of the drainage area characteristics. Rainfall losses due to evaporation, transpiration, depression and channel storage are inadequately evaluated, and may appreciably affect the estimate of the watershed peak rate of runoff, especially in natural cover and desert catchment areas. The effects of depth-area-duration (or depth-area) factors are not accounted for in the simple intensity-duration curve used for rational method studies. For large drainage areas, the absence of depth-area adjustments can result in significant differences in the estimate of the average depth of catchment point rainfalls.

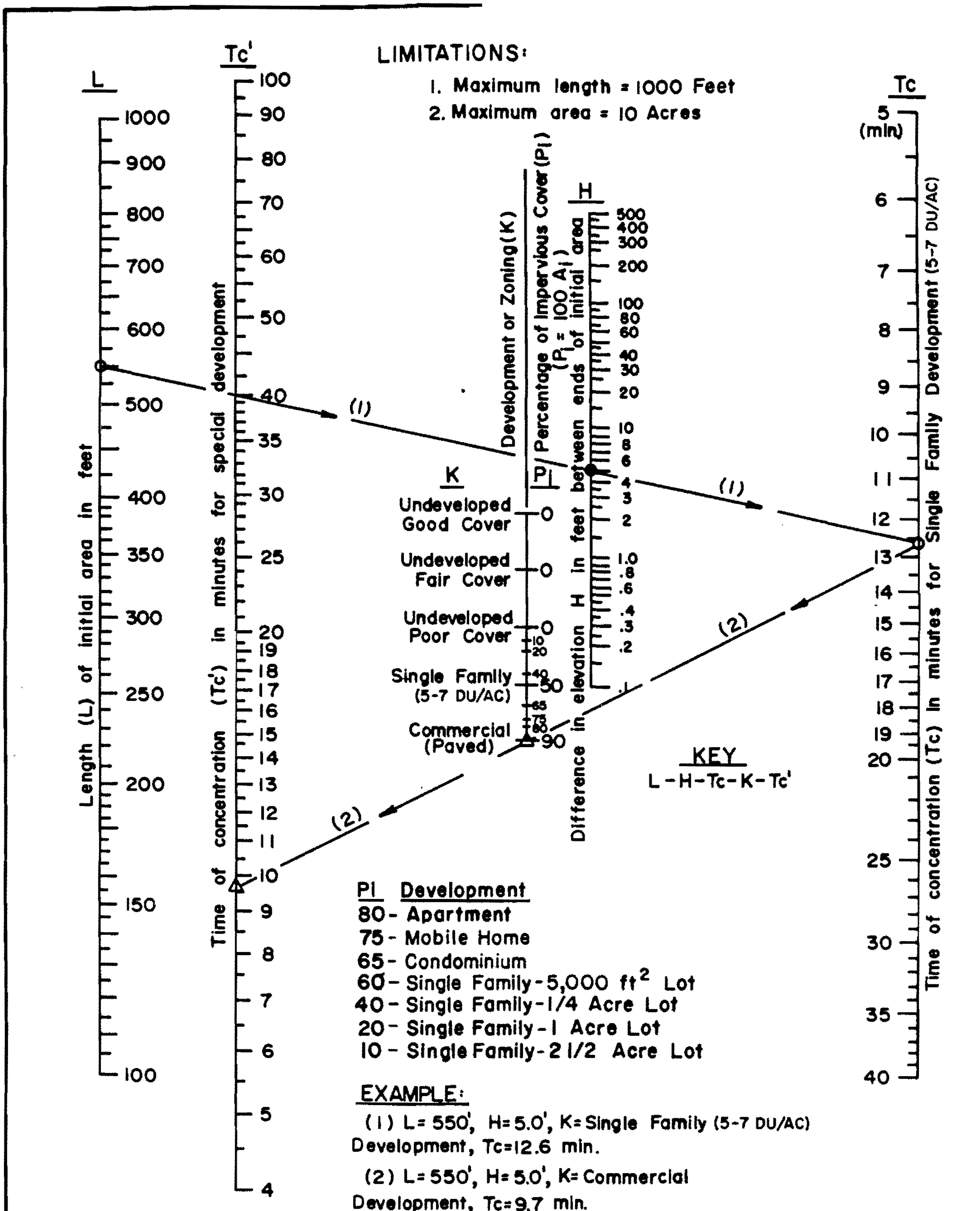
The above limitations indicate that an estimate of the peak rate of runoff becomes less reliable as the drainage area becomes larger and the rational method equation should generally not be used for drainage areas larger than 640 acres.

D.3. CRITICAL DURATION (TIME OF CONCENTRATION)

The critical duration of the storm rainfall required in the rational method equation is based on the time of concentration of the drainage area.

The time of concentration (Tc) is defined as the interval of time (in minutes) required for the flow at a given point to become a maximum under a uniform rainfall intensity. Often this occurs when all parts of the drainage area are contributing to the flow. Generally, the time of concentration is the interval of time from the beginning of rainfall for water from the hydraulically most remote portion of the drainage area to reach the point of concentration; e.g., the inlet of the drainage structure. The time of concentration is a function of many variables including the length of the flow path from the most remote point of an area to the concentration point, the slope and other characteristics of natural and improved channels in the area, the loss rate characteristics of the soil, and the extent and type of development.

For rational method studies based on this manual, the time of concentration for an initial subarea may be estimated from the nomograph of Figure D-1. The time of concentration for the next downstream subarea is computed by adding to the initial Tc, the time required for the computed peak flow to travel to the next concentration point. Time of concentration is computed for each subsequent subarea by computing the runoff peak flow rate travel time between subareas and adding to the cumulative sum.



SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

Figure D-1

When the flow is concentrated in curb and gutters, drainage channels or conduits, the flow velocity may be estimated by the well-known Manning's equation

$$V = \frac{1.49}{n} R^{2/3} S^{1/2} \qquad \text{(D.2)}$$

where

V	=	mean velocity (fps)
n	=	Manning coefficient of roughness
R	=	hydraulic radius (feet)
S	=	energy slope which equals the conduit invert slope for uniform flow

The travel time will then be the flow distance divided by the velocity of flow.

Computations of travel time through subareas which continually add runoff to the peak flow (e.g., streetflow) should be based on the average peak flow through the subarea. This average peak flow is generally a simple average of the peak flow rates estimated at the upstream and downstream points of the subarea.

The initial subarea Tc estimation often is the most significant factor leading to the Tc computation of a watershed. Small development studies typically utilize only initial subarea estimations due to the small subarea sizes. Larger study areas generally show high sensitivity to the initial subarea Tc. Consequently, judgment is needed when developing initial subarea Tc estimates. The nomograph of Figure D-1 is based on the Kirpich formula and relates an initial subarea Tc to subarea slope and development type. It is assumed in the nomograph that overland flow effects dominate the travel time hydraulics.

It is noted that the Tc computation procedure is based upon the summation of an initial subarea time of concentration with the several travel times estimated by normal depth flow-velocities of the peak flow rates through subsequent subareas.

D.4. INTENSITY-DURATION CURVES

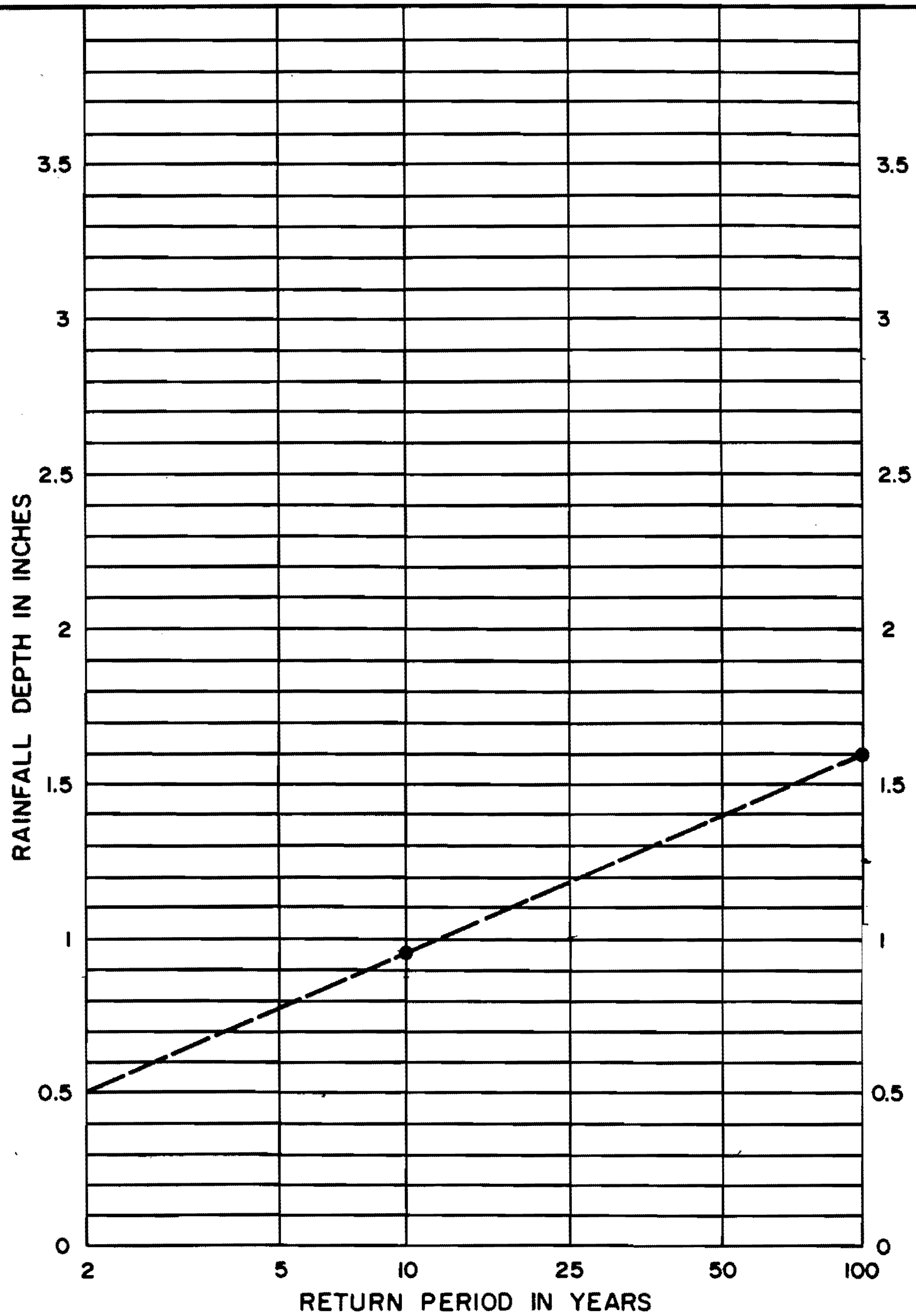
Rainfall intensity (I) is determined using intensity-duration curves which are appropriate for the study watershed.

San Bernardino County has prepared isohyetal maps corresponding to 10-year 1-hour and 100-year 1-hour return frequency precipitation. Point rainfall for intermediate return periods can be determined from Figure D-2. Intensity duration curves for a particular area can be developed using the log-log paper of Figure D-3, plotting the 1-hour point rainfall value for the desired return period, and drawing a straight line through the 1-hour value parallel to the required slope. The slope of the intensity duration curve is assumed to be 0.6 for watersheds in the southwest portion of the County. For desert and mountain watersheds, the slope of the intensity duration curves is assumed to be 0.7. These slope values may be modified if rainfall data record analysis indicates that such modifications are appropriate. Any modifications of the slope values must be approved by the County prior to submittal of a study for County review.

D.5. RUNOFF COEFFICIENT

The runoff coefficient (C) is the ratio of rate of runoff to the rate of rainfall at an average intensity (I) when the total drainage area is contributing. The selection of the runoff coefficient depends on rainfall intensity, drainage area slope, type and amount of vegetative cover, infiltration capacity of the ground surface, and various other factors.

Since one acre-inch/hour is equal to 1.008 cfs, the rational formula is used to estimate a peak flowrate in cfs. The runoff coefficient is assumed to be a function of the impervious and pervious area fractions, an infiltration rate,



NOTE:

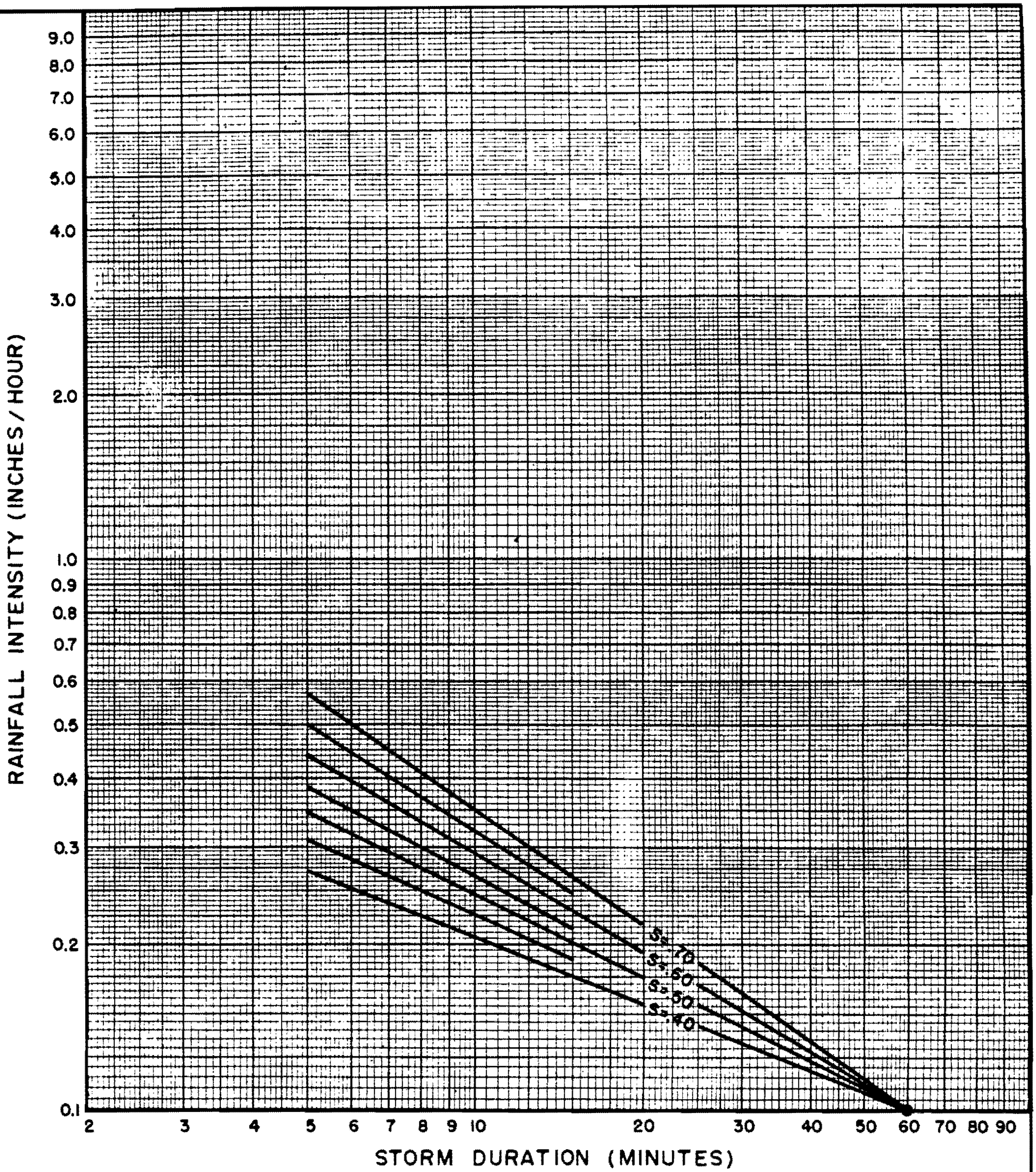
1. FOR INTERMEDIATE RETURN PERIODS PLOT 10-YEAR AND 100-YEAR ONE HOUR VALUES FROM MAPS, THEN CONNECT POINTS AND READ VALUE FOR DESIRED RETURN PERIOD. FOR EXAMPLE GIVEN 10-YEAR ONE HOUR = 0.95" AND 100-YEAR ONE HOUR = 1.60", 25-YEAR ONE HOUR = 1.18".

REFERENCE: NOAA ATLAS 2, VOLUME XI - CAL., 1973

SAN BERNARDINO COUNTY
HYDROLOGY MANUAL

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

FIGURE D-2



DESIGN STORM FREQUENCY = _____ YEARS

ONE HOUR POINT RAINFALL = _____ INCHES

LOG-LOG SLOPE = _____

PROJECT LOCATION = ____________________

SAN BERNARDINO COUNTY HYDROLOGY MANUAL	INTENSITY – DURATION CURVES CALCULATION SHEET

F_p, for the pervious area, and the effects of watershed detention. Runoff coefficient curves are developed using the relationship:

$$C = \begin{cases} 0.90\,(a_i + \frac{(I - F_p)a_p}{I}), \text{ for I greater than } F_p; \\ 0.90\,a_i, \text{ for I less than or equal to } F_p \end{cases} \qquad \text{(D.3)}$$

where the proportion factor of 0.90 is a calibration constant determined by an average fit between the rational method and design storm unit hydrograph (see Section E) peak flow rate estimates, and where

C	=	runoff coefficient
I	=	rainfall intensity (inches/hour)
F_p	=	infiltration rate for pervious areas (inches/hour) (see section C.6.4)
a_i	=	ratio of impervious area to total area (decimal fraction)
a_p	=	ratio of pervious area to total area (decimal fraction), ($a_p = 1 - a_i$)

D.6. PEAK FLOW RATE FORMULA

Combining Equations (D.1) and (D.3), the peak flow estimate for Q is written in simpler terms by

$$Q = .90\,(I - F_m)A \qquad \text{(D.4)}$$

where $F_m = a_pF_p$ (see section C.6.5), and where in (D.4) it is understood that I is greater than F_p (otherwise $Q = .90\,a_iIA$).

In (D.4), F_m represents the loss rate for the total watershed tributary to the point of concentration. Should the tributary area contain several runoff surfaces, an area-averaged F_m is calculated. Table D.1 illustrates such an area-averaged F_m computation.

GEOTECHNICAL • ENVIRONMENTAL • GEOLOGY • MATERIALS TESTING & INSPECTION • FORENSIC • LABORATORY

SALEM engineering group, inc.

LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION

PROPOSED LOADING DOCKS AND PARKING LOT
6730 SANTA FE AVENUE E
HESPERIA, CALIFORNIA

SALEM PROJECT NO. 3-223-0381
MAY 18, 2023

PREPARED FOR:

MR. GREG REITZ
CREDE GROUP
18301 VON KARMAN AVENUE, SUITE 510
IRVINE, CA 92612

PREPARED BY:

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(909) 980-6435 Fax

May 18, 2023 **Project No. 3-223-0381**

Mr. Greg Reitz
Crede Group
18301 Von Karman, Suite 510
Irvine, CA 92612

SUBJECT: LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED LOADING DOCKS AND PARKING LOT
6730 SANTA FE AVENUE E
HESPERIA, CALIFORNIA

Dear Mr. Reitz:

At your request and authorization, SALEM Engineering Group, Inc. (SALEM) has prepared this Limited Geotechnical Engineering Investigation report for the Proposed Loading Docks and Parking Lot to be located at the subject site.

The accompanying report presents our findings, conclusions, and recommendations regarding the geotechnical aspects of designing and constructing the project as presently proposed. In our opinion, the proposed project is feasible from a geotechnical viewpoint provided our recommendations are incorporated into the design and construction of the project.

We appreciate the opportunity to assist you with this project. Should you have questions regarding this report or need additional information, please contact the undersigned at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

Ibrahim Foud Ibrahim, PE, GE
Senior Managing Engineer
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LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED LOADING DOCKS AND PARKING LOT
6730 SANTA FE AVENUE E
HESPERIA, CALIFORNIA

1. PURPOSE AND SCOPE

This report presents the results of our Limited Geotechnical Engineering Investigation for the Proposed Loading Docks and Parking Lot to be located at 6730 Santa Fe Avenue E in the city of Hesperia, California (see Figure 1, Vicinity Map). The purpose of our limited geotechnical engineering investigation was to investigate the subsurface conditions encountered at the site, and provide conclusions and recommendations relative to the geotechnical aspects of constructing the project as presently proposed.

The scope of this investigation included a field exploration, percolation testing, laboratory testing, engineering analysis, and the preparation of this report. Our field exploration was performed on May 8, 2023, and included drilling of four (4) small-diameter soil borings to a maximum depth of 10 feet at the site. Additionally, two (2) percolation tests were performed at depths of approximately 3 and 4¾ feet below ground surface to determine the infiltration rates. The approximate locations of the soil borings and percolation tests are depicted on the Site Plan, Figure 2. A detailed discussion of our field investigation and exploratory boring logs are presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to evaluate pertinent physical properties for engineering analyses. Appendix B presents the laboratory test results in tabular and graphic format. The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions. If project details vary significantly from those described herein, SALEM should be contacted to determine the necessity for review and possible revision of this report. Earthwork and Pavement Specifications are presented in Appendix C. If text of the report conflict with the specifications in Appendix C, the recommendations in the text of the report have precedence.

2. PROJECT DESCRIPTION

Based on the site plans provided to us, we understand that the proposed development of the site will include construction of two (2) concrete loading docks and an asphaltic concrete (AC) parking lot. Each loading dock will have 4 depressed loading bays. A loading dock, 80 feet by 100 feet, will be located on the northeast side of the existing building, and another loading dock, 85 feet by 100 feet, will be located at the southeast end of the existing building. The parking lot will be located to the east of the existing building.

As the site area is relatively flat with no major changes in grade, we anticipate that cuts and fills during earthwork will be limited to providing positive site drainage. In the event that changes occur in the nature or design of the project, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions of our report are modified. The site configuration and locations of proposed improvements are shown on the Site Plan, Figure 2.

3. SITE LOCATION AND DESCRIPTION

The site is located northwest of the intersection of Jenny Street and Santa Fe Avenue E in the city of Hesperia, California (see Vicinity Map, Figure 1). The address of the site is 6730 Santa Fe Avenue E.

The subject site is irregular in shape and encompasses approximately 6.11 acres. The northern half of the site is vacant and will not be developed. The southern half of the site is occupied by a 21,831 square-foot sheet metal 67industrial building surrounded by associated asphalt concrete pavement and unpaved/non-landscaped land. An annex structure currently exists at the east corner of the industrial building. A steel frame structure is located in the north corner of the southern half of the site. A chain-linked fence surrounds the site. The southern half of the site is relatively flat with no major changes in grade.

4. FIELD EXPLORATION

Our field exploration consisted of site surface reconnaissance and subsurface exploration. The exploratory test borings (B-1 through B-4) were drilled on May 8, 2023, and were advanced with a 3-inch diameter hand auger. Exterior asphalt for B-1 and B-4 was cored using a coring machine prior to drilling. The test borings were extended to a maximum depth of approximately 10 feet below existing grade. Drilling was limited to 8 feet in boring B-4 due to auger refusal on hard soil conditions. The approximate locations of our test borings are shown on the Site Plan, Figure 2.

The materials encountered in the test borings were visually classified in the field, and logs were recorded by a field engineer and stratification lines were approximated on the basis of observations made at the time of drilling. Visual classification of the materials encountered in the test borings were generally made in accordance with the Unified Soil Classification System (ASTM D2488).

A soil classification chart and key to sampling is presented on the Unified Soil Classification Chart, in Appendix "A." The logs of the test borings are presented in Appendix "A." The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol. The location of the test borings were determined by measuring from features shown on the Site Plan, provided to us. Hence, accuracy can be implied only to the degree that this method warrants. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted. Soil samples were obtained from the test borings at the depths shown on the logs of borings. Bag samples were recovered and placed in a sealed bag to preserve their natural moisture content. Upon completion of the exploration, the borings were backfilled with soil cuttings, and then patched with concrete patch (where applicable),

5. LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory-testing program was formulated with emphasis on the evaluation of natural moisture, density, shear strength, maximum density and optimum moisture determination, and gradation of the materials encountered.

In addition, chemical tests were performed to evaluate the corrosivity of the soils to buried concrete and metal. Details of the laboratory test program and the results of laboratory test are summarized in Appendix "B." This information, along with the field observations, was used to prepare the final boring logs in Appendix "A."

6. SOIL AND GROUNDWATER CONDITIONS

6.1 Subsurface Conditions

The subsurface conditions encountered appear typical of those found in the geologic region of the site. In general, the soils within the depth of our borings consisted predominately of silty sand. The exterior surface within our test borings B-1 and B-4 consisted of approximately 2 to 3¼ inches of asphalt concrete (AC) underlain by approximately 2 to 3¼ inches of aggregate base (AB).

Fill soils may be present on site between our boring locations since the site was graded for the current development. The consistency of the fills should be verified during site construction. Prior to fill placement, Salem Engineering Group, Inc. should inspect the bottom of the excavation to verify no additional excavation will be required. Verification of the fill soils and the extent of fill should be determined during site grading.

The soils were classified in the field during the drilling and sampling operations. The stratification lines were approximated by the field engineer on the basis of observations made at the time of drilling. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted. The Boring Logs include the soil type, color, moisture content, and the applicable Unified Soil Classification System symbol. The locations of the test borings were determined by measuring from feature shown on the Site Plan provided to us. Hence, accuracy can be implied only to the degree that this method warrants.

6.2 Groundwater

The test boring locations were checked for the presence of groundwater during and after the drilling operations. Free groundwater was not encountered during our investigation. Based on regional groundwater data near the site vicinity, the historically highest groundwater depth is estimated to be greater than 50 feet below ground surface. It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, localized pumping, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

6.3 Soil Corrosion Screening

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete and the soil. The 2014 Edition of ACI 318 (ACI 318) has established criteria for evaluation of sulfate and chloride levels and how they relate to cement reactivity with soil and/or water.

A soil sample was obtained from the project site and was tested for the evaluation of the potential for concrete deterioration or steel corrosion due to attack by soil-borne soluble salts and soluble chloride. The water-soluble sulfate concentration in the saturation extract from the soil sample was detected to be less than 807 mg/kg. ACI 318 Tables 19.3.1.1 and 19.3.2.1 outline exposure categories, classes, and concrete requirements by exposure class. ACI 318 requirements for site concrete based upon soluble sulfate are summarized in Table 6.3 below.

TABLE 6.3
WATER SOLUBLE SULFATE EXPOSURE REQUIREMENTS

Water-Soluble Sulfate (SO_4) in Soil, %by Weight	Exposure Severity	Exposure Class	Maximum w/cm Ratio	Min. Concrete Compressive Strength	Cementitious Materials Type
0.0807	Not Severe	S0	N/A	2,500 psi	No Restriction

The water-soluble chloride concentration detected in saturation extract from the soil samples was 32 mg/kg. This level of chloride concentration is considered to be mildly corrosive. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, applicable manufacturer's recommendations for corrosion protection of buried metal pipe be closely followed.

6.4 Percolation Testing

Two percolation tests (P-1 and P-2) were performed. Results of the falling head tests are presented in the attachments to this report. The approximate locations of the percolation tests are shown on the attached Site Plan, Figure 2.

The boreholes were advanced to the depths shown on the percolation test worksheets. The holes were pre-saturated before percolation testing commenced. Percolation rates were measured by filling the test holes with clean water and measuring the water drops at a certain time interval. The difference in the percolation rates are reflected by the varied type of soil materials at the bottom of the test holes. The test results are shown on the table below.

TABLE 6.4
PERCOLATION TEST RESULTS

Test No.	Depth (feet)	Tested Infiltration Rate[1] (inch/hour)	Factor of Safety[2]	Design Infiltration Rate (inch/hour)	Soil Type[3]
P-1	4¾	**1.12**	**2.25**	**0.50**	Silty SAND (SM)
P-2	3	**2.32**	**2.25**	**1.03**	Poorly graded SAND (SP)

[1] **Tested infiltration Rate = (ΔH 60 r) / (Δt(r + 2H_{avg}))**
[2] **Based on Worksheets H, S_A = 1.5 and S_B = 1.5**
[3] **At bottom of test hole.**

The FS should be verified by the civil engineer based on Worksheets H: Factor of Safety and Design Infiltration Rate and Worksheet provided in the San Bernardino County Stormwater Program, Technical Guidance Document for Water Quality Management Plans (WQMP).

The soil infiltration or percolation rates are based on tests conducted with clear water. The infiltration/percolation rates may vary with time as a result of soil clogging from water impurities. The soils may also become less permeable to impermeable if the soil is compacted. Thus, periodic maintenance consisting of clearing the bottom of the drainage system of clogged soils should be expected. The infiltration/percolation rate may become slower if the surrounding soil is wet or saturated due to prolonged rainfalls. Additional percolation tests should be conducted at bottom of the drainage system during construction to verify the infiltration/percolation rate.

The scope of our services did not include a groundwater study and was limited to the performance of percolation testing and soil profile description, and the submitted data only. Our services did not include those associated with septic system design. Neither did services include an Environmental Site Assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere; or the presence of wetlands. Any statements, or absence of statements, in this report or on any boring logs regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessment.

The geotechnical engineering information presented herein is based upon professional interpretation utilizing standard engineering practices. The work conducted through the course of this investigation, including the preparation of this report, has been performed in accordance with the generally accepted standards of geotechnical engineering practice, which existed in the geographic area at the time the report was written. No other warranty, express or implied, is made. Please be advised that when performing percolation testing services in relatively small diameter borings, that the testing may not fully model the actual full scale long term performance of a given site. This is particularly true where percolation test data is to be used in the design of large infiltration system such as may be proposed for the site.

The measured percolation rate includes dispersion of the water at the sidewalls of the boring as well as into the underlying soils. Subsurface conditions, including percolation rates, can change over time as fine-grained soils migrate. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. We emphasize that this report is valid for the project outlined above and should not be used for any other sites.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

7.1.1 Based upon the data collected during this investigation, and from a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed construction at the site as planned, provided the recommendations contained in this report are incorporated into the project design and construction. Conclusions and recommendations provided in this report are based on our review of available literature, analysis of data obtained from our field exploration and laboratory testing program, and our understanding of the proposed development at this time.

7.1.2 The primary geotechnical constraints identified in our investigation is the presence of potentially compressible soils at the site. Recommendations to mitigate the effects of these soils are provided in this report.

7.1.3 The scope of this investigation did not include subsurface exploration within the existing building and structure areas during field exploration. As such, subsurface soil conditions and materials present below the existing site structures are unknown and may be different than those noted within this report. The presence of potentially unacceptable fill materials, undocumented fill, and/or loose soil material that may be present below existing site features shall be taken into consideration. Our firm shall be present at the time of demolition activities to verify soil conditions are consistent with those identified as part of this investigation.

7.1.4 No significant fill soils were encountered during this investigation. Fill soils may be present on site between our boring locations since the site was graded for the current development. Verification of the fill soil and the extent of fill should be determined during site grading. Undocumented/uncompacted fill materials are not suitable to support any future structures and should be excavated and replaced with Engineered Fill. Prior to fill placement, SALEM should inspect the bottom of the excavation to verify the fill condition.

7.1.5 Site demolition activities shall include removal of all surface obstructions not intended to be incorporated into final site design. In addition, underground buried structures and/or utility lines encountered during demolition and construction should be properly removed and the resulting excavations backfilled with Engineered Fill. It is suspected that possible demolition activities of the existing structures may disturb the upper soils. After demolition activities, it is recommended that disturbed soils be removed and/or recompacted.

7.1.6 Surface vegetation consisting of grasses and other similar vegetation should be removed by stripping to a sufficient depth to remove organic-rich topsoil. The upper 4 to 6 inches of the soils containing vegetation, roots, and other objectionable organic matter encountered at the time of grading should be stripped and removed from the surface. Deeper stripping may be required in localized areas. The stripped vegetation will not be suitable for use as Engineered Fill or within 5 feet of building pads, loading docks or within pavement areas. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas or exported from the site.

7.1.7 SALEM shall review the project grading and foundation plans and specifications prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required. If SALEM is not provided plans and specifications for review, we cannot assume any responsibility for the future performance of the project.

7.1.8 SALEM shall be present at the site during site demolition and preparation to observe site clearing/demolition, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

7.1.9 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

7.2 Seismic Design Criteria

7.2.1 For seismic design of the structures, and in accordance with the seismic provisions of the 2022 CBC, our recommended parameters are shown below. These parameters were determined using California's Office of Statewide Health Planning and Development (OSHPD) Seismic Design Map Tool Website (https://seismicmaps.org/) in accordance with the 2022 CBC. The Site Class was determined based on the soils encountered during our field exploration.

TABLE 7.2.1
SEISMIC DESIGN PARAMETERS

Seismic Item	Symbol	Value	ASCE 7-16 or 2022 CBC Reference
Site Coordinates (Datum = NAD 83)		34.3730 Lat -117.3211 Lon	
Site Class	--	D-Default	ASCE 7 Table 20.3
Risk Category	--	II	CBC Table 1604.5
Site Coefficient for PGA	F_{PGA}	1.2	ASCE 7 Table 11.8-1
Peak Ground Acceleration (adjusted for Site Class effects)	PGA_M	0.685g	ASCE 7 Equation 11.8-1
Seismic Design Category	SDC	D	ASCE 7 Table 11.6-1 & 2
Mapped Spectral Acceleration (Short period - 0.2 sec)	S_S	1.5 g	CBC Figure 1613.2.1(1-10)
Mapped Spectral Acceleration (1.0 sec. period)	S_1	0.6 g	CBC Figure 1613.2.1(1-10)
Site Class Modified Site Coefficient	F_a	1.2	CBC Table 1613.2.3(1)
Site Class Modified Site Coefficient	F_v	*1.7	CBC Table 1613.2.3(2)
MCE Spectral Response Acceleration (Short period - 0.2 sec) $S_{MS} = F_a S_S$	S_{MS}	1.8 g	CBC Equation 16-20
MCE Spectral Response Acceleration (1.0 sec. period) $S_{M1} = F_v S_1$	S_{M1}	*1.53 g	CBC Equation 16-21
Design Spectral Response Acceleration $S_{DS}=⅔S_{MS}$ (short period - 0.2 sec)	S_{DS}	1.2 g	CBC Equation 16-22
Design Spectral Response Acceleration $S_{D1}=⅔S_{M1}$ (1.0 sec. period)	S_{D1}	*1.02 g	CBC Equation 16-23
Short Term Transition Period (S_{D1}/S_{DS}), seconds	T_S	0.85	ASCE 7-16, Section 11.4.6
Long Period Transition Period (seconds)	T_L	12	ASCE 7-16, Figure 22-14

*** Determined per ASCE Table 11.4-2 for use in calculating T_S only.**

7.2.2 Site Specific Ground Motion Analysis was not included in the scope of this investigation. Per ASCE 11.4.8, structures on Site Class D with S_1 greater than or equal to 0.2 may require Site Specific Ground Motion Analysis. However, a site specific motion analysis may not be required based on Exceptions listed in ASCE 11.4.8. The Structural Engineer should verify whether

Exception No. 2 of ASCE 7-16, Section 11.4.8, is valid for the site. In the event that a site specific ground motion analysis is required, SALEM should be contacted for these services.

7.2.3 Conformance to the criteria in the above table for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

7.3 Soil and Excavation Characteristics

7.3.1 Based on the soil conditions encountered in our soil borings, the onsite soils can be excavated with moderate effort using conventional heavy-duty earthmoving equipment.

7.3.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable Occupational Safety and Health Administration (OSHA) rules and regulations to maintain safety and maintain the stability of adjacent existing improvements. Temporary excavations are further discussed in a later Section of this report.

7.3.3 The near surface soils identified as part of our investigation are, generally, slightly moist to moist due to the absorption characteristics of the soil. Earthwork operations may encounter very moist unstable soils which may require removal to a stable bottom. Exposed native soils exposed as part of site grading operations shall not be allowed to dry out and should be kept continuously moist prior to placement of subsequent fill.

7.4 Materials for Fill

7.4.1 Excavated soils generated from cut operations at the site are suitable for use as general Engineered Fill in structural areas provided they do not contain deleterious matter, debris, organic material, or rock material larger than 3 inches in maximum dimension.

7.4.2 Import soil shall be well-graded, slightly cohesive silty fine sand or sandy silt, with relatively impervious characteristics when compacted. A clean sand or very sandy soil is not acceptable for this purpose. This material should be approved by the Engineer prior to use and should typically possess the soil characteristics summarized below in Table 7.4.2.

TABLE 7.4.2
IMPORT FILL REQUIREMENTS

Minimum Percent Passing No. 200 Sieve	15
Maximum Percent Passing No. 200 Sieve	50
Minimum Percent Passing No. 4 Sieve	70
Maximum Particle Size	3"
Maximum Plasticity Index	10
Maximum CBC Expansion Index	15

7.4.3 The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the Contractor, since they have complete control of the project site.

7.4.4 Proposed import materials should be sampled, tested, and approved by SALEM prior to its transportation to the site.

7.4.5 Environmental characteristics and corrosion potential of import soil materials should also be considered.

7.5 Grading

7.5.1 A representative of our firm shall be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Geotechnical Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section as well as other portions of this report.

7.5.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer and geotechnical engineer in attendance.

7.5.3 Site preparation should begin with removal of existing surface/subsurface structures, underground utilities (as required), any existing uncertified fill, and debris. Excavations or depressions resulting from site clearing operations, or other existing excavations or depressions, should be restored with Engineered Fill in accordance with the recommendations of this report.

7.5.4 Site demolition activities shall include removal of all surface obstructions not intended to be incorporated into final site design. In addition, underground buried structures and/or utility lines encountered during demolition and construction should be properly removed and the resulting excavations backfilled with Engineered Fill. After demolition activities, it is recommended that disturbed soils be removed and/or recompacted.

7.5.5 Surface vegetation consisting of grasses and other similar vegetation should be removed by stripping to a sufficient depth to remove organic-rich topsoil. The upper 2 to 6 inches of the soils containing, vegetation, roots and other objectionable organic matter encountered at the time of grading should be stripped and removed from the surface. Deeper stripping may be required in localized areas. In addition, existing concrete and asphalt materials shall be removed from areas of proposed improvements and stockpiled separately from excavated soil material. The stripped vegetation, asphalt and concrete materials will not be suitable for use as Engineered Fill or within 5 feet of building pads, loading docks, or within pavement areas. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas or exported from the site.

7.5.6 Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than ½ inch in diameter.

Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

7.5.7 No significant fill soils were encountered in our test borings. Fill soil may be present onsite since the site was previously graded for the current development. Undocumented and uncompacted fill materials are not suitable to support any future structures and should be excavated and replaced with Engineered Fill. The actual depth of the overexcavation and recompaction should be determined by our field representative during construction.

7.5.8 To minimize post-construction soil movement and provide uniform support for the proposed loading docks, overexcavation and recompaction within the proposed loading dock areas should be performed to a minimum depth of **two (2) feet** below existing grade or **one (1) foot** below footing bottom, whichever is deeper. The overexcavation and recompaction should also extend laterally to a minimum of 3 feet beyond the outer edges of the proposed footings except in areas where lateral extension is restricted by existing footings.

7.5.9 Slot cuts, braced shorings or shields may be used for supporting vertical excavations near existing structures. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavations and installation.

7.5.10 Within pavement areas, it is recommended that scarification, moisture conditioning, and recompaction be performed to at least **12 inches** below existing grade or finish grade, whichever is deeper. In addition, the upper 12 inches of final pavement subgrade – whether completed at-grade, by excavation, or by filling – should be uniformly moisture-conditioned to near the optimum moisture content and compacted to at least 95% relative compaction

7.5.11 Prior to placement of fill soils, the upper 10 to 12 inches of native subgrade soils should be scarified, moisture-conditioned to no less than optimum moisture content, and recompacted to a minimum of 95% of the maximum dry density based on ASTM Test Method D1557 latest edition.

7.5.12 All Engineered Fill (including scarified ground surfaces and backfill) should be placed in thin lifts to allow for adequate bonding and compaction (typically 6 to 8 inches in loose thickness).

7.5.13 Engineered Fill soils should be placed, moisture conditioned to no less than optimum moisture content, and compacted to at least 95% relative compaction.

7.5.14 An integral part of satisfactory fill placement is the stability of the placed lift of soil. If placed materials exhibit excessive instability as determined by a SALEM field representative, the lift will be considered unacceptable and shall be remedied prior to placement of additional fill material. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

7.5.15 Final pavement subgrade should be finished to a smooth, unyielding surface. We further recommend proof-rolling the subgrade with a loaded water truck (or similar equipment with high contact pressure) to verify the stability of the subgrade prior to placing aggregate base.

7.5.16 The most effective site preparation alternatives will depend on site conditions prior to grading. We should evaluate site conditions and provide supplemental recommendations immediately prior to grading, if necessary.

7.5.17 We do not anticipate groundwater or seepage to adversely affect construction if conducted during the drier months of the year (typically summer and fall). However, groundwater and soil moisture conditions could be significantly different during the wet season (typically winter and spring) as surface soils become wet; perched groundwater conditions may develop. Grading during this time period will increase the chances of encountering wet materials resulting in possible excavation and fill placement difficulties.

Project site winterization consisting of placement of aggregate base and protecting exposed soils during construction should be performed. If the construction schedule requires grading operations during the wet season, we can provide additional recommendations as conditions warrant.

7.5.18 Wet soils may become non conducive to site grading as the upper soils yield under the weight of the construction equipment. Therefore, mitigation measures should be performed for stabilization.

Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material or placement of slurry, crushed rocks or aggregate base material; or mixing the soil with an approved lime or cement product.

The most common remedial measure of stabilizing the bottom of the excavation due to wet soil condition is to reduce the moisture of the soil to near the optimum moisture content by having the subgrade soils scarified and aerated or mixed with drier soils prior to compacting. However, the drying process may require an extended period of time and delay the construction operation.

To expedite the stabilizing process, slurry or crushed rock may be utilized for stabilization provided this method is approved by the owner for the cost purpose. If the use of slurry or crushed rock is considered, it is recommended that the upper soft and wet soils be replaced by 6 to 24 inches of 2-sack slurry or ¾-inch to 1-inch crushed rocks. The thickness of the slurry or rock layer depends on the severity of the soil instability. The recommended 6 to 24 inches of slurry or crushed rock material will provide a stable platform. It is further recommended that lighter compaction equipment be utilized for compacting the crushed rock.

A layer of geofabric is recommended to be placed on top of the compacted crushed rock to minimize migration of soil particles into the voids of the crushed rock, resulting in soil movement. Although it is not required, the use of geogrid (e.g. Tensar NX750) below the slurry or crushed rock will enhance stability and reduce the required thickness of crushed rock necessary for stabilization. Our firm should be consulted prior to implementing remedial measures to provide appropriate recommendations.

7.6 Shallow Foundations for loading docks

7.6.1 The site is suitable for use of conventional shallow foundations consisting of continuous footings and isolated pad footings bearing in properly compacted Engineered Fill.

7.6.2 The bearing wall footings considered for the structure should be continuous with a minimum width of 15 inches and extend to a minimum depth of 18 inches below the lowest adjacent soil grade. Isolated column footings should have a minimum width of 24 inches and extend a minimum depth of 18 inches below the lowest adjacent soil grade. Footing depth should be measured at the time of footing trench excavation not to include any future material (e.g. base, concrete, asphalt, etc.) over the subgrade.

7.6.3 The bottom of footing excavations should be maintained free of loose and disturbed soil. Footing concrete should be placed into a neat excavation.

7.6.4 New foundations planned directly adjacent to existing foundations should extend at a minimum to the bottom of new foundations or the depths specified above, whichever is greater

7.6.5 Footings proportioned as recommended above may be designed for the maximum allowable soil bearing pressures shown in the table below.

Loading Condition	Allowable Bearing
Dead Load Only	2,000 psf
Dead-Plus-Live Load	2,500 psf
Total Load, Including Wind or Seismic Loads	3,325 psf

7.6.6 For design purposes, total settlement due to static and seismic loadings on the order of 1½ inches may be assumed for shallow footings. Differential settlement due to static and seismic loadings, along a 30-foot exterior wall footing or between adjoining column footings, should be ¾ inches, producing an angular distortion of 0.002. Most of the settlement is expected to occur during construction as the loads are applied. However, additional post-construction settlement may occur if the foundation soils are flooded or saturated. The footing excavations should not be allowed to dry out any time prior to pouring concrete.

7.6.7 Resistance to lateral footing displacement can be computed using an allowable coefficient of friction factor of 0.45 acting between the base of foundations and the supporting subgrade.

7.6.8 Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 350 pounds per cubic foot acting against the appropriate vertical native footing faces. The frictional and passive resistance of the soil may be combined provided that a 50 percent reduction of the frictional resistance factor is used when determining the total lateral resistance. An increase of one-third is permitted when using the alternate load combination that includes wind or earthquake loads.

7.6.9 Underground utilities running parallel to footings should not be constructed in the zone of influence of footings. The zone of influence may be taken to be the area beneath the footing and within a 1:1 plane extending out and down from the bottom edge of the footing.

7.6.10 The foundation subgrade should be sprinkled as necessary to maintain a moist condition without significant shrinkage cracks as would be expected in any concrete placement. Prior to placing rebar reinforcement, foundation excavations should be evaluated by a representative of SALEM for appropriate support characteristics and moisture content. Moisture conditioning may be required for the materials exposed at footing bottom, particularly if foundation excavations are left open for an extended period.

7.7 Exterior Concrete Slabs

7.7.1 The upper 24 inches of the slab subgrade should be recompacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D1557, and the slab should be underlain by at least 6 inches of crushed aggregate base (CAB) compacted to a minimum relative compaction of 95 percent.

7.7.2 Slabs should have a minimum thickness of 5 inches, and a minimum compressive strength of 4,000 psi. Slabs should be reinforced as a minimum with No. 4 reinforcement bars at 18 inches on center, each way. Thicker slabs and/or additional reinforcement may be required by the structural engineer based on the anticipated loading.

7.7.3 Concrete slabs may be designed utilizing an allowable bearing pressure of 1,000 psf for dead-plus-live loads. This value may be increased by one-third for short duration loads, such as wind or seismic.

7.7.4 The subgrade should be kept in a moist condition until time of slab placement. Slabs subject to structural loading may be designed utilizing a modulus of subgrade reaction K of 200 pounds per square inch per inch. The K value was approximated based on inter-relationship of soil classification and bearing values (Portland Cement Association, Rocky Mountain Northwest).

7.7.5 It is recommended that utility trenches within the structure be compacted, as specified in our report, to minimize the transmission of moisture through the utility trench backfill.

7.7.6 Ponding of water should not be allowed adjacent to the slabs. Over-irrigation in landscaped areas adjacent to the slabs should be prevented.

7.7.7 Proper finishing and curing should be performed in accordance with the latest guidelines provided by the American Concrete Institute, Portland Cement Association, and ASTM.

7.8 Lateral Earth Pressures and Frictional Resistance

7.8.1 Active, at-rest and passive unit lateral earth pressures against footings and walls are summarized in the table below:

Lateral Pressures Drained and Level Backfill Conditions	Equivalent Fluid Pressure, pcf
Active Pressure	33
At-Rest Pressure	52
Passive Pressure	350
Related Parameters	
Allowable Coefficient of Friction	0.45
In-Place Soil Density (lbs/ft^3)	120

7.8.2 Active pressure applies to walls, which are free to rotate. At-rest pressure applies to walls, which are restrained against rotation. The preceding lateral earth pressures assume sufficient drainage behind retaining walls to prevent the build-up of hydrostatic pressure.

7.8.3 The top one-foot of adjacent subgrade should be deleted from the passive pressure computation.

7.8.4 A safety factor consistent with the design conditions should be included in the usage of the values in the above table.

7.8.5 For stability against lateral sliding, which is resisted solely by the passive pressure, we recommend a minimum safety factor of 1.5.

7.8.6 For stability against lateral sliding, which is resisted by the combined passive and frictional resistance, a minimum safety factor of 2.0 is recommended.

7.8.7 For lateral stability against seismic loading conditions, we recommend a minimum safety factor of 1.1.

7.8.8 For dynamic seismic lateral loading the following equation shall be used:

Dynamic Seismic Lateral Loading Equation
Dynamic Seismic Lateral Load = $\frac{3}{8}\gamma K_h H^2$
Where: γ = In-Place Soil Density
K_h = Horizontal Acceleration = $\frac{2}{3}PGA_M$
H = Wall Height

7.9 Retaining Walls

7.9.1 Retaining and/or below grade walls should be drained with either perforated pipe encased in free-draining gravel or a prefabricated drainage system. The gravel zone should have a minimum width of 12 inches wide and should extend upward to within 12 inches of the top of the wall. The upper 12 inches of backfill should consist of native soils, concrete, asphaltic-concrete or other suitable backfill to minimize surface drainage into the wall drain system. The gravel should be completely wrapped in nonwoven polypropylene geotextiles (filter fabric) to minimize migration of soil particles into the voids of the crushed rock.

7.9.2 Prefabricated drainage systems, such as Miradrain®, Enkadrain®, or an equivalent substitute, are acceptable alternatives in lieu of gravel provided they are installed in accordance with the manufacturer's recommendations. If a prefabricated drainage system is proposed, our firm should review the system for final acceptance prior to installation.

7.9.3 Drainage pipes should be placed with perforations down and should discharge in a non-erosive manner away from foundations and other improvements. The top of the perforated pipe should be placed at or below the bottom of the adjacent floor slab or pavements. The pipe should be placed in the center line of the drainage blanket and should have a minimum diameter of 4 inches. Slots should be no wider than 1/8-inch in diameter, while perforations should be no more than ¼-inch in diameter.

7.9.4 If retaining walls are less than 5 feet in height, the perforated pipe may be omitted in lieu of weep holes on 4 feet maximum spacing. The weep holes should consist of 2-inch minimum diameter holes (concrete walls) or unmortared head joints (masonry walls) and placed no higher than 18 inches above the lowest adjacent grade. Two 8-inch square overlapping patches of geotextile fabric (conforming to the CalTrans Standard Specifications for "edge drains") should be affixed to the rear wall opening of each weep hole to retard soil piping.

7.9.5 During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall, or within a lateral distance equal to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

7.10 Temporary Excavations

7.10.1 We anticipate that the majority of the near surface site soils will be classified as Cal-OSHA "Type C" soil when encountered in excavations during site development and construction. Excavation sloping, benching, the use of trench shields, and the placement of trench spoils should conform to the latest applicable Cal-OSHA standards. The contractor should have a Cal-OSHA-approved "competent person" onsite during excavation to evaluate trench conditions and make appropriate recommendations where necessary.

7.10.2 It is the contractor's responsibility to provide sufficient and safe excavation support as well as protecting nearby utilities, structures, and other improvements which may be damaged by earth movements. All onsite excavations must be conducted in such a manner that potential surcharges from existing structures, construction equipment, and vehicle loads are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing foundation or vehicle load.

7.10.3 Temporary excavations and slope faces should be protected from rainfall and erosion. Surface runoff should be directed away from excavations and slopes.

7.10.4 Open, unbraced excavations in undisturbed soils should be made according to the slopes presented in the following table:

RECOMMENDED EXCAVATION SLOPES

Depth of Excavation (ft)	Slope (Horizontal : Vertical)
0-5	1:1
5-10	2:1

7.10.5 If, due to space limitation, excavations near property lines or existing structures are performed in a vertical position, slot cuts, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavations and installation. A Specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction.

7.10.6 Braced shorings should be designed for a maximum pressure distribution of 30H, (where H is the depth of the excavation in feet). The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given herein. Equipment traffic should concurrently be limited to an area at least 3 feet from the shoring face or edge of the slope.

7.10.7 The excavation and shoring recommendations provided herein are based on soil characteristics derived from the borings within the area. Variations in soil conditions will likely be encountered during the excavations. SALEM Engineering Group, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation. Slope height, slope inclination, or excavation depth should in no case exceed those specified in local, state, or federal safety regulation, (e.g. OSHA) standards for excavations, 29 CFR part 1926, or Assessor's regulations.

7.11 Underground Utilities

7.11.1 Underground utility trenches should be backfilled with properly compacted material. The material excavated from the trenches should be adequate for use as backfill provided it does not contain deleterious matter, vegetation or rock larger than 3-inches in maximum dimension. Trench backfill utilizing native soils should be placed in loose lifts not exceeding 8-inches and compacted to 95% relative compaction.

7.11.2 Bedding and pipe zone backfill typically extends from the bottom of the trench excavations to approximately 6 to 12 inches above the crown of the pipe. Pipe bedding and backfill material should conform to the requirements of the governing utility agency.

7.11.3 It is suggested that underground utilities crossing beneath new or existing structures be plugged at entry and exit locations to the building or structure to prevent water migration. Trench plugs can consist of on-site clay soils, if available, or sand cement slurry. The trench plugs should extend 2 feet beyond each side of individual perimeter foundations.

7.11.4 The contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

7.12 Surface Drainage

7.12.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change to important engineering properties. Proper drainage should be maintained at all times.

7.12.2 The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than 5 percent for a minimum distance of 10 feet.

7.12.3 Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 percent away from the building and drainage gradients maintained to carry all surface water to collection facilities and off site. These grades should be maintained for the life of the project. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed.

7.12.4 Roof drains should be installed with appropriate downspout extensions out-falling on splash blocks so as to direct water a minimum of 5 feet away from the structures or be connected to the storm drain system for the development.

7.13 Pavement Design

7.13.1 Based on site soil conditions and laboratory testing, an R-value of 40 was used for the preliminary flexible asphaltic concrete pavement design. The R-value may be verified during grading of the pavement areas.

7.13.2 The pavement design recommendations provided herein are based on the State of California Department of Transportation (CALTRANS) design manual. The following table shows the recommended pavement sections for various traffic indices.

TABLE 7.13.2
ASPHALT CONCRETE PAVEMENT

Traffic Index	Asphaltic Concrete	Clean Crushed Aggregate Base*	Compacted Subgrade*
5.0 (Vehicle Parking and Drive Areas)	3.0"	4.0"	12.0"
6.0 (Occasional Truck Areas)	3.0"	6.0"	12.0"
7.0 (Heavy Truck Areas)	4.0"	7.0"	12.0"

95% compaction based on ASTM D1557 Test Method

7.13.3 The following recommendations are for light-duty, medium-duty and heavy-duty Portland Cement Concrete pavement sections.

TABLE 7.13.3
PORTLAND CEMENT CONCRETE PAVEMENT

Traffic Index	Portland Cement Concrete*	Clean Crushed Aggregate Base**	Compacted Subgrade**
5.0 (Light Duty)	5.0"	4.0"	12.0"
6.0 (Medium Duty)	6.0"	4.0"	12.0"
7.0 (Heavy Duty)	7.0"	6.0"	12.0"

**** Minimum Compressive Strength of 4,000 psi, Minimum Reinforcement of No. 4 bars at 18 inches o.c. each way***
***** 95% compaction based on ASTM D1557 Test Method***

8. PLAN REVIEW, CONSTRUCTION OBSERVATION AND TESTING

8.1 Plan and Specification Review

8.1.1 SALEM should review the project plans and specifications prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required.

8.2 Construction Observation and Testing Services

8.2.1 The recommendations provided in this report are based on the assumption that we will continue as Geotechnical Engineer of Record throughout the construction phase. It is important to maintain continuity of geotechnical interpretation and confirm that field conditions encountered are similar to those anticipated during design. If we are not retained for these services, we cannot assume any responsibility for others interpretation of our recommendations, and therefore the future performance of the project.

8.2.2 SALEM should be present at the site during site preparation to observe site clearing, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

8.2.3 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

9. LIMITATIONS AND CHANGED CONDITIONS

The analyses and recommendations submitted in this report are based upon the data obtained from the test borings drilled at the approximate locations shown on the Site Plan, Figure 2. The report does not reflect variations which may occur between borings. The nature and extent of such variations may not become evident until construction is initiated. If variations then appear, a re-evaluation of the recommendations of this report will be necessary after performing on-site observations during the excavation period and noting the characteristics of such variations.

The findings and recommendations presented in this report are valid as of the present and for the proposed construction. If site conditions change due to natural processes or human intervention on the property or adjacent to the site, or changes occur in the nature or design of the project, or if there is a substantial time lapse between the submission of this report and the start of the work at the site, the conclusions and recommendations contained in our report will not be considered valid unless the changes are reviewed by SALEM and the conclusions of our report are modified or verified in writing. The validity of the recommendations contained in this report is also dependent upon an adequate testing and observations program during the construction phase.

Our firm assumes no responsibility for construction compliance with the design concepts or recommendations unless we have been retained to perform the on-site testing and review during construction. SALEM has prepared this report for the exclusive use of the owner and project design consultants.

SALEM does not practice in the field of corrosion engineering. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, that manufacturer's recommendations for corrosion protection be closely followed. Further, a corrosion engineer may be needed to incorporate the necessary precautions to avoid premature corrosion of concrete slabs and foundations in direct contact with native soil. The importation of soil and or aggregate materials to the site should be screened to determine the potential for corrosion to concrete and buried metal piping.

The report has been prepared in accordance with generally accepted geotechnical engineering practices in the area. No other warranties, either express or implied, are made as to the professional advice provided under

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

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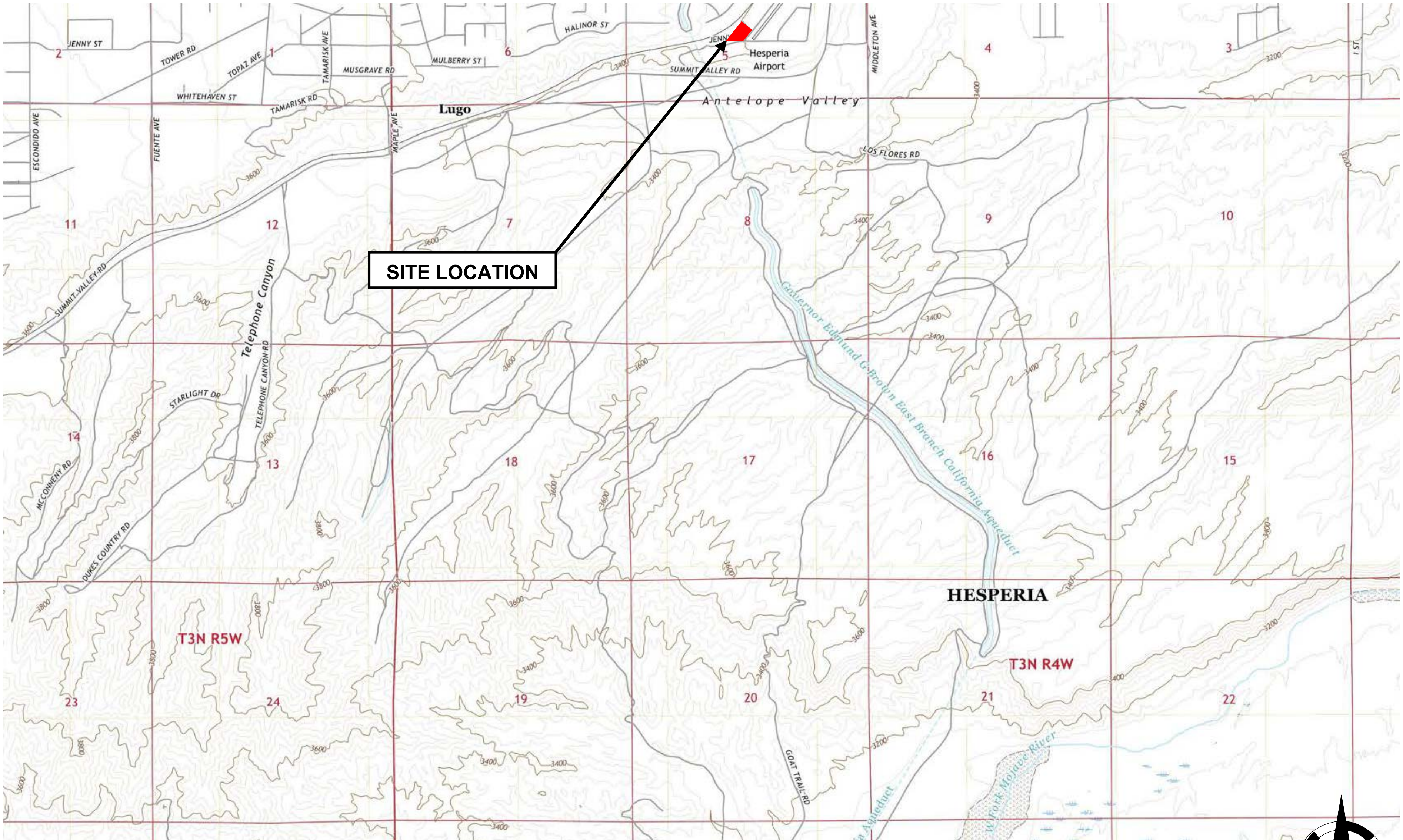
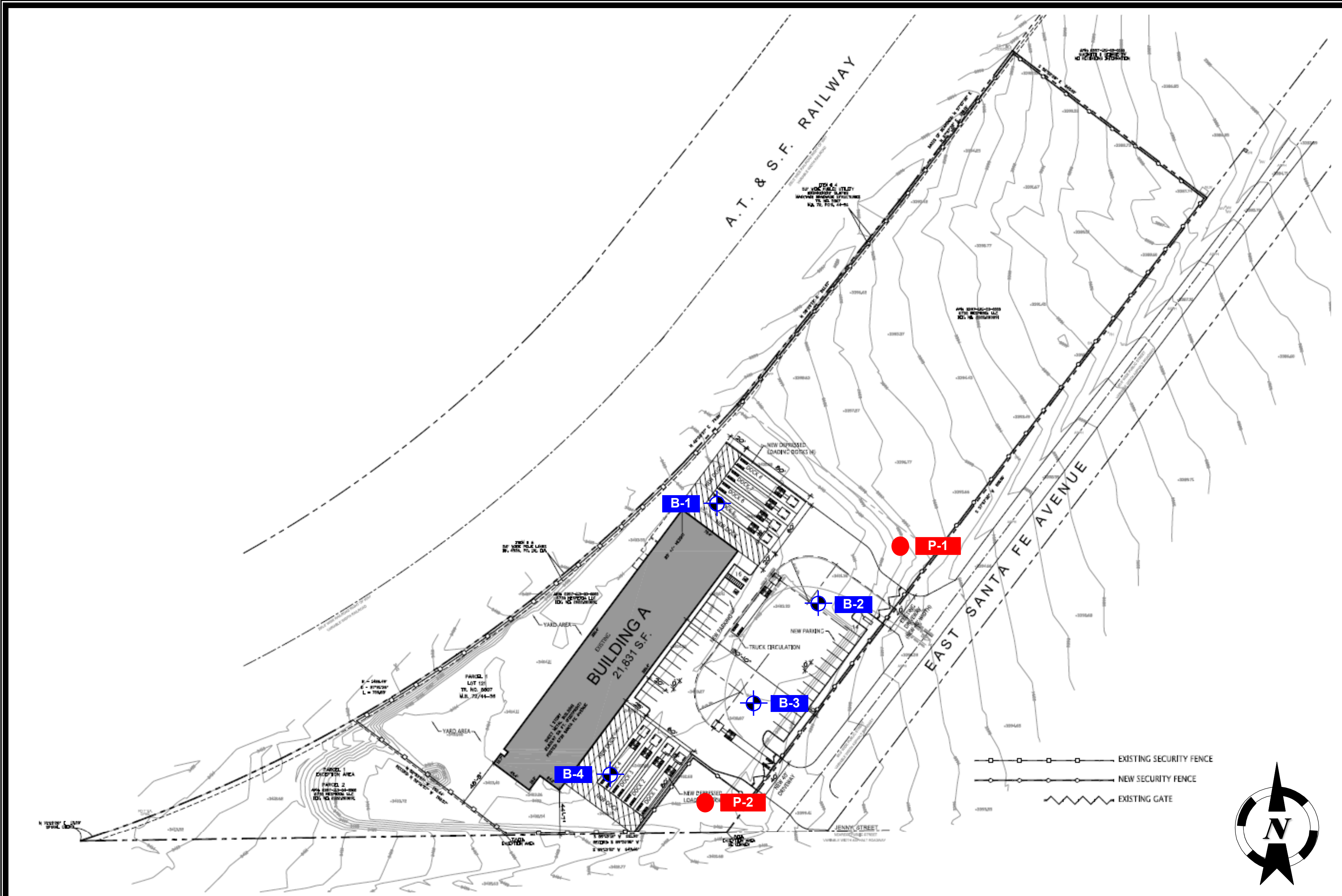


Source Image: U.S. Geological Survey, Silverwood Lake, California, https://ngmdb.usgs.gov/topoview (2021)

VICINITY MAP **LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION** **Proposed Loading Docks and Parking Lot** **6730 Santa Fe Avenue E** **Hesperia, California**	SCALE: NOT TO SCALE	DATE: 05/2023	SALEM engineering group, inc.
	DRAWN BY: JC	APPROVED BY: CJ	
	PROJECT NO. 3-223-0381	FIGURE NO. 1	



SITE PLAN

LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION
Proposed Loading Docks and Parking Lot
6730 Santa Fe Avenue E
Hesperia, California

SCALE: NOT TO SCALE	DATE: 05/2023
DRAWN BY: JC	APPROVED BY: CJ
PROJECT NO. 3-223-0381	FIGURE NO. 2

LEGEND:

B-1 Soil Boring Locations
P-1 Percolation Locations

All Locations Approximate

SALEM engineering group, inc.

APPENDIX

A

APPENDIX A
FIELD EXPLORATION

Fieldwork for our investigation (drilling) was conducted on May 8, 2023, and included a site visit, subsurface exploration, percolation testing, and soil sampling. The locations of the exploratory borings and percolation tests are shown on the Site Plan, Figure 2. Boring logs for our exploration are presented in figures following the text in this appendix. Borings were located in the field using existing reference points. Therefore, actual boring locations may deviate slightly.

In general, the test borings were advanced with a 3-inch diameter hand auger. Surface asphalt for borings B-1 and B-4 was cored using a coring machine prior to drilling. The test borings were extended to a maximum depth of 10 feet below existing grade. Subsurface soil samples were obtained from ring samples and the auger cuttings at the depths shown on the logs of borings.

Subsurface conditions encountered in the exploratory borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D2488). This system uses the Unified Soil Classification System (USCS) for soil designations. The logs depict soil and geologic conditions encountered and depths at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the field logs were revised based on subsequent laboratory testing.

Test Boring: B-1 **Page** 1 **Of:** 1

SALEM engineering group, inc.

Project Number: 3-223-0381

Date: 05/08/2023

Client: Crede Group

Project: Proposed Loading Docks and Parking Lot

Location: 6730 Santa Fe Avenue E, Hesperia, California

Drilled By: SALEM **Logged By:** CC

Drill Type: N/A **Elevation:** 3,411'

Auger Type: 3 in. Hand Auger **Initial Depth to Groundwater:** N/A

Hammer Type: 35 lb - Manual Drop **Final Depth to Groundwater:** N/A

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
0		AC	Asphalt Concrete = 2 in.				
		AB	Aggregate Base = 3.25				
3410		SM	Silty SAND Moist; brown; fine to coarse grain sand.				
2					5.5	105.8	
3408			Grades as above; reddish brown.				
4							
3406			Grades as above.		7.9	-	
6							
3404							
8							
3402			Grades as above; trace gravel.		5.6	-	
10			End of boring at 10 feet BSG.				
3400							

Notes:

Figure Number A-1

SALEM engineering group, inc.

Test Boring: B-2 **Page** 1 **Of:** 1

Project Number: 3-223-0381

Date: 05/08/2023

Client: Crede Group

Project: Proposed Loading Docks and Parking Lot

Location: 6730 Santa Fe Avenue E, Hesperia, California

Drilled By: SALEM **Logged By:** CC

Drill Type: N/A **Elevation:** 3,409'

Auger Type: 3 in. Hand Auger **Initial Depth to Groundwater:** N/A

Hammer Type: 35 lb - Manual Drop **Final Depth to Groundwater:** N/A

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
0		SM	Silty SAND Slightly moist; light brown; fine to coarse grain sand.				
3408					3.6	-	
2			Grades as above; brown.		4.4	-	
3406							
4			Grades as above; moist; fine to medium grain sand.		6.9	-	
3404			End of boring at 5 feet BSG.				
6							
3402							
8							
3400							
10							
3398							

Notes:

Figure Number A-2

SALEM engineering group, inc.

Test Boring: B-3 **Page** 1 **Of:** 1

Project Number: 3-223-0381

Date: 05/08/2023

Client: Crede Group

Project: Proposed Loading Docks and Parking Lot

Location: 6730 Santa Fe Avenue E, Hesperia, California

Drilled By: SALEM **Logged By:** CC

Drill Type: N/A **Elevation:** 3,412'

Auger Type: 3 in. Hand Auger **Initial Depth to Groundwater:** N/A

Hammer Type: 35 lb - Manual Drop **Final Depth to Groundwater:** N/A

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
3412 — 0		SM	Silty SAND Moist; brown; fine to coarse grain sand.				
			Grades as above.		5.1	-	
3410 — 2							
			Grades as above.		5.8	-	
			End of boring at 3 feet BSG.				
3408 — 4							
3406 — 6							
3404 — 8							
3402 — 10							

Notes:

Figure Number A-3

SALEM engineering group, inc.

Test Boring: B-4 **Page** 1 **Of:** 1

Project Number: 3-223-0381

Date: 05/08/2023

Client: Crede Group

Project: Proposed Loading Docks and Parking Lot

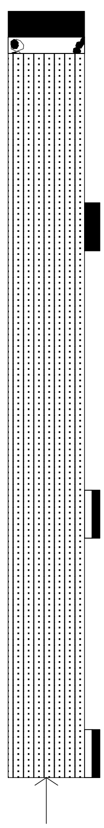
Location: 6730 Santa Fe Avenue E, Hesperia, California

Drilled By: SALEM **Logged By:** CC

Drill Type: N/A **Elevation:** 3,412'

Auger Type: 3 in. Hand Auger **Initial Depth to Groundwater:** N/A

Hammer Type: 35 lb - Manual Drop **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
3412 — 0	AC	Asphalt Concrete = 3.25 in.				
	AB	Aggregate Base = 2 in.				
	SM	Silty SAND Moist; reddish brown; fine to coarse grain sand; trace gravel.				
3410 — 2				8.6	115.8	
3408 — 4						
		Grades as above; brown; less silt.		7.2	-	
3406 — 6						
		Grades as above; light brown.		6.6	-	
3404 — 8		Refusal at 8 feet BSG due to hard soil.				
3402 — 10						

Notes:

Figure Number A-4

KEY TO SYMBOLS

Symbol Description

Strata symbols

Asphaltic Concrete

Description not given for:
"AG"

Silty sand

Misc. Symbols

Drill rejection

Soil Samplers

California sampler

Auger

Notes:

Granular Soils
Blows Per Foot (Uncorrected)

	MCS	SPT
Very loose	<5	<4
Loose	5-15	4-10
Medium dense	16-40	11-30
Dense	41-65	31-50
Very dense	>65	>50

Cohesive Soils
Blows Per Foot (Uncorrected)

	MCS	SPT
Very soft	<3	<2
Soft	3-5	2-4
Firm	6-10	5-8
Stiff	11-20	9-15
Very Stiff	21-40	16-30
Hard	>40	>30

MCS = Modified California Sampler
SPT = Standard Penetration Test Sampler

Percolation Test Worksheet

Project: **Proposed Loading Docks and Parking Lot**
6730 Santa Fe Avenue E
Hesperia, California

Job No.: **3-223-0381**
Date Drilled: **5/8/2023**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 3 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 57 in.

Test Hole No.: **P-1**
Tested by: **CC**
Drilled Hole Depth: **4.75** ft.

Presoaking Date: **5/8/2023**
Test Date: **5/8/2023**

Pipe Stick up: 0.25 ft.

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
8:25	8:50	5.0	Y	0:25	1.52	2.64	13.44	25	1.9	41.8	28.3	35.0	1.32
8:51	9:16	5.0	Y	0:25	1.60	2.63	12.36	25	2.0	40.8	28.4	34.6	1.23
9:17	9:27	5.0	Y	0:10	2.06	2.44	4.56	10	2.2	35.3	30.7	33.0	1.19
9:27	9:37	5.0	N	0:10	2.44	2.77	3.96	10	2.5	30.7	26.8	28.7	1.18
9:37	9:47	5.0	N	0:10	2.77	3.05	3.36	10	3.0	26.8	23.4	25.1	1.14
9:48	9:58	5.0	Y	0:10	1.64	2.05	4.92	10	2.0	40.3	35.4	37.9	1.13
9:58	10:08	5.0	N	0:10	2.05	2.41	4.32	10	2.3	35.4	31.1	33.2	1.12
10:08	10:18	5.0	N	0:10	2.41	2.73	3.84	10	2.6	31.1	27.2	29.2	1.13
												Infiltration Rate	**1.12**

SALEM engineering group, inc.

Percolation Test Worksheet

Project: **Proposed Loading Docks and Parking Lot**
6730 Santa Fe Avenue E
Hesperia, California

Job No.: **3-223-0381**
Date Drilled: **5/8/2023**
Soil Classification: **Poorly graded SAND (SP)**

Hole Radius: 3 in.
Pipe Dia.: 3 in.

Test Hole No.: **P-2**
Tested by: **CC**
Drilled Hole Depth: **3.0** ft.

Presoaking Date: **5/8/2023**
Test Date: **5/8/2023**

Total Depth of Hole: 36 in.
Pipe Stick up: 1.75 ft.

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
8:45	9:10	4.8	Y	0:25	2.40	3.75	16.20	25	1.5	28.2	12.0	20.1	2.70
9:11	9:36	4.8	Y	0:25	2.62	3.81	14.28	25	1.8	25.6	11.3	18.4	2.58
9:37	9:47	4.8	Y	0:10	2.70	3.23	6.36	10	1.6	24.6	18.2	21.4	2.50
9:47	9:57	4.8	N	0:10	3.23	3.62	4.68	10	2.1	18.2	13.6	15.9	2.42
9:57	10:07	4.8	N	0:10	3.62	3.91	3.48	10	2.9	13.6	10.1	11.8	2.35
10:08	10:18	4.8	Y	0:10	3.00	3.43	5.16	10	1.9	21.0	15.8	18.4	2.33
10:18	10:28	4.8	N	0:10	3.43	3.76	3.96	10	2.5	15.8	11.9	13.9	2.32
10:28	10:38	4.8	N	0:10	3.76	4.02	3.12	10	3.2	11.9	8.8	10.3	2.38
												Infiltration Rate	**2.32**

SALEM engineering group, inc.

APPENDIX

B

APPENDIX B
LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM), Caltrans, or other suggested procedures. Selected samples were tested for in-situ moisture content, density, shear strength, maximum density and optimum moisture content, gradation, and corrosivity of the material encountered. The results of the laboratory tests are summarized in the following figures.

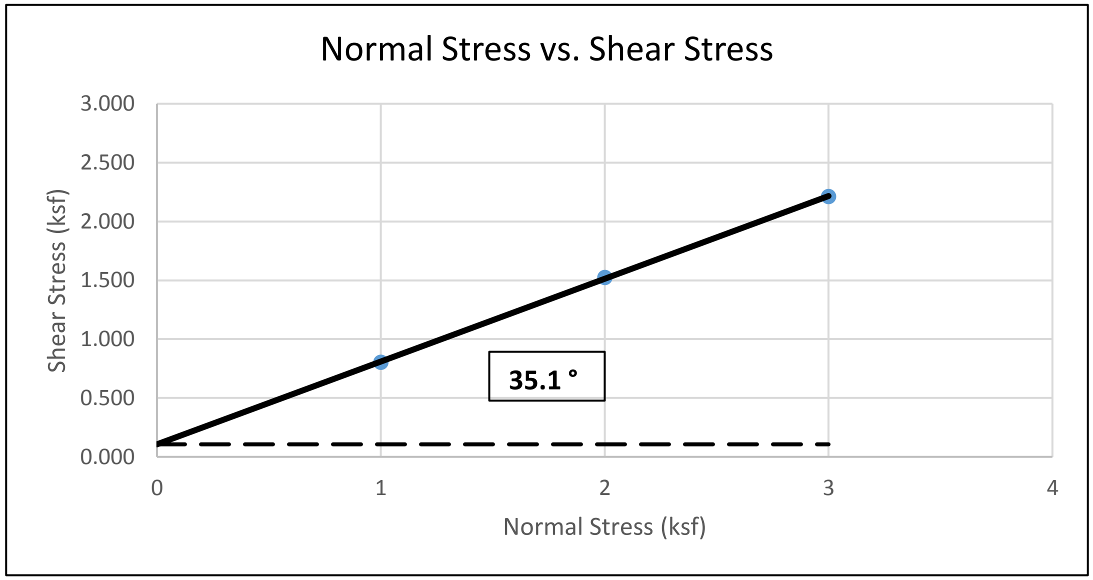
Direct Shear Test (ASTM D3080)

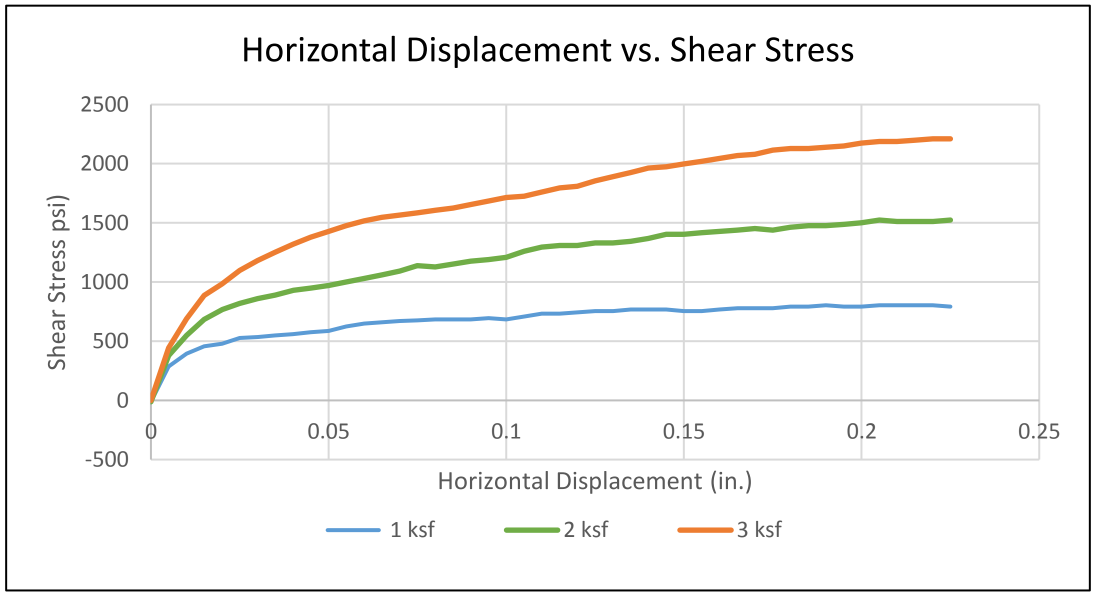
Project Name:	Proposed Loading Docks & Parking Lot - Hesperia, CA
Project Number:	3-223-0381
Client:	Crede Group
Sample Location:	B-1 @ 2'
Sample Type:	Undisturbed Ring
Soil Classification:	Silty SAND (SM)
Tested By:	M. Noorzay
Reviewed By:	CJ
Date:	5/11/2023
Equipment Used:	Geomatic Direct Shear Machine

	Sample 1	Sample 2	Sample 3
Normal Stress (ksf)	1.000	2.000	3.000
Shear Rate (in/min)	0.004		
Peak Shear Stress (ksf)	0.804	1.524	2.210
Residual Shear Stress (ksf)	0.000	0.000	0.000

Initial Height of Sample (in)	1.000	1.000	1.000
Height of Sample before Shear (in.)	1	1	1
Diameter of Sample (in)	2.416	2.416	2.416
Initial Moisture Content (%)	5.4		
Final Moisture Content (%)	14.5	13.6	13.4
Dry Density (pcf)	108.5	110.2	108.8

Peak Shear Strength Values	
Slope	0.70
Friction Angle	35.1
Cohesion (psf)	106

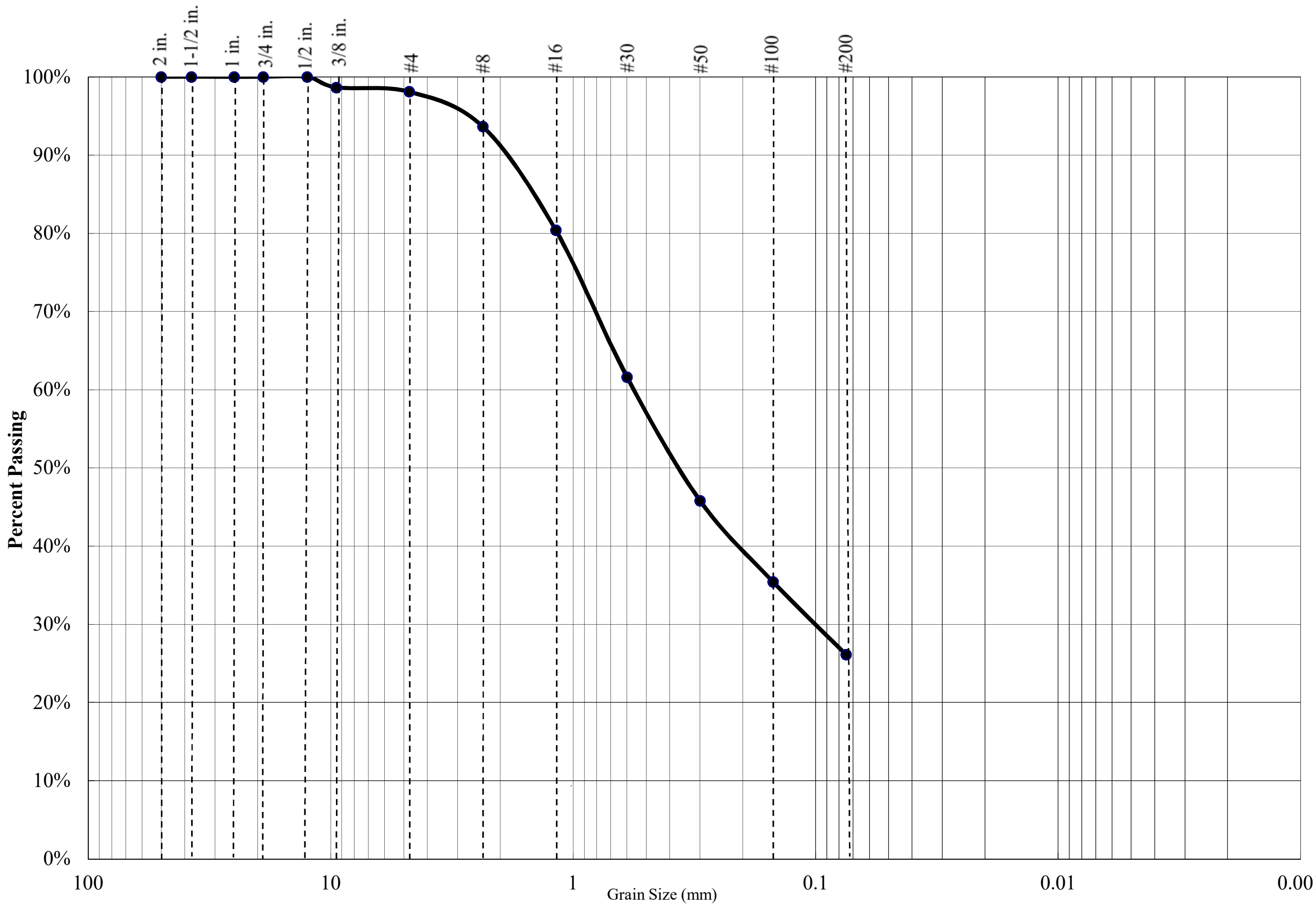




SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
2%	72%	26%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	98.7%
#4	98.1%
#8	93.6%
#16	80.4%
#30	61.6%
#50	45.8%
#100	35.4%
#200	26.1%

Atterberg Limits		
PL=	LL=	PI=

Coefficients				
D_{85}=		D_{60}=		D_{50}=
D_{30}=		D_{15}=		D_{10}=
C_u=	N/A	C_c=	N/A	

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

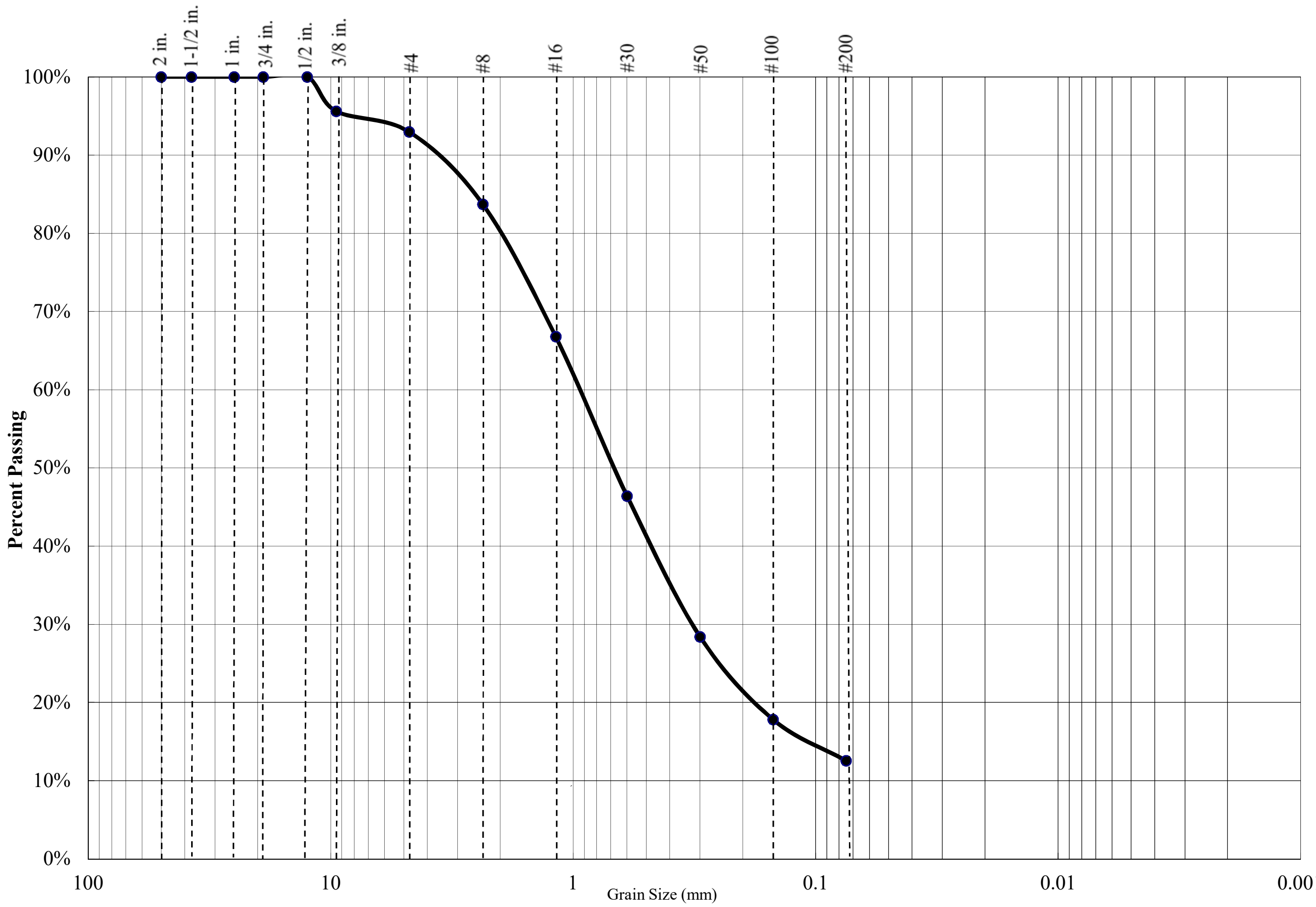
Project Number: 3-223-0381

Boring: B-1 @ 2'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
7%	80%	13%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	95.6%
#4	93.0%
#8	83.7%
#16	66.8%
#30	46.4%
#50	28.4%
#100	17.8%
#200	12.6%

Atterberg Limits		
PL=	LL=	PI=

Coefficients		
D_{85}=	D_{60}=	D_{50}=
D_{30}=	D_{15}=	D_{10}=
C_u= N/A	C_c= N/A	

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

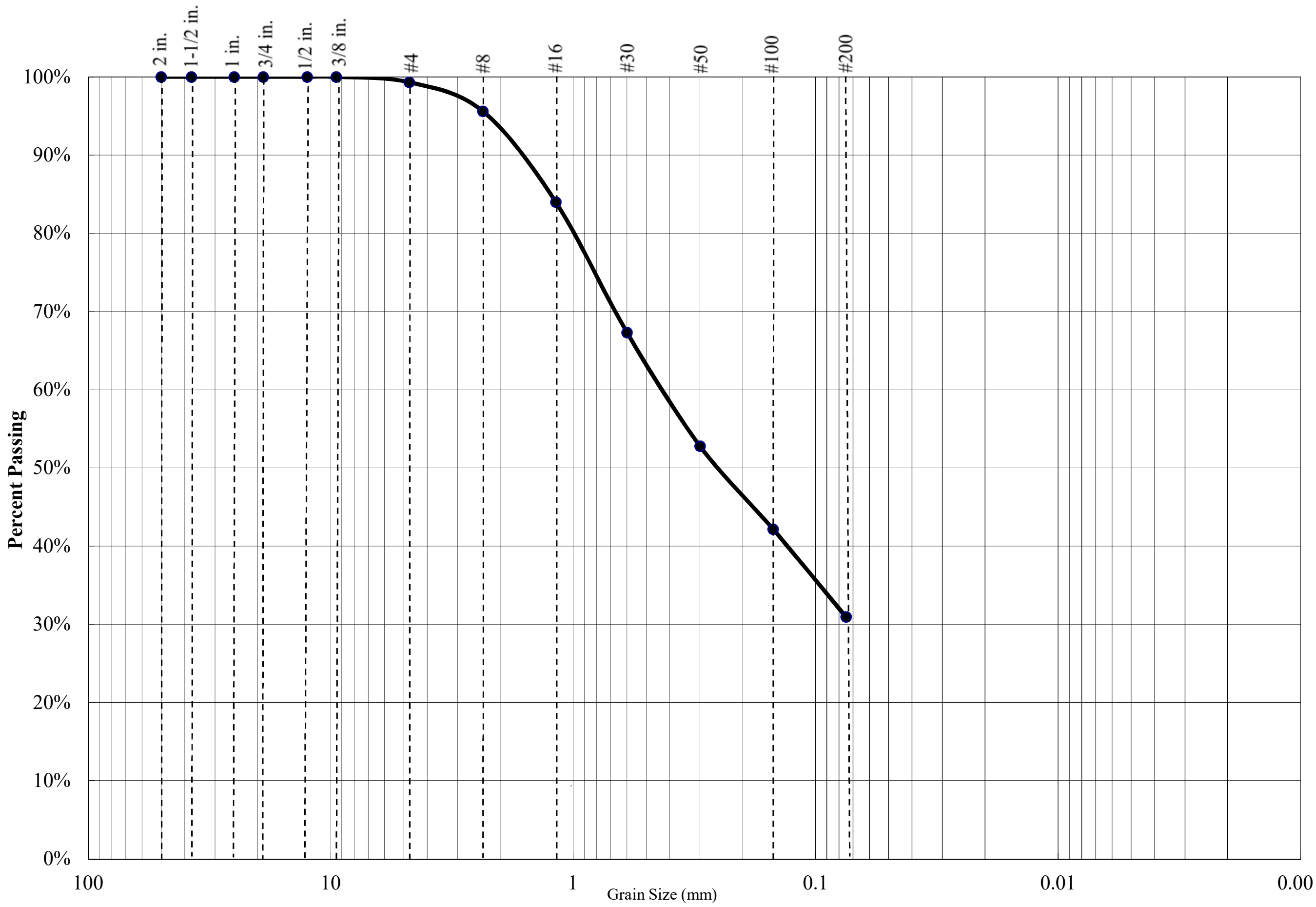
Project Number: 3-223-0381

Boring: B-1 @ 10'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
1%	68%	31%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	100.0%
#4	99.3%
#8	95.6%
#16	84.0%
#30	67.3%
#50	52.8%
#100	42.2%
#200	30.9%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Silty SAND (SM)

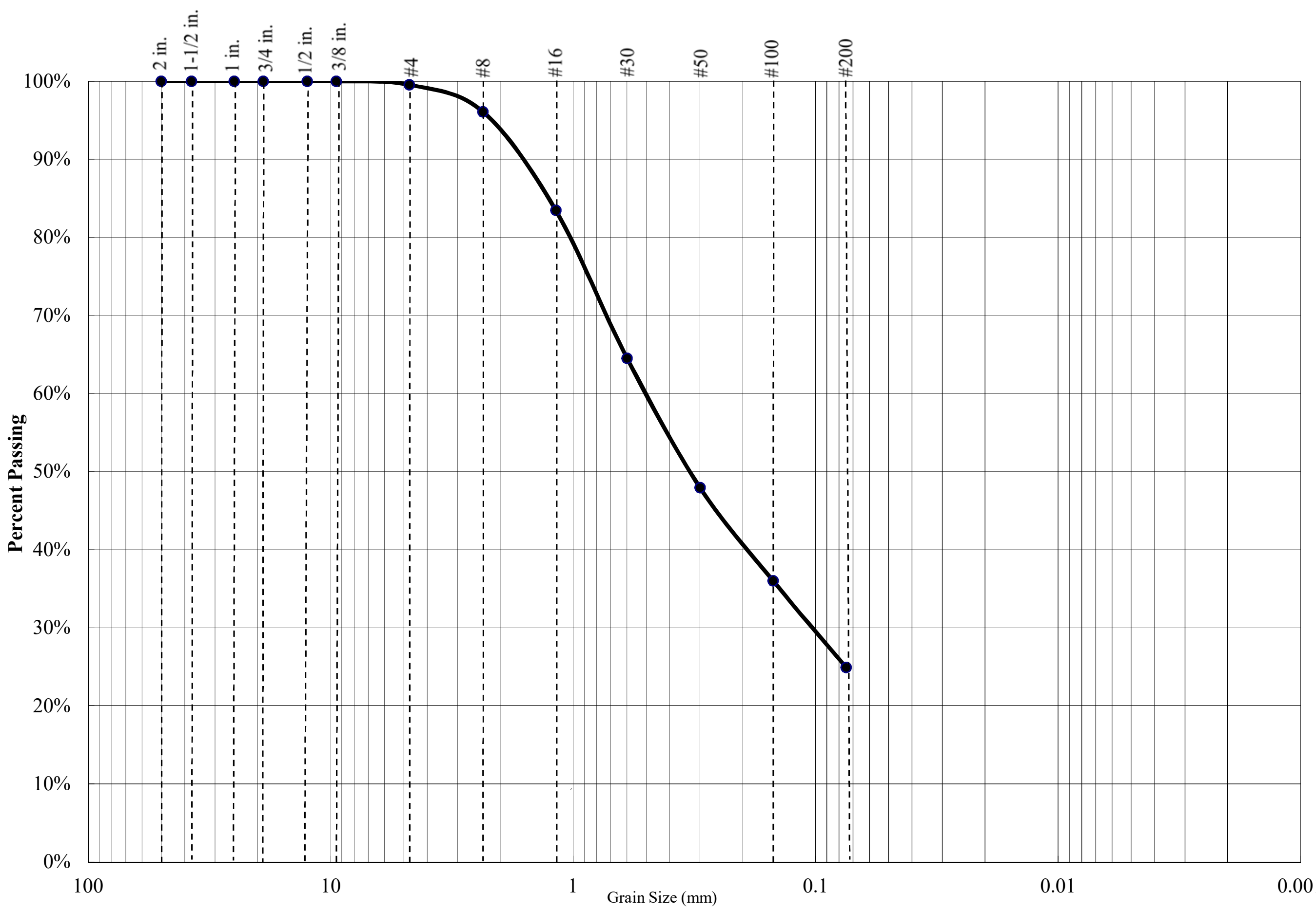
Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

Project Number: 3-223-0381

Boring: B-2 @ 5'

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
0%	75%	25%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	100.0%
#4	99.5%
#8	96.1%
#16	83.5%
#30	64.5%
#50	47.9%
#100	36.0%
#200	24.9%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

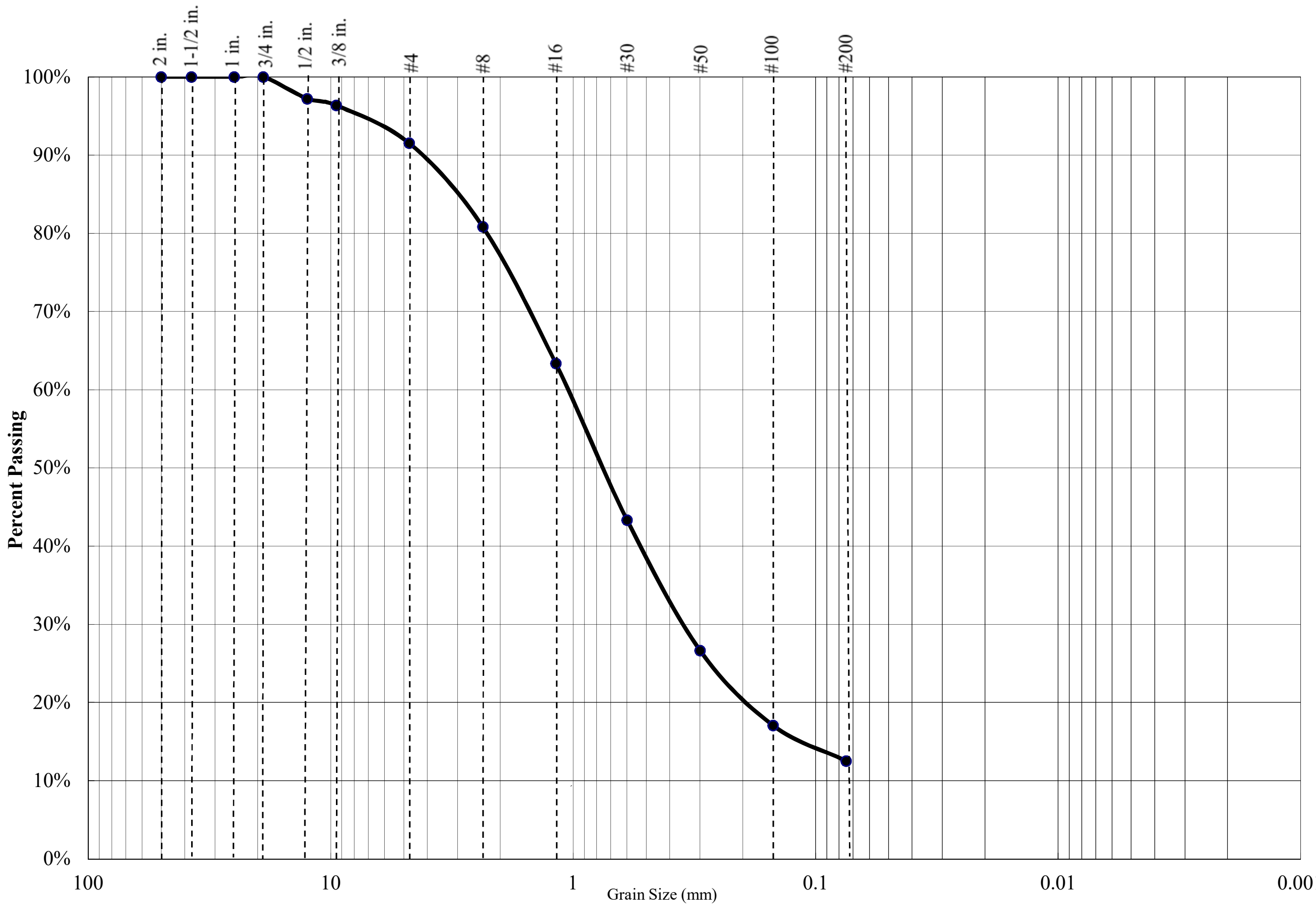
Project Number: 3-223-0381

Boring: B-3 @ 1'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
8%	79%	13%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	97.2%
3/8 inch	96.4%
#4	91.5%
#8	80.8%
#16	63.4%
#30	43.3%
#50	26.7%
#100	17.1%
#200	12.5%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

Project Number: 3-223-0381

Boring: B-4 @ 5'

SALEM engineering group, inc.

CHEMICAL ANALYSIS

SO_4 - Modified CTM 417 & Cl - Modified CTM 417/422

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA
Project Number: 3-223-0381
Date Sampled: 5/8/2023 Date Tested: 5/11/2023
Sampled By: CC Tested By: M. Noorzay
Soil Description: Brown Silty SAND (SM)

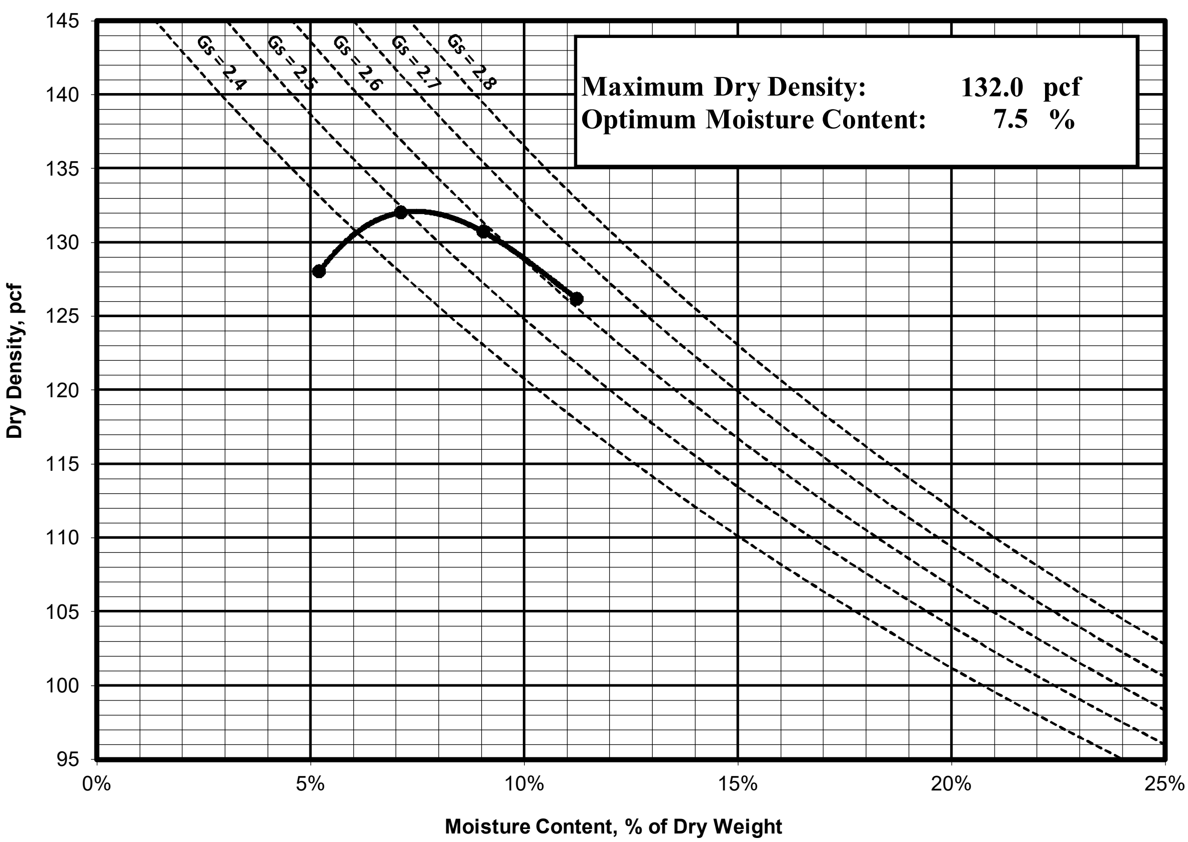
Sample Number	Sample Location	Soluble Sulfate SO_4-S	Soluble Chloride Cl	pH
1a.	B-2 @ 0'-5'	840 mg/kg	32 mg/kg	7.5
1b.	B-2 @ 0'-5'	780 mg/kg	31 mg/kg	7.5
1c.	B-2 @ 0'-5'	800 mg/kg	32 mg/kg	7.5
Average:		**807 mg/kg**	**32 mg/kg**	**7.5**

SALEM engineering group, inc.

Laboratory Compaction Curve
ASTM D1557

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA
Project Number: 3-223-0381
Date Sampled: 5/8/2023 Date Tested: 5/11/2023
Sampled By: CC Tested By: M. Noorzay
Sample Location: B-2 @ 0'-5'
Soil Description: Brown Silty SAND (SM)
Test Method: Method B

	1	2	3	4
Weight of Moist Specimen & Mold, (g)	6316.7	6418.3	6435.0	6401.9
Weight of Compaction Mold, (g)	4280.2	4280.2	4280.2	4280.2
Weight of Moist Specimen, (g)	2036.5	2138.1	2154.8	2121.7
Volume of Mold, (ft^3)	0.0333	0.0333	0.0333	0.0333
Wet Density, (pcf)	134.7	141.4	142.5	140.3
Weight of Wet (Moisture) Sample, (g)	200.0	200.0	200.0	200.0
Weight of Dry (Moisture) Sample, (g)	190.1	186.7	183.4	179.8
Moisture Content, (%)	5.2%	7.1%	9.1%	11.2%
Dry Density, (pcf)	128.0	132.0	130.7	126.2



Maximum Dry Density: 132.0 pcf
Optimum Moisture Content: 7.5 %

APPENDIX

C

APPENDIX C
GENERAL EARTHWORK AND PAVEMENT SPECIFICATIONS

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

1.0 SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including, but not limited to, the furnishing of all labor, tools and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans and disposal of excess materials.

2.0 PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of SALEM Engineering Group, Incorporated, hereinafter referred to as the Soils Engineer and/or Testing Agency. Attainment of design grades, when achieved, shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary adjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer, or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

3.0 TECHNICAL REQUIREMENTS: All compacted materials shall be densified to no less than 95 percent of relative compaction (90 percent for clay soils) based on ASTM D1557 Test Method (latest edition) or as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

4.0 SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the Geotechnical Engineering Report. The Contractor shall make his own interpretation of the data contained in the Geotechnical Engineering Report and the Contractor shall not be relieved of liability for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

5.0 DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or wind-blown materials attributable to his work. Site preparation shall consist of site clearing and grubbing and preparation of foundation materials for receiving fill.

6.0 CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter and all other matter determined by the Soils Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than 1 inch in diameter. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

7.0 SUBGRADE PREPARATION: Surfaces to receive Engineered Fill and/or building or slab loads shall be prepared as outlined above, scarified to a minimum of 12 inches, moisture-conditioned as necessary, and recompacted to 95 percent relative compaction (90 percent for clay soils).

Loose soil areas and/or areas of disturbed soil shall be moisture-conditioned as necessary and recompacted to 95 percent relative compaction (90 percent for clay soils). All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any fill material.

8.0 EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

9.0 FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence or approval of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills, provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

10.0 PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. Compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer. Both cut and fill shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

11.0 SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing, or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill is as specified.

12.0 DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term “Standard Specifications”: hereinafter referred to, is the most recent edition of the Standard Specifications of the State of California, Department of Transportation. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as determined by ASTM D1557 Test Method (latest edition).

13.0 PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 95 percent (90 percent for clay soils) based upon ASTM D1557. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

14.0 AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class II material, ¾-inch or 1½-inches maximum size. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent based upon ASTM D1557. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

15.0 ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10, unless otherwise stipulated or local conditions warrant more stringent grade. The mineral aggregate shall be Type A or B, ½ inch maximum size, medium grading, and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning, and mixing of the materials shall conform to Section 39. The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with a combination steel-wheel and pneumatic rollers, as described in the Standard Specifications. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

Appendix E

Water Quality Management Plan

MOJAVE RIVER WATERSHED

Water Quality Management Plan

For:

Hesperia Industrial

WHERE APPLICABLE, INSERT GRADING PERMIT NO., BUILDING PERMIT NO., TRACT NUMBER, LAND DEVELOPMENT FILE NO., CUP, SUP AND/OR APN (SPECIFY LOT NUMBERS IF SITE IS A PORTION OF A TRACT)

Prepared for:

Cire Equity

530 B St. Suite 2050

San Diego, CA 92101

Phone: (520) 370-2571

Prepared by:

IMEG Corp

901 Via Piemonte, Suite 400

Ontario, California 91764

Phone: (909) 942-5540

Submittal Date: 05/30/2023

Revision No. and Date: Insert No and Current Revision Date

Revision No. and Date: Insert No and Current Revision Date

Revision No. and Date: Insert No and Current Revision Date

Revision No. and Date: Insert No and Current Revision Date

Revision No. and Date: Insert No and Current Revision Date

Final Approval Date:______________________

Project Owner's Certification

This Mojave River Watershed Water Quality Management Plan (WQMP) has been prepared for Cire Equity by IMEG Corp. The WQMP is intended to comply with the requirements of the City of Hesperia and the Phase II Small MS4 General Permit for the Mojave River Watershed. 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 the Phase II Small MS4 Permit and the intent of San Bernardino County (unincorporated areas of Phelan, Oak Hills, Spring Valley Lake and Victorville) and the incorporated cities of Hesperia and Victorville and the Town of Apple Valley. Once the undersigned transfers its interest in the property, its successors in interest and the city/county/town 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):	
Tract/Parcel Map Number(s):	5807	Building Permit Number(s):	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: 0397-113-03-0000 Lots 120 and 121

Owner's Signature			
Owner Name:			
Title	Owner		
Company	Cire Equity		
Address	7878 N. 16th Street Phoenix, AZ 85020		
Email	srussell@cireequity.com		
Telephone #	(520) 370-2571		
Signature		Date	

Preparer's Certification

Project Data			
Permit/Application Number(s):		Grading Permit Number(s):	
Tract/Parcel Map Number(s):	5807	Building Permit Number(s):	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract):			APN: 0397-113-03-0000 Lots 120 and 121

"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 the California State Water Resources Control Board Order No. 2013-0001-DWQ.

Engineer: John Thompson		PE Stamp Below
Title	Client Executive	
Company	IMEG Corp	
Address	901 Via Piemonte, Suite 400, Ontario CA 91764	
Email	John.M.Thompson@imegcorp.com	
Telephone #	909-942-5540	
Signature		
Date		

Table of Contents

Forms

Section I – Introduction

This WQMP template has been prepared specifically for the Phase II Small MS4 General Permit in the Mojave River Watershed. This location is within the jurisdiction of the Lahontan Regional Water Quality Control Board (LRWQCB). This document should not be confused with the WQMP template for the Santa Ana Phase I area of San Bernardino County.

WQMP preparers must refer to the MS4 Permit for the Mojave Watershed WQMP template and Technical Guidance (TGD) document found at: http://cms.sbcounty.gov/dpw/Land/NPDES.aspx to find pertinent arid region and Mojave River Watershed specific references and requirements.

Section 1 Discretionary Permit(s)

Form 1-1 Project Information

Project Name	Hesperia Industrial				
Project Owner Contact Name:	Steve Russell				
Mailing Address:	7878 N. 16th Street, Pheniox AZ 85020	E-mail Address:	srussell@cireequity.com	Telephone:	520-370-2571
Permit/Application Number(s):		Tract/Parcel Map Number(s):	5807		
Additional Information/ Comments:					
Description of Project:	The project site has an existing warehouse building with a building area of 21,831 s.f. Only about 8.2% of the site including the building and small amount of pavement is developed and most of the site consists of dirt and landscaping. The proposed improvements incluide adding loading docks for the trailers, making the parking layout and striping ADA compliant, and utility coordination to assist drainage on site since there will be an increase in paving and impervious areas after the improvements. The paved area on the north end of the site will be used for storage and will have forklift drivers movig products to and from the warehouse.				
Provide summary of Conceptual WQMP conditions (if previously submitted and approved). Attach complete copy.	N/A				

Section 2 Project Description

2.1 Project Information

The WQMP shall 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.

2.1.1 Project Sizing Categorization

If the Project is greater than 5,000 square feet, and not on the excluded list as found on Section 1.4 of the TGD, the Project is a Regulated Development Project.

If the Project is creating and/or replacing greater than 2,500 square feet but less than 5,000 square feet of impervious surface area, then it is considered a Site Design Only project. This criterion is applicable to all development types including detached single family homes that create and/or replace greater than 2,500 square feet of impervious area and are not part of a larger plan of development.

Form 2.1-1 Description of Proposed Project					
1 Regulated Development Project Category (Select all that apply):					
☐ #1 New development involving the creation of 5,000 ft² or more of impervious surface collectively over entire site		☒ #2 Significant re-development involving the addition or replacement of 5,000 ft² or more of impervious surface on an already developed site	☐ #3 Road Project – any road, sidewalk, or bicycle lane project that creates greater than 5,000 square feet of contiguous impervious surface		☐ #4 LUPs – linear underground/overhead projects that has a discrete location with 5,000 sq. ft. or more new constructed impervious surface
☐ Site Design Only (Project Total Square Feet > 2,500 but < 5,000 sq.ft.) *Will require source control Site Design Measures. Use the "PCMP" Template. Do not use this WQMP Template.*					
2 Project Area (ft2):	266,353	3 Number of Dwelling Units:	N/A	4 SIC Code:	1541
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.*					

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:
The project provides design and engineering services for construction of Hesperial Industrial. The warehouse is located at 6730 Santa Fe Ave. East Hesperia, California on a 6.11 acres. The property owner of the project site is Cire Equity. The consultant in charge of the civil engineering scope of the project is IMEG corp. The main scope that IMEG corp will be handling is the design of the proposed loading docks, ADA parking, parking lot striping and layout, the ramp between lots and utility coordinattion. Along with these reponsibilities, the IMEG engineers will be submitting a hydrology study, WQMP, and will create a plan set including the demolition, grading and drainage. Once IMEG finishes these duties and is approved by the city, IMEG is not reponsible for long term matinance of the project stormwater facilities. Details on how to best manage the storwater facilities will be provided in the studies. The maintiance will fall onto the property owners once the civil scope is complete.

2.3 Potential Stormwater Pollutants

Best Management Practices (BMP) measures for pollutant generating activities and sources shall be designed consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment (or an equivalent manual). Pollutant generating activities must be considered when determining the overall pollutants of concern for the Project as presented in Form 2.3-1.

Determine and describe expected stormwater pollutants of concern based on land uses and site activities (refer to Table 3-2 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 ☐	
Nutrients - Phosphorous	E ☒	N ☐	
Nutrients - Nitrogen	E ☒	N ☐	
Noxious Aquatic Plants	E ☒	N ☐	
Sediment	E ☒	N ☐	
Metals	E ☒	N ☐	
Oil and Grease	E ☒	N ☐	
Trash/Debris	E ☒	N ☐	
Pesticides / Herbicides	E ☒	N ☐	
Organic Compounds	E ☒	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	
Other:	E ☐	N ☐	

Section 3 Site and Watershed Description

Describe the project site conditions that will facilitate the selection of BMPs 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 Drainage Management Areas (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. A map presenting the DMAs must be included as an appendix to the WQMP document.***

Form 3-1 Site Location and Hydrologic Features

Site coordinates *take GPS measurement at approximate center of site*	Latitude 34.3730	Longitude -117.3211	Thomas Bros Map page
1 San Bernardino County climatic region: ☒ Desert			
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 DMA A to Outlet 1	
DA1 DMA B to Outlet 1	
DA2 to Outlet 2	

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1

For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA A	DMA B	DMA C	DMA D
1 DMA drainage area (ft^2)	65,455	8,037	120,620	
2 Existing site impervious area (ft^2)	57,635.3	8,037	100	
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*	N/A	N/A	N/A	
4 Hydrologic soil group *Refer to County Hydrology Manual Addendum for Arid Regions – http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_addendum.pdf*	B	B	B	
5 Longest flowpath length (ft)	242	78	442	
6 Longest flowpath slope (ft/ft)	1.26%	4.10%	2.87%	
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*	90	90	86	
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***	POOR	POOR	POOR	

Form 3-2 Existing Hydrologic Characteristics for Drainage Area 1 (use only as needed for additional DMA w/in DA 1)

For Drainage Area 1's sub-watershed DMA, provide the following characteristics	DMA E	DMA F	DMA G	DMA H
1 DMA drainage area (ft^2)				
2 Existing site impervious area (ft^2)				
3 Antecedent moisture condition *For desert areas, use http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_map.pdf*				
4 Hydrologic soil group *County Hydrology Manual Addendum for Arid Regions – http://www.sbcounty.gov/dpw/floodcontrol/pdf/20100412_addendum.pdf*				
5 Longest flowpath length (ft)				
6 Longest flowpath slope (ft/ft)				
7 Current land cover type(s) *Select from Fig C-3 of Hydrology Manual*				
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*				

Form 3-3 Watershed Description for Drainage Area	
Receiving waters Refer to SWRCB site: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml	Mojavie river below lower narrows, the mohavie river upper narrows to lower narrows, and mojave river mohave forks outlet to upper narrows.
Applicable TMDLs *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*	Fluoride, sulfates, total dissolved solids
303(d) listed impairments *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*	Fluoride, sulfates, total dissolved solids
Environmentally Sensitive Areas (ESA) *Refer to Watershed Mapping Tool –* *http://sbcounty.permitrack.com/WAP*	N/A
Hydromodification Assessment	☒ Yes *Complete Hydromodification Assessment. Include Forms 4.2-2 through Form 4.2-5 and Hydromodification BMP Form 4.3-9 in submittal* ☐ No

Section 4 Best Management Practices (BMP)

4.1 Source Control BMPs and Site Design BMP Measures

The information and data in this section are required for both Regulated Development and Site Design Only Projects. Source Control BMPs and Site Design BMP Measures are the basis of site-specific pollution management.

4.1.1 Source Control BMPs

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.

The identified list of source control BMPs correspond to the CASQA Stormwater BMP Handbook for New Development and Redevelopment.

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	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Landscape Management BMPs	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☒	☐	
N6	Local Water Quality Ordinances	☒	☐	
N7	Spill Contingency Plan	☐	☒	The site does not anticipate spillage of any chemicals
N8	Underground Storage Tank Compliance	☐	☒	THe site does not propose any underground storage tanks
N9	Hazardous Materials Disclosure Compliance	☐	☒	The site does not anticipate hazardous materials on-site

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	
N10	Uniform Fire Code Implementation	☒	☐	
N11	Litter/Debris Control Program	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☒	☐	
N14	Catch Basin Inspection Program	☒	☐	
N15	Vacuum Sweeping of Private Streets and Parking Lots	☒	☐	
N16	Other Non-structural Measures for Public Agency Projects	☐	☐	
N17	Comply with all other applicable NPDES permits	☐	☐	

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)	☒	☐	
S2	Design and construct outdoor material storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-34)	☒	☐	
S3	Design and construct trash and waste storage areas to reduce pollution introduction (CASQA New Development BMP Handbook SD-32)	☒	☐	
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)	☒	☐	
S5	Finish grade of landscaped areas at a minimum of 1-2 inches below top of curb, sidewalk, or pavement	☒	☐	
S6	Protect slopes and channels and provide energy dissipation (CASQA New Development BMP Handbook SD-10)	☒	☐	
S7	Covered dock areas (CASQA New Development BMP Handbook SD-31)	☐	☒	Trench drain provided to capture runoff
S8	Covered maintenance bays with spill containment plans (CASQA New Development BMP Handbook SD-31)	☐	☒	The truck base will not anticipate any spillage
S9	Vehicle wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	The site does not propose any vehicle wash areas.
S10	Covered outdoor processing areas (CASQA New Development BMP Handbook SD-36)	☐	☒	The site does not propose any outdoor processing areas.

Form 4.1-2 Structural Source Control BMPs

Identifier	Name	Check One: Included	Check One: Not Applicable	Describe BMP Implementation OR, If not applicable, state reason
S11	Equipment wash areas with spill containment plans (CASQA New Development BMP Handbook SD-33)	☐	☒	The site does not antincipate any spillage.
S12	Fueling areas (CASQA New Development BMP Handbook SD-30)	☐	☒	The site does not propose any fueling areas.
S13	Hillside landscaping (CASQA New Development BMP Handbook SD-10)	☐	☒	There is no proposed hillside landscaping
S14	Wash water control for food preparation areas	☐	☒	There is not proposed wash water control for food prepreation areas on site.
S15	Community car wash racks (CASQA New Development BMP Handbook SD-33)	☐	☒	Community car wash racks are not proposed for this site.

4.1.2 Site Design BMPs

As part of the planning phase of a project, the site design practices associated with new LID requirements in the Phase II Small MS4 Permit must be considered. Site design BMP measures can result in smaller Design Capture Volume (DCV) to be managed by both LID and hydromodification control BMPs by reducing runoff generation.

As is stated in the Permit, it is necessary to evaluate site conditions such as soil type(s), existing vegetation and flow paths will influence the overall site design.

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 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 site provides enough impervious area for trucks to enter and exit the site.
Maximize natural infiltration capacity; Including improvement and maintenance of soil: Yes ☒ No ☐ Explanation: Proposed landscaped areas were added to the site and infiltration BMPs are proposed.
Preserve existing drainage patterns and time of concentration: Yes ☒ No ☐ Explanation: The proposed drainage patterns were not altered.
Disconnect impervious areas. Including rerouting of rooftop drainage pipes to drain stormwater to storage or infiltration BMPs instead of to storm drain : Yes ☒ No ☐ Explanation: All flows are captured and directed towards infiltration BMPs.
Use of Porous Pavement.: Yes ☐ No ☒ Explanation:
Protect existing vegetation and sensitive areas: Yes ☒ No ☐ Explanation: Existing Joshua tree will be protected as indicated in the geotechnical report.
Re-vegetate disturbed areas. Including planting and preservation of drought tolerant vegetation. : Yes ☐ No ☒ Explanation:

Minimize unnecessary compaction in stormwater retention/infiltration basin/trench areas: Yes ☒ No ☐ Explanation: Pervious areas are not compacted.
Utilize naturalized/rock-lined drainage swales in place of underground piping or imperviously lined swales: Yes ☐ No ☒ Explanation:
Stake off areas that will be used for landscaping to minimize compaction during construction : Yes ☐ No ☒ Explanation:
Use of Rain Barrels and Cisterns, Including the use of on-site water collection systems.: Yes ☐ No ☒ Explanation:
Stream Setbacks. Includes a specified distance from an adjacent steam: : Yes ☐ No ☒ Explanation:

It is noted that, in the Phase II Small MS4 Permit, site design elements for green roofs and vegetative swales are required. Due to the local climatology in the Mojave River Watershed, proactive measures are taken to maximize the amount of drought tolerant vegetation. It is not practical in this region to have green roofs or vegetative swales. As part of site design the project proponent should utilize locally recommended vegetation types for landscaping. Typical landscaping recommendations are found in following local references:

San Bernardino County Special Districts:

Guide to High Desert Landscaping -
http://www.specialdistricts.org/Modules/ShowDocument.aspx?documentid=795

Recommended High-Desert Plants -
http://www.specialdistricts.org/modules/showdocument.aspx?documentid=553

Mojave Water Agency:

Desert Ranch: http://www.mojavewater.org/files/desertranchgardenprototype.pdf

Summertree: http://www.mojavewater.org/files/Summertree-Native-Plant-Brochure.pdf

Thornless Garden: http://www.mojavewater.org/files/thornlessgardenprototype.pdf

Mediterranean Garden: http://www.mojavewater.org/files/mediterraneangardenprototype.pdf

Lush and Efficient Garden: http://www.mojavewater.org/files/lushandefficientgardenprototype.pdf

Alliance for Water Awareness and Conservation (AWAC) outdoor tips – http://hdawac.org/save-outdoors.html

4.2 Treatment BMPs

After implementation and design of both Source Control BMPs and Site Design BMP measures, any remaining runoff from impervious DMAs must be directed to one or more on-site, treatment BMPs (LID or biotreatment) designed to infiltrate, evaportranspire, and/or bioretain the amount of runoff specified in Permit Section E.12.e (ii)(c) Numeric Sizing Criteria for Storm Water Retention and Treatment.

4.2.1 Project Specific Hydrology Characterization

The purpose of this section of the Project WQMP is to establish targets for post-development hydrology based on performance criteria specified in Section E.12.e.ii.c and Section E.12.f of the Phase II Small 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 from hydromodification.

If the project has more than one outlet for stormwater runoff, then complete additional versions of these forms for each DA / outlet.

It is noted that in the Phase II Small MS4 Permit jurisdictions, the LID BMP Design Capture Volume criteria is based on the 2-year rain event. The hydromodification performance criterion is based on the 10-year rain event.

Methods applied in the following forms include:

- For LID BMP Design Capture Volume (DCV), San Bernardino County requires use of the P_6 method (Form 4.2-1) For pre- and post-development hydrologic calculation, San Bernardino County 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 hydromodification 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): 65,445	2 Imperviousness after applying preventative site design practices (Imp%): 88.1	3 Runoff Coefficient (Rc): _0.703 *R_c = 0.858(Imp%)^3-0.78(Imp%)^2+0.774(Imp%)+0.04*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in): 0.473 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.59 *P_6 = Item 4 *C_1, where C_1 is a function of site climatic region specified in Form 3-1 Item 1 (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): 4,402 *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 Hydromodification Assessment (DA 1)

Is the change in post- and pre- condition flows captured on-site? : Yes ☒ No ☐

If "Yes", then complete Hydromodification assessment of site hydrology for 10yr 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- Addendum 1)*

If "No," then proceed to Section 4.3 BMP Selection and Sizing

Condition	Runoff Volume (ft^3)	Time of Concentration (min)	Peak Runoff (cfs)
Pre-developed	1 35,729 *Form 4.2-3 Item 12*	2 13.029 *Form 4.2-4 Item 13*	3 0.21 *Form 4.2-5 Item 10*
Post-developed	4 37,779 *Form 4.2-3 Item 13*	5 4.716 *Form 4.2-4 Item 14*	6 0.54 *Form 4.2-5 Item 14*
Difference	7 *2,049* *Item 4 – Item 1*	8 *-8.313* *Item 2 – Item 5*	9 *0.33* *Item 6 – Item 3*
Difference (as % of pre-developed)	10 *0.057%* *Item 7 / Item 1*	11 *-0.638%* *Item 8 / Item 2*	12 *1.571%* *Item 9 / Item 3*

Form 4.2-1 LID BMP Performance Criteria for Design Capture Volume (DA 2)

1 Project area DA (ft^2): 8037	**2** Imperviousness after applying preventative site design practices (Imp%): 100	**3** Runoff Coefficient (Rc): _0.892 *R_c = 0.858(Imp%)^3-0.78(Imp%)^2+0.774(Imp%)+0.04*
4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr-1hr}$ (in): 0.473 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html		
5 Compute P_6, Mean 6-hr Precipitation (inches): 0.59 *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): 686 *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 3)

1 Project area DA (ft^2): 120,720	2 Imperviousness after applying preventative site design practices (Imp%): 0.001	3 Runoff Coefficient (Rc): _0.041 *$R_c = 0.858(Imp\%)^{\wedge 3}-0.78(Imp\%)^{\wedge 2}+0.774(Imp\%)+0.04$*

4 Determine 1-hour rainfall depth for a 2-year return period $P_{2yr\text{-}1hr}$ (in): 0.473 http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

5 Compute P_6, Mean 6-hr Precipitation (inches): 0.59

*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): 470

*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 4.2-3 Hydromodification 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	Barren							
2a Hydrologic Soil Group (HSG)	B							
3a DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	194,454							
4a Curve Number (CN) *use Items 1 and 2 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	86							
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	Industrial	Industrial	Barren					
2b Hydrologic Soil Group (HSG)	B	B	B					
3b DMA Area, ft^2 *sum of areas of DMA should equal area of DA*	65,455	8,037	120,620					
4b Curve Number (CN) *use Items 5 and 6 to select the appropriate CN from Appendix C-2 of the TGD for WQMP*	90	90	86					

5 Pre-Developed area-weighted CN: 86	**7** Pre-developed soil storage capacity, S (in): 1.63 *S = (1000 / Item 5) - 10*	**9** Initial abstraction, I_a (in): 0.326 *I_a = 0.2 * Item 7*
6 Post-Developed area-weighted CN: 87.5	**8** Post-developed soil storage capacity, S (in): 1.43 *S = (1000 / Item 6) - 10*	**10** Initial abstraction, I_a (in): 0.285 *I_a = 0.2 * Item 8*

11 Precipitation for 10 yr, 24 hr storm (in): 3.62
Go to: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

12 Pre-developed Volume (ft^3): 35,729
*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): 37,779
*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 hydromodification requirement, (ft^3): 160
*Vhydro = (Item 13 * 0.95) – Item 12*

Form 4.2-4 Hydromodification 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*	472				242	78	442	
2 Change in elevation (ft)	12.72				3.07	3.2	12.67	
3 Slope (ft/ft), *S_o = Item 2 / Item 1*	0.027				0.013	0.041	0.029	
4 Land cover	Barren				Indsutrial	Industrial	Barren	
5 Initial DMA Time of Concentration (min) *Appendix C-1 of the TGD for WQMP*	13				6.5	4	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*	19				27	320	20	
7 Cross-sectional area of channel (ft^2)	3				3	1	3	
8 Wetted perimeter of channel (ft)	5				5	4	5	
9 Manning's roughness of channel (n)	0.016				0.016	0.016	0.016	
10 Channel flow velocity (ft/sec) *V_{fps} = (1.49 / Item 9) * (Item 7/Item 8)^0.67 * (Item 3)^0.5*	10.9				7.4	7.5	11.2	
11 Travel time to outlet (min) *T_t = Item 6 / (Item 10 * 60)*	0.029				0.060	0.716	0.030	
12 Total time of concentration (min) *T_c = Item 5 + Item 11*	13.029				6.560	4.716	12.530	

13 Pre-developed time of concentration (min): 13.029 *Minimum of Item 12 pre-developed DMA*

14 Post-developed time of concentration (min): 4.716 *Minimum of Item 12 post-developed DMA*

15 Additional time of concentration needed to meet hydromodification requirement (min): 7.662 *$T_{C-Hydro}$ = (Item 13 * 0.95) – Item 14*

Form 4.2-5 Hydromodification 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 - 0.7 LOG Form 4.2-4 Item 5 /60)*	0.477			0.464	0.466	0.460
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)*	4.46			1.50	0.18	2.77
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)*	0.8522			0.119	0	1
4 Pervious area infiltration rate (in/hr) *Use pervious area CN and antecedent moisture condition with Appendix C-3 of the TGD for WQMP*	0.5			0.5	0.5	0.5
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)*	0.4261			0.0595	0	0.5
6 Peak Flow from DMA (cfs) *Q_p =Item 2 * 0.9 * (Item 1 - Item 5)*	0.21			0.55	0.08	-0.10
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*	0.72	1
DMA B	1	*n/a*		1	*n/a*	1
DMA C	1		*n/a*	0.52	0.37	*n/a*

8 Pre-developed Q_p at T_c for DMA A: 0.21 *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): 0.21 *Maximum of Item 8, 9, and 10 (including additional forms as needed)*

11 Post-developed Q_p at T_c for DMA A: 0.53
Same as Item 8 for post-developed values

12 Post-developed Q_p at T_c for DMA B: 0.54
Same as Item 9 for post-developed values

13 Post-developed Q_p at T_c for DMA C: 0.52
Same as Item 10 for post-developed values

14 Peak runoff from post-developed condition confluence analysis (cfs): 0.54 *Maximum of Item 11, 12, and 13 (including additional forms as needed)*

15 Peak runoff reduction needed to meet Hydromodification Requirement (cfs): 0.303 $Q_{p-hydro}$ *= (Item 14 * 0.95) – Item 10*

4.3 BMP Selection and Sizing

Complete the following forms for each project site DA to document that the proposed treatment (LID/Bioretention) BMPs conform to the project DCV developed to meet performance criteria specified in the Phase II Small 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 Phase II Small MS4 Permit (see Section 5.3 in the TGD for WQMP). The forms compute the following for on-site LID BMP:

- Site Design Measures (Form 4.3-2)
- Retention and Infiltration BMPs (Form 4.3-3) or
- Biotreatment BMPs (Form 4.3-4).

> Please note that the selected BMPs may also be used as dual purpose for on-site, hydromodification mitigation and management.

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 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 Form 4.3-2 to determine the feasibility of applicable Site Design 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 Site Design 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 site design, retention and/or infiltration BMPs is unable to mitigate the entire DCV, then the remainder of the volume-based performance criteria that cannot be achieved with site design, retention and/or infiltration BMPs must be managed through biotreatment BMPs. If biotreatment BMPs are used, then they must be sized to provide equivalent effectiveness based on Template Section 4.3.4.

4.3.1 Exceptions to Requirements for Bioretention Facilities

Contingent on a demonstration that use of bioretention or a facility of equivalent effectiveness is infeasible, other types of biotreatment or media filters (such as tree-box-type biofilters or in-vault media filters) may be used for the following categories of Regulated Projects:

1) Projects creating or replacing an acre or less of impervious area, and located in a designated pedestrian-oriented commercial district (i.e., smart growth projects), and having at least 85% of the entire project site covered by permanent structures;

2) Facilities receiving runoff solely from existing (pre-project) impervious areas; and

3) Historic sites, structures or landscapes that cannot alter their original configuration in order to maintain their historic integrity.

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 ten 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, Selection and Evaluation of Biotreatment 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, Site Design 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, Site Design BMPs.*

4.3.2 Site Design BMP

Section E.12.e. of the Small Phase II MS4 Permit emphasizes the use of LID preventative measures; and the use of Site Design Measures reduces the portion of the DCV that must be addressed in downstream BMPs. Therefore, all applicable Site Design Measures 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 Site Design BMPs. If a project cannot feasibly meet BMP sizing requirements or cannot fully address hydromodification, feasibility of all applicable Site Design BMPs 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 BMP. Refer to Section 5.4 in the TGD for more detailed guidance.

Form 4.3-2 Site Design 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): $V_{retention}$ *=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) (min. 0.5 ft.)			
9 Surface area of amended soil/gravel (ft^2)			
10 Average depth of amended soil/gravel (ft) (min. 1 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): $V_{retention}$ *=Sum of Item 12 for all BMPs*			

Form 4.3-2 Site Design BMPs (DA 1)

Form 4.3-2 cont. Site Design BMPs (DA 1)

14 Implementation of Street Trees: Yes ☐ No ☐ *If yes, complete Items 14-18. If no, proceed to Item 19*	DA DMA BMP Type	DA DMA BMP Type	DA DMA BMP Type *(Use additional forms for more BMPs)*
15 Number of Street Trees			
16 Average canopy cover over impervious area (ft^2)			
17 Runoff volume retention from street trees (ft^3) *$V_{retention}$ = Item 15 * Item 16 * (0.05/12) assume runoff retention of 0.05 inches*			
18 Runoff volume retention from street tree BMPs (ft^3): *$V_{retention}$ = Sum of Item 17 for all BMPs*			
19 Total Retention Volume from Site Design BMPs: *Sum of Items 5, 13 and 18*			

4.3.3 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 C 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 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).

4.3.3.1 Allowed Variations for Special Site Conditions

The bioretention system design parameters of this Section may be adjusted for the following special site conditions:

1) Facilities located within 10 feet of structures or other potential geotechnical hazards established by the geotechnical expert for the project may incorporate an impervious cutoff wall between the bioretention facility and the structure or other geotechnical hazard.

2) Facilities with documented high concentrations of pollutants in underlying soil or groundwater, facilities located where infiltration could contribute to a geotechnical hazard, and facilities located on elevated plazas or other structures may incorporate an impervious liner and may locate the underdrain discharge at the bottom of the subsurface drainage/storage layer (this configuration is commonly known as a “flow-through planter”).

3) Facilities located in areas of high groundwater, highly infiltrative soils or where connection of underdrain to a surface drain or to a subsurface storm drain are infeasible, may omit the underdrain.

4) Facilities serving high-risk areas such as fueling stations, truck stops, auto repairs, and heavy industrial sites may be required to provide adequate pretreatment to address pollutants of concern unless these high-risk areas are isolated from storm water runoff or bioretention areas with no chance of spill migration.

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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 BMP (ft³): 5,557 *V_{unmet} = Form 4.2-1 Item 7 - Form 4.3-2 Item19*

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 A BMP Type Drywell	DA 2 DMA B BMP Type Drywell	DA 3 DMA C BMP Type Basin *(Use additional forms for more BMPs)*
[2] Infiltration rate of underlying soils (in/hr) *See Section 5.4.2 and Appendix C of the TGD for WQMP for minimum requirements for assessment methods*	1.12	1.12	1.12
[3] Infiltration safety factor *See TGD Section 5.4.2 and Appendix D*	2.25	2.25	2.25
[4] Design percolation rate (in/hr) *P_{design} = Item 2 / Item 3*	0.50	0.50	0.50
[5] Ponded water drawdown time (hr) *Copy Item 6 in Form 4.2-1*	48	48	48
[6] Maximum ponding depth (ft) *BMP specific, see Table 5-4 of the TGD for WQMP for BMP design details*			1
[7] Ponding Depth (ft) *d_{BMP} = Minimum of (1/12*Item 4*Item 5) or Item 6*			1
[8] Infiltrating surface area, SA_{BMP} (ft²) *the lesser of the area needed for infiltration of full DCV or minimum space requirements from Table 5.7 of the TGD for WQMP*			470
[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*			
[10] Amended soil porosity			
[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*			
[12] Gravel porosity			
[13] Duration of storm as basin is filling (hrs) *Typical ~ 3hrs*			3
[14] Above Ground Retention Volume (ft³) *$V_{retention}$ = Item 8 * [Item7 + (Item 9 * Item 10) + (Item 11 * Item 12) + (Item 13 * (Item 4 / 12))]*			470
[15] Underground Retention Volume (ft³) *Volume determined using manufacturer's specifications and calculations*	4500	720	500

[16] Total Retention Volume from LID Infiltration BMPs: 5720 *(Sum of Items 14 and 15 for all infiltration BMP included in plan)*

[17] Fraction of DCV achieved with infiltration BMP: 129% *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.

4.3.4 Biotreatment BMP

Biotreatment BMPs may be considered if the full LID DCV cannot be met by maximizing retention and infiltration. 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 4.3-4 to summarize the potential for volume based and/or flow based biotreatment options to biotreat the remaining unmet LID DCV. Biotreatment computations are included as follows:

- Use Form 4.3-5 to compute biotreatment in small volume based biotreatment BMP (e.g. bioretention w/underdrains);
- Use Form 4.3-6 to compute biotreatment in large volume based biotreatment BMP (e.g. constructed wetlands);
- Use Form 4.3-7 to compute sizing criteria for flow-based biotreatment BMP (e.g. bioswales)

Form 4.3-4 Selection and Evaluation of Biotreatment BMP (DA 1)		
1 Remaining LID DCV not met by site design , or infiltration, BMP for potential biotreatment (ft³): *Form 4.2-1 Item 7 - Form 4.3-2 Item 19 – Form 4.3-3 Item 16*	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 4.3-5 and 4.3-6 to compute treated volume*	Flow-based biotreatment *Use Form 4.3-7 to compute treated flow*
	☐ 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 (ft³): *Form 4.3-5 Item 15 + Form 4.3-6 Item 13*	4 Compute remaining LID DCV with implementation of volume based biotreatment BMP (ft³): *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): *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 Volume Based Biotreatment (DA 1) – Bioretention and Planter Boxes with Underdrains

Biotreatment BMP Type *(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 4.3-6 Volume Based Biotreatment (DA 1) – Constructed Wetlands and Extended Detention

Biotreatment BMP Type *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 4.3-7 Flow Based Biotreatment (DA 1)			
Biotreatment BMP Type *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 $2^{\wedge 1.67}$ * Item $3^{\wedge 0.5}$)*			
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 $2^{\wedge 2}$)*			
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 4.3-8 to demonstrate how on-site LID DCV is met with proposed site design, infiltration, 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 4.3-8 Conformance Summary and Alternative Compliance Volume Estimate (DA 1)
1 Total LID DCV for the Project DA-1 (ft^3): *Copy Item 7 in Form 4.2-1*
2 On-site retention with site design BMP (ft^3): *Copy Item18 in Form 4.3-2*
3 On-site retention with LID infiltration BMP (ft^3): *Copy Item 16 in Form 4.3-3*
4 On-site biotreatment with volume based biotreatment BMP (ft^3): *Copy Item 3 in Form 4.3-4*
5 Flow capacity provided by flow based biotreatment BMP (cfs): *Copy Item 6 in Form 4.3-4*
6 LID BMP performance criteria are achieved if answer to any of the following is "Yes": • Full retention of LID DCV with site design or infiltration 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; therefore biotreatment BMP provides 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*
7 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 Site Design, retention and infiltration, , and biotreatment BMPs provide less than full LID DCV capture: ☐ *Checked yes if Form 4.3-4 Item 7is checked yes, Form 4.3-4 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)%* • Facilities, or a combination of facilities, of a different design than in Section E.12.e.(ii)(f) may be permitted if all of the following Phase II Small MS4 General Permit 2013-0001-DWQ 55 February 5, 2013 measures of equivalent effectiveness are demonstrated: 1) Equal or greater amount of runoff infiltrated or evapotranspired; ☐ 2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment; ☐ 3) Equal or greater protection against shock loadings and spills; ☐ 4) Equal or greater accessibility and ease of inspection and maintenance. ☐

4.3.6 Hydromodification Control BMP

Use Form 4.3-9 to compute the remaining runoff volume retention, after Site Design BMPs are implemented, needed to address hydromodification, and the increase in time of concentration and decrease in peak runoff necessary to meet targets for protection of waterbodies with a potential hydromodification. Describe the proposed hydromodification treatment control BMP. Section 5.6 of the TGD for WQMP provides additional details on selection and evaluation of hydromodification control BMP.

Form 4.3-9 Hydromodification Control BMPs (DA 1)	
1 Volume reduction needed for hydromodification performance criteria (ft^3): 5,557 *(Form 4.2-2 Item 4 * 0.95) – Form 4.2-2 Item 1*	**2** On-site retention with site design and infiltration, BMP (ft^3): 5,720 *Sum of Form 4.3-8 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 hydromodification volume reduction*
3 Remaining volume for hydromodification volume capture (ft^3): 0 *Item 1 – Item 2*	**4** Volume capture provided by incorporating additional on-site BMPs (ft^3): 100%
5 Is Form 4.2-2 Item 11 less than or equal to 5%: Yes ☒ No ☐ *If yes, hydromodification 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 BMP ☐ • 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 ☐	
6 Form 4.2-2 Item 12 less than or equal to 5%: Yes ☒ No ☐ *If yes, hydromodification 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 retention BMPs ☐	

4.4 Alternative Compliance Plan (if applicable)

Describe an alternative compliance plan (if applicable) for projects not fully able to infiltrate, 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 Designs — Facilities, or a combination of facilities, of a different design than in Permit Section E.12.e.(ii)(f) may be permitted if all of the following measures of equivalent effectiveness are demonstrated:

1) Equal or greater amount of runoff infiltrated or evapotranspired;

2) Equal or lower pollutant concentrations in runoff that is discharged after biotreatment;

3) Equal or greater protection against shock loadings and spills;

4) Equal or greater accessibility and ease of inspection and maintenance.

The Project Proponent will need to obtain written approval for an alternative design from the Lahontan Regional Water Board Executive Officer (see Section 6 of the TGD for WQMP).

Section 5 Inspection and Maintenance Responsibility for Post Construction BMP

All BMPs 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 a Maintenance Agreement. The Maintenance Agreement must also be attached to the WQMP.

Note that at time of Project construction completion, the Maintenance Agreement must be completed, signed, notarized and submitted to the County Stormwater Department

Form 5-1 BMP Inspection and Maintenance
(use additional forms as necessary)

BMP	Reponsible Party(s)	Inspection/ Maintenance Activities Required	Minimum Frequency of Activities
N-1 Education for property owners, tenants, and occupants	Owner	The property owner will provide BMP educational information materials to all employees or occupants of site.	As needed
N2- Activity Restrictions	Owner	Activity restrictions such as "No littering" signs to prevent pollution to stormwater BMP.	As needed
N3- Landscape Management	Owner	Install irrigation system with timing devices to avoid overwatering. Repair as needed.	As needed.
N4-BMP Maintance	Owner	Inspect, clean, repair, and maintain BMP as indicated in BMP operations and maintance guide.	Monthly

N11-Litter Control	Owner	Inspect and clean site for trash and debris	Weekly
N12-Employee Training	Owner	Educational materials on general housekeeping pratices for the protection of storm water quality shall be provided to all employees	Yearly
N15 Vaccum Sweep Private Streets and Parking Lots	Owner	Parking lots shall be swept and vaccumed regularly.	Weekly

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

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 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.

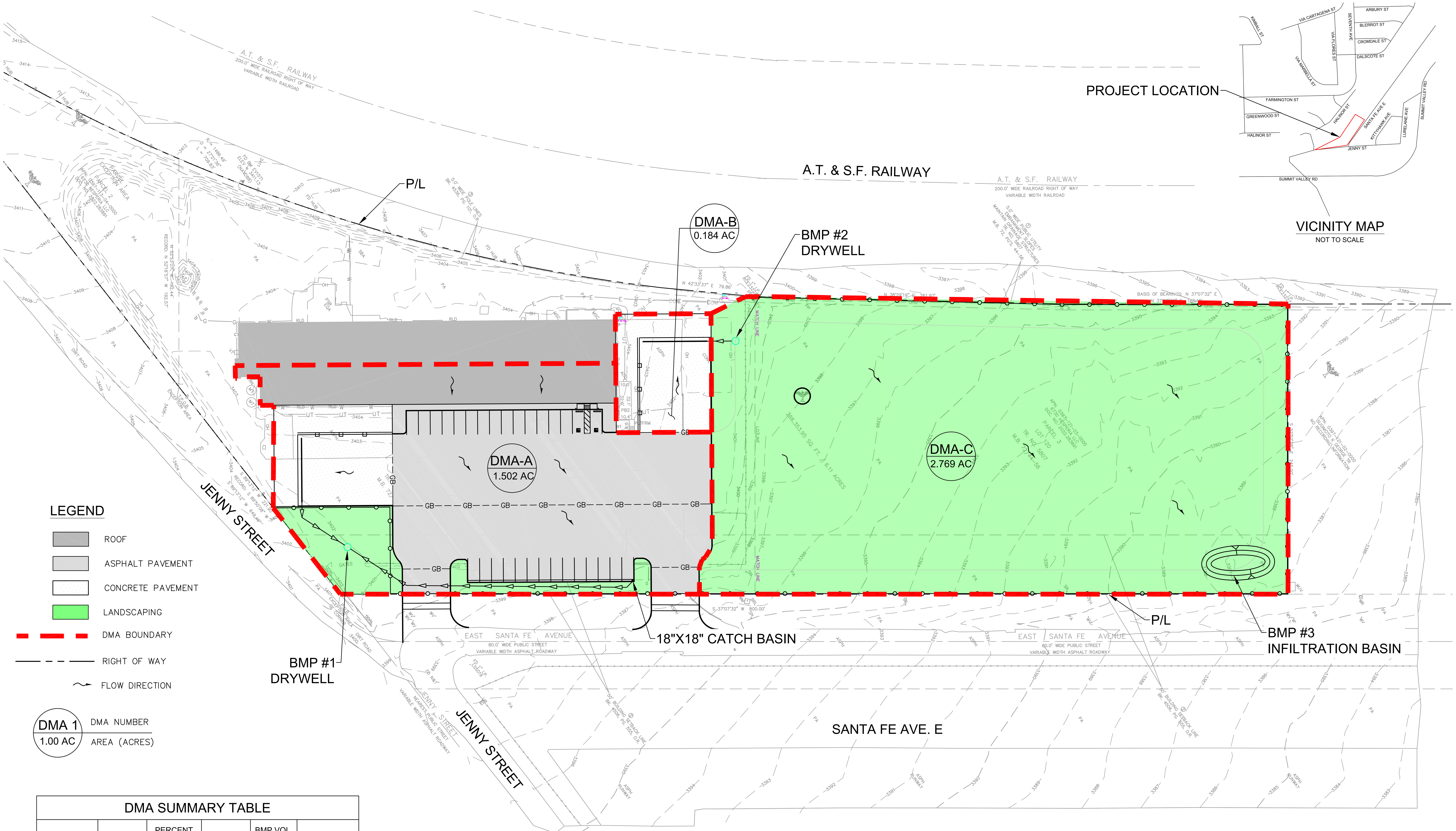
6.3 Post Construction

Attach all O&M Plans and Maintenance Agreements for BMP to the WQMP.

6.4 Other Supporting Documentation

- BMP Educational Materials
- Activity Restriction – C,C&R's & Lease Agreements

Appendix A: Vicinity Map, WQMP Site Plan, and Receiving Waters Map



DMA SUMMARY TABLE

	TOTAL (ACRES)	PERCENT IMPERVIOUS (%)	DCV (CF)	BMP VOL. PROVIDED (CF)	BMP TYPE
DMA A	1.502	88.1%	4402	4500	DRYWELL
DMA B	0.184	100%	686	720	DRYWELL
DMA C	2.769	0.1%	470	500	INFILTRATION BASIN
TOTAL	**4.45**		5557	5720	

SCALE: 1" = 40'

REVISIONS

No.	DESCRIPTION	DATE

IMEG
901 VIA PIEMONTE SUITE 400 ONTARIO, CA 91764
PH 909.477.6915 www.imegcorp.com

HESPERIA INDUSTRIAL
6730 SANTA FE AVENUE E HESPERIA, CA 92345

WQMP EXHIBIT

IMEG Project No: 23002420
File Name: WQMP Exhibit.dwg

Field Book No:
Drawn By: AF
Checked By: RH
Date: 5/30/2023

EXH
Sheet 1 of 1

Tuesday, May 30, 2023 1:50:01 PM
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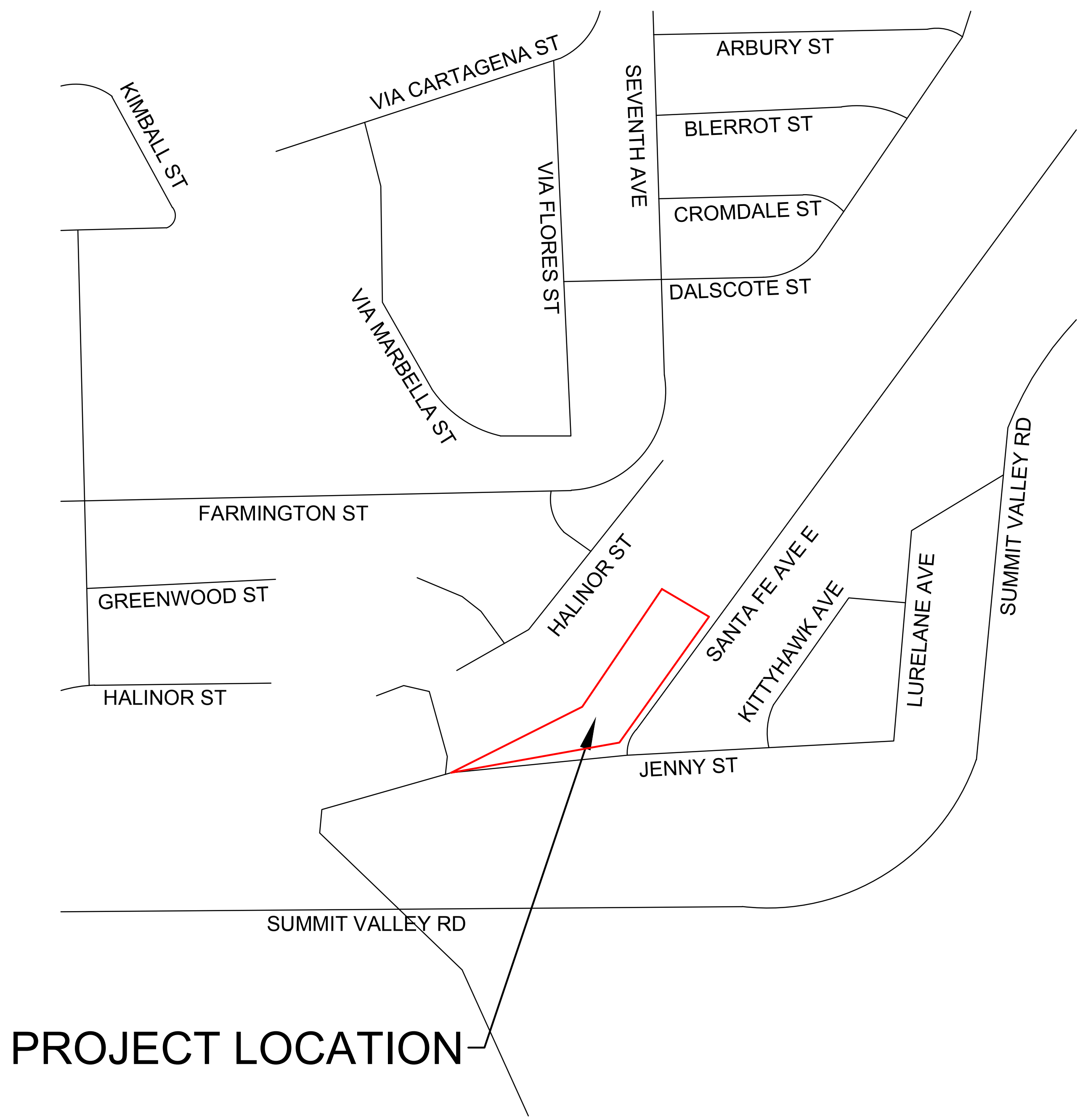


VICINITY MAP
NOT TO SCALE

IMEG
901 VIA PIEMONTE
SUITE 400
ONTARIO, CA 91764
PH: 909.477.6915
www.imegcorp.com

HESPERIA INDUSTRIAL

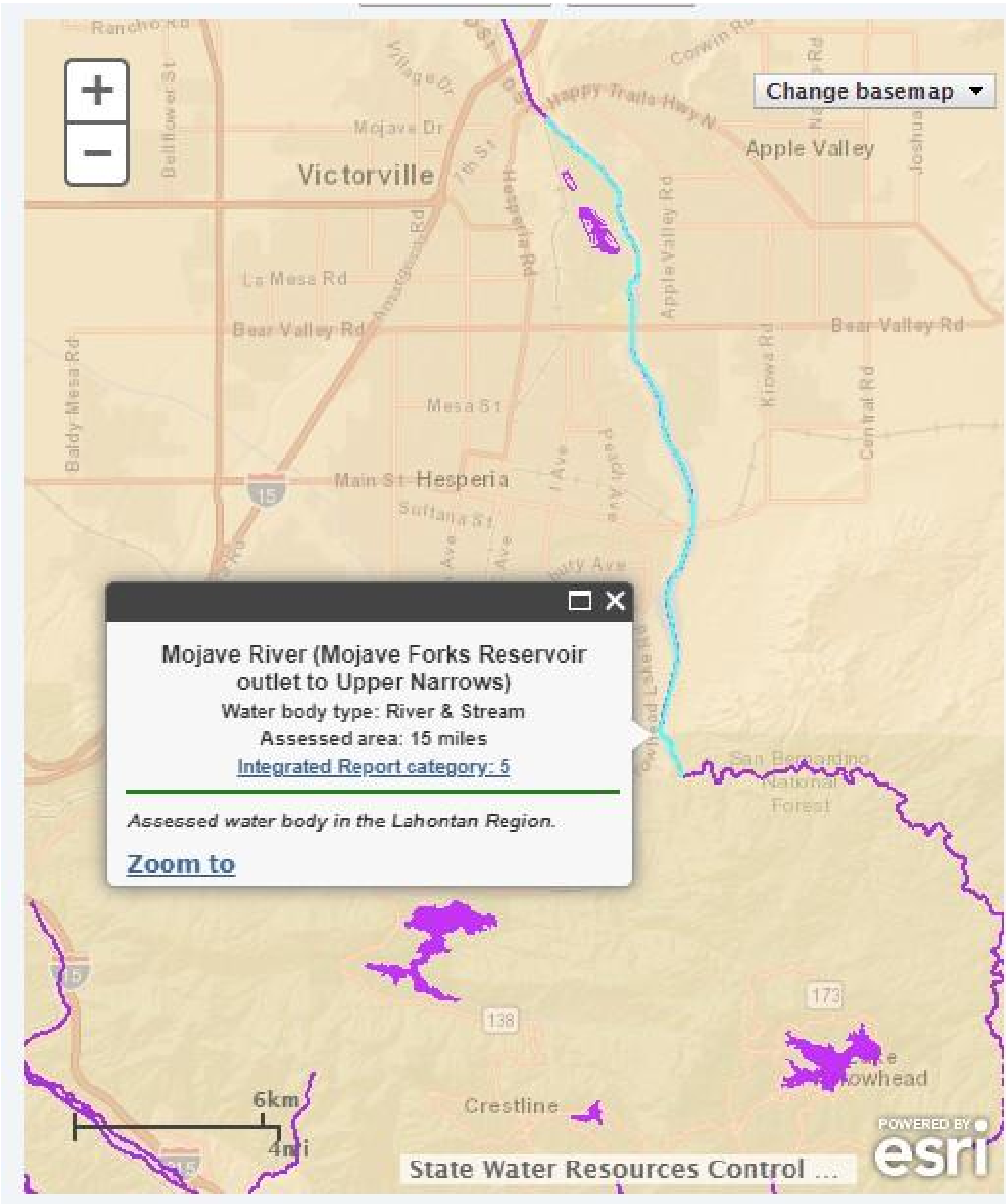
6730 SANTA FE AVE EAST, HESPERIA, CA

VICINITY MAP

EXHIBIT

-

5/24/23 \\FILES\ACTIVE\PROJECTS\2023\23002420.00\DESIGN\CIVIL\C3D\EXHIBITCONCEPT\WQMP VICINITY MAP EXHIBIT.DWG



Receiving Waters Map

Appendix B: Supporting detail related to Hydrologic Conditions of Concern

Table 3-2. Pollutants of Concern for Project Categories and Land Uses

Regulated Project Categories and/or Project Features	General Pollutant Categories								
	Pathogens (Bacterial / Virus)	Metals	Nutrients / Noxious Aquatic Plants	Organic Compounds	Pesticides / Herbicides	Sediments / Total Suspended Solids / pH	Trash & Debris	Oxygen Demanding Compounds	Oil & Grease
Detached Residential Development	E	N	E	E(1)	E	E	E	E(1)	E
Attached Residential Development	E	N	E	E(1)	E	E	E	E	E(2)
Commercial / Industrial Development	E(3)	E	E(1)	E(1,4)	E	E(1)	E	E(1)	E
Automotive Repair Shops	N	E	N	E(1,3,4)	E	N	E	E(1)	E
Restaurants (>5,000 ft²)	E	E(2)	E(1)	E(1)	E	E(1)(2)	E	N	E
Hillside Development (>5,000 ft²)	E	N	E	E(1)	E	E	E	E	E
Parking Lots (>5,000 ft²)	E(5)	E	E(1)	E(3)	E	E(1)	E	E(1)	E
Retail Gasoline Outlets	N	E	N	E(3)	E	N	E	E(1)	E

E = Expected to be a concern in stormwater runoff
N = Not expected to be a concern in stormwater runoff
(1) Expected pollutant if landscaping exists on-site; otherwise not expected.
(2) Expected pollutant if the project includes uncovered parking areas; otherwise not expected
(3) Including petroleum hydrocarbons
(4) Including solvents
(5) Bacterial indicators are routinely detected in pavement runoff

3.3.2 Expected Pollutants of Concern

The WQMP must list all identified pollutants of concern that are expected to be generated by the project and compare this with the list of pollutants for which the receiving waters are impaired. To identify pollutants of concern in receiving waters, each project proponent shall reference Table 3-2 and Table 3-3 to determine if any pollutants expected to be generated by the project are also listed as causing impairments of downstream receiving waters for the project.

3.3.3 Receiving Water Impairments and TMDLs

For each of the proposed project discharge points, the Regulated Project proponent shall identify the proximate receiving water for each point of discharge and all downstream receiving waters, using the Watershed Geodatabase. For all downstream receiving waters identified, determine if they are listed on the most recent list of CWA Section 303(d) impaired

Appendix C: Educational Material

STORMWATER POLLUTION PREVENTION

Best Management Practices for San Bernardino County Homeowner's Associations, Property Managers and Property Owners

Your Guide To Maintaining Water Friendly Standards In Your Community

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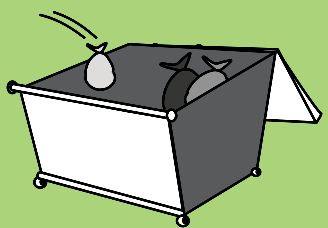
GENERAL HOA

COMMERCIAL **TRASH ENCLOSURES** REQUIREMENTS

In San Bernardino County, stormwater pollution is caused by food waste, landscape waste, chemicals, and other debris that are washed into storm drains and end up in our waterways - untreated! You can be part of the solution by maintaining a water-friendly trash enclosure.

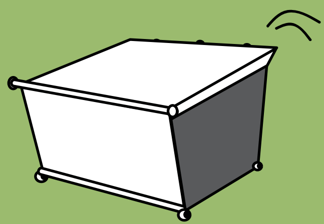
FOLLOW THESE REQUIREMENTS TO KEEP OUR WATERWAYS CLEAN

PUT TRASH INSIDE



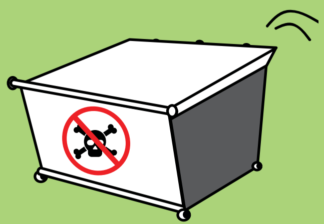
Place trash inside the bin (preferably in sealed bags).

CLOSE THE LID



Prevent rain from entering the bin in order to avoid leakage of polluted water runoff.

KEEP TOXICS OUT



NO:

- **Paint**
- **Grease**
- **Fats**
- **Used Oils**
- **Batteries**
- **Electronics**
- **Fluorescent Lights**

These items should be disposed of at a local hazardous waste collection center

SWEEP FREQUENTLY

Sweep trash enclosure areas frequently, instead of hosing them down, to prevent polluted water from flowing into the streets and storm drains.

FIX LEAKS

Address trash bin leaks immediately by using dry clean-up methods and reporting to your waste hauler to receive a replacement.

CONSTRUCT ROOF

Construct a solid cover roof over the existing trash enclosure structure to prevent rainwater from coming into contact with trash and garbage. Check with your local City/County for Building Codes.

To report illegal dumping or toxic spills, call **(877) WASTE18** or visit **sbcountystormwater.org/report**

To dispose of hazardous waste, call **1 (800) OILYCAT**

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SIDEWALK + PARKING LOT CLEANING

Littering and vehicle use can leave behind pollutants on sidewalks, plazas, and other pedestrian traffic areas. Properly inspecting, cleaning, and repairing pedestrian areas and HOA-owned surfaces and structures can reduce pollutant runoff from these areas.

Maintain these areas by following the best management practices listed below.

LITTER CONTROL

- Enforce anti-litter laws.
- Place trash cans in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Ensure trash cans remain covered at all times.
- Clean out trash cans frequently to prevent leaking/spillage or overflow.

TIP: POST "NO LITTERING" SIGNS.

SIDEWALKS AND PLAZAS

- When cleaning sidewalks and plazas, use dry methods such as sweeping, vacuuming, and using backpack blowers whenever practical, rather than hosing, pressure washing, or steam cleaning.
- **DO NOT** sweep or blow material into the street or gutter.

PARKING AREAS, DRIVEWAYS, DRIVE-THRU

- Sweep or vacuum parking facilities on a regular basis.
- Sweep all parking lots at least once before the onset of the wet season.
- Use absorbents to pick up oil; then dry sweep.
- Appropriately dispose of spilled materials and absorbents.
- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, and proximity to water courses.

TIP: IF WATER MUST BE USED, BLOCK STORM DRAIN INLETS TO CONTAIN RUNOFF. WHEN DONE, DISCHARGE WASH WATER TO LANDSCAPING OR CONTAIN AND DISPOSE OF PROPERLY.

To report illegal dumping or toxic spills, call **(877) WASTE18** or visit **sbcountystormwater.org/report**

To dispose of hazardous waste, call **1 (800) OILYCAT**

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SURFACE CLEANING

Proper inspection, cleaning, and repair of pedestrian areas and HOA-owned surfaces and structures can reduce pollutant runoff from these areas. Discharges of wash water to the stormwater drainage system from cleaning or hosing of impervious surfaces is prohibited.

Maintain these areas by following the best management practices listed below.

WHEN CLEANING BUILDING SURFACES

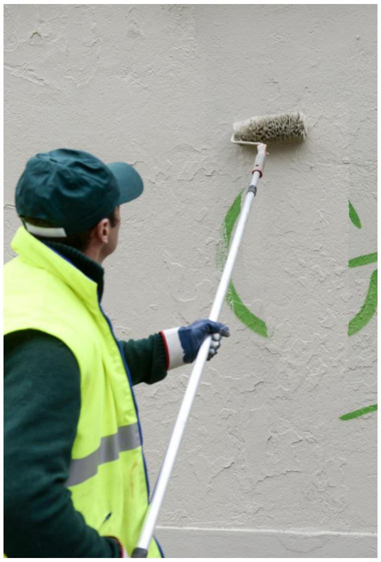
If water must be used, block storm drain inlets and contain runoff. Discharge wash water to landscaping or contain and dispose of properly.

BUILDING SURFACES, DECKS, ETC., WITHOUT LOOSE PAINT

- Use high-pressure water, no soap.

UNPAINTED BUILDING SURFACES, WOOD DECKS, ETC.

- If using a biodegradable or another cleaning agent to remove deposits, contain and dispose of them properly.



GRAFFITI REMOVAL

- Avoid graffiti abatement activities during rain events.
- Protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterward by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.
- Take care when disposing of water since it may need to be disposed of as hazardous waste.

TIP: CONSIDER USING A WATERLESS AND NON-TOXIC CHEMICAL CLEANING METHOD FOR GRAFFITI REMOVAL (E.G. GELS OR SPRAY COMPOUNDS).

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CONCRETE + SIDEWALK REPAIR

Properly inspecting and repairing pedestrian areas and HOA-owned surfaces and structures can reduce pollutant runoff.

Maintain these areas by following the best management practices listed below.

CONCRETE INSTALLATION + REPAIR

- Avoid mixing excess amounts of fresh concrete or cement mortar on-site. Only mix what is needed for the job.
- Wash concrete trucks off-site or in designated areas on-site, such that there is no discharge of concrete wash water into storm drain inlets, open ditches, streets, or other stormwater conveyance structures.
- Store dry and wet concrete materials under cover, protected from rainfall and runoff, and away from drainage areas. After the job is complete, remove temporary stockpiles such as asphalt materials and sand as soon as possible.
- Return leftover materials to the transit mixer. Dispose of small amounts of excess concrete, grout, and mortar in the trash.
- When washing concrete to remove fine particles and expose the aggregate, contain the wash water for proper disposal.
- **DO NOT** wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose of in the trash.
- Protect applications of fresh concrete from rainfall and runoff until the material has hardened.

SIDEWALK REMOVAL + REPAIR

- Schedule surface removal activities for dry weather.
- Avoid creating excess dust when breaking asphalt or concrete.

PROTECT NEARBY STORM DRAIN INLETS

- Prior to breaking up asphalt or concrete, take measures such as placing straw waddles or gravel bags around inlets. Clean afterward by sweeping up material.
- During the sawing operation, cover each storm drain inlet with filter fabric and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets.

CLEAN UP

- Designate an area for clean-up and proper disposal of excess materials.
- Remove and recycle as much of the broken pavement as possible.
- When making saw cuts in the pavement, use as little water as possible. After the liquid drains, shovel or vacuum the slurry, remove it from the site, and dispose of it properly.
- Once dry sweeping is complete, the area may be hosed down if needed.
- Discharge wash water to landscaping, pump to the sanitary sewer if permitted to do so, or contain and dispose of properly.
- **ALWAYS** dry sweep first with a street sweeper or vacuum truck to clean up tracked dirt. **DO NOT** dump vacuumed liquid in storm drains.

To report illegal dumping or toxic spills, call **(877) WASTE18** or visit **sbcountystormwater.org/report**

To dispose of hazardous waste, call **1 (800) OILYCAT**

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When Working Outdoors Use the 3Cs

CUANDO TRABAJE AL AIRE LIBRE UTILICE LAS 3Cs

CONTROL • CONTROL

Locate the nearest storm drain and ensure nothing can enter or be discharged into it.

Ubique el desagüe de aguas pluviales más cercano y asegúrese de que nada pueda ingresar a éste ni descargarse en él.

CONTAIN • CONTENER

Isolate your area to prevent material from potentially flowing or being blown away.

Aísle su área para evitar que el material pueda discurrirse o ser llevado por el viento.

CAPTURE • CAPTURAR

Sweep up debris and place it in the trash. Clean up spills with an absorbent material (e.g. kitty litter) or vacuum with a Wet-Vac and dispose of properly.

Recoja los restos y colóquelos en la basura. Limpie los derrames con un material absorbente (como la arena para gatos) o aspírelos con una Wet-Vac (aspiradora de humedad) y deséchelos correctamente.

To report illegal dumping or toxic spills, call **(877) WASTE18** or visit **sbcountystormwater.org/report**

To dispose of hazardous waste, call **1 (800) OILYCAT**

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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 **sbcountystormwater.org/report**

To dispose of hazardous waste, call **1 (800) OILYCAT**

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POOL MAINTENANCE

When discharged to the street, gutters, or storm drains, pool chemicals and filter solids DO NOT GET TREATED before reaching the Santa Ana River.

FOLLOW THESE TIPS FOR PROPER DISPOSAL OF POOL WATER:

- **De-chlorinate** – Chlorine naturally dissipates over time and should be completely gone if the water is left standing for 3-5 days. Use a pool testing kit prior to discharge to ensure the concentration of chlorine is zero.
- **Check pH** – determine the pH of the pool water before discharging on your own or ask your pool maintenance company to check it for you. It should be between 6.5 and 8.5.
- **Free and clear** – Make certain the water is free of any discoloration, dirt or algae.
- **Use your grass** – When discharging to a grassy area, the flow should be controlled so it doesn't cause any erosion problems or enter a neighbor's property.
- **Avoid metal-based algaecides** (i.e. copper sulfate). If used, empty your pool or spa into the sewer.

Chlorine, acid cleaning chemicals and metal-based algaecides used in pools can kill beneficial organisms in the food chain and pollute our drinking water.

WHEN ACID CLEANING OR OTHER CHEMICAL CLEANING:

- Neutralize the pool water to pH of 6.5 to 8.5, then discharge to the sewer.

WHEN DRAINING YOUR POOL:

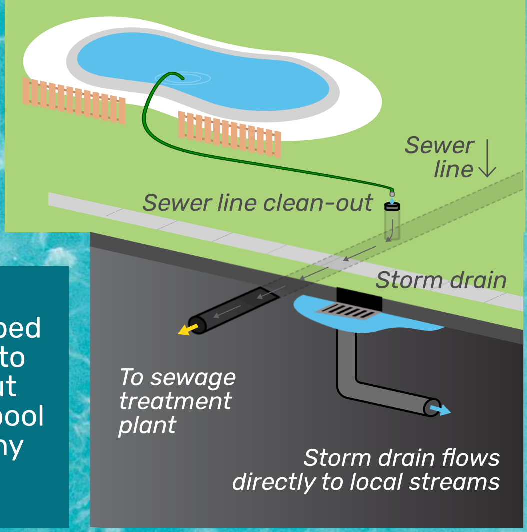
- Before draining your pool, contact your city for approval to drain your pool water into the sewer or storm drain.
- Saltwater pools must only be drained to the sewer or hauled away. Check with your pool maintenance company for draining requirements.

FOR SWIMMING POOL AND SPA FILTER BACKWASH:

- Dispose of solids into trash bag, then wash filter into a landscape area. Discharge water to the sewer, never to the storm drain.

! Many pools are plumbed to discharge directly to the sanitary sewer but call your plumber or pool maintenance company if you are unsure.

What's the difference between discharging to the sewer vs storm drain?



To report illegal dumping or toxic spills, call **(877) WASTE18** or visit **sbcountystormwater.org/report**

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HHW RESOURCES

Here are some resources with useful information for your HOA residents. You may add these free resources to your newsletters, websites, and any other communication channels you use.

HHW Materials Insert
Ideal for newsletters

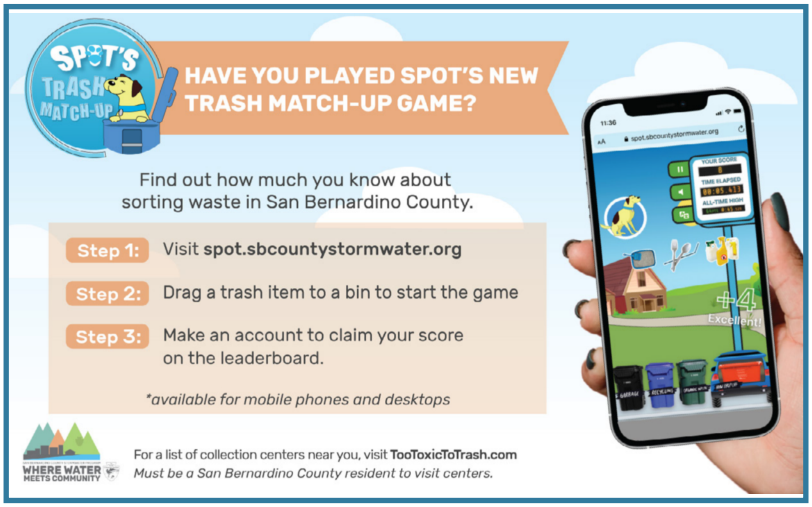
HHW Locations Insert
Ideal for newsletters

HHW Tote Bin Insert
Ideal for newsletters

HHW Flyer
Ideal for printing

PET WASTE DISPOSAL RESOURCES

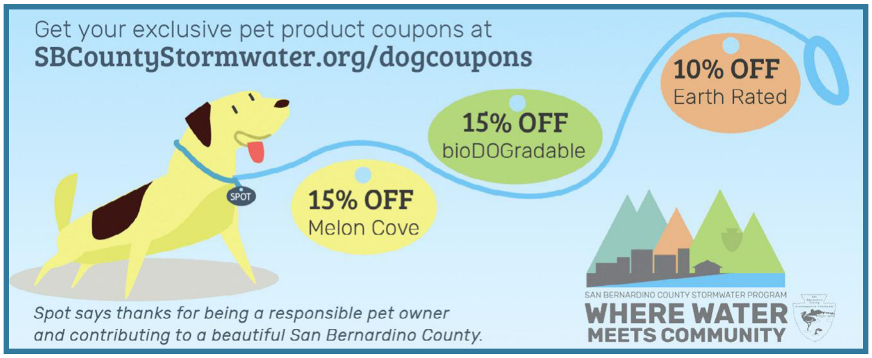
Here are some resources with useful information for your HOA residents. You may add these free resources to your newsletters, websites, and any other communication channels you use.



Spot's Trash Match-Up Game Insert
Ideal for newsletters

Dog Waste Insert
Ideal for newsletters

Dog Waste Insert
Ideal for newsletters



Dog Waste Coupon Insert
Ideal for newsletters

RESIDENTS

WE DID IT OURSELVES **AND WE DID IT RIGHT**

WHEN PAINTING YOUR HOME, PROTECT YOUR FAMILY AND COMMUNITY.

PAINTS that are water-based are less toxic and should be used whenever possible.

BRUSHES with water-based paint should be washed in the sink. Those with oil-based paint should be cleaned with paint thinner.

SAFELY dispose of unwanted paint and paint thinner at a household hazardous waste collection center near you.

For a list of acceptable materials, location information, and hours of operation, visit TooToxicToTrash.com.

To report illegal dumping or toxic spills, call **(877) WASTE18**
or visit **sbcountystormwater.org/report**

To dispose of hazardous waste, call **1 (800) OILYCAT**

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Vehicle Cleaning and Maintenance

Discharge into storm drain, accidental or not, can lead to enforcement actions which can include fines.

Follow these best practices to prevent polluted water and other materials from flowing into the street, gutter, and storm drain. Residents should first check HOA rules to see if vehicle maintenance is allowed on site.

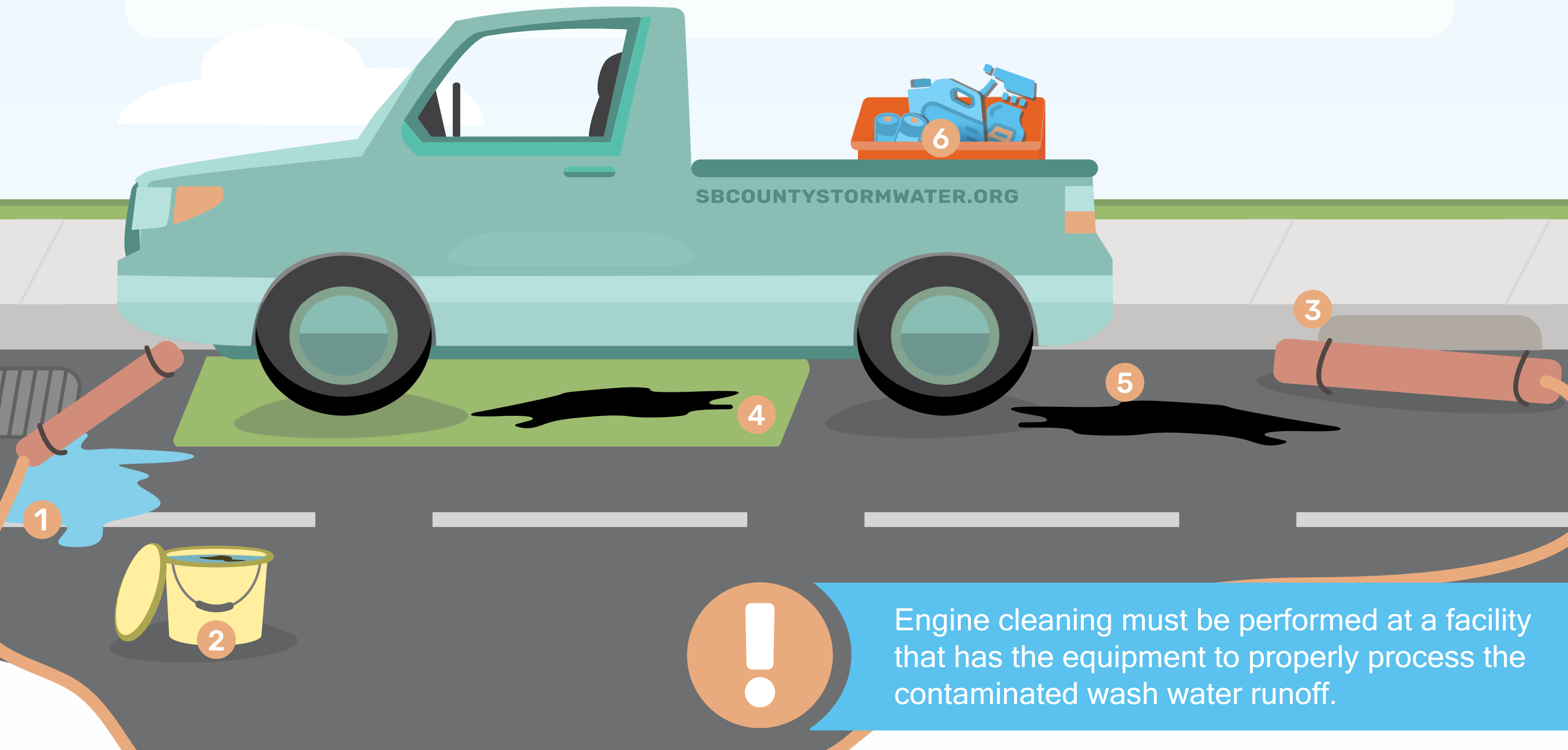
Wash Water Disposal

1. Wash in a contained area that has been bermed up to contain the wash water.
2. If washing items contaminated by hazardous materials, ensure the wash water is collected and hauled off-site for proper disposal.
3. Locate the nearest storm drain and place a barrier in front to ensure nothing can enter or be discharged into it.

Hazardous Waste Spill Clean-Up and Disposal

4. Use a tarp to catch drips and contain spills.
5. If a spill occurs, use absorbent material like kitty litter or absorbent pads to soak up the spill, then place in a bucket and properly dispose of at a local household hazardous waste facility.
6. Properly dispose of toxic materials at your local household hazardous waste facility.

Motor Oil
Oil Filters
Antifreeze
Batteries
Gasoline



Engine cleaning must be performed at a facility that has the equipment to properly process the contaminated wash water runoff.

To report illegal dumping, call **(877) WASTE18**
To report toxic spills, call **(800) 33 TOXIC**
To dispose of hazardous waste from a business, call San Bernardino County Fire at **(909) 386-8401**

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Step 2: Bag the poop and tie the bag.

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WHY SHOULD I PICK UP?

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- Your dog can get infected from the waste of other dogs.
- Dog waste can affect the quality of our rivers and oceans and make the water unsafe for swimming, drinking, or fishing.

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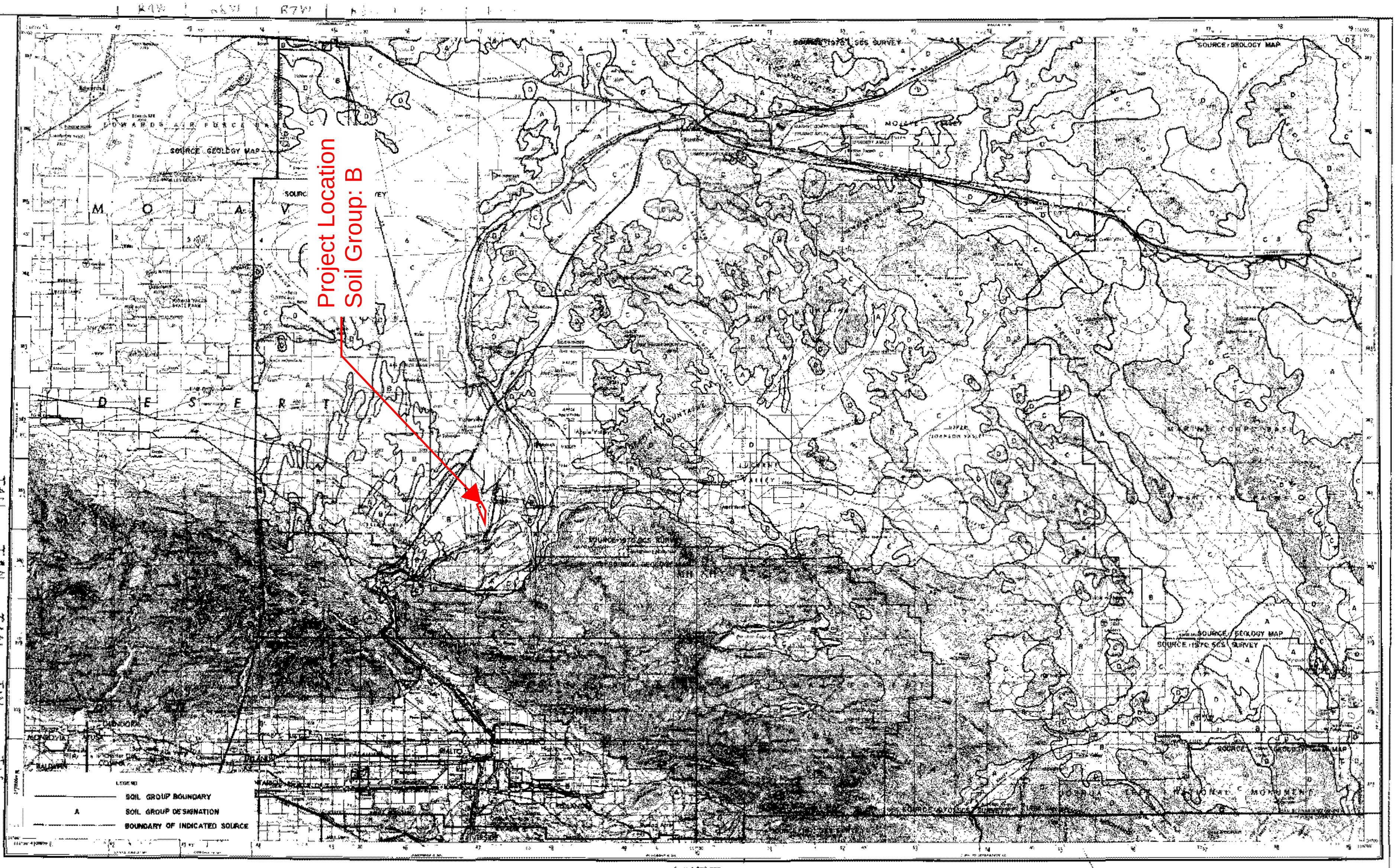
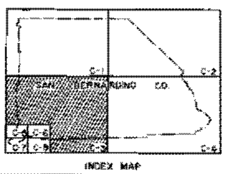
info@sbcountystormwater.org

SAN BERNARDINO COUNTY STORMWATER PROGRAM
WHERE WATER MEETS COMMUNITY

Appendix D: Education Materials



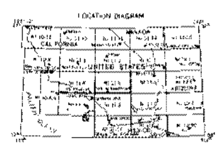


Scale 1:250,000

CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS
TRANSVERSE MERCATOR PROJECTION

BASE MAP REPRODUCED FROM U.S.G.S. "SAN BERNARDINO" TOPOGRAPHIC MAP

SCALE REDUCED BY 1/2



SAN BERNARDINO COUNTY

HYDROLOGY MANUAL

HYDROLOGIC SOILS GROUP MAP
FOR
SOUTHCENTRAL AREA

FIGURE C-11

GEOTECHNICAL • ENVIRONMENTAL • GEOLOGY • MATERIALS TESTING & INSPECTION • FORENSIC • LABORATORY

SALEM engineering group, inc.

LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION

PROPOSED LOADING DOCKS AND PARKING LOT
6730 SANTA FE AVENUE E
HESPERIA, CALIFORNIA

SALEM PROJECT NO. 3-223-0381
MAY 18, 2023

PREPARED FOR:

MR. GREG REITZ
CREDE GROUP
18301 VON KARMAN AVENUE, SUITE 510
IRVINE, CA 92612

PREPARED BY:

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May 18, 2023

Project No. 3-223-0381

Mr. Greg Reitz
Crede Group
18301 Von Karman, Suite 510
Irvine, CA 92612

SUBJECT: **LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION**
PROPOSED LOADING DOCKS AND PARKING LOT
6730 SANTA FE AVENUE E
HESPERIA, CALIFORNIA

Dear Mr. Reitz:

At your request and authorization, SALEM Engineering Group, Inc. (SALEM) has prepared this Limited Geotechnical Engineering Investigation report for the Proposed Loading Docks and Parking Lot to be located at the subject site.

The accompanying report presents our findings, conclusions, and recommendations regarding the geotechnical aspects of designing and constructing the project as presently proposed. In our opinion, the proposed project is feasible from a geotechnical viewpoint provided our recommendations are incorporated into the design and construction of the project.

We appreciate the opportunity to assist you with this project. Should you have questions regarding this report or need additional information, please contact the undersigned at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

Ibrahim Foud Ibrahim, PE, GE
Senior Managing Engineer
RCE 86724, GE 3222

Clarence Jiang, GE
Senior Geotechnical Engineer
RGE 2477

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LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED LOADING DOCKS AND PARKING LOT
6730 SANTA FE AVENUE E
HESPERIA, CALIFORNIA

1. PURPOSE AND SCOPE

This report presents the results of our Limited Geotechnical Engineering Investigation for the Proposed Loading Docks and Parking Lot to be located at 6730 Santa Fe Avenue E in the city of Hesperia, California (see Figure 1, Vicinity Map). The purpose of our limited geotechnical engineering investigation was to investigate the subsurface conditions encountered at the site, and provide conclusions and recommendations relative to the geotechnical aspects of constructing the project as presently proposed.

The scope of this investigation included a field exploration, percolation testing, laboratory testing, engineering analysis, and the preparation of this report. Our field exploration was performed on May 8, 2023, and included drilling of four (4) small-diameter soil borings to a maximum depth of 10 feet at the site. Additionally, two (2) percolation tests were performed at depths of approximately 3 and 4¾ feet below ground surface to determine the infiltration rates. The approximate locations of the soil borings and percolation tests are depicted on the Site Plan, Figure 2. A detailed discussion of our field investigation and exploratory boring logs are presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to evaluate pertinent physical properties for engineering analyses. Appendix B presents the laboratory test results in tabular and graphic format. The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions. If project details vary significantly from those described herein, SALEM should be contacted to determine the necessity for review and possible revision of this report. Earthwork and Pavement Specifications are presented in Appendix C. If text of the report conflict with the specifications in Appendix C, the recommendations in the text of the report have precedence.

2. PROJECT DESCRIPTION

Based on the site plans provided to us, we understand that the proposed development of the site will include construction of two (2) concrete loading docks and an asphaltic concrete (AC) parking lot. Each loading dock will have 4 depressed loading bays. A loading dock, 80 feet by 100 feet, will be located on the northeast side of the existing building, and another loading dock, 85 feet by 100 feet, will be located at the southeast end of the existing building. The parking lot will be located to the east of the existing building.

As the site area is relatively flat with no major changes in grade, we anticipate that cuts and fills during earthwork will be limited to providing positive site drainage. In the event that changes occur in the nature or design of the project, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions of our report are modified. The site configuration and locations of proposed improvements are shown on the Site Plan, Figure 2.

3. SITE LOCATION AND DESCRIPTION

The site is located northwest of the intersection of Jenny Street and Santa Fe Avenue E in the city of Hesperia, California (see Vicinity Map, Figure 1). The address of the site is 6730 Santa Fe Avenue E.

The subject site is irregular in shape and encompasses approximately 6.11 acres. The northern half of the site is vacant and will not be developed. The southern half of the site is occupied by a 21,831 square-foot sheet metal 67industrial building surrounded by associated asphalt concrete pavement and unpaved/non-landscaped land. An annex structure currently exists at the east corner of the industrial building. A steel frame structure is located in the north corner of the southern half of the site. A chain-linked fence surrounds the site. The southern half of the site is relatively flat with no major changes in grade.

4. FIELD EXPLORATION

Our field exploration consisted of site surface reconnaissance and subsurface exploration. The exploratory test borings (B-1 through B-4) were drilled on May 8, 2023, and were advanced with a 3-inch diameter hand auger. Exterior asphalt for B-1 and B-4 was cored using a coring machine prior to drilling. The test borings were extended to a maximum depth of approximately 10 feet below existing grade. Drilling was limited to 8 feet in boring B-4 due to auger refusal on hard soil conditions. The approximate locations of our test borings are shown on the Site Plan, Figure 2.

The materials encountered in the test borings were visually classified in the field, and logs were recorded by a field engineer and stratification lines were approximated on the basis of observations made at the time of drilling. Visual classification of the materials encountered in the test borings were generally made in accordance with the Unified Soil Classification System (ASTM D2488).

A soil classification chart and key to sampling is presented on the Unified Soil Classification Chart, in Appendix "A." The logs of the test borings are presented in Appendix "A." The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol. The location of the test borings were determined by measuring from features shown on the Site Plan, provided to us. Hence, accuracy can be implied only to the degree that this method warrants. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted. Soil samples were obtained from the test borings at the depths shown on the logs of borings. Bag samples were recovered and placed in a sealed bag to preserve their natural moisture content. Upon completion of the exploration, the borings were backfilled with soil cuttings, and then patched with concrete patch (where applicable),

5. LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory-testing program was formulated with emphasis on the evaluation of natural moisture, density, shear strength, maximum density and optimum moisture determination, and gradation of the materials encountered.

In addition, chemical tests were performed to evaluate the corrosivity of the soils to buried concrete and metal. Details of the laboratory test program and the results of laboratory test are summarized in Appendix "B." This information, along with the field observations, was used to prepare the final boring logs in Appendix "A."

6. SOIL AND GROUNDWATER CONDITIONS

6.1 Subsurface Conditions

The subsurface conditions encountered appear typical of those found in the geologic region of the site. In general, the soils within the depth of our borings consisted predominately of silty sand. The exterior surface within our test borings B-1 and B-4 consisted of approximately 2 to 3¼ inches of asphalt concrete (AC) underlain by approximately 2 to 3¼ inches of aggregate base (AB).

Fill soils may be present on site between our boring locations since the site was graded for the current development. The consistency of the fills should be verified during site construction. Prior to fill placement, Salem Engineering Group, Inc. should inspect the bottom of the excavation to verify no additional excavation will be required. Verification of the fill soils and the extent of fill should be determined during site grading.

The soils were classified in the field during the drilling and sampling operations. The stratification lines were approximated by the field engineer on the basis of observations made at the time of drilling. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted. The Boring Logs include the soil type, color, moisture content, and the applicable Unified Soil Classification System symbol. The locations of the test borings were determined by measuring from feature shown on the Site Plan provided to us. Hence, accuracy can be implied only to the degree that this method warrants.

6.2 Groundwater

The test boring locations were checked for the presence of groundwater during and after the drilling operations. Free groundwater was not encountered during our investigation. Based on regional groundwater data near the site vicinity, the historically highest groundwater depth is estimated to be greater than 50 feet below ground surface. It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, localized pumping, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

6.3 Soil Corrosion Screening

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete and the soil. The 2014 Edition of ACI 318 (ACI 318) has established criteria for evaluation of sulfate and chloride levels and how they relate to cement reactivity with soil and/or water.

A soil sample was obtained from the project site and was tested for the evaluation of the potential for concrete deterioration or steel corrosion due to attack by soil-borne soluble salts and soluble chloride. The water-soluble sulfate concentration in the saturation extract from the soil sample was detected to be less than 807 mg/kg. ACI 318 Tables 19.3.1.1 and 19.3.2.1 outline exposure categories, classes, and concrete requirements by exposure class. ACI 318 requirements for site concrete based upon soluble sulfate are summarized in Table 6.3 below.

TABLE 6.3
WATER SOLUBLE SULFATE EXPOSURE REQUIREMENTS

Water-Soluble Sulfate (SO_4) in Soil, %by Weight	Exposure Severity	Exposure Class	Maximum w/cm Ratio	Min. Concrete Compressive Strength	Cementitious Materials Type
0.0807	Not Severe	S0	N/A	2,500 psi	No Restriction

The water-soluble chloride concentration detected in saturation extract from the soil samples was 32 mg/kg. This level of chloride concentration is considered to be mildly corrosive. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, applicable manufacturer's recommendations for corrosion protection of buried metal pipe be closely followed.

6.4 Percolation Testing

Two percolation tests (P-1 and P-2) were performed. Results of the falling head tests are presented in the attachments to this report. The approximate locations of the percolation tests are shown on the attached Site Plan, Figure 2.

The boreholes were advanced to the depths shown on the percolation test worksheets. The holes were pre-saturated before percolation testing commenced. Percolation rates were measured by filling the test holes with clean water and measuring the water drops at a certain time interval. The difference in the percolation rates are reflected by the varied type of soil materials at the bottom of the test holes. The test results are shown on the table below.

TABLE 6.4
PERCOLATION TEST RESULTS

Test No.	Depth (feet)	Tested Infiltration Rate[1] (inch/hour)	Factor of Safety[2]	Design Infiltration Rate (inch/hour)	Soil Type[3]
P-1	4¾	**1.12**	**2.25**	**0.50**	Silty SAND (SM)
P-2	3	**2.32**	**2.25**	**1.03**	Poorly graded SAND (SP)

[1] **Tested infiltration Rate = (ΔH 60 r) / (Δt(r + 2H_{avg}))**
[2] **Based on Worksheets H, S_A = 1.5 and S_B = 1.5**
[3] **At bottom of test hole.**

The FS should be verified by the civil engineer based on Worksheets H: Factor of Safety and Design Infiltration Rate and Worksheet provided in the San Bernardino County Stormwater Program, Technical Guidance Document for Water Quality Management Plans (WQMP).

The soil infiltration or percolation rates are based on tests conducted with clear water. The infiltration/percolation rates may vary with time as a result of soil clogging from water impurities. The soils may also become less permeable to impermeable if the soil is compacted. Thus, periodic maintenance consisting of clearing the bottom of the drainage system of clogged soils should be expected. The infiltration/percolation rate may become slower if the surrounding soil is wet or saturated due to prolonged rainfalls. Additional percolation tests should be conducted at bottom of the drainage system during construction to verify the infiltration/percolation rate.

The scope of our services did not include a groundwater study and was limited to the performance of percolation testing and soil profile description, and the submitted data only. Our services did not include those associated with septic system design. Neither did services include an Environmental Site Assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere; or the presence of wetlands. Any statements, or absence of statements, in this report or on any boring logs regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessment.

The geotechnical engineering information presented herein is based upon professional interpretation utilizing standard engineering practices. The work conducted through the course of this investigation, including the preparation of this report, has been performed in accordance with the generally accepted standards of geotechnical engineering practice, which existed in the geographic area at the time the report was written. No other warranty, express or implied, is made. Please be advised that when performing percolation testing services in relatively small diameter borings, that the testing may not fully model the actual full scale long term performance of a given site. This is particularly true where percolation test data is to be used in the design of large infiltration system such as may be proposed for the site.

The measured percolation rate includes dispersion of the water at the sidewalls of the boring as well as into the underlying soils. Subsurface conditions, including percolation rates, can change over time as fine-grained soils migrate. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. We emphasize that this report is valid for the project outlined above and should not be used for any other sites.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1 General

7.1.1 Based upon the data collected during this investigation, and from a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed construction at the site as planned, provided the recommendations contained in this report are incorporated into the project design and construction. Conclusions and recommendations provided in this report are based on our review of available literature, analysis of data obtained from our field exploration and laboratory testing program, and our understanding of the proposed development at this time.

7.1.2 The primary geotechnical constraints identified in our investigation is the presence of potentially compressible soils at the site. Recommendations to mitigate the effects of these soils are provided in this report.

7.1.3 The scope of this investigation did not include subsurface exploration within the existing building and structure areas during field exploration. As such, subsurface soil conditions and materials present below the existing site structures are unknown and may be different than those noted within this report. The presence of potentially unacceptable fill materials, undocumented fill, and/or loose soil material that may be present below existing site features shall be taken into consideration. Our firm shall be present at the time of demolition activities to verify soil conditions are consistent with those identified as part of this investigation.

7.1.4 No significant fill soils were encountered during this investigation. Fill soils may be present on site between our boring locations since the site was graded for the current development. Verification of the fill soil and the extent of fill should be determined during site grading. Undocumented/uncompacted fill materials are not suitable to support any future structures and should be excavated and replaced with Engineered Fill. Prior to fill placement, SALEM should inspect the bottom of the excavation to verify the fill condition.

7.1.5 Site demolition activities shall include removal of all surface obstructions not intended to be incorporated into final site design. In addition, underground buried structures and/or utility lines encountered during demolition and construction should be properly removed and the resulting excavations backfilled with Engineered Fill. It is suspected that possible demolition activities of the existing structures may disturb the upper soils. After demolition activities, it is recommended that disturbed soils be removed and/or recompacted.

7.1.6 Surface vegetation consisting of grasses and other similar vegetation should be removed by stripping to a sufficient depth to remove organic-rich topsoil. The upper 4 to 6 inches of the soils containing vegetation, roots, and other objectionable organic matter encountered at the time of grading should be stripped and removed from the surface. Deeper stripping may be required in localized areas. The stripped vegetation will not be suitable for use as Engineered Fill or within 5 feet of building pads, loading docks or within pavement areas. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas or exported from the site.

7.1.7 SALEM shall review the project grading and foundation plans and specifications prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required. If SALEM is not provided plans and specifications for review, we cannot assume any responsibility for the future performance of the project.

7.1.8 SALEM shall be present at the site during site demolition and preparation to observe site clearing/demolition, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

7.1.9 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

7.2 Seismic Design Criteria

7.2.1 For seismic design of the structures, and in accordance with the seismic provisions of the 2022 CBC, our recommended parameters are shown below. These parameters were determined using California's Office of Statewide Health Planning and Development (OSHPD) Seismic Design Map Tool Website (https://seismicmaps.org/) in accordance with the 2022 CBC. The Site Class was determined based on the soils encountered during our field exploration.

TABLE 7.2.1
SEISMIC DESIGN PARAMETERS

Seismic Item	Symbol	Value	ASCE 7-16 or 2022 CBC Reference
Site Coordinates (Datum = NAD 83)		34.3730 Lat -117.3211 Lon	
Site Class	--	D-Default	ASCE 7 Table 20.3
Risk Category	--	II	CBC Table 1604.5
Site Coefficient for PGA	F_{PGA}	1.2	ASCE 7 Table 11.8-1
Peak Ground Acceleration (adjusted for Site Class effects)	PGA_M	0.685g	ASCE 7 Equation 11.8-1
Seismic Design Category	SDC	D	ASCE 7 Table 11.6-1 & 2
Mapped Spectral Acceleration (Short period - 0.2 sec)	S_S	1.5 g	CBC Figure 1613.2.1(1-10)
Mapped Spectral Acceleration (1.0 sec. period)	S_1	0.6 g	CBC Figure 1613.2.1(1-10)
Site Class Modified Site Coefficient	F_a	1.2	CBC Table 1613.2.3(1)
Site Class Modified Site Coefficient	F_v	*1.7	CBC Table 1613.2.3(2)
MCE Spectral Response Acceleration (Short period - 0.2 sec) $S_{MS} = F_a S_S$	S_{MS}	1.8 g	CBC Equation 16-20
MCE Spectral Response Acceleration (1.0 sec. period) $S_{M1} = F_v S_1$	S_{M1}	*1.53 g	CBC Equation 16-21
Design Spectral Response Acceleration $S_{DS}=⅔S_{MS}$ (short period - 0.2 sec)	S_{DS}	1.2 g	CBC Equation 16-22
Design Spectral Response Acceleration $S_{D1}=⅔S_{M1}$ (1.0 sec. period)	S_{D1}	*1.02 g	CBC Equation 16-23
Short Term Transition Period (S_{D1}/S_{DS}), seconds	T_S	0.85	ASCE 7-16, Section 11.4.6
Long Period Transition Period (seconds)	T_L	12	ASCE 7-16, Figure 22-14

*** Determined per ASCE Table 11.4-2 for use in calculating T_S only.**

7.2.2 Site Specific Ground Motion Analysis was not included in the scope of this investigation. Per ASCE 11.4.8, structures on Site Class D with S_1 greater than or equal to 0.2 may require Site Specific Ground Motion Analysis. However, a site specific motion analysis may not be required based on Exceptions listed in ASCE 11.4.8. The Structural Engineer should verify whether

Exception No. 2 of ASCE 7-16, Section 11.4.8, is valid for the site. In the event that a site specific ground motion analysis is required, SALEM should be contacted for these services.

7.2.3 Conformance to the criteria in the above table for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

7.3 Soil and Excavation Characteristics

7.3.1 Based on the soil conditions encountered in our soil borings, the onsite soils can be excavated with moderate effort using conventional heavy-duty earthmoving equipment.

7.3.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable Occupational Safety and Health Administration (OSHA) rules and regulations to maintain safety and maintain the stability of adjacent existing improvements. Temporary excavations are further discussed in a later Section of this report.

7.3.3 The near surface soils identified as part of our investigation are, generally, slightly moist to moist due to the absorption characteristics of the soil. Earthwork operations may encounter very moist unstable soils which may require removal to a stable bottom. Exposed native soils exposed as part of site grading operations shall not be allowed to dry out and should be kept continuously moist prior to placement of subsequent fill.

7.4 Materials for Fill

7.4.1 Excavated soils generated from cut operations at the site are suitable for use as general Engineered Fill in structural areas provided they do not contain deleterious matter, debris, organic material, or rock material larger than 3 inches in maximum dimension.

7.4.2 Import soil shall be well-graded, slightly cohesive silty fine sand or sandy silt, with relatively impervious characteristics when compacted. A clean sand or very sandy soil is not acceptable for this purpose. This material should be approved by the Engineer prior to use and should typically possess the soil characteristics summarized below in Table 7.4.2.

TABLE 7.4.2
IMPORT FILL REQUIREMENTS

Minimum Percent Passing No. 200 Sieve	15
Maximum Percent Passing No. 200 Sieve	50
Minimum Percent Passing No. 4 Sieve	70
Maximum Particle Size	3"
Maximum Plasticity Index	10
Maximum CBC Expansion Index	15

7.4.3 The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the Contractor, since they have complete control of the project site.

7.4.4 Proposed import materials should be sampled, tested, and approved by SALEM prior to its transportation to the site.

7.4.5 Environmental characteristics and corrosion potential of import soil materials should also be considered.

7.5 Grading

7.5.1 A representative of our firm shall be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Geotechnical Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section as well as other portions of this report.

7.5.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer and geotechnical engineer in attendance.

7.5.3 Site preparation should begin with removal of existing surface/subsurface structures, underground utilities (as required), any existing uncertified fill, and debris. Excavations or depressions resulting from site clearing operations, or other existing excavations or depressions, should be restored with Engineered Fill in accordance with the recommendations of this report.

7.5.4 Site demolition activities shall include removal of all surface obstructions not intended to be incorporated into final site design. In addition, underground buried structures and/or utility lines encountered during demolition and construction should be properly removed and the resulting excavations backfilled with Engineered Fill. After demolition activities, it is recommended that disturbed soils be removed and/or recompacted.

7.5.5 Surface vegetation consisting of grasses and other similar vegetation should be removed by stripping to a sufficient depth to remove organic-rich topsoil. The upper 2 to 6 inches of the soils containing, vegetation, roots and other objectionable organic matter encountered at the time of grading should be stripped and removed from the surface. Deeper stripping may be required in localized areas. In addition, existing concrete and asphalt materials shall be removed from areas of proposed improvements and stockpiled separately from excavated soil material. The stripped vegetation, asphalt and concrete materials will not be suitable for use as Engineered Fill or within 5 feet of building pads, loading docks, or within pavement areas. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas or exported from the site.

7.5.6 Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than ½ inch in diameter.

Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

7.5.7 No significant fill soils were encountered in our test borings. Fill soil may be present onsite since the site was previously graded for the current development. Undocumented and uncompacted fill materials are not suitable to support any future structures and should be excavated and replaced with Engineered Fill. The actual depth of the overexcavation and recompaction should be determined by our field representative during construction.

7.5.8 To minimize post-construction soil movement and provide uniform support for the proposed loading docks, overexcavation and recompaction within the proposed loading dock areas should be performed to a minimum depth of **two (2) feet** below existing grade or **one (1) foot** below footing bottom, whichever is deeper. The overexcavation and recompaction should also extend laterally to a minimum of 3 feet beyond the outer edges of the proposed footings except in areas where lateral extension is restricted by existing footings.

7.5.9 Slot cuts, braced shorings or shields may be used for supporting vertical excavations near existing structures. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavations and installation.

7.5.10 Within pavement areas, it is recommended that scarification, moisture conditioning, and recompaction be performed to at least **12 inches** below existing grade or finish grade, whichever is deeper. In addition, the upper 12 inches of final pavement subgrade – whether completed at-grade, by excavation, or by filling – should be uniformly moisture-conditioned to near the optimum moisture content and compacted to at least 95% relative compaction

7.5.11 Prior to placement of fill soils, the upper 10 to 12 inches of native subgrade soils should be scarified, moisture-conditioned to no less than optimum moisture content, and recompacted to a minimum of 95% of the maximum dry density based on ASTM Test Method D1557 latest edition.

7.5.12 All Engineered Fill (including scarified ground surfaces and backfill) should be placed in thin lifts to allow for adequate bonding and compaction (typically 6 to 8 inches in loose thickness).

7.5.13 Engineered Fill soils should be placed, moisture conditioned to no less than optimum moisture content, and compacted to at least 95% relative compaction.

7.5.14 An integral part of satisfactory fill placement is the stability of the placed lift of soil. If placed materials exhibit excessive instability as determined by a SALEM field representative, the lift will be considered unacceptable and shall be remedied prior to placement of additional fill material. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

7.5.15 Final pavement subgrade should be finished to a smooth, unyielding surface. We further recommend proof-rolling the subgrade with a loaded water truck (or similar equipment with high contact pressure) to verify the stability of the subgrade prior to placing aggregate base.

7.5.16 The most effective site preparation alternatives will depend on site conditions prior to grading. We should evaluate site conditions and provide supplemental recommendations immediately prior to grading, if necessary.

7.5.17 We do not anticipate groundwater or seepage to adversely affect construction if conducted during the drier months of the year (typically summer and fall). However, groundwater and soil moisture conditions could be significantly different during the wet season (typically winter and spring) as surface soils become wet; perched groundwater conditions may develop. Grading during this time period will increase the chances of encountering wet materials resulting in possible excavation and fill placement difficulties.

Project site winterization consisting of placement of aggregate base and protecting exposed soils during construction should be performed. If the construction schedule requires grading operations during the wet season, we can provide additional recommendations as conditions warrant.

7.5.18 Wet soils may become non conducive to site grading as the upper soils yield under the weight of the construction equipment. Therefore, mitigation measures should be performed for stabilization.

Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material or placement of slurry, crushed rocks or aggregate base material; or mixing the soil with an approved lime or cement product.

The most common remedial measure of stabilizing the bottom of the excavation due to wet soil condition is to reduce the moisture of the soil to near the optimum moisture content by having the subgrade soils scarified and aerated or mixed with drier soils prior to compacting. However, the drying process may require an extended period of time and delay the construction operation.

To expedite the stabilizing process, slurry or crushed rock may be utilized for stabilization provided this method is approved by the owner for the cost purpose. If the use of slurry or crushed rock is considered, it is recommended that the upper soft and wet soils be replaced by 6 to 24 inches of 2-sack slurry or ¾-inch to 1-inch crushed rocks. The thickness of the slurry or rock layer depends on the severity of the soil instability. The recommended 6 to 24 inches of slurry or crushed rock material will provide a stable platform. It is further recommended that lighter compaction equipment be utilized for compacting the crushed rock.

A layer of geofabric is recommended to be placed on top of the compacted crushed rock to minimize migration of soil particles into the voids of the crushed rock, resulting in soil movement. Although it is not required, the use of geogrid (e.g. Tensar NX750) below the slurry or crushed rock will enhance stability and reduce the required thickness of crushed rock necessary for stabilization. Our firm should be consulted prior to implementing remedial measures to provide appropriate recommendations.

7.6 Shallow Foundations for loading docks

7.6.1 The site is suitable for use of conventional shallow foundations consisting of continuous footings and isolated pad footings bearing in properly compacted Engineered Fill.

7.6.2 The bearing wall footings considered for the structure should be continuous with a minimum width of 15 inches and extend to a minimum depth of 18 inches below the lowest adjacent soil grade. Isolated column footings should have a minimum width of 24 inches and extend a minimum depth of 18 inches below the lowest adjacent soil grade. Footing depth should be measured at the time of footing trench excavation not to include any future material (e.g. base, concrete, asphalt, etc.) over the subgrade.

7.6.3 The bottom of footing excavations should be maintained free of loose and disturbed soil. Footing concrete should be placed into a neat excavation.

7.6.4 New foundations planned directly adjacent to existing foundations should extend at a minimum to the bottom of new foundations or the depths specified above, whichever is greater

7.6.5 Footings proportioned as recommended above may be designed for the maximum allowable soil bearing pressures shown in the table below.

Loading Condition	Allowable Bearing
Dead Load Only	2,000 psf
Dead-Plus-Live Load	2,500 psf
Total Load, Including Wind or Seismic Loads	3,325 psf

7.6.6 For design purposes, total settlement due to static and seismic loadings on the order of 1½ inches may be assumed for shallow footings. Differential settlement due to static and seismic loadings, along a 30-foot exterior wall footing or between adjoining column footings, should be ¾ inches, producing an angular distortion of 0.002. Most of the settlement is expected to occur during construction as the loads are applied. However, additional post-construction settlement may occur if the foundation soils are flooded or saturated. The footing excavations should not be allowed to dry out any time prior to pouring concrete.

7.6.7 Resistance to lateral footing displacement can be computed using an allowable coefficient of friction factor of 0.45 acting between the base of foundations and the supporting subgrade.

7.6.8 Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 350 pounds per cubic foot acting against the appropriate vertical native footing faces. The frictional and passive resistance of the soil may be combined provided that a 50 percent reduction of the frictional resistance factor is used when determining the total lateral resistance. An increase of one-third is permitted when using the alternate load combination that includes wind or earthquake loads.

7.6.9 Underground utilities running parallel to footings should not be constructed in the zone of influence of footings. The zone of influence may be taken to be the area beneath the footing and within a 1:1 plane extending out and down from the bottom edge of the footing.

7.6.10 The foundation subgrade should be sprinkled as necessary to maintain a moist condition without significant shrinkage cracks as would be expected in any concrete placement. Prior to placing rebar reinforcement, foundation excavations should be evaluated by a representative of SALEM for appropriate support characteristics and moisture content. Moisture conditioning may be required for the materials exposed at footing bottom, particularly if foundation excavations are left open for an extended period.

7.7 Exterior Concrete Slabs

7.7.1 The upper 24 inches of the slab subgrade should be recompacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D1557, and the slab should be underlain by at least 6 inches of crushed aggregate base (CAB) compacted to a minimum relative compaction of 95 percent.

7.7.2 Slabs should have a minimum thickness of 5 inches, and a minimum compressive strength of 4,000 psi. Slabs should be reinforced as a minimum with No. 4 reinforcement bars at 18 inches on center, each way. Thicker slabs and/or additional reinforcement may be required by the structural engineer based on the anticipated loading.

7.7.3 Concrete slabs may be designed utilizing an allowable bearing pressure of 1,000 psf for dead-plus-live loads. This value may be increased by one-third for short duration loads, such as wind or seismic.

7.7.4 The subgrade should be kept in a moist condition until time of slab placement. Slabs subject to structural loading may be designed utilizing a modulus of subgrade reaction K of 200 pounds per square inch per inch. The K value was approximated based on inter-relationship of soil classification and bearing values (Portland Cement Association, Rocky Mountain Northwest).

7.7.5 It is recommended that utility trenches within the structure be compacted, as specified in our report, to minimize the transmission of moisture through the utility trench backfill.

7.7.6 Ponding of water should not be allowed adjacent to the slabs. Over-irrigation in landscaped areas adjacent to the slabs should be prevented.

7.7.7 Proper finishing and curing should be performed in accordance with the latest guidelines provided by the American Concrete Institute, Portland Cement Association, and ASTM.

7.8 Lateral Earth Pressures and Frictional Resistance

7.8.1 Active, at-rest and passive unit lateral earth pressures against footings and walls are summarized in the table below:

Lateral Pressures Drained and Level Backfill Conditions	Equivalent Fluid Pressure, pcf
Active Pressure	33
At-Rest Pressure	52
Passive Pressure	350
Related Parameters	
Allowable Coefficient of Friction	0.45
In-Place Soil Density (lbs/ft^3)	120

7.8.2 Active pressure applies to walls, which are free to rotate. At-rest pressure applies to walls, which are restrained against rotation. The preceding lateral earth pressures assume sufficient drainage behind retaining walls to prevent the build-up of hydrostatic pressure.

7.8.3 The top one-foot of adjacent subgrade should be deleted from the passive pressure computation.

7.8.4 A safety factor consistent with the design conditions should be included in the usage of the values in the above table.

7.8.5 For stability against lateral sliding, which is resisted solely by the passive pressure, we recommend a minimum safety factor of 1.5.

7.8.6 For stability against lateral sliding, which is resisted by the combined passive and frictional resistance, a minimum safety factor of 2.0 is recommended.

7.8.7 For lateral stability against seismic loading conditions, we recommend a minimum safety factor of 1.1.

7.8.8 For dynamic seismic lateral loading the following equation shall be used:

Dynamic Seismic Lateral Loading Equation
Dynamic Seismic Lateral Load = $\frac{3}{8}\gamma K_h H^2$
Where: γ = In-Place Soil Density
K_h = Horizontal Acceleration = $\frac{2}{3}PGA_M$
H = Wall Height

7.9 Retaining Walls

7.9.1 Retaining and/or below grade walls should be drained with either perforated pipe encased in free-draining gravel or a prefabricated drainage system. The gravel zone should have a minimum width of 12 inches wide and should extend upward to within 12 inches of the top of the wall. The upper 12 inches of backfill should consist of native soils, concrete, asphaltic-concrete or other suitable backfill to minimize surface drainage into the wall drain system. The gravel should be completely wrapped in nonwoven polypropylene geotextiles (filter fabric) to minimize migration of soil particles into the voids of the crushed rock.

7.9.2 Prefabricated drainage systems, such as Miradrain®, Enkadrain®, or an equivalent substitute, are acceptable alternatives in lieu of gravel provided they are installed in accordance with the manufacturer's recommendations. If a prefabricated drainage system is proposed, our firm should review the system for final acceptance prior to installation.

7.9.3 Drainage pipes should be placed with perforations down and should discharge in a non-erosive manner away from foundations and other improvements. The top of the perforated pipe should be placed at or below the bottom of the adjacent floor slab or pavements. The pipe should be placed in the center line of the drainage blanket and should have a minimum diameter of 4 inches. Slots should be no wider than 1/8-inch in diameter, while perforations should be no more than ¼-inch in diameter.

7.9.4 If retaining walls are less than 5 feet in height, the perforated pipe may be omitted in lieu of weep holes on 4 feet maximum spacing. The weep holes should consist of 2-inch minimum diameter holes (concrete walls) or unmortared head joints (masonry walls) and placed no higher than 18 inches above the lowest adjacent grade. Two 8-inch square overlapping patches of geotextile fabric (conforming to the CalTrans Standard Specifications for "edge drains") should be affixed to the rear wall opening of each weep hole to retard soil piping.

7.9.5 During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall, or within a lateral distance equal to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

7.10 Temporary Excavations

7.10.1 We anticipate that the majority of the near surface site soils will be classified as Cal-OSHA "Type C" soil when encountered in excavations during site development and construction. Excavation sloping, benching, the use of trench shields, and the placement of trench spoils should conform to the latest applicable Cal-OSHA standards. The contractor should have a Cal-OSHA-approved "competent person" onsite during excavation to evaluate trench conditions and make appropriate recommendations where necessary.

7.10.2 It is the contractor's responsibility to provide sufficient and safe excavation support as well as protecting nearby utilities, structures, and other improvements which may be damaged by earth movements. All onsite excavations must be conducted in such a manner that potential surcharges from existing structures, construction equipment, and vehicle loads are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing foundation or vehicle load.

7.10.3 Temporary excavations and slope faces should be protected from rainfall and erosion. Surface runoff should be directed away from excavations and slopes.

7.10.4 Open, unbraced excavations in undisturbed soils should be made according to the slopes presented in the following table:

RECOMMENDED EXCAVATION SLOPES

Depth of Excavation (ft)	Slope (Horizontal : Vertical)
0-5	1:1
5-10	2:1

7.10.5 If, due to space limitation, excavations near property lines or existing structures are performed in a vertical position, slot cuts, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavations and installation. A Specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction.

7.10.6 Braced shorings should be designed for a maximum pressure distribution of 30H, (where H is the depth of the excavation in feet). The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given herein. Equipment traffic should concurrently be limited to an area at least 3 feet from the shoring face or edge of the slope.

7.10.7 The excavation and shoring recommendations provided herein are based on soil characteristics derived from the borings within the area. Variations in soil conditions will likely be encountered during the excavations. SALEM Engineering Group, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation. Slope height, slope inclination, or excavation depth should in no case exceed those specified in local, state, or federal safety regulation, (e.g. OSHA) standards for excavations, 29 CFR part 1926, or Assessor's regulations.

7.11 Underground Utilities

7.11.1 Underground utility trenches should be backfilled with properly compacted material. The material excavated from the trenches should be adequate for use as backfill provided it does not contain deleterious matter, vegetation or rock larger than 3-inches in maximum dimension. Trench backfill utilizing native soils should be placed in loose lifts not exceeding 8-inches and compacted to 95% relative compaction.

7.11.2 Bedding and pipe zone backfill typically extends from the bottom of the trench excavations to approximately 6 to 12 inches above the crown of the pipe. Pipe bedding and backfill material should conform to the requirements of the governing utility agency.

7.11.3 It is suggested that underground utilities crossing beneath new or existing structures be plugged at entry and exit locations to the building or structure to prevent water migration. Trench plugs can consist of on-site clay soils, if available, or sand cement slurry. The trench plugs should extend 2 feet beyond each side of individual perimeter foundations.

7.11.4 The contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

7.12 Surface Drainage

7.12.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change to important engineering properties. Proper drainage should be maintained at all times.

7.12.2 The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than 5 percent for a minimum distance of 10 feet.

7.12.3 Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 percent away from the building and drainage gradients maintained to carry all surface water to collection facilities and off site. These grades should be maintained for the life of the project. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed.

7.12.4 Roof drains should be installed with appropriate downspout extensions out-falling on splash blocks so as to direct water a minimum of 5 feet away from the structures or be connected to the storm drain system for the development.

7.13 Pavement Design

7.13.1 Based on site soil conditions and laboratory testing, an R-value of 40 was used for the preliminary flexible asphaltic concrete pavement design. The R-value may be verified during grading of the pavement areas.

7.13.2 The pavement design recommendations provided herein are based on the State of California Department of Transportation (CALTRANS) design manual. The following table shows the recommended pavement sections for various traffic indices.

TABLE 7.13.2
ASPHALT CONCRETE PAVEMENT

Traffic Index	Asphaltic Concrete	Clean Crushed Aggregate Base*	Compacted Subgrade*
5.0 (Vehicle Parking and Drive Areas)	3.0"	4.0"	12.0"
6.0 (Occasional Truck Areas)	3.0"	6.0"	12.0"
7.0 (Heavy Truck Areas)	4.0"	7.0"	12.0"

95% compaction based on ASTM D1557 Test Method

7.13.3 The following recommendations are for light-duty, medium-duty and heavy-duty Portland Cement Concrete pavement sections.

TABLE 7.13.3
PORTLAND CEMENT CONCRETE PAVEMENT

Traffic Index	Portland Cement Concrete*	Clean Crushed Aggregate Base**	Compacted Subgrade**
5.0 (Light Duty)	5.0"	4.0"	12.0"
6.0 (Medium Duty)	6.0"	4.0"	12.0"
7.0 (Heavy Duty)	7.0"	6.0"	12.0"

**** Minimum Compressive Strength of 4,000 psi, Minimum Reinforcement of No. 4 bars at 18 inches o.c. each way***
***** 95% compaction based on ASTM D1557 Test Method***

8. PLAN REVIEW, CONSTRUCTION OBSERVATION AND TESTING

8.1 Plan and Specification Review

8.1.1 SALEM should review the project plans and specifications prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required.

8.2 Construction Observation and Testing Services

8.2.1 The recommendations provided in this report are based on the assumption that we will continue as Geotechnical Engineer of Record throughout the construction phase. It is important to maintain continuity of geotechnical interpretation and confirm that field conditions encountered are similar to those anticipated during design. If we are not retained for these services, we cannot assume any responsibility for others interpretation of our recommendations, and therefore the future performance of the project.

8.2.2 SALEM should be present at the site during site preparation to observe site clearing, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

8.2.3 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

9. LIMITATIONS AND CHANGED CONDITIONS

The analyses and recommendations submitted in this report are based upon the data obtained from the test borings drilled at the approximate locations shown on the Site Plan, Figure 2. The report does not reflect variations which may occur between borings. The nature and extent of such variations may not become evident until construction is initiated. If variations then appear, a re-evaluation of the recommendations of this report will be necessary after performing on-site observations during the excavation period and noting the characteristics of such variations.

The findings and recommendations presented in this report are valid as of the present and for the proposed construction. If site conditions change due to natural processes or human intervention on the property or adjacent to the site, or changes occur in the nature or design of the project, or if there is a substantial time lapse between the submission of this report and the start of the work at the site, the conclusions and recommendations contained in our report will not be considered valid unless the changes are reviewed by SALEM and the conclusions of our report are modified or verified in writing. The validity of the recommendations contained in this report is also dependent upon an adequate testing and observations program during the construction phase.

Our firm assumes no responsibility for construction compliance with the design concepts or recommendations unless we have been retained to perform the on-site testing and review during construction. SALEM has prepared this report for the exclusive use of the owner and project design consultants.

SALEM does not practice in the field of corrosion engineering. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, that manufacturer’s recommendations for corrosion protection be closely followed. Further, a corrosion engineer may be needed to incorporate the necessary precautions to avoid premature corrosion of concrete slabs and foundations in direct contact with native soil. The importation of soil and or aggregate materials to the site should be screened to determine the potential for corrosion to concrete and buried metal piping.

The report has been prepared in accordance with generally accepted geotechnical engineering practices in the area. No other warranties, either express or implied, are made as to the professional advice provided under

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

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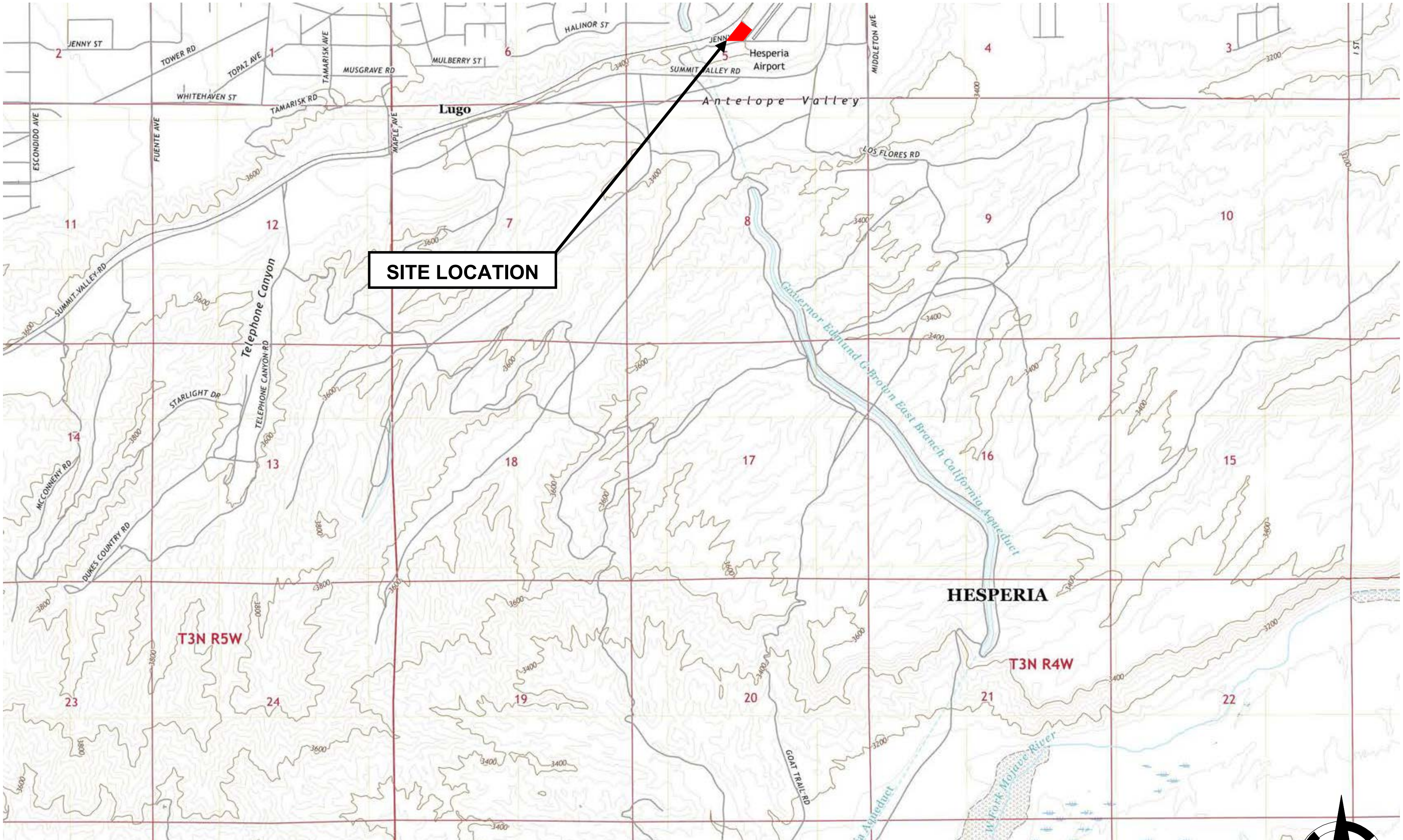
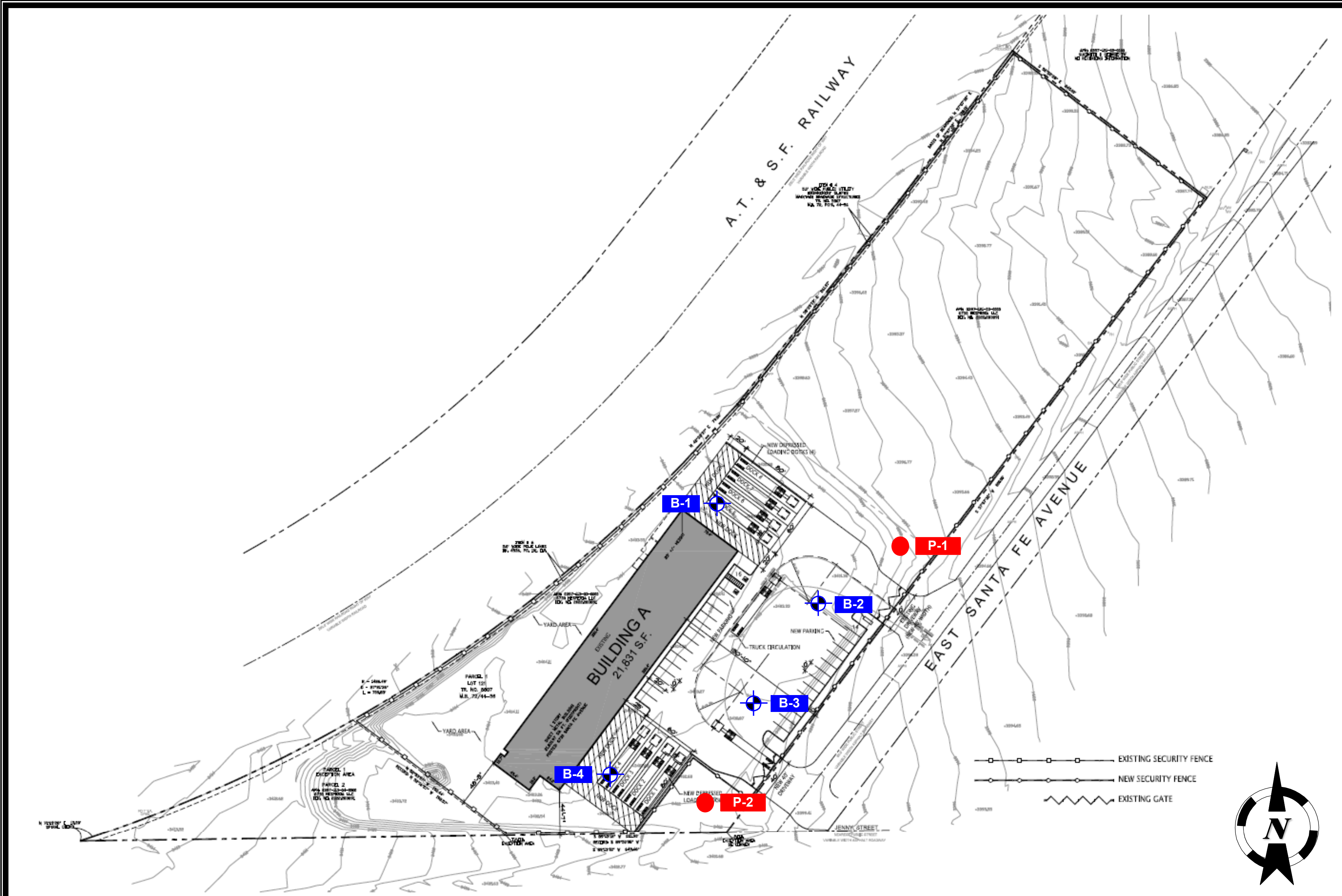


Source Image: U.S. Geological Survey, Silverwood Lake, California, https://ngmdb.usgs.gov/topoview (2021)

VICINITY MAP	SCALE: NOT TO SCALE	DATE: 05/2023	SALEM engineering group, inc.
LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION Proposed Loading Docks and Parking Lot 6730 Santa Fe Avenue E Hesperia, California	DRAWN BY: JC	APPROVED BY: CJ	
	PROJECT NO. 3-223-0381	FIGURE NO. 1	



SITE PLAN

LIMITED GEOTECHNICAL ENGINEERING INVESTIGATION
Proposed Loading Docks and Parking Lot
6730 Santa Fe Avenue E
Hesperia, California

SCALE:	DATE:
NOT TO SCALE	05/2023
DRAWN BY: JC	APPROVED BY: CJ
PROJECT NO. 3-223-0381	FIGURE NO. 2

LEGEND:

B-1 Soil Boring Locations
P-1 Percolation Locations

All Locations Approximate

SALEM engineering group, inc.

APPENDIX

A

APPENDIX A
FIELD EXPLORATION

Fieldwork for our investigation (drilling) was conducted on May 8, 2023, and included a site visit, subsurface exploration, percolation testing, and soil sampling. The locations of the exploratory borings and percolation tests are shown on the Site Plan, Figure 2. Boring logs for our exploration are presented in figures following the text in this appendix. Borings were located in the field using existing reference points. Therefore, actual boring locations may deviate slightly.

In general, the test borings were advanced with a 3-inch diameter hand auger. Surface asphalt for borings B-1 and B-4 was cored using a coring machine prior to drilling. The test borings were extended to a maximum depth of 10 feet below existing grade. Subsurface soil samples were obtained from ring samples and the auger cuttings at the depths shown on the logs of borings.

Subsurface conditions encountered in the exploratory borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D2488). This system uses the Unified Soil Classification System (USCS) for soil designations. The logs depict soil and geologic conditions encountered and depths at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the field logs were revised based on subsequent laboratory testing.

Test Boring: B-1 **Page** 1 **Of:** 1

SALEM engineering group, inc.

Project Number: 3-223-0381

Date: 05/08/2023

Client: Crede Group

Project: Proposed Loading Docks and Parking Lot

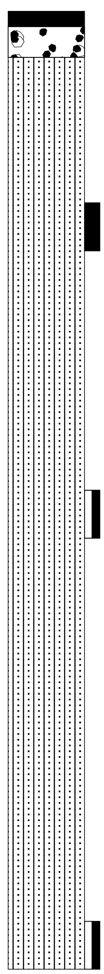
Location: 6730 Santa Fe Avenue E, Hesperia, California

Drilled By: SALEM **Logged By:** CC

Drill Type: N/A **Elevation:** 3,411'

Auger Type: 3 in. Hand Auger **Initial Depth to Groundwater:** N/A

Hammer Type: 35 lb - Manual Drop **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
0		AC	Asphalt Concrete = 2 in.				
		AB	Aggregate Base = 3.25				
3410		SM	Silty SAND Moist; brown; fine to coarse grain sand.				
2					5.5	105.8	
			Grades as above; reddish brown.				
3408							
4							
3406			Grades as above.		7.9	-	
6							
3404							
8							
3402							
			Grades as above; trace gravel.		5.6	-	
10			End of boring at 10 feet BSG.				
3400							

Notes:

Figure Number A-1

SALEM
engineering group, inc.

Test Boring: B-2 **Page** 1 **Of:** 1

Project Number: 3-223-0381

Date: 05/08/2023

Client: Crede Group

Project: Proposed Loading Docks and Parking Lot

Location: 6730 Santa Fe Avenue E, Hesperia, California

Drilled By: SALEM **Logged By:** CC

Drill Type: N/A **Elevation:** 3,409'

Auger Type: 3 in. Hand Auger **Initial Depth to Groundwater:** N/A

Hammer Type: 35 lb - Manual Drop **Final Depth to Groundwater:** N/A

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
0		SM	Silty SAND Slightly moist; light brown; fine to coarse grain sand.				
3408					3.6	-	
2			Grades as above; brown.		4.4	-	
3406							
4							
3404			Grades as above; moist; fine to medium grain sand.		6.9	-	
			End of boring at 5 feet BSG.				
6							
3402							
8							
3400							
10							
3398							

Notes:

Figure Number A-2

Test Boring: B-3 **Page** 1 **Of:** 1

Project Number: 3-223-0381

Date: 05/08/2023

Client: Crede Group

Project: Proposed Loading Docks and Parking Lot

Location: 6730 Santa Fe Avenue E, Hesperia, California

Drilled By: SALEM **Logged By:** CC

Drill Type: N/A **Elevation:** 3,412'

Auger Type: 3 in. Hand Auger **Initial Depth to Groundwater:** N/A

Hammer Type: 35 lb - Manual Drop **Final Depth to Groundwater:** N/A

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
3412 — 0		SM	Silty SAND Moist; brown; fine to coarse grain sand.				
			Grades as above.		5.1	-	
3410 — 2							
			Grades as above.		5.8	-	
			End of boring at 3 feet BSG.				
3408 — 4							
3406 — 6							
3404 — 8							
3402 — 10							

Notes:

Figure Number A-3

Test Boring: B-4 **Page** 1 **Of:** 1

Project Number: 3-223-0381

Date: 05/08/2023

Client: Crede Group

SALEM engineering group, inc.

Project: Proposed Loading Docks and Parking Lot

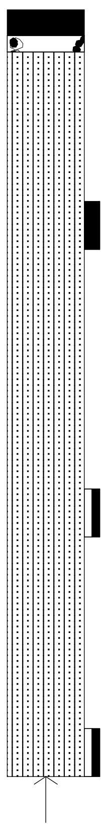
Location: 6730 Santa Fe Avenue E, Hesperia, California

Drilled By: SALEM **Logged By:** CC

Drill Type: N/A **Elevation:** 3,412'

Auger Type: 3 in. Hand Auger **Initial Depth to Groundwater:** N/A

Hammer Type: 35 lb - Manual Drop **Final Depth to Groundwater:** N/A



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	N-Values blows/ft.	Moisture Content %	Dry Density, PCF	Remarks
3412 — 0		AC	Asphalt Concrete = 3.25 in.				
		AB	Aggregate Base = 2 in.				
		SM	Silty SAND Moist; reddish brown; fine to coarse grain sand; trace gravel.				
3410 — 2					8.6	115.8	
3408 — 4							
			Grades as above; brown; less silt.		7.2	-	
3406 — 6							
			Grades as above; light brown.		6.6	-	
3404 — 8			Refusal at 8 feet BSG due to hard soil.				
3402 — 10							

Notes:

Figure Number A-4

KEY TO SYMBOLS

Symbol Description

Strata symbols

Asphaltic Concrete

Description not given for:
"AG"

Silty sand

Misc. Symbols

Drill rejection

Soil Samplers

California sampler

Auger

Notes:

Granular Soils
Blows Per Foot (Uncorrected)

	MCS	SPT
Very loose	<5	<4
Loose	5-15	4-10
Medium dense	16-40	11-30
Dense	41-65	31-50
Very dense	>65	>50

Cohesive Soils
Blows Per Foot (Uncorrected)

	MCS	SPT
Very soft	<3	<2
Soft	3-5	2-4
Firm	6-10	5-8
Stiff	11-20	9-15
Very Stiff	21-40	16-30
Hard	>40	>30

MCS = Modified California Sampler
SPT = Standard Penetration Test Sampler

Percolation Test Worksheet

Project: **Proposed Loading Docks and Parking Lot**
6730 Santa Fe Avenue E
Hesperia, California

Job No.: **3-223-0381**
Date Drilled: **5/8/2023**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 3 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 57 in.

Test Hole No.: **P-1**
Tested by: **CC**
Drilled Hole Depth: **4.75** ft.

Presoaking Date: **5/8/2023**
Test Date: **5/8/2023**

Pipe Stick up: 0.25 ft.

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
8:25	8:50	5.0	Y	0:25	1.52	2.64	13.44	25	1.9	41.8	28.3	35.0	1.32
8:51	9:16	5.0	Y	0:25	1.60	2.63	12.36	25	2.0	40.8	28.4	34.6	1.23
9:17	9:27	5.0	Y	0:10	2.06	2.44	4.56	10	2.2	35.3	30.7	33.0	1.19
9:27	9:37	5.0	N	0:10	2.44	2.77	3.96	10	2.5	30.7	26.8	28.7	1.18
9:37	9:47	5.0	N	0:10	2.77	3.05	3.36	10	3.0	26.8	23.4	25.1	1.14
9:48	9:58	5.0	Y	0:10	1.64	2.05	4.92	10	2.0	40.3	35.4	37.9	1.13
9:58	10:08	5.0	N	0:10	2.05	2.41	4.32	10	2.3	35.4	31.1	33.2	1.12
10:08	10:18	5.0	N	0:10	2.41	2.73	3.84	10	2.6	31.1	27.2	29.2	1.13
											Infiltration Rate		**1.12**

SALEM engineering group, inc.

Percolation Test Worksheet

Project: **Proposed Loading Docks and Parking Lot**
6730 Santa Fe Avenue E
Hesperia, California

Job No.: **3-223-0381**
Date Drilled: **5/8/2023**
Soil Classification: **Poorly graded SAND (SP)**

Hole Radius: 3 in.
Pipe Dia.: 3 in.

Test Hole No.: **P-2**
Tested by: **CC**
Drilled Hole Depth: **3.0** ft.

Presoaking Date: **5/8/2023**
Test Date: **5/8/2023**

Total Depth of Hole: 36 in.
Pipe Stick up: 1.75 ft.

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
8:45	9:10	4.8	Y	0:25	2.40	3.75	16.20	25	1.5	28.2	12.0	20.1	2.70
9:11	9:36	4.8	Y	0:25	2.62	3.81	14.28	25	1.8	25.6	11.3	18.4	2.58
9:37	9:47	4.8	Y	0:10	2.70	3.23	6.36	10	1.6	24.6	18.2	21.4	2.50
9:47	9:57	4.8	N	0:10	3.23	3.62	4.68	10	2.1	18.2	13.6	15.9	2.42
9:57	10:07	4.8	N	0:10	3.62	3.91	3.48	10	2.9	13.6	10.1	11.8	2.35
10:08	10:18	4.8	Y	0:10	3.00	3.43	5.16	10	1.9	21.0	15.8	18.4	2.33
10:18	10:28	4.8	N	0:10	3.43	3.76	3.96	10	2.5	15.8	11.9	13.9	2.32
10:28	10:38	4.8	N	0:10	3.76	4.02	3.12	10	3.2	11.9	8.8	10.3	2.38
												Infiltration Rate	**2.32**

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APPENDIX

B

APPENDIX B
LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM), Caltrans, or other suggested procedures. Selected samples were tested for in-situ moisture content, density, shear strength, maximum density and optimum moisture content, gradation, and corrosivity of the material encountered. The results of the laboratory tests are summarized in the following figures.

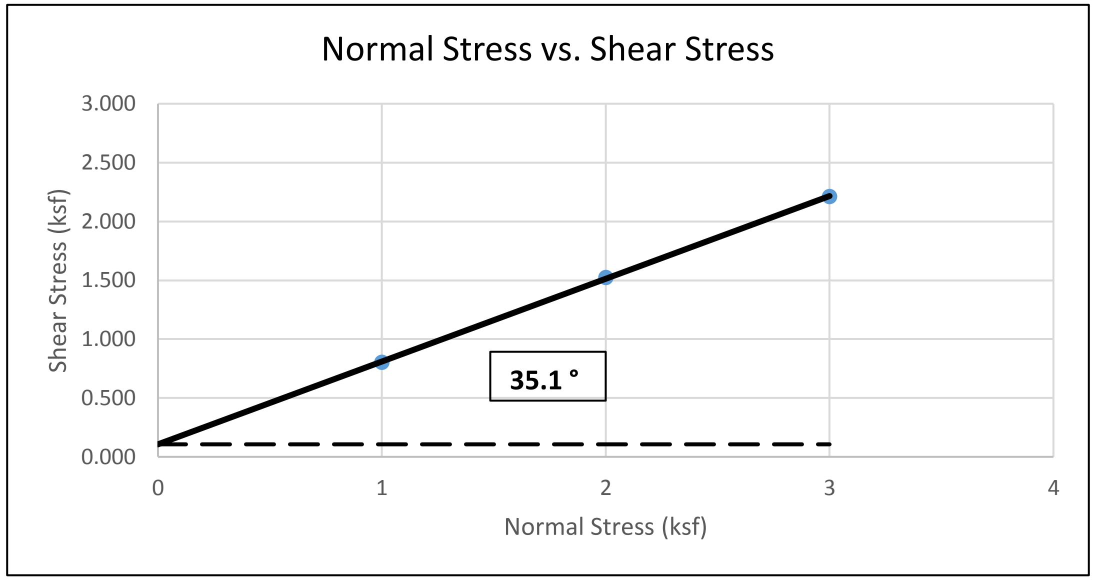
Direct Shear Test (ASTM D3080)

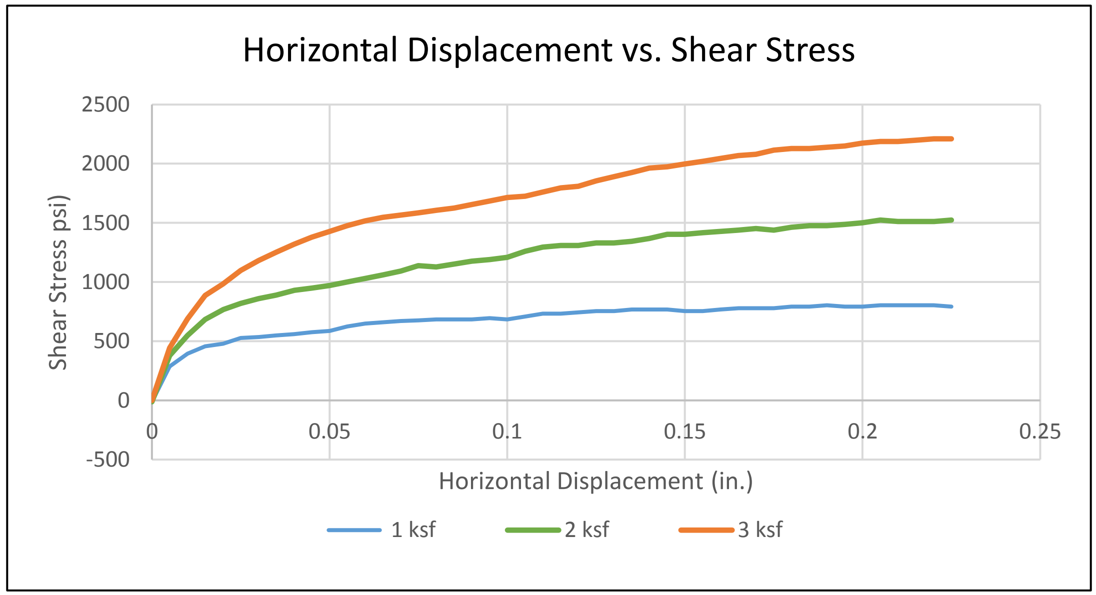
Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA
Project Number: 3-223-0381
Client: Crede Group
Sample Location: B-1 @ 2'
Sample Type: Undisturbed Ring
Soil Classification: Silty SAND (SM)
Tested By: M. Noorzay
Reviewed By: CJ
Date: 5/11/2023
Equipment Used: Geomatic Direct Shear Machine

	Sample 1	Sample 2	Sample 3
Normal Stress (ksf)	1.000	2.000	3.000
Shear Rate (in/min)	0.004		
Peak Shear Stress (ksf)	0.804	1.524	2.210
Residual Shear Stress (ksf)	0.000	0.000	0.000

Initial Height of Sample (in)	1.000	1.000	1.000
Height of Sample before Shear (in.)	1	1	1
Diameter of Sample (in)	2.416	2.416	2.416
Initial Moisture Content (%)	5.4		
Final Moisture Content (%)	14.5	13.6	13.4
Dry Density (pcf)	108.5	110.2	108.8

Peak Shear Strength Values	
Slope	0.70
Friction Angle	35.1
Cohesion (psf)	106





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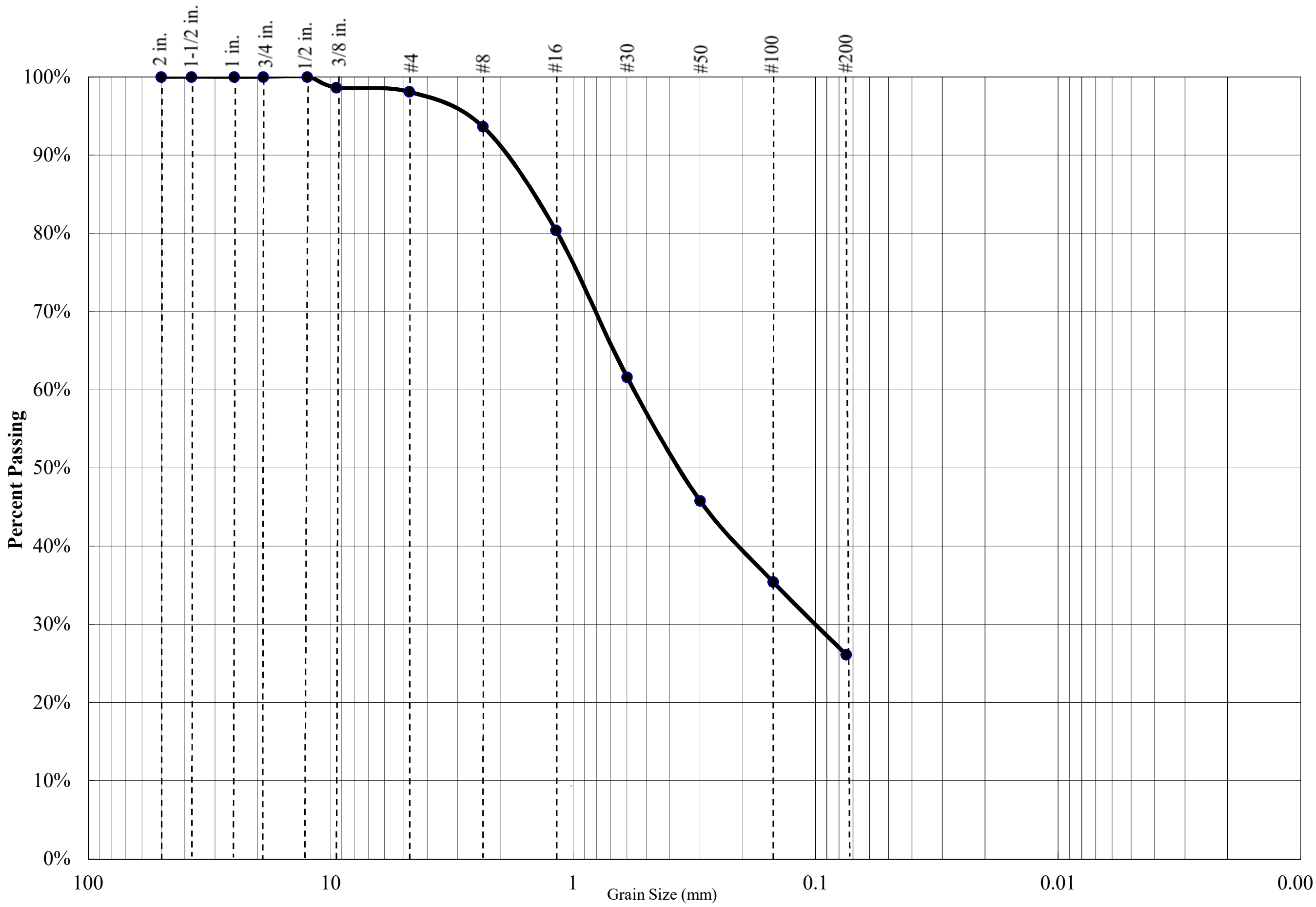
PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
2%	72%	26%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	98.7%
#4	98.1%
#8	93.6%
#16	80.4%
#30	61.6%
#50	45.8%
#100	35.4%
#200	26.1%

Atterberg Limits		
PL=	LL=	PI=

Coefficients					
D_{85}=		D_{60}=		D_{50}=	
D_{30}=		D_{15}=		D_{10}=	
C_u=	N/A	C_c=	N/A		

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

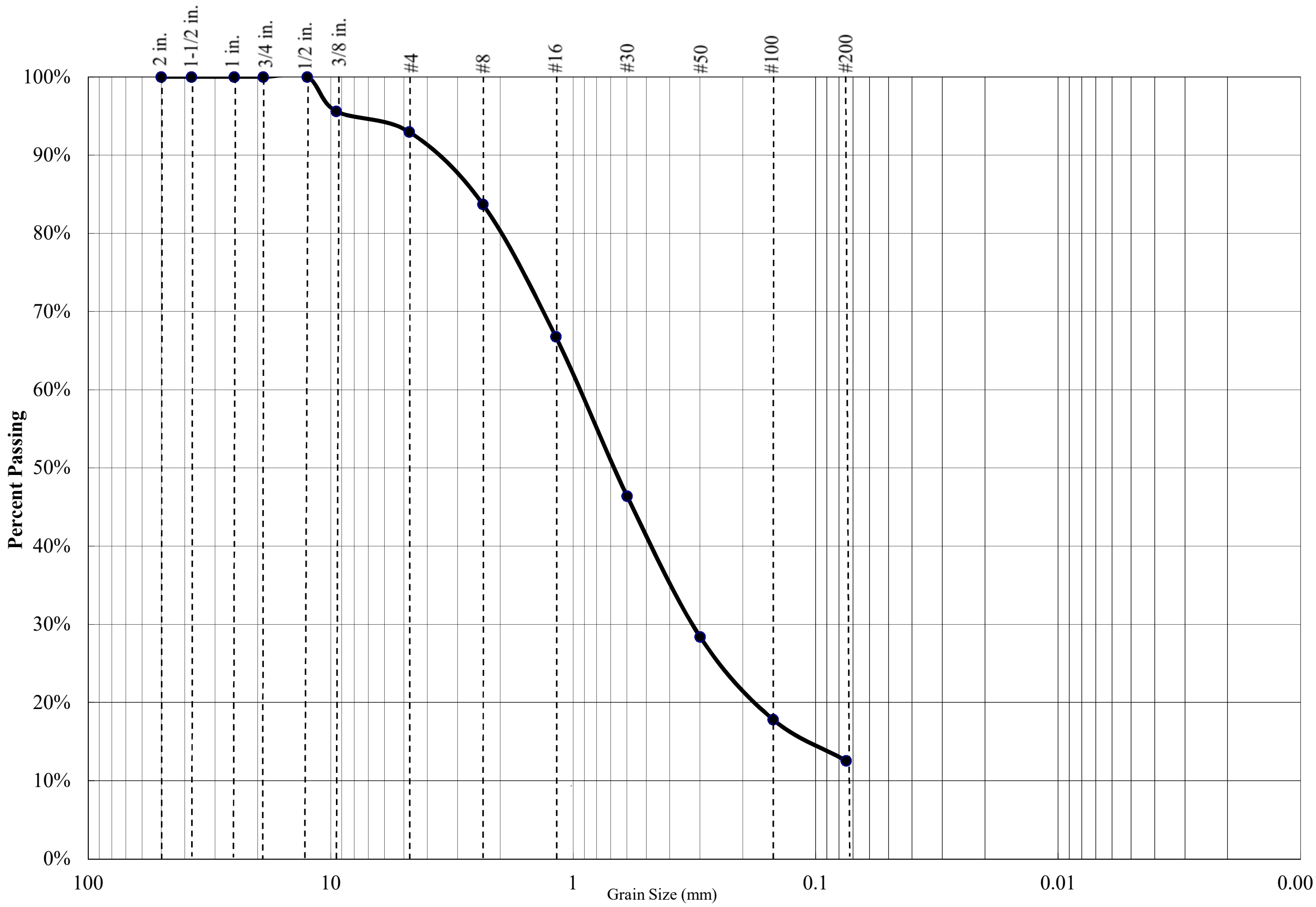
Project Number: 3-223-0381

Boring: B-1 @ 2'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
7%	80%	13%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	95.6%
#4	93.0%
#8	83.7%
#16	66.8%
#30	46.4%
#50	28.4%
#100	17.8%
#200	12.6%

Atterberg Limits		
PL=	LL=	PI=

Coefficients				
D_{85}=		D_{60}=		D_{50}=
D_{30}=		D_{15}=		D_{10}=
C_u=	N/A	C_c=	N/A	

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

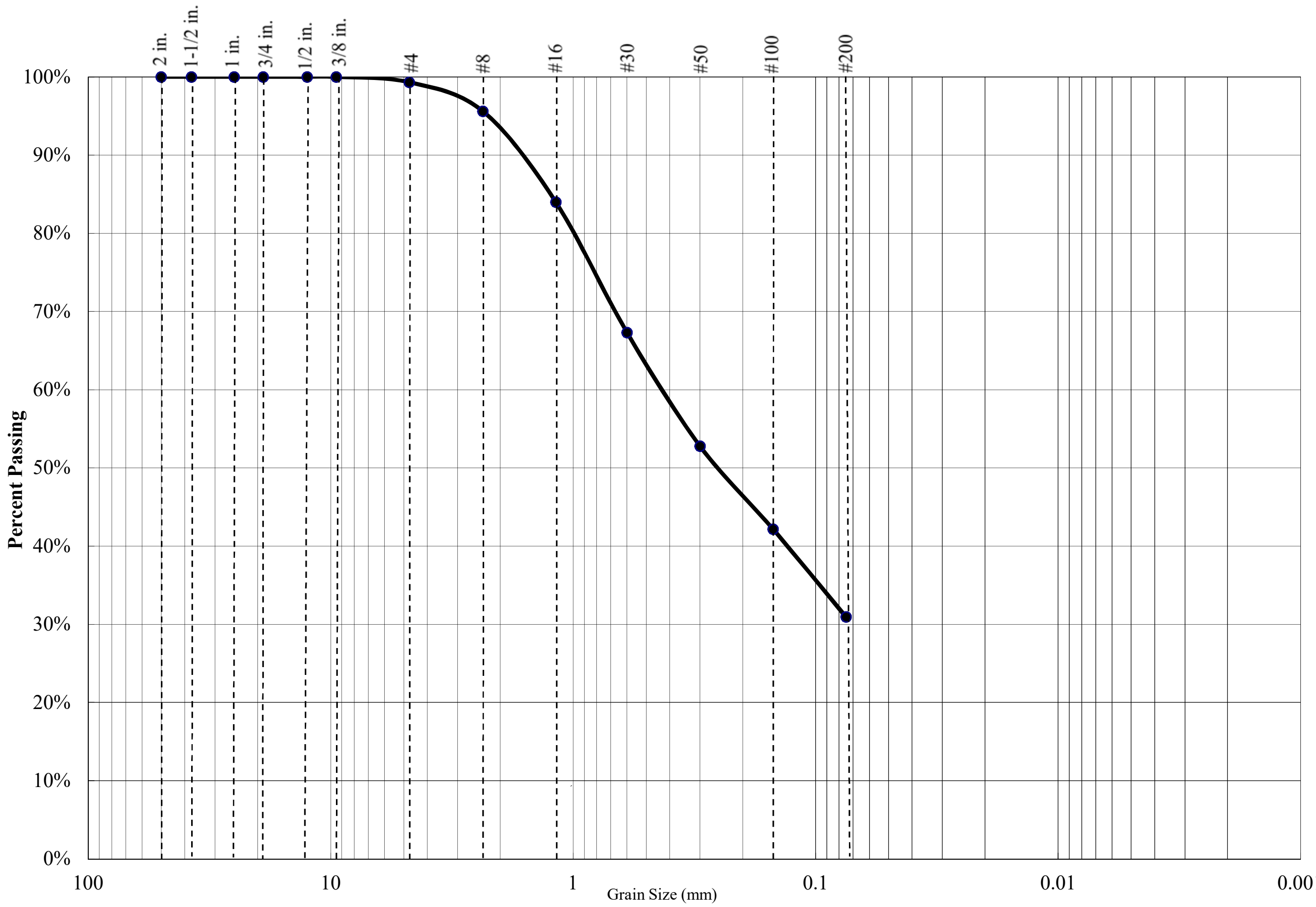
Project Number: 3-223-0381

Boring: B-1 @ 10'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
1%	68%	31%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	100.0%
#4	99.3%
#8	95.6%
#16	84.0%
#30	67.3%
#50	52.8%
#100	42.2%
#200	30.9%

Atterberg Limits		
PL=	LL=	PI=

Coefficients		
D_{85}=	D_{60}=	D_{50}=
D_{30}=	D_{15}=	D_{10}=
C_u= N/A	C_c= N/A	

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

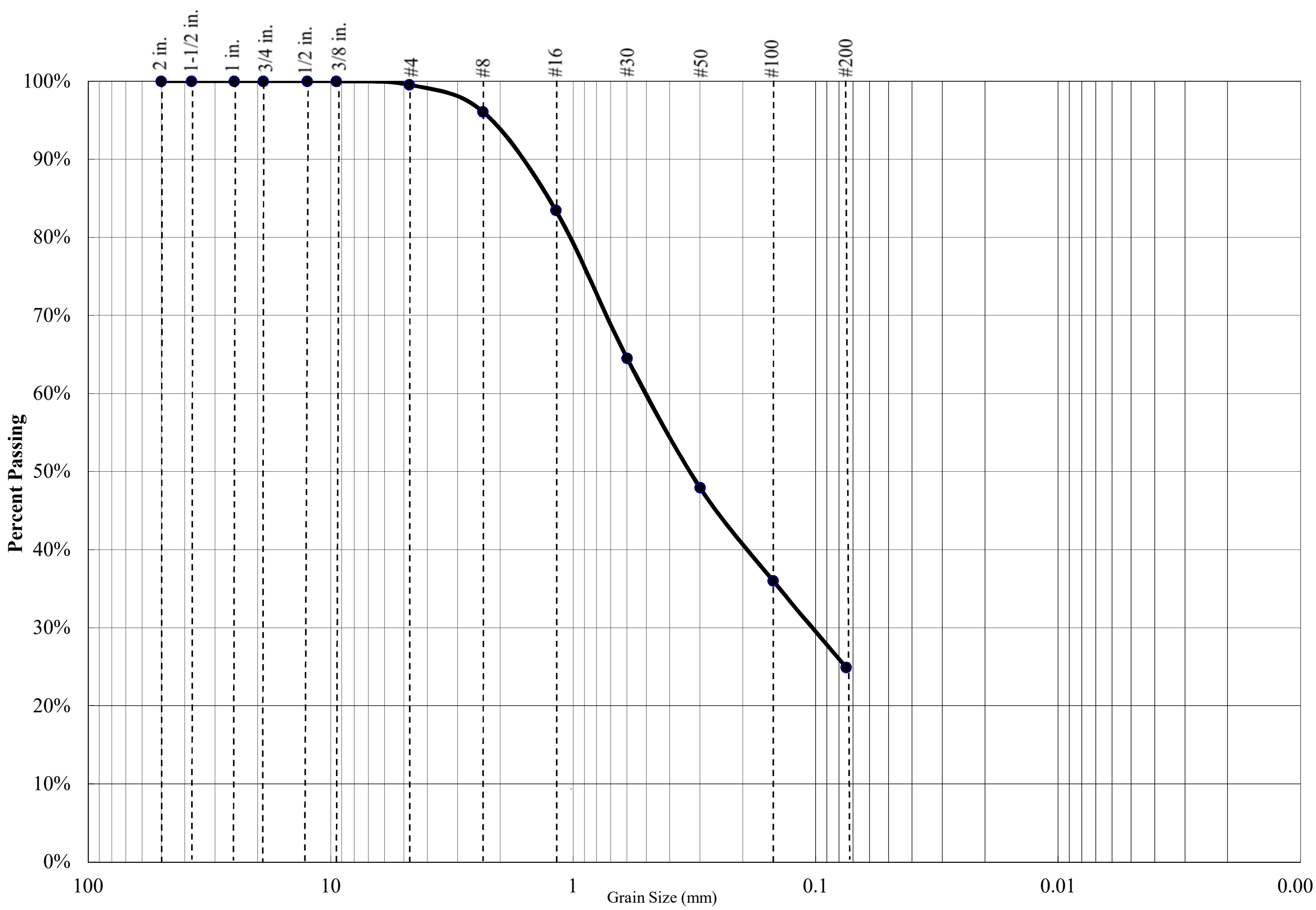
Project Number: 3-223-0381

Boring: B-2 @ 5'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
0%	75%	25%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	100.0%
3/8 inch	100.0%
#4	99.5%
#8	96.1%
#16	83.5%
#30	64.5%
#50	47.9%
#100	36.0%
#200	24.9%

Atterberg Limits		
PL=	LL=	PI=

Coefficients		
D85=	D60=	D50=
D30=	D15=	D10=
C_u= N/A	C_c= N/A	

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

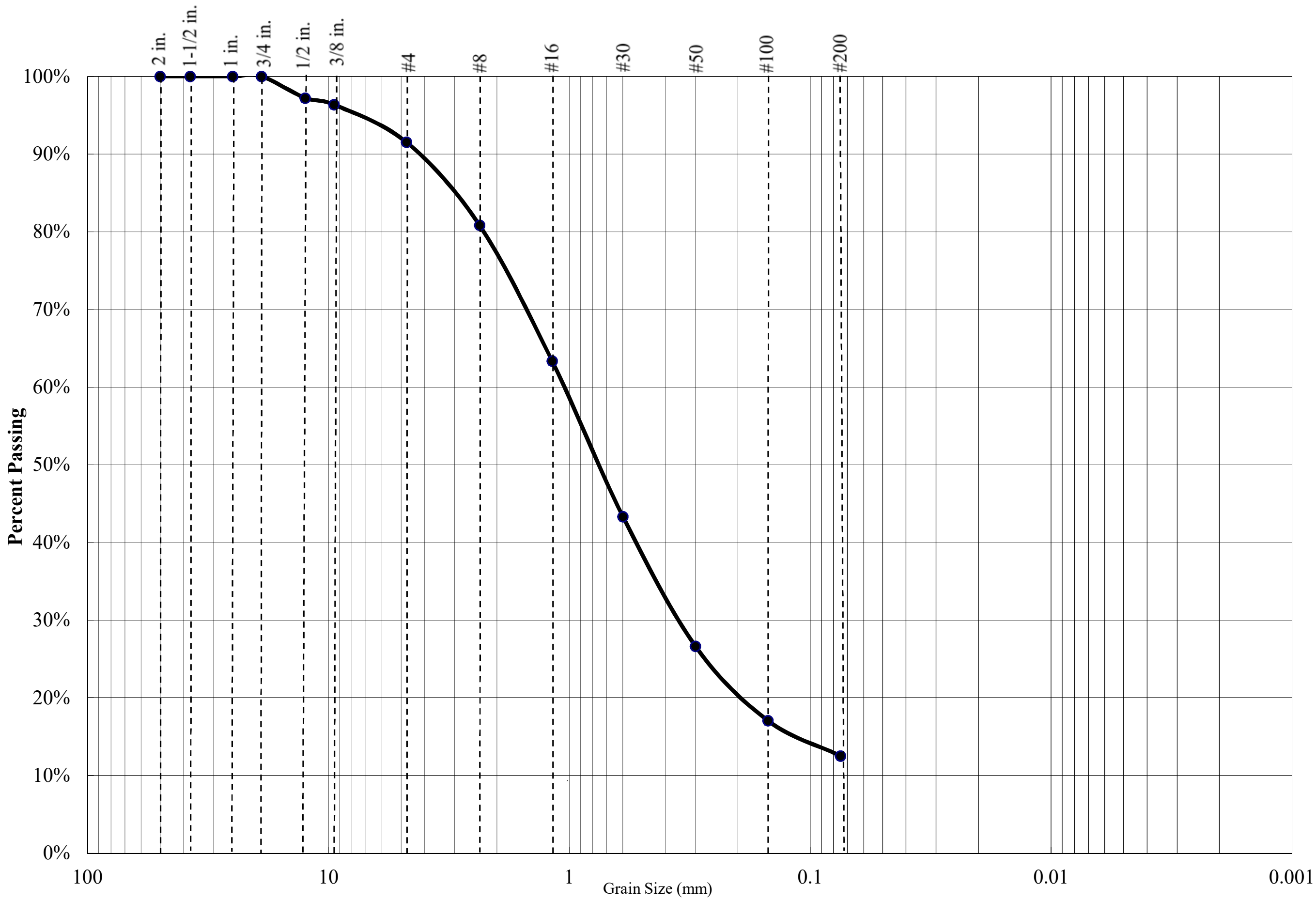
Project Number: 3-223-0381

Boring: B-3 @ 1'

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Percent Gravel	Percent Sand	Percent Silt/Clay
8%	79%	13%

Sieve Size	Percent Passing
3/4 inch	100.0%
1/2 inch	97.2%
3/8 inch	96.4%
#4	91.5%
#8	80.8%
#16	63.4%
#30	43.3%
#50	26.7%
#100	17.1%
#200	12.5%

Atterberg Limits		
PL=	LL=	PI=

Coefficients			
D_{85}=		D_{60}=	D_{50}=
D_{30}=		D_{15}=	D_{10}=
C_u=	N/A	C_c= N/A	

USCS CLASSIFICATION
Silty SAND (SM)

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA

Project Number: 3-223-0381

Boring: B-4 @ 5'

SALEM engineering group, inc.

CHEMICAL ANALYSIS

SO_4 - Modified CTM 417 & Cl - Modified CTM 417/422

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA
Project Number: 3-223-0381
Date Sampled: 5/8/2023 Date Tested: 5/11/2023
Sampled By: CC Tested By: M. Noorzay
Soil Description: Brown Silty SAND (SM)

Sample Number	Sample Location	Soluble Sulfate SO_4-S	Soluble Chloride Cl	pH
1a.	B-2 @ 0'-5'	840 mg/kg	32 mg/kg	7.5
1b.	B-2 @ 0'-5'	780 mg/kg	31 mg/kg	7.5
1c.	B-2 @ 0'-5'	800 mg/kg	32 mg/kg	7.5
Average:		**807 mg/kg**	**32 mg/kg**	**7.5**

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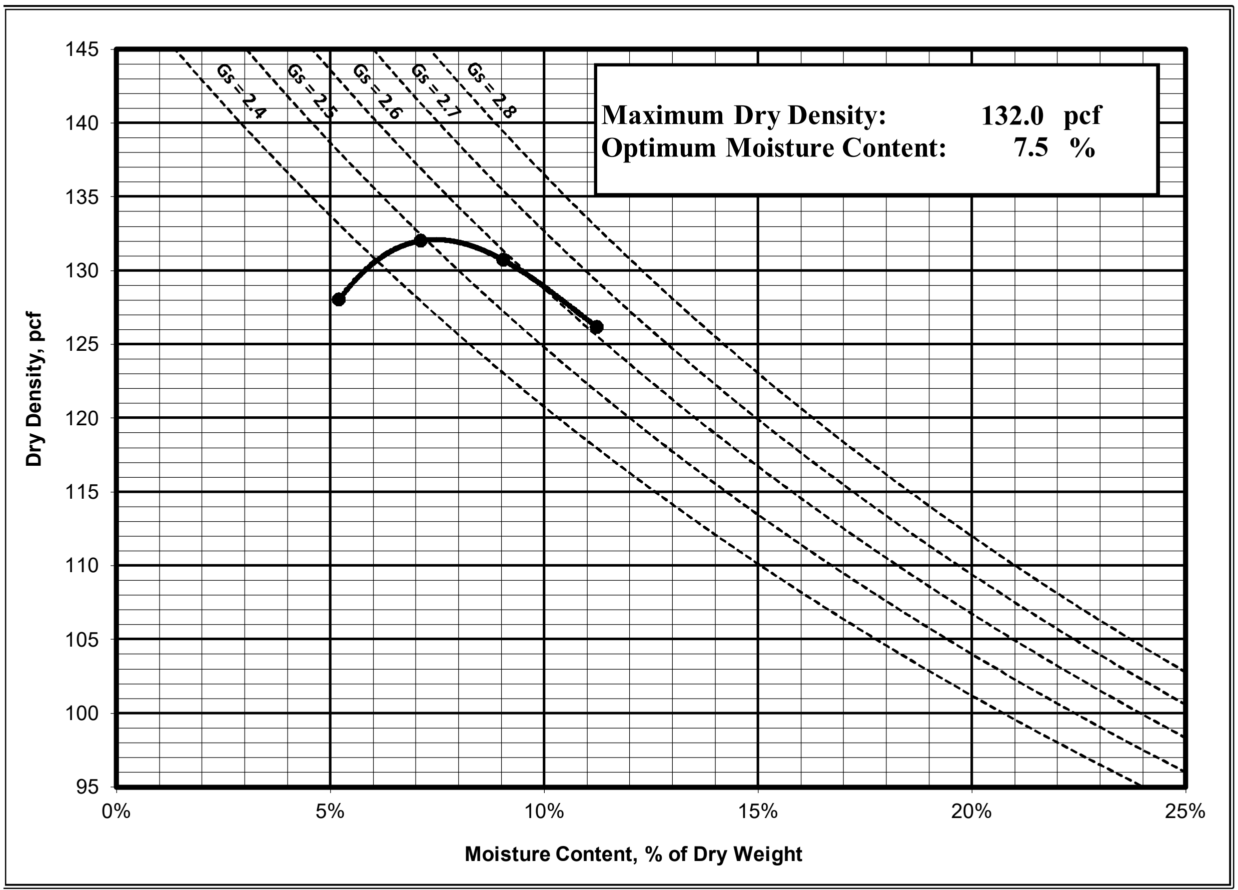
Laboratory Compaction Curve
ASTM D1557

Project Name: Proposed Loading Docks & Parking Lot - Hesperia, CA
Project Number: 3-223-0381
Date Sampled: 5/8/2023 Date Tested: 5/11/2023
Sampled By: CC Tested By: M. Noorzay
Sample Location: B-2 @ 0'-5'
Soil Description: Brown Silty SAND (SM)
Test Method: Method B

	1	2	3	4
Weight of Moist Specimen & Mold, (g)	6316.7	6418.3	6435.0	6401.9
Weight of Compaction Mold, (g)	4280.2	4280.2	4280.2	4280.2
Weight of Moist Specimen, (g)	2036.5	2138.1	2154.8	2121.7
Volume of Mold, (ft^3)	0.0333	0.0333	0.0333	0.0333
Wet Density, (pcf)	134.7	141.4	142.5	140.3
Weight of Wet (Moisture) Sample, (g)	200.0	200.0	200.0	200.0
Weight of Dry (Moisture) Sample, (g)	190.1	186.7	183.4	179.8
Moisture Content, (%)	5.2%	7.1%	9.1%	11.2%
Dry Density, (pcf)	128.0	132.0	130.7	126.2



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APPENDIX

C

APPENDIX C
GENERAL EARTHWORK AND PAVEMENT SPECIFICATIONS

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

1.0 SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including, but not limited to, the furnishing of all labor, tools and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans and disposal of excess materials.

2.0 PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of SALEM Engineering Group, Incorporated, hereinafter referred to as the Soils Engineer and/or Testing Agency. Attainment of design grades, when achieved, shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary adjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer, or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

3.0 TECHNICAL REQUIREMENTS: All compacted materials shall be densified to no less than 95 percent of relative compaction (90 percent for clay soils) based on ASTM D1557 Test Method (latest edition) or as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

4.0 SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the Geotechnical Engineering Report. The Contractor shall make his own interpretation of the data contained in the Geotechnical Engineering Report and the Contractor shall not be relieved of liability for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

5.0 DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or wind-blown materials attributable to his work. Site preparation shall consist of site clearing and grubbing and preparation of foundation materials for receiving fill.

6.0 CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter and all other matter determined by the Soils Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than 1 inch in diameter. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

7.0 SUBGRADE PREPARATION: Surfaces to receive Engineered Fill and/or building or slab loads shall be prepared as outlined above, scarified to a minimum of 12 inches, moisture-conditioned as necessary, and recompacted to 95 percent relative compaction (90 percent for clay soils).

Loose soil areas and/or areas of disturbed soil shall be moisture-conditioned as necessary and recompacted to 95 percent relative compaction (90 percent for clay soils). All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any fill material.

8.0 EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

9.0 FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence or approval of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills, provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

10.0 PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. Compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer. Both cut and fill shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

11.0 SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing, or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill is as specified.

12.0 DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term "Standard Specifications": hereinafter referred to, is the most recent edition of the Standard Specifications of the State of California, Department of Transportation. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as determined by ASTM D1557 Test Method (latest edition).

13.0 PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 95 percent (90 percent for clay soils) based upon ASTM D1557. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

14.0 AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class II material, ¾-inch or 1½-inches maximum size. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent based upon ASTM D1557. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

15.0 ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10, unless otherwise stipulated or local conditions warrant more stringent grade. The mineral aggregate shall be Type A or B, ½ inch maximum size, medium grading, and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning, and mixing of the materials shall conform to Section 39. The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with a combination steel-wheel and pneumatic rollers, as described in the Standard Specifications. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

Appendix E: Soils Report

XIV.3. Infiltration BMP Fact Sheets (INF)

INF-1: Infiltration Basin Fact Sheet

An infiltration basin consists of an earthen basin constructed in naturally pervious soils (Type A or B soils) with a flat bottom. An energy dissipating inlet must be provided, along with an emergency spillway to control excess flows. An optional relief underdrain may be provided to drain the basin if standing water conditions occur. A forebay settling basin or separate treatment control measure must be provided as pretreatment. An infiltration basin retains the stormwater quality design volume in the basin and allows the retained runoff to percolate into the underlying soils in 72 hours or less. The bottom of an infiltration basin is typically vegetated with dryland grasses or irrigated turf grass; however other types of vegetation are permissible if they can survive periodic inundation and long inter-event dry periods.

Feasibility Screening Considerations

- Infiltration bains shall pass infeasibility screening criteria to be considered for use
- Infiltration basins pose a potential risk of groundwater contamination if underlying soils have very high permeability and low pollutant assimilation capacity; pretreatment should always be provided.
- Evaporation tends to be minor, therefore increases in infiltration compared to natural conditions may result.
- The potential for groundwater mounding should be evaluated if depth to seasonally high groundwater (unmounded) is less than 15 feet.

Also known as:

- *Recharge basins*
- *Infiltration pond*

Infiltration Basin

Source: Pennsylvania Stormwater BMP Manual

Opportunity Criteria

- Soils are adequate for infiltration or can be amended to provide an adequate infiltration rate.
- Typically need 2-5 percent of drainage area available for infiltration.
- Space available for pretreatment (biotreatment or treatment control BMP as described below).
- 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
- The 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. Basins can be integrated into parks and open spaces. High pollutant land uses should not be tributary to infiltration BMPs.

OC-Specific Design Criteria and Considerations

☐ Placement of BMPs shall observe geotechnical recommendations with respect to geological hazards (e.g. landslides, liquefaction zones, erosion, etc.) and set-backs (e.g., foundations, utilities, roadways, etc.)

- ☐ For facilities with tributary area less than 5 acres, minimum separation to mounded seasonally high groundwater of 5 feet shall be observed.
- ☐ For facilities with tributary area greater than 5 acres, minimum separation to mounded seasonally high groundwater of 10 feet shall be observed.
- ☐ Minimum pretreatment (settling forebay or separate BMP) should be provided upstream of the infiltration basin, and water bypassing pretreatment should not be directed to the infiltration basin.
- ☐ If a settling forebay is used, forebay should have a volume equal to 25% of facility volume and have a minimum length to width ratio of 2:1
- ☐ Infiltration basins 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.
- ☐ Side-slopes should be no steeper than 3H:1V.
- ☐ Design infiltration rate should be determined consistent with guidance contained in **Appendix VII**.
- ☐ Energy dissipators should be provided at inlet and outlet to prevent erosion.
- ☐ An overflow device must be provided if basin is on-line.
- ☐ A minimum freeboard of one foot should be provided above the overflow device (for an on-line basin) or the outlet (for an off-line basin).
- ☐ Infiltration basin bottom must be as flat as possible.
- ☐ Basin length to width ratio should be a minimum of 2:1 L:W.

Simple Sizing Method for Infiltration Basins

If the Simple DCV Sizing Method is used to size an infiltration basin, the user calculates the DCV and designs the BMP geometry required to draw down the DCV in 48 hours. The sizing steps are as follows:

Step 1: Determine Infiltration Basin DCV

Calculate the DCV using the Simple Design Capture Volume Sizing Method described in **Appendix III.3.1**.

Step 2: Determine the 48-hour Depth

The depth of water that can be drawn down in 48 hours can be calculated using the following equation:

$d_{48} = K_{DESIGN} \times 4$

Where:

d_{48} = basin 48-hour drawdown depth, ft

K_{DESIGN} = basin design infiltration rate, in/hr (See Appendix VII)

This is the maximum depth of the basin below the overflow device to achieve drawdown in 48 hours.

Step 3: Calculate the Required Infiltrating Area

The required infiltrating area (i.e. basin area at mid ponding depth) can be calculated using the following equation:

$A = DCV / (d_P)$

Where:

A = required basin infiltrating area, sq-ft (assumed to be the basin area at mid-ponding depth)

DCV = design capture volume, cu-ft (see Step 1)

d_P = ponding depth, ft (should be equal to or less than d_{48})

Capture Efficiency Method for Infiltration Basins

If BMP geometry has already been defined and deviates from the 48 hour drawdown time, the designer can use the Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs (See **Appendix III.3.2**) to determine the fraction of the DCV that must be provided to manage 80 percent of average annual runoff volume. This method accounts for drawdown time different than 48 hours.

Step 1: Determine the drawdown time associated with the selected basin geometry

$DD = (d_P / K_{DESIGN}) \times 12$

Where:

DD = time to completely drain infiltration basin ponding depth, hours

d_P = ponding depth below overflow device, ft

K_{DESIGN} = basin design infiltration rate, in/hr (See **Appendix VII**)

Step 2: Determine the Required Adjusted DCV for this Drawdown Time

Use the Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs (**Appendix III.3.2**) to calculate the fraction of the DCV the basin must hold to achieve 80 percent capture of average annual stormwater runoff volume based on the basin drawdown time calculated above.

Step 3: Determine the Basin Infiltrating Area Needed

The required infiltrating area (i.e. basin bottom) can be calculated using the following equation:

$A = DCV/ ((d_P)$

Where:

A = required basin infiltrating area, sq-ft (assumed to be the basin area at mid-ponding depth)

DCV = design capture volume, adjusted for drawdown time, cu-ft (see Step 1)

d_P = ponding depth, ft

If the area required is greater than the selected basin area, adjust surface area or adjust ponding depth and recalculate required area until the required area is achieved.

Configuration for Use in a Treatment Train

- Infiltration basins may be preceeded in a treatment train by HSCs in the drainage area, which would reduce the required design volume of the basins.
- Infiltration basins must be preceeded by some form of pretreatment, which may be biotreatment or a treatment control BMP; if an approved biotreatment BMP is used as pretreatment, the overflow from the infiltration basin may be considered "biotreated" for the purposes of meeting the LID requirements.
- The overflow or bypass from an infiltration basin can be routed to a downstream biotreatment BMP and/or a treatment control BMP if additional control is required to achieve LID or treatment control requirements.

Additional References for Design Guidance

- CASQA BMP Handbook for New and Redevelopment: http://www.cabmphandbooks.com/Documents/Development/TC-11.pdf
- SMC LID Manual (pp 139): http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- Los Angeles County Stormwater BMP Design and Maintenance Manual, Chapter 6: http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf
- City of Portland Stormwater Management Manual (Basin, page 2-57) http://www.portlandonline.com/bes/index.cfm?c=47954&a=202883
- San Diego County LID Handbook Appendix 4 (Factsheet 2): http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf

3.1 INFILTRATION BASIN

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evapotranspiration (when vegetated), Evaporation, and Sedimentation
Maximum Treatment Area	50 acres
Other Names	Bioinfiltration Basin

Description

An Infiltration Basin is a flat earthen basin designed to capture the design capture volume, V_{BMP}. The stormwater infiltrates through the bottom of the basin into the underlying soil over a 72 hour drawdown period. Flows exceeding V_{BMP} must discharge to a downstream conveyance system. Trash and sediment accumulate within the forebay as stormwater passes into the basin. Infiltration basins are highly effective in removing all targeted pollutants from stormwater runoff.

Figure 1 – Infiltration Basin

See Appendix A, and Appendix C, Section 1 of *Basin Guidelines*, for additional requirements.

Siting Considerations

The use of infiltration basins may be restricted by concerns over ground water contamination, soil permeability, and clogging at the site. See the applicable WQMP for any specific feasibility considerations for using infiltration BMPs. Where this BMP is being used, the soil beneath the basin must be thoroughly evaluated in a geotechnical report since the underlying soils are critical to the basin's long term performance. To protect the basin from erosion, the sides and bottom of the basin must be vegetated, preferably with native or low water use plant species.

In addition, these basins may not be appropriate for the following site conditions:

- Industrial sites or locations where spills of toxic materials may occur
- Sites with very low soil infiltration rates
- Sites with high groundwater tables or excessively high soil infiltration rates, where pollutants can affect ground water quality
- Sites with unstabilized soil or construction activity upstream
- On steeply sloping terrain
- Infiltration basins located in a fill condition should refer to Appendix A of this Handbook for details on special requirements/restrictions

Setbacks

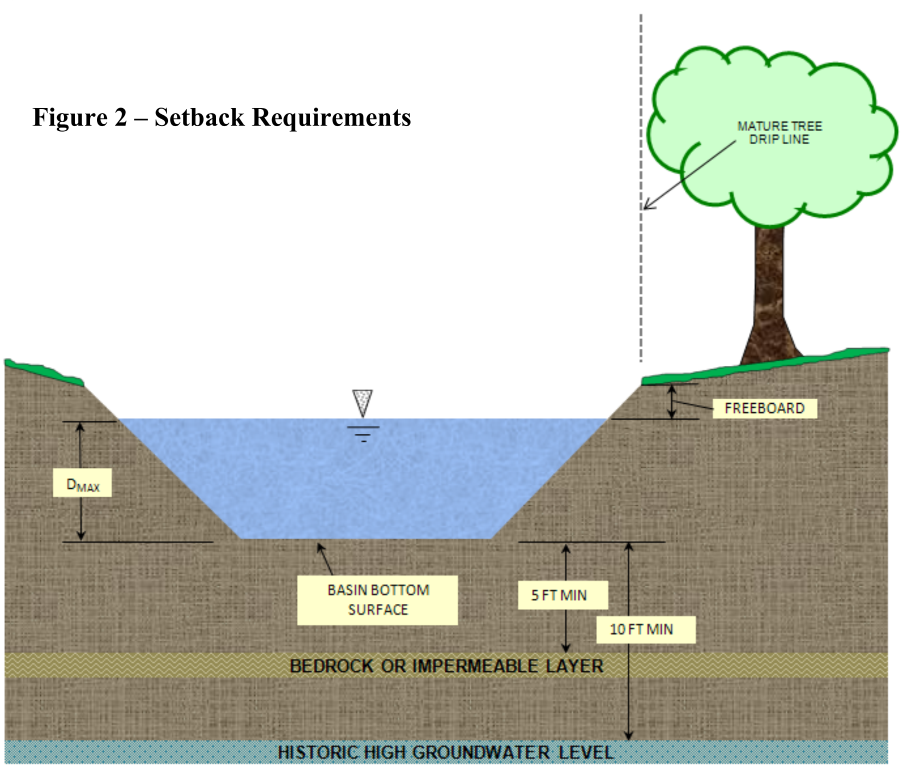
Always consult your geotechnical engineer for site specific recommendations regarding setbacks for infiltration trenches. Recommended setbacks are needed to protect buildings, existing trees, walls, onsite or nearby wells, streams, and tanks. Setbacks should be considered early in the design process since they can affect where infiltration facilities may be placed and how deep they are allowed to be. For instance, depth setbacks can dictate fairly shallow facilities that will have a larger footprint and, in some cases, may make an infiltration basin infeasible. In that instance, another BMP must be selected.

Infiltration basins typically must be set back:

- 10 feet from the historic high groundwater (measured vertically from the bottom of the basin, as shown in Figure 2)
- 5 feet from bedrock or impermeable surface layer (measured vertically from the bottom of the basin, as shown in Figure 2)
- From all existing mature tree drip lines as indicated in Figure 2 (to protect their root structure)
- 100 feet horizontally from wells, tanks or springs

Setbacks to walls and foundations must be included as part of the Geotechnical Report. All other setbacks shall be in accordance with applicable standards of the District's *Basin Guidelines* (Appendix C).

Figure 2 – Setback Requirements



Forebay

A concrete forebay shall be provided to reduce sediment clogging and to reduce erosion. The forebay shall have a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall / berm. Full height notch-type weir(s), offset from the line of flow from the basin inlet to prevent short circuiting, shall be used to outlet the forebay. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

Overflow

Flows exceeding V_{BMP} must discharge to an acceptable downstream conveyance system. Where an adequate outlet is present, an overflow structure may be used. Where an embankment is present, an emergency spillway may be used instead. Overflows must be placed just above the design water surface for V_{BMP} and be near the outlet of the system. The overflow structure shall be similar to the District's Standard Drawing CB 110. Additional details may be found in the District's *Basin Guidelines* (Appendix C).

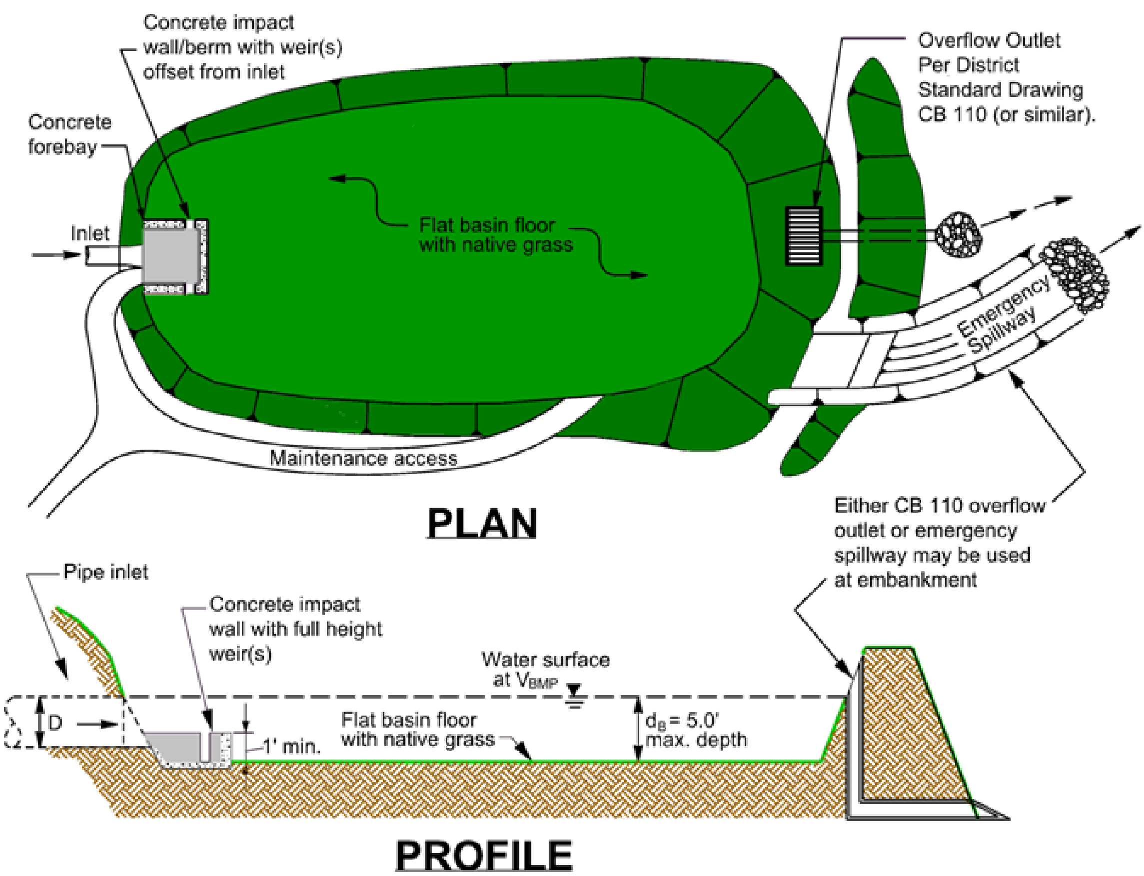


Figure 3 – Infiltration Basin

Landscaping Requirements

Basin vegetation provides erosion protection, improves sediment removal and assists in allowing infiltration to occur. The basin surface and side slopes shall be planted with native grasses. Proper landscape management is also required to ensure that the vegetation does not contribute to water pollution through pesticides, herbicides, or fertilizers. Landscaping shall be in accordance with County of Riverside Ordinance 859 and the District's *Basin Guidelines* (Appendix C), or other guidelines issued by the Engineering Authority.

Maintenance

Normal maintenance of an infiltration basin includes the maintenance of landscaping, debris and trash removal from the surface of the basin, and tending to problems associated with standing water (vectors, odors, etc.). Significant ponding, especially more than 72 hours after an event, may indicate that the basin surface is no longer providing sufficient infiltration and requires aeration. See the District's *Basin Guidelines* (Appendix C) for additional requirements (i.e., fencing, maintenance access, etc.).

Table 1 - Inspection and Maintenance

Schedule	Inspection and Maintenance Activity
Ongoing including just before annual storm seasons and following rainfall events.	• Maintain vegetation as needed. Use of fertilizers, pesticides and herbicides should be strenuously avoided to ensure they don't contribute to water pollution. If appropriate native plant selections and other IPM methods are used, such products shouldn't be needed. If such projects are used, ○ Products shall be applied in accordance with their labeling, especially in relation to application to water, and in areas subjected to flooding. ○ Fertilizers should not be applied within 15 days before, after, or during the rain season. • Remove debris and litter from the entire basin to minimize clogging and improve aesthetics. • Check for obvious problems and repair as needed. Address odor, insects, and overgrowth issues associated with stagnant or standing water in the basin bottom. There should be no long-term ponding water. • Check for erosion and sediment laden areas in the basin. Repair as needed. Clean forebay if needed. • Revegetate side slopes where needed.
Annually. If possible, schedule these inspections within 72 hours after a significant rainfall.	• Inspection of hydraulic and structural facilities. Examine the inlet for blockage, the embankment and spillway integrity, as well as damage to any structural element. • Check for erosion, slumping and overgrowth. Repair as needed. • Check basin depth for sediment build up and reduced total capacity. Scrape bottom as needed and remove sediment. Restore to original cross-section and infiltration rate. Replant basin vegetation. • Verify the basin bottom is allowing acceptable infiltration. Use a disc or other method to aerate basin bottom only if there is actual significant loss of infiltrative capacity, rather than on a routine basis[1]. • No water should be present 72 hours after an event. No long term standing water should be present at all. No algae formation should be visible. Correct problem as needed.
1. CA Stormwater BMP Handbook for New Development and Significant Redevelopment	

Table 2 - Design and Sizing Criteria for Infiltration Basins

Design Parameter	Infiltration Basin
Design Volume	V_{BMP}
Forebay Volume	0.5% V_{BMP}
Drawdown time (maximum)	72 hours
Maximum tributary area	50 acres [2]
Minimum infiltration rate	Must be sufficient to drain the basin within the required Drawdown time over the life of the BMP. The WQMP may include specific requirements for minimum tested infiltration rates.
Maximum Depth	5 feet
Spillway erosion control	Energy dissipators to reduce velocities[1]
Basin Slope	0%
Freeboard (minimum)	1 foot [1]
Historic High Groundwater Setback (max)	10 feet
Bedrock/impermeable layer setback (max)	5 feet
Tree setbacks	Mature tree drip line must not overhang the basin
Set back from wells, tanks or springs	100 feet
Set back from foundations	As recommended in Geotechnical Report

1. **Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures**
2. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Note: The information contained in this BMP Factsheet is intended to be a summary of design considerations and requirements. Additional information which applies to all detention basins may be found in the District's Basin Guidelines (Appendix C). In addition, information herein may be superseded by other guidelines issued by the co-permittee.

INFILTRATION BASIN SIZING PROCEDURE

1. Find the Design Volume, V_{BMP}.
    a) Enter the Tributary Area, A_T.
    b) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.
2. Determine the Maximum Depth.
    a) Enter the infiltration rate. The infiltration rate shall be established as described in Appendix A: "Infiltration Testing".
    b) Enter the design Factor of Safety from Table 1 in Appendix A: "Infiltration Testing".
    c) The spreadsheet will determine D_1, the maximum allowable depth of the basin based on the infiltration rate along with the maximum drawdown time (72 hours) and the Factor of Safety.

$$D_1 = [(t) \times (I)] / 12s$$

Where I = site infiltration rate (in/hr)
s = safety factor
t = drawdown time (maximum 72 hours)

d) Enter the depth of freeboard.

e) Enter the depth to the historic high groundwater level measured from the top of the basin.

f) Enter the depth to the top of bedrock or other impermeable layer measured from the finished grade.

g) The spreadsheet will determine D_2, the total basin depth (including freeboard, if used) of the basin, based on restrictions to the depth by groundwater and an impermeable layer.

$$D_2 = \text{Depth to groundwater} - (10 + \text{freeboard})\ (\text{ft});$$

or

$$D_2 = \text{Depth to impermeable layer} - (5 + \text{freeboard})\ (\text{ft})$$

Whichever is least.

h) The spreadsheet will determine the maximum allowable effective depth of basin, D_{MAX}, based on the smallest value between D_1 and D_2. D_{MAX} is the maximum depth of water only and does not include freeboard. D_{MAX} shall not exceed 5 feet.

3. Basin Geometry

a) Enter the basin side slopes, z (no steeper than 4:1).

b) Enter the proposed basin depth, d_B excluding freeboard.

c) The spreadsheet will determine the minimum required surface area of the basin:

$$A_s = V_{BMP} / d_B$$

Where A_s = minimum area required (ft^2)
V_{BMP} = volume of the infiltration basin (ft^3)
d_B= proposed depth not to exceed maximum allowable depth, D_{MAX} (ft)

d) Enter the proposed bottom surface area. This area shall not be less than the minimum required surface area.

4. Forebay

A concrete forebay with a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall shall be provided. Full-height rectangular weir(s) shall be used to outlet the forebay. The weir(s) must be offset from the line of flow from the basin inlet. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

a) The spreadsheet will determine the minimum required forebay volume based on 0.5% V_{BMP}.

b) Enter the proposed depth of the forebay berm/splashwall (1foot minimum).

c) The spreadsheet will determine the minimum required forebay surface area.

d) Enter the width of rectangular weir to be used (minimum 1.5 inches). Weir width should be established based on a 5 minute drawdown time.

Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID	Legend:	Required Entries / Calculated Cells

Company Name: Date:

Designed by: County/City Case No.:

Design Volume

a) Tributary area (BMP subarea) A_T = acres

b) Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= ft^3

Maximum Depth

a) Infiltration rate I = in/hr

b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook) FS =

c) Calculate D_1

$$D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$$

D_1 = ft

d) Enter the depth of freeboard (at least 1 ft) ft

e) Enter depth to historic high ground water (measured from **top** of basin) ft

f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin) ft

g) D_2 is the smaller of:

Depth to groundwater - (10 ft + freeboard) and

Depth to impermeable layer - (5 ft + freeboard)

D_2 = ft

h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet D_{MAX} = ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1) z = :1

b) Proposed basin depth (excluding freeboard) d_B = ft

c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$) A_S = ft^2

d) Proposed Design Surface Area A_D = ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP}) Volume = ft^3

b) Forebay depth (height of berm/splashwall. 1 foot min.) Depth = ft

c) Forebay surface area (minimum) Area = ft^2

d) Full height notch-type weir Width (W) = in

Notes:

Appendix F: Covenant and agreements, BMP maintance agreements and/or other mechanisms for ensuring ongoing operation, maintenance, funding and transfer of requirements for this project - specific WQMP

RECORDING REQUESTED BY:
County of San Bernardino
Department of Public Works

AND WHEN RECORDED MAIL TO:
County of San Bernardino
Department of Public Works
825 E. Third Street, Room 117
San Bernardino, CA 92415-0835

SPACE ABOVE THIS LINE FOR RECORDER'S USE

COVENANT AND AGREEMENT REGARDING WATER QUALITY MANAGEMENT PLAN AND STORMWATER BEST MANAGEMENT PRACTICES TRANSFER, ACCESS AND MAINTENANCE

THIS PAGE ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING INFORMATION

Covenant and Agreement Regarding Water Quality Management Plan and Stormwater Best Management Practices Transfer, Access and Maintenance

OWNER NAME: ____

PROPERTY ADDRESS: ____

____

APN: ____

THIS AGREEMENT is made and entered into in

______________________________________ ,California, this _________ day of

______________________________________ , by and between

____ , hereinafter

referred to as Owner, and the COUNTY OF SAN BERNARDINO, a political subdivision of the State of California, hereinafter referred to as "the County";

WHEREAS, the Owner owns real property ("Property") in the County of San Bernardino, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated herein by this reference; and

WHEREAS, at the time of initial approval of development project known as

____ within the Property described herein, the County 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, dated ______________________, on file with the County and incorporated herein by this reference, 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 County; and

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. Owner shall comply with the WQMP.

2. All maintenance or replacement of BMPs proposed as part of the WQMP are the sole responsibility of the Owner in accordance with the terms of this Agreement.

3. Owner hereby provides the County'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 the County Director of Public Works, 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 owner's expense as provided in paragraph 5 below. The County shall make every effort at all times to minimize or avoid interference with Owner's use of the Property. Denial of access to any premises or facility that contains WQMP features is a breach of this Agreement and may also be a violation of the County's Pollutant Discharge Elimination System regulations, which on the effective date of this Agreement are found in County Code Sections 35.0101 et seq. If there is reasonable cause to believe that an illicit discharge or breach of this Agreement is occurring on the premises then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction in addition to other enforcement actions. Owner recognizes that the County may perform routine and regular inspections, as well as emergency inspections, of the BMPs. Owner or Owner's successors or assigns shall pay County for all costs incurred by County in the inspection, sampling, testing of the BMPs within thirty (30) calendar days of County invoice.

4. 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 Owner and 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 County, the Owner shall provide the County with documentation identifying the material(s) removed, the quantity, and disposal destination), testing construction or reconstruction.

5. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) business days of being given written notice by the County , the County is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense against the Property and/or to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the County Code from the date of the notice of expense until paid in full. Owner or Owner's successors or assigns shall pay County within thirty (30) calendar days of County invoice.

6. The County may require the owner to post security in form and for a time period satisfactory to the County to guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the County 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 surety(ies) to perform the obligations of this Agreement.

7. The County agrees, from time to time, within ten (10) business days after request of Owner, to execute and deliver to Owner, or Owner's designee, an estoppel certificate requested by Owner, stating that this Agreement is in full force and effect, and that Owner is not in default hereunder with regard to any maintenance or payment obligations (or specifying in detail the nature of Owner's default). Owner shall pay all costs and expenses incurred by the County in its investigation of whether to issue an estoppel certificate within thirty (30) calendar days after receipt of a County invoice and prior to the County's issuance of such certificate. Where the County cannot issue an estoppel certificate, Owner shall pay the County within thirty (30) calendar days of receipt of a County invoice.

8. Owner shall not change any BMPs identified in the WQMP without an amendment to this Agreement approved by authorized representatives of both the County and the Owner.

9. County and Owner shall comply with all applicable laws, ordinances, rules, regulations, court orders and government agency orders now or hereinafter in effect in carrying out the terms of this Agreement. If a provision of this Agreement is terminated or held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall remain in full effect.

10. In addition to any remedy available to County under this Agreement, if Owner violates any term of this Agreement and does not cure the violation within the time already provided in this Agreement, or, if not provided, within thirty (30) calendar days, or within such time authorized by the County if said cure reasonably requires more than the subject time, the County may bring an action at law or in equity in a court of competent jurisdiction to enforce compliance by the Owner with the terms of this Agreement. In such action, the County may recover any damages to which the County may be entitled for the violation, enjoin the violation by temporary or permanent injunction without the necessity of proving actual damages or the inadequacy of otherwise available legal remedies, or obtain other equitable relief, including, but not limited to, the restoration of the Property and/or the BMPs identified in the WQMP to the condition in which it/they existed prior to any such violation or injury.

11. 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 County, including interest as herein above set forth, subject to foreclosure in event of default in payment.

12. 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 hold the County harmless and pay all costs incurred by the County 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.

13. 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 there against.

14. 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. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an

interest in all or part of the Property. Owner shall provide a copy of such notice to the County at the same time such notice is provided to the successor.

15. Time is of the essence in the performance of this Agreement.

16. 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.

17. Owner agrees to indemnify, defend (with counsel reasonably approved by the County) and hold harmless the County and its authorized officers, employees, agents and volunteers from any and all claims, actions, losses, damages, and/or liability arising out of this Agreement from any cause whatsoever, including the acts, errors or omissions of any person and for any costs or expenses incurred by the County on account of any claim except where such indemnification is prohibited by law. This indemnification provision shall apply regardless of the existence or degree of fault of indemnitees. The Owner's indemnification obligation applies to the County's "active" as well as "passive" negligence but does not apply to the County's "sole negligence" or "willful misconduct" within the meaning of Civil Code Section 2782, or to any claims, actions, losses, damages, and/or liabilities, to the extent caused by the acts or omissions of any third party contractors undertaking any work (other than field inspections) or other maintenance on the Property on behalf of the County under this Agreement..

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IF TO COUNTY :

Director of Public Works

825 E. Third Street, Room 117

San Bernardino, CA 92415-0835

IF TO OWNER:

____

____

____

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

OWNER:

Company/Trust:__________________________

Signature: _____________________________

Name: _______________________________

Title: _______________________________

Date: _______________________________

OWNER:

Company/Trust:__________________________

Signature: _____________________________

Name: _______________________________

Title: _______________________________

Date: _______________________________

FOR: Maintenance Agreement, dated __________________________, for the project known as __________________________________ __________________________________

(APN)______________________________,

As described in the WQMP dated __________________________________.

<u>NOTARIES ON FOLLOWING PAGE</u>

A notary acknowledgement is required for recordation.

ACCEPTED BY:

____

BRENDON BIGGS, M.S., P.E., Director of Public Works

Date: ___________________________________

Attachment: Notary Acknowledgement