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Subject: CEQA Initial Study for a Warehouse/Office Building Development in Palmdale, California

Dear Mr. Herrera:

Yorke Engineering, LLC (Yorke) is pleased to provide this California Environmental Quality Act (CEQA) Initial Study (IS), which includes summary narrative responses to the 21 CEQA environmental factors contained in the Appendix G Environmental Checklist Form that are directly or indirectly impacted by this project, as listed below under Environmental Factors Potentially Affected.

This version supersedes the July 18, 2024 version and incorporates the Tribal Cultural Resources (TCR) mitigation measures (MMs) provided by the Cultural Resources Management Division of the Fernando Tataviam Band of Mission Indians, the Native Sovereign Nation of Northern Los Angeles County.

LIST OF APPENDICES

The following appendices are provided under separate covers (pdf files):

- Appendix A – Air Quality, Greenhouse Gas, and Noise Study
- Appendix B – Biological Resources Study
- Appendix C – Transportation Study
- Appendix D – Cultural/Tribal Cultural Study
- Appendix E – Geotechnical Study
- Appendix F – Hydrology Study

PROJECT INFORMATION

Project Title

Case No. 22-014 Site Plan Review (SPR). A request to develop approximately four acres with one industrial building totaling approximately 53,000 square feet for warehouse and office use.

Lead Agency Name and Address

City of Palmdale
Economic and Community Development Department, Planning Division
38250 Sierra Highway
Palmdale, California, 93550
Main: (661) 267-5100

Contact Person and Phone Number

Ms. Brenda Magaña
Planning Manager
Office: (661) 603-0005
E-mail: bmagana@cityofpalmdale.org

Project Location

Northwest corner of Avenue M-8 and 10th Street West [Assessor's Parcel Numbers (APNs) 3111-012-083 and 3111-012-0]. See Figures 1 and 2.

Name and Address

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General Plan Designation

Employment Flex (EF)

Zoning

Office Flex (OF)

Project Description

SHL Engineering is assisting in the development of a 15-unit light industrial building comprising combination warehouse and office spaces (Units "A" through "O"). The project site is a vacant lot at the northwest corner of Avenue M-8 and 10th Street West [Assessor's Parcel Numbers (APNs) 3111-012-083 and 3111-012-084] in Palmdale, CA (the City), which is under the jurisdiction of the Antelope Valley Air Quality Management District (AVAQMD). The approximately four-acre parcel will be developed with one building totaling 53,233 square feet, including 38,473 total square feet of warehouse space and 14,760 total square feet for office use. The office spaces will face the front of the building, and the rear of the building will feature passage and roll-up doors for each unit. Paved parking areas will total 94,590 square feet, with 19,471 square feet of drought-tolerant landscaping. Other areas not paved with asphalt will total 20,353 square feet.

Surrounding Land Uses and Setting

The project site is approximately 1,000 feet east of the Antelope Valley Freeway (SR 14) corridor and approximately 6,000 feet west of the Sierra Highway corridor. Lands to the north and west of the project site are zoned Office Flex (OF), and lands to the east and south are zoned Light Industrial (LI). The Specific Plan (SP) Antelope Valley Business Park is northeast of the project site, and further north of the project site is an area zoned Visitor Commercial (VC). Further on the east and south is Aerospace Industrial (AI) zoning. No residences are within 3,000 feet of the project site, which are on the western side of SR 14. The project location is shown in Figure 1, and the project area zoning is shown in Figure 2.

Figure 1. Project Location



Figure 2. Project Area Zoning



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 topics on the following pages.

2019 CEQA Appendix G Environmental Factors Potentially Affected		
<input checked="" type="checkbox"/> Aesthetics	<input type="checkbox"/> Agriculture/Forestry Resources	<input checked="" type="checkbox"/> Air Quality
<input checked="" type="checkbox"/> Biological Resources	<input checked="" type="checkbox"/> Cultural Resources	<input checked="" type="checkbox"/> Energy
<input checked="" type="checkbox"/> Geology/Soils	<input checked="" type="checkbox"/> Greenhouse Gas Emissions	<input checked="" type="checkbox"/> Hazards and Hazardous Materials
<input checked="" type="checkbox"/> Hydrology/Water Quality	<input type="checkbox"/> Land Use/Planning	<input type="checkbox"/> Mineral Resources
<input checked="" type="checkbox"/> Noise	<input type="checkbox"/> Population/Housing	<input type="checkbox"/> Public Services
<input type="checkbox"/> Recreation	<input checked="" type="checkbox"/> Transportation	<input checked="" type="checkbox"/> Tribal Cultural Resources
<input checked="" type="checkbox"/> Utilities/Service Systems	<input type="checkbox"/> Wildfire	<input checked="" type="checkbox"/> Mandatory Findings of Significance

AESTHETICS

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. Aesthetics. Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) In nonurbanized 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Determination:**a) Have a substantial adverse effect on a scenic vista?**

No Impact. A significant impact would occur if the proposed Project would have a substantial adverse effect on a scenic vista. A scenic vista refers to views of focal points or panoramic views of broader geographic areas that have visual interest. A focal point view would consist of a view of a notable object, building, or setting. Diminishment of a scenic vista would occur if the bulk or design of a building or development contrasts enough with a visually interesting view, so that the quality of the view is permanently affected.

The Project site consists primarily of highly disturbed desert, roadways, and commercial and light industrial development and has a flat topography. It does not include any scenic vistas or other significant natural features in the immediate vicinity. The closest vista that could be considered “scenic” would be the Lamont Odett Vista Point overlooking Lake Palmdale from State Route 14 (SR-14). This overlook is seven miles from the project site.

The opportunities for views from vantage points adjacent to the site would remain substantially similar to existing conditions. There would be no impacts on scenic vistas generated by the proposed Project.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. Satellite imagery shows that the vacant project site is generally flat with approximately four to five Joshua Trees present (Appendix B). There are no other trees, rock outcroppings, or historic buildings on the project site. No substantial damage would occur to scenic resources overall. The closest vista that could be considered “scenic” would be the Lamont Odett Vista Point overlooking Lake Palmdale from SR-14. This overlook is seven miles from the project site. At this distance, and due to intervening development and topography, the Project would not affect views along or from the SR-14 corridor.

Because the Project site is not located within or adjacent to a scenic highway corridor and is not visible from a designated or eligible corridor, the proposed Project would have no impact upon a scenic highway corridor.

c) In nonurbanized 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?

No Impact. The vacant land which makes up the project site and land immediately adjacent have already been disturbed through development and use. Commercial and industrial facilities, and impacted land occurred prior to 1995 based on satellite imagery. The project site was disturbed, possibly through grading, prior to 2003 based on satellite imagery. This facility would just become a part of the existing view in the area. Development as planned will blend with the surrounding area and will follow Palmdale Municipal Code (PMC) requirements such as those found in Chapter 17 for aesthetically pleasing construction. The proposed project would not substantially degrade the existing visual character or quality of the site or its surroundings.

Based on the preceding, the potential for the Project to degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable zoning and other regulations governing scenic quality is considered to have no impact. Additionally, the proposed development would be consistent with adjacent land use developments and would have no impact on the exiting visual character of the site.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant Impact. The Project site is undeveloped and therefore does not have any existing sources of light or glare during the day or night. This project would create a new source of light, to include lighting for the parking area and exterior building lights. The additional lighting would not be considered substantial given the existing surrounding uses. Major shopping centers and restaurants are present to the south, residential housing to the northwest across the SR 14 freeway (approximately 0.6 miles from the project site), and commercial facilities are present to the north. This project is situated within a commercial/light industrial use area and is compatible with allowable uses

within the Office Flex (OF) zone and adjacent Light Industrial (LI) zone (City 2023). The project will incorporate standards detailed within the PMC for lighting.

Therefore, the proposed Project would not generate substantial sources of glare, and impacts would be less than significant.

Mitigation Measures:

None required.

AGRICULTURE AND FORESTRY RESOURCES

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. 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 Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) 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 conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Determination:

- 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?*

No Impact. This project site is not considered prime, unique, or farmland of statewide importance based on the Farmland Mapping and Monitoring Program – DLRP Important Farmland Finder (CA.gov). The project site is zoned Office Flex (OF) and not considered agricultural (City of Palmdale 2022).

Farmland of Local Importance is assigned to land that is either currently producing agricultural crops or has the capability of production, but does not meet the criteria of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. According to Center of Disease Control (CDC) classifications, lands designated as “Farmland of Local Importance” likely carry the designation because the soils in this area are capable of agricultural production, but the property has never been used for agriculture and/or lacks available irrigation water for use in agricultural crop production and no active farming is occurring in the general area. Because the Project site does not contain land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance), the Project has no potential to convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. No impact would occur.

- b) *Conflict with existing zoning for agricultural use, or a Williamson Act contract?*

No Impact. The proposed Project would not conflict with agricultural zoning or a Williamson Act contract. There are no Williamson Act contracts within the City of Palmdale (Rincon 2022). Therefore, implementation of the proposed Project would not conflict with existing zoning for agricultural use or a Williamson Act contract, and no impact would occur.

- 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))?*

No Impact. There is no noted farmland nearby and therefore no conversion of farmland to non-agricultural use could occur. The area, both project site and adjacent sites, are zoned Office Flex and Light Industrial, respectively. The proposed Project is not located within forest land, timberland, or timberland zoned Timberland Production. As a result, the proposed Project would not conflict with, or cause any alteration to, existing zoning for forest land, timberland, or timberland zoned Timberland Production. This is apparent in “California’s Forest Resources: Forest Inventory and Analysis, 2001-2010,” where the site and the surrounding area are not forested or a forest plot [United States Department of Agriculture (U.S. DOA) 2016].

- d) *Result in the loss of forest land or conversion of forest land to non-forest use?*

No Impact. The proposed Project is not within forest land, will not result in the loss of forest land and will not convert forest land to non-forest use. “California’s Forest

Resources: Forest Inventory and Analysis, 2001-2010” shows that the site and surrounding area are not forested or a forest plot (U.S. DOA 2016).

- 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 conversion of forest land to non-forest use?*

No Impact. The proposed Project is not within forest land and will not convert forest land to non-forest use and does not propose or require uses or facilities that would result in changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use.

Mitigation Measures:

None required.

AIR QUALITY

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting:

The Project site is in Los Angeles County within the Mojave Desert Air Basin (MDAB). The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains which dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in southern California by differential heating are channeled through the MDAB. The MDAB is

separated from the Southern California coastal and Central California valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevada in the north by the Tehachapi Pass (3,800 feet elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 feet). The MDAB is bordered in the southwest by the San Bernardino Mountains, separated from the San Gabriel Mountains by the Cajon Pass (4,200 feet). A lesser channel lies between the San Bernardino Mountains and the Little San Bernardino Mountains (the Morongo Valley). The Palo Verde Valley portion of the Mojave Desert lies in the low desert, at the eastern end of a series of valleys (notably the Coachella Valley) whose primary channel is the San Gorgonio Pass (2,300 feet) between the San Bernardino and San Jacinto Mountains.

The United States Environmental Protection Agency (U.S. EPA), under the federal Clean Air Act (CAA), has determined maximum ambient concentrations that should be allowed for the protection of public health for seven “criteria” air pollutants. These maximum concentrations are known as the National Ambient Air Quality Standards (NAAQS). The seven criteria air pollutants are ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), and lead (Pb).

The California Air Resources Board (CARB), under the California CAA, establishes maximum concentrations for the seven federal criteria air pollutants, as well as four additional air pollutants: visibility-reducing particles, sulfates, hydrogen sulfide (H₂S), and vinyl chloride. These maximum concentrations are known as the California Ambient Air Quality Standards (CAAQS). For areas within the State that have not attained air quality standards, CARB works with local air districts to develop and implement attainment plans to obtain compliance with both federal and State air quality standards. The local air district with jurisdiction over the Project site is the AVAQMD.

Environmental Determination:

Estimated construction and operational impacts are evaluated against quantitative criteria established by the AVAQMD. These criteria are relied upon to make significance determinations based on mass emissions of criteria pollutants. As shown in Tables 1 and 2 below, the proposed Project would result in a less than significant impact related to regional emissions. Further, the proposed Project would not conflict with AVAQMD planning goals, cause substantial air pollutant concentrations, or be a source of objectionable odors. Appendix A contains the Yorke technical report dated September 25, 2023, with details of the air quality and greenhouse gas (GHG) emissions study conducted.

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

Less Than Significant Impact. The applicable air quality plan for the Project is the 2023 Ozone Attainment Plan (2023 Plan). The purpose of the 2023 Plan is to address the attainment and maintenance of State and federal ambient air quality standards for ozone in the MDAB. The portion of the MDAB that includes the Project site is designated as non-attainment for ozone NAAQS and CAAQS and PM₁₀ CAAQS. The AVAQMD has adopted or is in the process of adopting the control measures recommended in the 2023 Plan in its Rules and Regulations. The AVAQMD has also adopted fugitive dust control requirements in its Rule 403, Fugitive Dust, which will be part of the Project design.

Because the Project would comply with the AVAQMD's Rules and Regulations, including those adopted from the 2023 Plan, the Project would not conflict with or obstruct implementation of the applicable Air Quality Plan. Therefore, the Project would have a less than significant impact with respect to this criterion.

- 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?***

Less Than Significant Impact. Intermittent (short-term construction emissions that occur from activities, such as site grading, paving, and building construction) and long-term air quality impacts related to the operation of the Project were evaluated. The analysis focuses on daily and annual emissions from construction and operational (mobile, area, and fugitive source) activities.

A significant impact would occur if the proposed Project would violate any air quality standard or contribute substantially to an existing or Projected air quality violation. Project construction and operation emissions are estimated using the California Emissions Estimator Model® (CalEEMod), the statewide land use emissions computer model designed to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from land use projects.

See Appendix A, which contains additional details on the air quality and GHG emissions study conducted by Yorke.

Construction Emissions

Construction of the Project would occur over approximately one year. Construction activities would consist of site preparation, grading, building construction, paving, and architectural coating. Earthwork would be balanced on-site. Table 1 provides the estimated maximum daily construction emissions that would be associated with the Project and compares those emissions to the AVAQMD's significance thresholds for construction exhaust emissions. All construction-related emissions would be below the AVAQMD significance thresholds. It should be noted that although emissions are labeled as "mitigated", these emissions reflect project design features, i.e., required Best Management Practices (BMPs). For this project, applicable AVAQMD and City Planning approved BMPs will be implemented as project design features. This is a standard Condition of Approval and pursuant to CEQA, is not considered mitigation.

Table 1: Construction Emissions Summary and Significance Evaluation

Criteria Pollutants	Unmitigated		Mitigated		Threshold		Significance
	Daily (lbs/day)	Annual (tons/yr)	Daily (lbs/day)	Annual (tons/yr)	Daily (lbs/day)	Annual (tons/yr)	
ROG (VOC)	19.1	0.18	19.1	0.18	137	25	LTS
NO _x	36.1	1.57	36.1	1.57	137	25	LTS
CO	34.2	1.97	34.2	1.97	548	100	LTS
SO _x	0.1	0.003	0.1	0.003	137	25	LTS
Total PM ₁₀	21.5	0.19	9.5	0.14	82	15	LTS
Total PM _{2.5}	11.6	0.11	5.5	0.09	65	12	LTS

Sources: AVAQMD 2016, CalEEMod version 2022.1.1.18

Notes: lbs/day are winter or summer maxima for planned land use

Total PM₁₀/PM_{2.5} comprises fugitive dust plus engine exhaust

LTS – Less Than Significant

The Project would be required to comply with the fugitive dust control requirements for construction projects in AVAQMD Rule 403; therefore, impacts would be less than significant.

Operation Emissions

CalEEMod was used to estimate emissions that would be associated with motor vehicle use, landscape maintenance, and other minor area sources (paints, solvents, etc.) expected to occur once the Project is operational. Emissions estimates assume an operational year of 2025 (the first full year the Project could conceivably operate), and emissions would decrease on annual basis in subsequent years of operation due to the phase-out of higher polluting vehicles and the implementation of more stringent emission standards.

Estimated daily operational emissions that would be associated with the Project are presented in Table 2 and are compared to the AVAQMD's thresholds of significance. As indicated in Table 2, the estimated operational emissions would be below the AVAQMD's significance thresholds and would be less than significant. It should be noted that although emissions are labeled as "mitigated," these emissions reflect project design features, i.e., required BMPs. For this project, applicable AVAQMD and City Planning approved BMPs will be implemented as project design features. This is a standard Condition of Approval and pursuant to CEQA, is not considered mitigation.

Table 2: Operational Emissions Summary and Significance Evaluation

Criteria Pollutants	Unmitigated		Mitigated		Threshold		Significance
	Daily (lbs/day)	Annual (tons/yr)	Daily (lbs/day)	Annual (tons/yr)	Daily (lbs/day)	Annual (tons/yr)	
ROG (VOC)	2.75	0.41	2.75	0.41	137	25	LTS
NO _x	1.10	0.18	1.10	0.18	137	25	LTS
CO	9.85	1.22	9.85	1.22	548	100	LTS
SO _x	0.02	0.002	0.02	0.002	137	25	LTS
Total PM ₁₀	1.17	0.18	1.17	0.18	82	15	LTS
Total PM _{2.5}	0.32	0.05	0.32	0.05	65	12	LTS

Sources: AVAQMD 2016, CalEEMod version 2022.1.1.18

Notes: lbs/day are winter or summer maxima for planned land use

Total PM₁₀/PM_{2.5} comprises fugitive dust plus engine exhaust

LTS – Less Than Significant

Conclusions

As indicated in Tables 1 and 2, construction and operational emissions from the Project would be below the applicable significance thresholds. Compliance with the applicable fugitive dust rules would ensure fugitive dust is controlled and less than significant. Because the Project's emissions are less than significance thresholds, the emissions during construction and operations would not be expected to result in a cumulatively considerable impact to air quality. Therefore, the Project would have a less than significant impact.

c) *Expose sensitive receptors to substantial pollutant concentrations?*

Less Than Significant Impact. The AVAQMD CEQA and Federal Conformity Guidelines (AVAQMD 2016) defines sensitive receptor land uses as residences, schools, daycare centers, playgrounds, and medical facilities. The following proposed Project types for sites within the specified distance of existing or planned sensitive receptor land uses must be evaluated using the AVAQMD's health risk significance thresholds:

- Any industrial project within 1,000 feet;
- A distribution center (40 or more trucks per day) within 1,000 feet;
- A major transportation project (50,000 or more vehicles per day) within 1,000 feet;
- A dry cleaner using perchloroethylene within 500 feet; and
- A gasoline dispensing facility within 300 feet.

Project operations would not consist of industrial stationary sources or generate heavy truck trips. Operations would consist of buildings for offices/warehousing and parking. The nearest permanent sensitive (residential) receptor is approximately 3,150 feet (960 meters) to the northwest of the Project site. Construction and operation of the Project

would not expose sensitive receptors to substantial pollutant concentrations. Therefore, the Project would have a less than significant impact.

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

Less Than Significant Impact. Potential sources that may emit odors during construction activities include equipment exhaust and architectural coatings. Odors from these sources would be localized and generally confined to the immediate area surrounding the Project site. The proposed Project would utilize typical construction techniques, and the odors would be typical of most construction sites and temporary in nature. Construction of the proposed Project would not cause an odor nuisance. The Project would consist of buildings for warehouse/office and parking and would not include activities known to generate odors.

Examples of land uses and industrial operations that have the potential to generate considerable odors include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The Project would consist of buildings for self-storage and parking and would not include activities known to generate odors. Therefore, the proposed Project would result in a less than significant impact related to objectionable odors, and no mitigation is required.

Mitigation Measures:

None required.

BIOLOGICAL RESOURCES

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Biological Resources. Would the Project:				
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Setting:

Circle Mountain Biological Consultants, Inc. (CMBC) performed a focused survey for Agassiz's desert tortoise, habitat assessment for burrowing owl, and a general biological resource assessment on a parcel located in Lancaster or Palmdale, California. Appendix B contains the technical report prepared by CMBC dated March 2022, with additional information regarding biological resources and the details of the study.

On March 1, 2022, CMBC surveyed the site and adjacent areas as described herein. This entailed a survey of 10 transects, spaced at 10-meter (30-foot) intervals and oriented along an east-west axis throughout the approximately four-acre site. Five zones of influence transects were surveyed for detection of burrowing owls at 30-meter (100-foot) intervals to the west, north, and east.

No blueline streams designated by the U.S. Geological Survey (USGS) occur on-site, but a drainage channel for urban run-off is present on the western boundary of the site.

Based on the absence of tortoise signs on-site and in adjacent areas, and available information reviewed for this habitat assessment, CMBC concludes that tortoises are absent from the subject property. As such, no impacts are expected, and no mitigation measures are recommended.

Based on the field survey and habitat assessment, CMBC concludes that none of the following special status species reported from the region will be adversely affected by site development: Lancaster milkvetch, alkali mariposa lily, Parry's spineflower, Rosamond eriastrum, Soledad shoulderband snail, tricolored blackbird, ferruginous hawk, Swainson's hawk, burrowing owl, and merlin. CMBC concludes that Mohave ground squirrel is absent from the site and that protocol trapping surveys are not warranted. As such, no adverse impacts have been identified and no mitigation measures are recommended for the above species.

Those species either identified during the current survey or for which suitable habitats are present include the western Joshua tree, white pigmy-poppy, Crotch bumble bee, Northern California legless lizard, coast horned lizard, sharp-shinned hawk, Cooper's hawk, loggerhead shrike, LeConte's thrasher. Potential impacts to the other special-status species that have potential to occur on the site may include loss of individual plants or animals if present; loss of approximately 4 acres of suitable habitat; and/or temporary disturbance. CMBC recommends the California Department of Fish and Wildlife (CDFW) to be contacted to determine what avoidance, salvage, and/or mitigation measures are appropriate for the western Joshua trees found on the site.

Environmental Determination:

- 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?*

Less Than Significant Impact with Mitigation Incorporated. According to the CMBC's biological resources report, based on the absence of tortoise signs on-site and in adjacent areas, and available information reviewed for this habitat assessment, it is concluded that tortoises are absent from the subject property. As such, no impacts to tortoises are expected, and no mitigation measures are recommended.

Based on the field survey and habitat assessment, CMBC concludes that none of the following special status species reported from the region will be adversely affected by site development: Lancaster milkvetch, alkali mariposa lily, Parry's spineflower, Rosamond eriastrum, Soledad shoulderband snail, tricolored blackbird, ferruginous hawk, Swainson's hawk, burrowing owl, and merlin. CMBC concludes that Mohave ground squirrel is absent from the site and that protocol trapping surveys are not warranted. As such, no adverse impacts have been identified and no mitigation measures are recommended for the above species.

Those species either identified during the current survey or for which suitable habitats are present include the western Joshua tree, white pigmy-poppy, Crotch bumble bee, northern California legless lizard, coast horned lizard, sharp-shinned hawk, Cooper's hawk, loggerhead shrike, LeConte's thrasher. Potential impacts to the other special-status species that have potential to occur on the site may include loss of individual plants or animals if present; loss of approximately four acres of suitable habitat; and/or temporary disturbance.

CMBC recommends the CDFW to be contacted to determine what avoidance, salvage, and/or mitigation measures are appropriate for the Joshua trees found on the site. This

potential impact would be reduced to less than significant levels with contacting CDFW and implementing their proposed mitigation measures (if any).

- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***

Less Than Significant Impact. A significant impact would occur if any riparian habitat or natural community would be lost or destroyed as a result of urban development. The Project site does not contain any riparian habitat and does not contain any streams or water courses necessary to support riparian habitat. Species found in riparian habitats, the Soledad shoulderband snail and the Swainson's hawk, were found to have been recorded in the California Natural Diversity Database (CNDDB) but not within the boundaries of the Project site. The closest record for the Swainson's hawk was 6.8 miles north-northeast of the site in 2016. No specific location or year is provided for the Soledad shoulderband snail; however, it may be found in rock piles, flood-borne debris, or under dead yuccas where other cover is not available. The Project would not have a substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or the United States Fish and Wildlife Services.

- 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?***

No Impact. No wetlands were found on or adjacent to the proposed Project site during the field survey or have been reported in the literature. Therefore, there would be no impact.

- 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?***

Less Than Significant Impact with Mitigation Incorporated. Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests, including raptors and other migratory nongame birds (As listed under the Migratory Bird Treaty Act). Typically, CDFW requires that vegetation not be removed from a project site between March 15 and September 15 to avoid impacts to nesting birds. If it is necessary to commence project construction between March 15 and September 15, a qualified biologist should survey all shrubs and structures within the project site for nesting birds, prior to project activities (including construction and/or site preparation). Refer to MM-BIO-2.

The project area is not within an established migratory wildlife corridor habitat linkage (Penrod, et al. 2012) and does not contain suitable habitat for migratory fish or wildlife movement. It is not connected to regional natural open space areas. No impact would result to such resources from Project implementation.

- e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?***

Less Than Significant Impact. The proposed project would not conflict with any local policies or ordinances, such as a tree preservation policy, protecting biological resources. The proposed project would be subject to the requirements of PMC Chapter 14.04, “Joshua Tree and Native Desert Vegetation Preservation,” which requires appropriate action must be taken in order to protect and preserve desert vegetation, and particularly Joshua trees, so as to retain the unique natural desert aesthetics in some areas of this City, and to promote the general welfare of the community. The applicant shall abide by current law and follow the procedures outlined in the ordinance. Therefore, the impacts are expected to be less than significant.

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?

No Impact. The Project site is not subject to any adopted Habitat Conservation Plan and is therefore subject to regulation by local, State, or federal laws on a case-by-case basis. As there is no adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State Habitat Conservation Plan applicable to the Project site, no impact would occur in this regard.

Mitigation Measures:

Mitigation Measure BIO-1: CMBC recommends the CDFW to be contacted to determine what avoidance, salvage, and/or mitigation measures are appropriate for the Joshua trees found on the site.

Mitigation Measure BIO-2: CMBC recommends conducting surveys at the appropriate time of day during the breeding season, and surveys would end no more than three days prior to clearing. CDFW is typically notified in writing prior to the start of the surveys. Documentation of surveys and findings should be submitted to the CDFW within 10 days of the last survey. If no nesting birds were observed, project activities may begin. If an active bird nest is located, the plant in which it occurs should be left in place until the birds leave the nest. No construction is allowed near active bird nests of threatened or endangered species.

CULTURAL RESOURCES

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Cultural Resources. Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental Setting:

ArchaeoPaleo Resource Management, Inc. (APRM) was contracted to perform a Phase 1 Archaeological and Paleontological Assessment of the proposed Project. Appendix D contains the technical report prepared by APRM dated December 2023, with additional information regarding cultural resources and the details of the study.

To determine the archaeological and paleontological sensitivity of the Project area, APRM conducted the following research methods: an archaeological and paleontological field reconnaissance survey, paleontological records check from the Natural History Museum of Los Angeles County, a cultural resources records search from the South-Central Coastal Information Center and a Sacred Lands File Search and Native American Contacts list from the Native American Heritage Commission. Additional archival research was also performed for the Project.

The field reconnaissance survey determined that the Project area was an undeveloped desert property. Observed flora included five Joshua Trees, Sage brush, Creosote bushes, Desert Cholla, Turkey Mullein, Wire Lettuce, as well as other desert grasses and wildflowers. Observed fauna included cotton-tail rabbits, lizards, birds, and a burrow that is potentially home to a desert tortoise. The south side of Project area has been used as a scattered trash dump and vehicle tracks though the east project area shows that it has been previously disturbed by cars and or trucks. Paleontological or Native American cultural resources were not observed, but a historic manmade rock feature was observed along the west site border, just east of the drainage ditch. Potential historic trash items included miscellaneous rusted metal cans, glass bottles/jars, and other unidentifiable rusted metal objects. Although no paleontological or Native American resources were observed during survey, the potential for uncovering such resources during Project related ground disturbing activities still exists.

The paleontological record search results did not identify any known fossil localities within the Project site, but the Natural History Museum of Los Angeles County Collections Manager states that there are four vertebrate fossil sites that have been recorded in the City of Palmdale within similar sedimentary deposits to those which may be found within the Project boundaries. These soils include both Holocene and Pleistocene alluvial sediments. The Pleistocene alluvial deposits that may be present on the Project area derive from the Anaverde and Harold Formations, as confirmed by the 2008 geologic map of the Lancaster & Alpine Butte quadrangles. Since there is a high possibility that Harold Formation sediments may be present, and there is a precedent set by the fossils identified by Dr. Bell, there exists the potential to uncover paleontological resources during excavation of soil on the property.

The cultural research records search conducted by the South-Central Coastal Information Center (SCCIC) did not identify the presence of any previously recorded cultural (prehistoric/tribal/

historic) resources that were located within the direct Project area. The results of the record search included one prehistoric site, four historic sites, and three historic buildings within a one-mile radius of the Project area, although none of the buildings are on the California or National Register and none have been locally designated. An analysis of the reports provided by the SCCIC indicates that two more prehistoric sites, one more prehistoric isolate, and seven more historic sites (largely trash deposits) are located within a one-mile radius of the Project area. This indicates that there is a high potential for the discovery of cultural resources during ground-disturbing activities.

Environmental Determination:

- a) *Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?*

Less Than Significant with Mitigation Incorporated. The cultural research records search conducted by the SCCIC did not identify the presence of any previously recorded cultural (prehistoric/tribal/ historic) resources that were located within the direct Project area. The results of the record search included one prehistoric site, four historic sites and three historic buildings within a one-mile radius of the Project area, although none of the buildings are on the California or National Register and none have been locally designated (refer to Appendix D, APRM 2023, Tables 4 and 5). An analysis of the reports provided by the SCCIC indicates that two more prehistoric sites, one more prehistoric isolate, and seven more historic sites (largely trash deposits) are located within a one-mile radius of the Project area. This indicates that there is a high potential for the discovery of cultural resources during ground-disturbing activities.

Although cultural resources were not found on-site during the pedestrian survey or in the database searches, there is a potential that buried resources could be found during ground disturbance activities. Mitigation Measures CUL-1 through CUL-13 and TCR-1 through TCR-3 would reduce potentially significant impacts on archaeological and historical resources to less than significant.

- b) *Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?*

Less Than Significant with Mitigation Incorporated. Due to the number of historic and prehistoric sites within a one-mile radius of the Project, there is a high probability that historical and archaeological resources may be discovered. Construction activities may lead to encountering previously unreported subsurface historical and archaeological resources. Measures CUL-1 through CUL-13 and TCR-1 through TCR-3 would reduce potentially significant impacts on archaeological and historical resources to less than significant.

- c) *Disturb any human remains, including those interred outside of dedicated cemeteries?*

Less Than Significant with Mitigation Incorporated. The discovery of human remains is always a possibility during ground disturbances. Mitigation Measure CUL-11 would reduce potentially significant impacts to less than significant.

Mitigation Measures:

Mitigation Measure CUL-1: Prior to the start of Project excavation, a qualified paleontologist shall be retained and create a Worker's Environmental Awareness Program (WEAP) pamphlet that will be provided as training to Project personnel as to understand the regulatory requirements for the protection of paleontological resources. This training shall include examples of paleontological resources to look for and protocols to follow if discoveries are made. The paleontologist shall develop the training and any supplemental materials necessary to execute said training.

Mitigation Measure CUL-2: Paleontological resources monitoring shall be conducted during Project excavation by a qualified paleontological resource monitor, per Society for Vertebrate Paleontology (2010) standards, under the supervision of a qualified Lead Paleontologist. Monitoring will entail the visual inspection of excavation and grading areas during excavation. The qualified paleontological resources monitor will periodically assess monitoring results in consultation with the Lead Paleontologist. If no (or few) fossils have been exposed, the Lead Paleontologist may determine that monitoring is no longer necessary, and/or periodic spot checks would be required. During construction monitoring, the monitor should process soil samples for micro-fauna per SVP guidelines.

Mitigation Measure CUL-3: In the event that paleontological resources are encountered when a monitor is not on-site, all excavation shall cease within at least 50 feet of the discovery and the Principal Investigator and Lead Paleontologist must be notified immediately. If the monitor is present at the time of discovery, then the monitor will have the authority to temporarily divert the excavation equipment around the find and notify the Principal Investigator and Lead Paleontologist until it is assessed for scientific significance. Work cannot resume in the direct area of the discovery until the Principal Investigator and/or Lead Paleontologist indicates that excavation can resume.

Mitigation Measure CUL-4: If a paleontological discovery requires an excavation team or requires additional time to collect specimens, the area will be cordoned off and secured so that a paleontological resources excavation crew, led by the Principal Investigator and Lead Paleontologist, may retrieve the remains out of that localized area of in situ deposits while excavation, monitored by a paleontological resource monitor, can continue in other areas. Once the Principal Investigator and Lead Paleontologist has determined that the collection process is complete for a given area or locality, construction activity will resume in that localized area.

Mitigation Measure CUL-5: All significant fossils collected will be prepared in a properly equipped paleontology laboratory to a point ready for curation. Preparation will include the careful removal of excess matrix from fossil materials and stabilizing and repairing specimens, as necessary. Any fossils encountered and recovered shall be identified to the lowest taxonomic level, photographed, catalogued, analyzed, and delivered to an accredited museum repository for permanent curation and storage. Any fossils collected shall be donated to a public, non-profit institution with a research interest in the materials within Los Angeles County or another local repository. Accompanying notes, maps, and photographs shall also be filed at the repository. The cost of curation is assessed by the repository and is the responsibility of the Project proponent.

Mitigation Measure CUL-6: At the conclusion of laboratory work and museum curation, a final report will be prepared describing the results of the paleontological mitigation monitoring efforts

associated with the project. The report will include a summary of the field and laboratory methods, an overview of the geology and paleontology in the project vicinity, a list of taxa recovered (if any), an analysis of fossils recovered (if any) and their scientific significance, and recommendations. If the monitoring efforts produced fossils, then a copy of the report will also be submitted to the designated museum repository.

Mitigation Measure CUL-7: Prior to the start of Project excavation, a qualified archaeologist shall be retained and create a WEAP pamphlet that will be provided as training to Project personnel as to understand the regulatory requirements for the protection of cultural resources. This training shall include examples of archaeological cultural resources to look for and protocols to follow if discoveries are made. The archaeologist shall develop the training and any supplemental materials necessary to execute said training.

Mitigation Measure CUL-8: Archaeological resources monitoring shall be conducted by an archaeological resource monitor during Project related earth-disturbing activities, per OHP standards, under the supervision of a qualified Lead Archaeologist. Monitoring will entail visual inspection of Project related earth-disturbing activities in native soil.

Mitigation Measure CUL-9: Per the Native American contact responses, an approved Native American monitor, with documented ancestral ties to the area consistent with the standards of the Native American Heritage Commission (NAHC) shall be present for all ground disturbing activities that involve excavation of previously undisturbed soil until the archaeologist and Native American monitor deems that they are no longer in soil that may contain prehistoric and/or historic artifacts, sites, or features. Monitoring will entail visual inspection Project related earth-disturbing activities.

Mitigation Measure CUL-10: If an archaeological resource is encountered during excavation when a monitor is not on-site, all excavation shall cease within at least 50 feet of the discovery and the Principal Investigator and Lead Archaeologist must be notified. Work cannot resume in the direct area of the discovery until it is assessed by the Principal Investigator and/or Lead Archaeologist and indicates that excavation can resume.

Mitigation Measure CUL-11: If an archaeological discovery cannot be preserved in situ and requires an excavation team or requires additional time to collect cultural resources, a Discovery and Treatment Plan (DTP) will be developed and the area will be cordoned off and secured so that an archaeological resources excavation team, led by the Principal Investigator and Lead Archaeologist, may recover the cultural resources out of that contained area. Once the Principal Investigator has determined that the collection process is complete for a given area or locality, construction activity will resume in that localized area.

If any non-Native American human remains are encountered at any point during the Project, the coroner must be notified and all work on the site must cease until the coroner removes the remains and allows the Project to proceed as dictated by law.

Mitigation Measure CUL-12: All significant cultural resources collected by the archaeologist will be prepared in a properly equipped laboratory to a point ready for curation. All significant artifacts collected will be prepared in a properly equipped archaeological laboratory to a point ready for curation. Artifacts will be identified, photographed, catalogued, analyzed, and delivered to an accredited museum repository for permanent curation and storage or to the appropriate Tribe.

Accompanying notes, maps, and photographs shall also be filed at the repository. The cost of curation is assessed by the repository and is the responsibility of the Project proponent.

Mitigation Measure CUL-13: At the conclusion of laboratory work but prior to museum curation, a final (negative or positive) report will be prepared describing the results of the cultural mitigation monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the cultural background within the project vicinity, a list of cultural resources recovered (if any), an analysis of cultural resources recovered (if any) and their scientific significance, and recommendations. A copy of the report will be prepared for the City of Palmdale, the SCCIC, and be submitted to the designated museum repository (if applicable).

ENERGY

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. Energy. Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy?*

Less Than Significant Impact. During construction and operation, this project will be required to comply with the latest U.S. EPA and CARB) emissions standards as well as Title 24 Building Efficiency Standards. Following these standards will ensure there is no significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources occur.

- b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

No Impact. This project will comply with applicable regulations and City of Palmdale General Plan policies to prevent wasteful, inefficient, or unnecessary consumption of energy resources during construction and operation and would not conflict with or obstruct any adopted energy conservation plans or state or local plans for renewable energy or energy efficiency. The project will construct and operate in a manner consistent with energy efficiency goals contained in the City of Palmdale Energy Action Plan. Construction and operation would comply with relevant provisions of the State's CALGreen and Title 24 of the California Energy Code (City of Palmdale 2022, Rincon 2022) that are designed to reduce unnecessary energy consumption in newly constructed

and existing buildings, such as residential and commercial structures. The Building Energy Efficiency Standards are applicable to the proposed Project, which is designed for human habitation [California Energy Commission (CEC) 2022]. Thus, the proposed Project would not conflict with Title 24 or obstruct its implementation on applicable land use development projects in California.

Mitigation Measures:

None required.

GEOLOGY AND SOILS

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. Geology and Soils. Would the project:				
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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.*

Less Than Significant Impact. A significant impact would occur if the proposed Project would cause personal injury or death or result in property damage as a result of a fault rupture occurring on the Project site and if the Project site is located within a State-designated Alquist-Priolo Fault Zone or other designated fault zone.

Based on geotechnical studies of this site and a similar site 1.5 miles south, there are no known active faults crossing the Project site, and the site is not within an the Alquist-Priolo special studies zone (Engineering Services & Design 2022, Earth Systems 2008, Bruin Geotechnical Services Inc. 2022). However, the site is situated in a region subject to strong earthquakes occurring along active faults. These active faults include, but are not limited to, the San Jacinto Fault and the San Andreas Fault. The possibility of ground acceleration, or shaking at the site, may be considered as approximately similar to the Southern California region as a whole. The potential for mapped fault splay to cause surface rupture to usable areas of the site is considered low. Thus, the impacts would be less than significant.

ii. Strong seismic ground shaking?

Less Than Significant Impact. A significant impact would occur if the proposed Project would cause personal injury or death or resulted in property damage as a result of seismic ground shaking.

Strong seismic shaking could occur anywhere in Southern California. The facilities would have to comply with the California Building Codes.

The possibility of ground acceleration, or shaking at the site, may be considered as approximately similar to the Southern California region as a whole. Thus, moderate to strong ground shaking can be expected at the site. The amount of motion can vary depending upon the distance to the fault, the magnitude of the earthquake, and the local geology. Greater movement can be expected at sites located closer to an earthquake epicenter that consists of poorly consolidated material such as alluvium and in response to an earthquake of great magnitude.

The potential for this fault splay to cause surface rupture to usable areas of the site is considered low.

State law requires that all cities and counties in California enforce the building codes as mandated by the California Building Standards Commission. As a mandatory condition of Project approval, the Project's building would be required to be constructed in accordance with currently adopted California Building Standards Code, Los Angeles County Ordinances, and California Title 24 regulations in effect at the time of building plan submittal.

Through established Site Plan, Building Permit, and Certificate of Occupancy requirements, the County would verify that required design and construction standards are incorporated throughout Project development and are functionally implemented in the completed structures and supporting facilities. With the Project's mandatory compliance with these standard and site-specific design and construction measures, potential impacts related to seismic ground shaking would be less than significant.

iii. Seismic-related ground failure, including liquefaction?

No Impact. A significant impact may occur if a Project site is located within a liquefaction zone. Liquefaction is the loss of soil strength or stiffness due to a buildup of pore-water pressure during severe ground shaking. The potential for on-site liquefaction or seismically induced dynamic settlement is negligible (Engineering Services & Design 2022, Earth Systems 2008, Bruin Geotechnical Services Inc. 2022).

Therefore, there would be no impacts from seismic-related ground failure, including liquefaction.

iv. Landslides?

No Impact. A significant impact would occur if the proposed Project would be implemented on a site that would be located in a hillside area with unstable geological conditions or soil types that would be susceptible to failure when saturated.

Site topography is relatively flat, hazards from landslides are considered negligible (Engineering Services & Design 2022, Earth Systems 2008, Bruin Geotechnical Services Inc. 2022).

Regional geologic maps do not indicate the presence of landslides on the property (Morton and Weber, 1991). Properties adjacent to the Project site are not at substantially different elevations and are not slopes that would be subject to landslides or that would result in landslide impacts. Thus, through compliance with the recommendations set forth within the GSI's report, the potential for the Project to be located in a hillside area with unstable geological conditions or soil types that would be susceptible to failure when saturated, would have no impact.

b) Result in substantial soil erosion or the loss of topsoil?

No Impact. Construction of the proposed Project would result in ground surface disturbance during site clearance, excavation, and grading, which could create the potential for soil erosion to occur. Construction activities would be performed in accordance with all applicable regulations. Project construction would comply with all BMPs detailed in a Project-specific Storm Water Pollution Prevention Plan (SWPPP) and reduce any risks related to soil erosion. Cut and fill slopes will be subject to surficial erosion during and after grading. On-site earth materials have a moderate to high erosion potential. Consideration should be given to providing hay bales and silt fences for the temporary control of surface water, from a geotechnical viewpoint. In addition, the Project would be required to comply with SCAQMD Rule 403, which would reduce the amount of particulate matter in the air and minimize the potential for wind erosion (SCAQMD 2005).

Measures have been incorporated into the construction that will minimize any sheet flow erosion potential (Engineering Services & Design 2022, Earth Systems 2008, Bruin Geotechnical Services Inc. 2022).

With mandatory compliance to the requirements identified in the Project's SWPPP, as well as applicable regulatory requirements, the potential for water and/or wind erosion impacts during Project construction would have no impact.

- 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?*

No Impact. A significant impact would occur if any unstable geological conditions would result in any type of geological failure, including lateral spreading, off-site landslides, liquefaction, or collapse.

The project would comply with the California Building Code and incorporate recommendations from the geo-technical and soils report into the development of the project. Liquefaction on this project site should be negligible (Earth Systems 2008, Bruin Geotechnical Services Inc. 2022)

Subsidence and ground collapse generally occur in areas with active groundwater withdrawal or petroleum production. The extraction of groundwater or petroleum from sedimentary source rocks can cause the permanent collapse of the pore space previously occupied by the removed fluid. The Project site is not identified as being located in an oil field or within an oil drilling area. The proposed Project would be required to implement standard construction practices that would ensure that the integrity of the Project site and the proposed structures is maintained. With the implementation of the CBC requirements, the potential for landslide lateral spreading, subsidence, liquefaction, or collapse would have no impact and no mitigation would be required.

- 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?*

No Impact. A significant impact would occur if the proposed Project were built on expansive soil without proper site preparation or design features to provide adequate foundations for project buildings, thus posing a hazard to life and property. Expansive soils have relatively high clay mineral and expand with the addition of water and shrink when dried, which can cause damage to overlying structures. Soils on the Project site may have the potential to shrink and swell resulting from changes in the moisture content.

Expansion index (E.I.) testing (ASTM D 4829) performed on a representative sample of the on-site soils indicates indicate that the upper site soils are considered to have a "very low" (0-20) expansion potential (Earth Systems 2008, Bruin Geotechnical Services Inc. 2022). Therefore, risks to life or property are considered to have no impact.

- 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?*

No Impact. A project would have a significant impact if adequate wastewater disposal were unavailable. The Project site is located in an area serviced by existing wastewater infrastructure. Connections to main wastewater lines will be constructed during Project construction and would not use septic tanks or alternative wastewater disposal systems. Therefore, no impact would occur, and no mitigation would be required.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

Less Than Significant with Mitigation Incorporated. A significant impact could occur if grading or excavation activities associated with the Project were to disturb unique paleontological resources or unique geologic features that presently exist within the Project site.

There were no indication of any paleontological resources and no unique geologic features present or expected. However, mitigation measures will be employed in the event resources are discovered during construction. These measures are listed in the Cultural Resources section and Appendix D.

Based on the geologic age of the sediments at the Project, their low potential to yield paleontological resources, the shallow excavation depths needed for the proposed improvements, and the distant locations of known paleontological resource localities, adverse impacts to significant paleontological resources are not likely. Therefore, potential paleontological or geologic impacts of the Project would be less than significant with mitigation measures incorporated.

Mitigation Measures:

Mitigation Measures CUL-1 through CUL-6 (Appendix D).

GREENHOUSE GAS EMISSIONS

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Greenhouse Gas Emissions. Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting:

Gases that trap heat in the atmosphere are referred to as GHGs because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does.

The accumulation of GHGs has been implicated as the driving force for global climate change. The primary GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated compounds, including sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

While the presence of the primary GHGs in the atmosphere is naturally occurring, CO₂, CH₄, and N₂O are also emitted from human activities, accelerating the rate at which these compounds occur within Earth's atmosphere. Emissions of CO₂ are largely byproducts of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which are generated in certain industrial processes. Refrigerants (R) can also be emitted and act as ozone depleting substances.

CO₂ is the reference gas for climate change because it is the predominant GHG emitted. The effect that each of the aforementioned gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). GWP indicates, on a pound-for-pound basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO₂. CH₄ and N₂O are substantially more potent GHGs than CO₂, with GWPs of 25 and 298 times that of CO₂, respectively.

In emissions inventories, GHG emissions are typically reported in terms of pounds or metric tons (MT) of CO₂ equivalents (CO₂e) per year. CO₂e is calculated as the product of the mass emitted of a given GHG and its specific GWP. While CH₄ and N₂O have much higher GWPs than CO₂, CO₂ is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO₂e.

There is international scientific consensus that human-caused increases in GHG emissions have and will continue to contribute to global warming. Potential global warming impacts in California may include, but are not limited to, loss in snowpack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity (CalEPA, 2006). Appendix A contains a technical report prepared by Yorke dated September 25, 2023, with details of the air quality and GHG emissions study.

Environmental Determination:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

Less Than Significant Impact. Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills (CARB 2017).

California's Building Energy Efficiency Standards are updated on an approximately 3-year cycle. The 2022 standards improved upon the 2019 standards for new construction of, and

additions and alterations to, residential, commercial, and industrial buildings. The 2022 standards went into effect on January 1, 2023 (CEC 2023).

Since the CBC Title 24 standards require energy conservation features in new construction [e.g., high-efficiency lighting; high-efficiency heating, ventilation, and air conditioning (HVAC) systems; thermal insulation; double glazed windows; water conserving plumbing fixtures; etc.], they indirectly regulate and reduce GHG emissions.

Using CalEEMod, direct on-site and off-site GHG emissions were estimated for construction and operation, and indirect off-site GHG emissions were estimated to account for electric power used by the proposed Project, water conveyance, and solid waste disposal. Table 3 shows the maximum GHG emissions based on CalEEMod (See Appendix A) and evaluates emissions against AVAQMD significance thresholds. Operational measures incorporate typical code-required energy and water conservation features. Off-site traffic impacts are included in these emissions estimates, along with construction emissions amortized over 30 years.

As shown in Table 3, GHG emissions are below the AVAQMD significance threshold of 90,718 MT CO₂e per year. It should be noted that although emissions are labeled as “mitigated”, these emissions reflect project design features, i.e., required BMPs. For this project, applicable AVAQMD and City Planning approved BMPs will be implemented as project design features. This is a standard Condition of Approval and pursuant to CEQA, is not considered mitigation. Therefore, the Project would result in a less than significant impact due to GHG emissions.

Table 3: GHG Emissions Summary and Significance Evaluation

GHGs	Unmitigated (MT/yr)	Mitigated (MT/yr)	Threshold (MT/yr)	Significance
CO ₂	399.0	399.0	—	—
CH ₄	0.845	0.845	—	—
N ₂ O	0.0197	0.0197	—	—
R	0.345	0.345	—	—
CO ₂ e	426.3	426.3	90,718	LTS

Sources: AVAQMD 2016, CalEEMod version 2022.1.1.18

Notes: Comprises annual operational emissions plus construction emissions amortized over 30 years

LTS – Less Than Significant

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact. With the passage of California Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, jurisdictions are required to reduce their GHG emissions to 1990 levels by 2020, as well as comply with other post-2020 reduction targets. To comply with this regulation, in 2011 the City of Palmdale authorized and directed staff to partner with PMC to conduct a citywide GHG emissions inventory and GHG Reduction Plan. With that process complete, the City of Palmdale has adopted an Energy Action Plan (EAP) to demonstrate how the City will reduce its GHG emissions in compliance with AB 32. The EAP is not an additional regulation created by the City, inasmuch as the regulation

to reduce GHGs already exists under CEQA, including “Section 15064.4 Determining the Significance of Impacts from GHG Emissions.” The EAP assists in identifying how the City will use energy efficiency and independence strategies to achieve its GHG emission reduction target of 15 percent by the year 2020 consistent with the State’s overall target to reduce GHG emissions statewide to 1990 levels by 2020. The EAP provides goals and measures focused on energy use, water use, transportation, land use, and solid waste to reduce GHG emissions wherever possible while enhancing the local economy and reducing reliance on inefficient energy imports.

As shown in Table 3, maximum GHG emissions are below the AVAQMD significance threshold for land use projects of 90,718 MT CO₂e per year. The Project would be consistent with the City’s EAP and therefore, the Project would result in a less than significant impact from GHG emissions

Mitigation Measures:

None required.

HAZARDS AND HAZARDOUS MATERIALS

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. Hazards and Hazardous Materials. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) Create significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

No Impact. A significant impact would occur if the proposed Project would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Construction of the proposed Project would involve transport, use, and disposal of hazardous materials including paints, solvents, oils, grease, and caulking. However, construction activities are short-term in nature and impacts would therefore be less than significant.

Operation of the proposed Project would require routine maintenance involving transport, use, or disposal of hazardous materials. However, no industrial uses or activities are proposed that would result in the use or discharge of unregulated hazardous materials and/or substances, or create a public hazard through transport, use, or disposal. With regard to airborne hazards, the Project will comply with all applicable rules of the AVAQMD that regulate air contaminants. With compliance to applicable standards and regulations and adherence to manufacturer's instructions related to the transport, use, or disposal of hazardous materials, the proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and impacts would have no impact, and no mitigation is required.

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?

No Impact. All processes which include the use (transporting, delivery, handling, storage, etc.) of hazardous materials (gasoline and diesel fuel primarily) would comply with all

applicable, Federal, State and local agencies and regulations, including the U.S. Environmental Protection Agency; the California Department of Transportation, The California Department of Toxic Substance Control; the California Department of Industrial Relations; the Resource Conservation and Recovery Act (RCRA); and the Los Angeles County Fire Department (LACFD), which is the Certified Unified Program Agency for Los Angeles County. Underground storage tanks (UST) would be permitted by the Los Angeles County Department of Public Works (LACDPW) Environmental Programs Division. These underground storage tanks (USTs) would store gas and diesel fuel on the project site. Routine inspections are made by Federal, State and local regulatory agencies with jurisdiction over fuel dispensing facilities. Provisions established by Section 2540.1, Gasoline Dispensing and Service Stations, of the California Occupational Safety and Health Regulations; Chapter 38, Liquefied Petroleum Gases, of the California Fire Code; RCRA and LACFD must be followed to remain in operation. Given the regulatory parameters, impacts associated with handling, storing and dispensing of hazardous material would have no impact.

- c) *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

No Impact. No schools are within 0.25 mile of the project site. Valley View Elementary School is 2.4 miles west of the project site. In addition, this project is located in an area zoned Office Flex and adjacent to Light Industrial with no nearby residences.

The transport of hazardous substances or materials to and from the Project site during construction and long-term operational maintenance activities would be required to comply with applicable federal, State, and local regulations to preclude substantial public safety hazards. Accordingly, there would be no potential for existing or proposed schools to be exposed to substantial safety hazards associated with the routine transport of hazardous substances or materials to and from the Project site. Therefore, the potential to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste to schools near the Project site has no impact.

- d) *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code 65962.5 and as a result, would it create a significant hazard to the public or the environment?*

No Impact. A significant impact would occur if the Project site were included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would create a significant hazard to the public or the environment. The California Department of Toxic Substances Control (DTSC) maintains a database (EnviroStor) that provides access to detailed information on hazardous waste permitted sites and corrective action facilities, as well as existing site cleanup information. EnviroStor also provides information on investigation, cleanup, permitting, and/or corrective actions that are planned, being conducted, or have been completed under the DTSC's oversight. A review of EnviroStor did not identify any records of hazardous waste facilities on the Project site or within 0.5 miles. Therefore, the proposed Project is not located on a site that is included on a list of hazardous materials sites and would not create a significant hazard to the public or the environment, and no impact would occur.

- 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?*

Less Than Significant Impact. The project site is approximately two miles from the western ends of the Palmdale Regional Airport and Air Force Plant 42 runways.

The project site is 2.06 miles west by northwest (bearing 285 degrees) from Runway 25 of Air Force Plant 42. The project site is subject to General Plan Policy S2.2.1, which requires all development to be consistent with Department of Defense regulations, as outlined in the Air Force Plant 42 Air Installation Compatibility Use Zone (AICUZ) Report, and to comply with applicable Federal Aviation Administration (FAA) regulations, which affect development in the Accident Potential Zones (*Amendment 04-01, adopted by the Palmdale City Council on April 14, 2004*).

Based on the Airport Noise Contour map, the project site lies within the 65 dBA area. The City considers the noise levels of 65 dBA acceptable for industrial land uses. Therefore, the total operational noise levels generated by the Palmdale Regional Airport and Air Force Plant 42 are not expected to expose people working in the project area to excessive noise levels.

In addition, the project site is approximately 15 degrees off the axis (north) of Runway 25. Normal takeoffs and landings would not cause aircraft to fly over the project site (i.e., outside the normal flight path). Therefore, no significant impacts regarding safety hazards or excessive noise for people residing or working in the Project area would occur.

- f) *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

No Impact. The proposed Project would not require the closure of any public or private streets and would not impede emergency vehicle access to the Project site or surrounding area. Additionally, emergency access to and from the Project site would be provided in accordance with requirements of the Los Angeles County Fire Department (LAFD). Ongoing coordination with the local fire and police departments during construction would ensure that potential interference with emergency response and evacuation efforts are avoided. Therefore, the potential for the proposed Project to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, is considered less than significant.

- g) *Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*

No Impact. The context of the project site is such that the risk of wildland fires would be anticipated to be low to nonexistent. The Project Site is located within an area that does not include wildlands or high-fire-hazard terrain or vegetation. Additionally, the proposed industrial building would not create a fire hazard that has the potential to exacerbate the current environmental condition relative to wildfires. Therefore, the project would not subject people or structures to a significant risk of loss, injury, or death as a result of

exposure to wildland fires. No impacts related to this issue would occur, and no mitigation is required.

Mitigation Measures:

None required.

HYDROLOGY AND WATER QUALITY

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. Hydrology and Water Quality. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) substantial erosion or siltation on- or offsite?				<input checked="" type="checkbox"/>
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site?				<input checked="" type="checkbox"/>
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?				<input checked="" type="checkbox"/>
iv) impede or redirect flood flows?				<input checked="" type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Summary:

The pre-project site is undeveloped property. The existing site is undeveloped, and the existing drainage pattern of the project area generally flows from southeast to northwest by sheet flow. The proposed development will consist of a new 57,000-square-foot mixed-use building and parking. Drainage will be controlled with site grading, integral flowline swales, drain inlets, storm drainpipes, and an underground storm water retention system. The proposed improvements will generally maintain the existing drainage pattern.

Regulatory Setting:***Federal******Clean Water Act***

Increasing public awareness and concern for controlling water pollution led to the enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the CWA (33 U.S. Code Section 1251 et seq.). The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA established basic guidelines for regulating discharges of pollutants into waters of the United States. The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the CWA.

Section 303 of the Clean Water Act (Beneficial Use and Water Quality Objectives)

The Zone 6 (Victorville) RWQCB is responsible for the protection of the beneficial uses of water within the proposed Project area in Los Angeles County. The RWQCB uses its planning, permitting, and enforcement authority to meet its responsibilities adopted in the Basin Plan to implement plans, policies, and provisions for water quality management.

In accordance with State policy for water quality control, the RWQCB employs a range of beneficial use definitions for surface waters, groundwater basins, marshes, and mudflats that serve as the basis for establishing water quality objectives and discharge conditions and prohibitions. The Basin Plan for the Central Coast Region has identified existing and potential beneficial uses supported by the key surface water drainages throughout its jurisdiction. Under CWA Section 303(d), the State of California is required to develop a

list of impaired water bodies that do not meet water quality standards and objectives. A Total Maximum Daily Load (TMDL) defines how much of a specific pollutant/stressor a given water body can tolerate and still meet relevant water quality standards. The RWQCB has developed TMDLs for select reaches of water bodies.

Section 401 of the Clean Water Act (Water Quality Certification)

Section 401 of the CWA requires that an applicant for any federal permit (e.g., a USACE Section 404 permit) obtain certification from the State, requiring discharge to waters of the United States to comply with provisions of the CWA and with State water quality standards. For example, an applicant for a permit under Section 404 of the CWA must also obtain water quality certification per Section 401 of the CWA. Section 404 of the CWA requires a permit from the USACE prior to discharging dredged or fill material into waters of the United States unless such a discharge is exempt from CWA Section 404. For the Project area, the Zone 6 (Victorville) RWQCB provides the water quality certification required under Section 401 of the CWA.

Section 402 of the Clean Water Act (NPDES)

The CWA was amended in 1972 to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with an NPDES permit. The NPDES permit program, as authorized by Section 402 of the CWA, was established to control water pollution by regulating point sources that discharge pollutants into waters of the United States (33 U.S. Code Section 1342). In California, the U.S. EPA has authorized the State Water Resources Control Board (SWRCB) permitting authority to implement the NPDES program.

The Phase II Rule that became final on December 8, 1999, expanded the existing NPDES Program to address storm water discharges from construction sites that disturb land equal to or greater than one acre and less than five acres (small construction activity). The regulations also require that storm water discharges from small municipal separate storm sewer systems (MS4s) be regulated by an NPDES General Permit for Storm Water Discharges Associated with Construction Activity, Order No. 99-08-DWQ (i.e., the Construction General Permit). Based on this document, it is the responsibility of applicants to obtain coverage under the Construction General Permit and develop a SWPPP, which describes BMPs the discharger would use to protect storm water runoff. The BMPs must be designed to prevent, to the maximum extent practicable, an increase in the sediment yield and flow velocity from pre-construction/pre-development conditions, to ensure that applicable water quality standards, including TMDL waste allocations, are met.

The SWPPP must contain a visual monitoring program, a chemical monitoring program for “non-visible” pollutants to be implemented if there is a failure of BMPs, and a sediment monitoring plan if the site discharges directly to a water body listed on the Section 303(d) list for sediment. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. On September 2, 2009, the SWRCB issued a new NPDES General Permit for Storm Water Associated with Construction Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002), which became effective July 1, 2010.

National Flood Insurance Program

The National Flood Insurance Act of 1968 established the National Flood Insurance Program in order to provide flood insurance within communities that were willing to adopt floodplain management programs to mitigate future flood losses. The Act also required the identification of all floodplain areas within the United States and the establishment of flood risk zones within those areas. The Federal Emergency Management Agency (FEMA) is the primary agency responsible for administering programs and coordinating with communities to establish effective floodplain management standards. FEMA is responsible for preparing Flood Insurance Rate Maps that delineate the areas of known special flood hazards and their risk to the community. The program encourages the adoption and enforcement by local communities of floodplain management ordinances that reduce flood risks. In support of the program, FEMA identifies flood hazard areas throughout the United States on FEMA flood hazard boundary maps.

Federal Antidegradation Policy

The Federal Antidegradation Policy (40 CFR Part 131.12) requires states to develop statewide antidegradation policies and identify methods for implementing them. Pursuant to this regulation, state antidegradation policies and implementation methods shall, at a minimum, protect and maintain: (1) existing in-stream water uses; (2) existing water quality where the quality of the waters exceeds levels necessary to support existing beneficial uses, unless the state finds that allowing lower water quality is necessary to accommodate economic and social development in the area; and (3) water quality in waters considered an outstanding national resource.

State

Senate Bill 610 and Senate Bill 221: Water Supply Assessments and Water Supply Verifications

SB 610 and SB 221, effective January 1, 2002, improve the linkage between certain land use decisions made by cities and counties and water supply availability. Under Water Code Section 10912(a), projects subject to CEQA requiring a water supply assessment include a residential development of more than 500 dwelling units; a shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; a commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space; a hotel, motel, or both having more than 500 rooms; an industrial, manufacturing, or processing plant or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land or having more than 650,000 square feet of floor area; a mixed-use project that includes one or more of the projects specified; or a project that would demand an amount of water equivalent to or greater than the amount required by a 500 dwelling unit project. A fundamental source document for compliance with SB 610 is the Urban Water Management Plan (UWMP), which can be used by the water supplier to meet the standard for SB 610.

Sustainable Groundwater Management Act

On September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package – AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley) – collectively known as the Sustainable Groundwater Management Act (SGMA), which requires governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under the SGMA, these basins should reach sustainability within 20 years of implementing their sustainability plans. For critically over-drafted basins, sustainability should be achieved by 2040. For the remaining high- and medium-priority basins, 2042 is the deadline. Through the SGMA, the California Department of Water Resources (DWR) provides ongoing support to local agencies through guidance, financial assistance, and technical assistance. The SGMA empowers local agencies to form Groundwater Sustainability Agencies to manage basins sustainably and requires Groundwater Sustainability Plans to be completed for crucial (i.e., medium- to high-priority) groundwater basins in California. Adjudicated basins are exempt from developing a Groundwater Sustainability Agency or Groundwater Sustainability Plan.

California Porter-Cologne Water Quality Control Act

Since 1973, the California SWRCB and its nine RWQCBs have been delegated the responsibility for administering permitted discharge into the waters of California. The Project site falls within the jurisdiction of the Zone 6 (Victorville) RWQCB. The Porter-Cologne Water Quality Act (California Water Code Section 13000 et seq.; 23 CCR Division 3, Chapter 15) provides a comprehensive water quality management system for the protection of California waters. Under the Act, “any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state” must file a report of the discharge with the appropriate RWQCB. Pursuant to the Act, the RWQCB may then prescribe “waste discharge requirements” that add conditions related to control of the discharge. Porter-Cologne defines “waste” broadly, and the term has been applied to a diverse array of materials, including non-point source pollution. When regulating discharges that are included in the federal Clean Water Act, the State essentially treats Waste Discharge Requirements and NPDES permits as a single permitting vehicle. In April 1991, the SWRCB and other State environmental agencies were incorporated into the California Environmental Protection Agency.

The RWQCB regulates urban runoff discharges under the NPDES permit regulations. NPDES permitting requirements cover runoff discharged from point (e.g., industrial outfall discharges) and non-point (e.g., storm water runoff) sources. The RWQCB implements the NPDES program by issuing construction and industrial discharge permits.

Under the NPDES permit regulations, BMPs are required as part of a SWPPP and thus not considered mitigation. The U.S. EPA defines BMPs as “schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the United States.” BMPs include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage” (40 CFR Part 122.2).

CALGreen

Formerly known as the California Green Building Standards Code, 24 CCR Part 11, CALGreen is designed to improve public health, safety, and general welfare by using design and construction methods that reduce the negative environmental impact of development and to encourage sustainable construction practices. CALGreen provides mandatory direction to developers of all new construction and renovations of residential and non-residential structures with regard to all aspects of design and construction, including, but not limited to, site drainage design, storm water management, and water use efficiency. Required measures are accompanied by a set of voluntary standards designed to encourage developers and local agencies to aim for a higher standard of development.

California Antidegradation Policy

The California Antidegradation Policy, otherwise known as the Statement of Policy with Respect to Maintaining High-Quality Water in California, was adopted by the SWRCB (State Board Resolution No. 68-16) in 1968. Unlike the Federal Antidegradation Policy, the California Antidegradation Policy applies to all waters of the State (e.g., isolated wetlands and groundwater), not just surface waters. The policy states that whenever the existing quality of a water body is better than the quality established in individual Basin Plans, such high quality shall be maintained, and discharges to that water body shall not unreasonably affect present or anticipated beneficial use of such water resource.

California Toxics Rule

The U.S. EPA has established water quality criteria for certain toxic substances via the California Toxics Rule. The California Toxics Rule established acute (i.e., short-term) and chronic (i.e., long-term) standards for bodies of water such as inland surface waters and enclosed bays and estuaries that are designated by each RWQCB as having beneficial uses protective of aquatic life or human health.

California Water Code

The California Water Code includes 22 kinds of districts or local agencies with specific statutory provisions to manage surface water. Many of these agencies have statutory authority to exercise some forms of groundwater management. For example, a Water Replenishment District (Water Code Section 60000 et seq.) is authorized to establish groundwater replenishment programs and collect fees for that service, while a Water Conservation District (Water Code Section 75500 et seq.) can levy groundwater extraction fees. Through special acts of the Legislature, 13 local agencies have been granted greater authority to manage groundwater. Most of these agencies, formed since 1980, have the authority to limit export and control some in-basin extraction upon evidence of overdraft or the threat of an overdraft condition. These agencies can also generally levy fees for groundwater management activities and for water supply replenishment.

Assembly Bill 3030 – Groundwater Management Act

In 1992, AB 3030 was passed, which increased the number of local agencies authorized to develop a groundwater management plan and set forth a common framework for management by local agencies throughout California. These agencies could possess the

same authority as a water replenishment district to “fix and collect fees and assessments for groundwater management” (Water Code Section 10754), provided they receive a majority of votes in favor of the proposal in a local election (Water Code Section 10754.3).

Local

Regional MS4 Permit

Regional MS4 Permit regulations are included in Title 13 of the City’s Municipal Code. The MS4 Permit:

- Provides the framework for the program management activities and plan development;
- Provides the legal authority for prohibiting unpermitted discharges into the storm drain system and for requiring BMPs in new development and significant redevelopment;
- Ensures that all new development and significant redevelopment incorporates appropriate Site Design, Source Control, and Treatment Control BMPs to address specific water quality issues; and
- Ensures that construction sites implement control practices that address construction-related pollutants, including erosion and sediment control and on-site hazardous materials and waste management.

The Regional MS4 Permit requires that new development and significant redevelopment projects (or priority projects), such as the proposed Project, develop and implement a WQMP that includes BMPs and Low Impact Development (LID) design features that would provide on-site treatment of storm water to prevent pollutants from on-site uses from leaving the site. These BMPs and design features are required and thus not considered mitigation.

Environmental Determination:

- a) ***Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?***

Less Than Significant Impact. Development of the proposed Project would mean more impervious surfaces will cover the Project site than before. The project will apply NPDES Best Management Practices (BMPs) to ensure water quality standards and waste discharge requirements are met. The required SWPPP further ensures no violations would occur. An underground detention system, catch basin, pumps, and filters to clean and remove water during a storm event will be constructed for the project (Duke Engineering 2022a).

Drainage will be controlled with site grading, integral flowline swales, drain inlets, storm drainpipes, and an underground storm water retention system. The proposed improvements will generally maintain the existing drainage pattern.

Construction

Implementation of the proposed Project includes grading, site preparation, construction of new buildings, and infrastructure improvements. Grading, stockpiling of materials,

excavation, construction of new structures, and landscaping activities would expose and loosen sediment and building materials, which would have the potential to mix with storm water and urban runoff and degrade surface and receiving water quality.

Additionally, construction generally requires the use of heavy equipment and construction-related materials and chemicals, such as concrete, cement, asphalt, fuels, oils, antifreeze, transmission fluid, grease, solvents, and paints. In the absence of proper controls, these potentially harmful materials could be accidentally spilled or improperly disposed of during construction activities and could wash into and pollute surface waters or groundwater, resulting in a significant impact to water quality.

Pollutants of concern during construction activities generally include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. In addition, chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked during construction, which would have the potential to be transported via storm runoff into nearby receiving waters and eventually may affect surface or groundwater quality. During construction activities, excavated soil would be exposed, thereby increasing the potential for soil erosion and sedimentation to occur compared to existing conditions. In addition, during construction, vehicles and equipment are prone to tracking soil and/or spoil from work areas to paved roadways, which is another form of erosion that could affect water quality.

However, the use of BMPs during construction implemented as part of a SWPPP as required by the NPDES Construction General Permit would serve to ensure that Project impacts related to construction activities resulting in a degradation of water quality would be less than significant. Under the NPDES permit regulations, BMPs are required as part of a SWPPP and thus not considered mitigation.

A SWPPP for the proposed Project will be prepared once the entitlement package has been approved while the final engineering plans are being prepared. Furthermore, an Erosion and Sediment Transport Control Plan prepared by a qualified SWPPP developer is required to be included in the SWPPP for the Project and typically includes the following types of erosion control methods that are designed to minimize potential pollutants entering storm water during construction:

- Prompt revegetation of proposed landscaped areas;
- Perimeter gravel bags or silt fences to prevent off-site transport of sediment;
- Storm drain inlet protection (filter fabric gravel bags and straw wattles), with gravel bag check dams within paved roadways;
- Regular sprinkling of exposed soils to control dust during construction and soil binders for forecasted windstorms;
- Specifications for construction waste handling and disposal;
- Contained equipment wash-out and vehicle maintenance areas;

- Erosion control measures including soil binders, hydro-mulch, geotextiles, and hydroseeding of disturbed areas ahead of forecasted storms;
- Construction of stabilized construction entry/exits to prevent trucks from tracking sediment on City roadways;
- Construction timing to minimize soil exposure to storm events; and
- Training of subcontractors on general site housekeeping.

Therefore, compliance with the Construction General Permit requirements, which would be verified during the County's construction permitting process, would ensure that Project impacts related to construction activities resulting in a degradation of water quality would be less than significant.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

No Impact. The Project would not result in changes to the projected groundwater pumping that would decrease groundwater supplies, and the Project would not otherwise impede the sustainable groundwater management of the basin.

The Project site is largely undeveloped impervious surface. After completion of project construction, a substantial portion of the site would be impervious. The project would convey storm water drainage into landscaping areas and the water quality basin, which would infiltrate into soils, groundwater, and lakes. Therefore, impacts to groundwater recharge are less than significant.

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 a substantial erosion or situation on- or off-site;*
- ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; and*
- 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; or*
- iv. Impede or redirect flood flows?*

No Impact. A significant impact would occur if the proposed Project would substantially alter the drainage pattern of the site or area, including through the alteration of the course of a stream or river, such that erosion or siltation would result. The Project site does not contain, nor is adjacent to, any stream or river. Therefore, implementation of the proposed Project would not alter the course of a stream or river.

Construction of the proposed Project would require excavation and grading activities that would expose and loosen building materials and sediment, which has the potential to mix with storm water runoff and result in erosion or siltation off-site. However, the project site

does not include any slopes, which reduces the erosion potential, and the large majority of soil disturbance would be related to excavation and backfill for installation of building foundations and underground utilities. Additionally, compliance with construction related BMPs and/or the SWPPP would control and minimize erosion and siltation.

During project operation, storm water or any runoff irrigation waters would be directed into storm drains and into the proposed retention basin. Significant alterations to existing drainage patterns within the Project site and surrounding area would not occur. Therefore, the proposed Project would result in less than significant impact related to the alteration of drainage patterns and on- or off-site erosion or siltation and no mitigation is required.

d) In flood hazard, tsunami or seiche zones, risk release of pollutants due to project inundation?

No Impact. According to the FEMA Flood Map Service Center, the project site is not within a flood zone. Thus, the project site is not located within a flood hazard area that could be inundated with flood flows and result in release of pollutants. Impacts related to flood hazards and pollutants would not occur from the project.

A 50-year storm post-project runoff volume has been calculated for the Project using the Los Angeles County Hydro Calculator (version 1.0.3). These calculations resulted in a required storm water retention volume of 37,622 cubic feet using 102-inch diameter corrugated metal pipe (CMP).

On the basis of the above, where the before and after project conditions have been evaluated for the 10-year, 25-year, 50-year and 100-year peak flows, we find that the proposed development drainage facilities will adequately convey drainage flows from the required design storm frequencies. The preliminary storm water retention system has been designed to store post-project 50-year storm runoff volume. The building pads have been elevated and sloped to accommodate the anticipated flows.

Tsunamis are generated ocean wave trains generally caused by the tectonic displacement of the seafloor associated with shallow earthquakes, seafloor landslides, rock falls, and exploding volcanic islands. The proposed Project is in the high desert, far from the ocean shoreline, and shielded by mountains. Based on the 50-mile distance of the Project site to the Pacific Ocean and its 2,500-foot elevation, the project site is not at risk of inundation from a tsunami. Therefore, the proposed Project would not risk the release of pollutants from inundation from a tsunami. No impact would occur, and no mitigation is required.

Seiching is a phenomenon that occurs when seismic ground shaking induces standing waves (seiches) inside water retention facilities (e.g., reservoirs and lakes). Such waves can cause retention structures to fail and flood downstream properties. Lake Palmdale is seven miles south from the project site. Thus, the project site is not located near any lake that could generate a seiche, and the possibility of seiches impacting the site is less than significant. Therefore, the proposed project would result in a less than significant risk related to the release of pollutants from inundation from a seiche.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact. The proposed project is being developed within an already evaluated area zoned Office Flex and Light Industrial. This development is small, normal construction, and normal operations fitting within the bounds expected within the General Plan for build out (City of Palmdale 2022). Implementation of BMPs during construction as part of a SWPPP would ensure that Project impacts related to construction activities resulting in a degradation of water quality would be less than significant. Thus, construction of the Project would not conflict with or obstruct implementation of a water quality control plan.

All new development projects are required to implement a WQMP that would comply with the MS4 permit requirements. The WQMP and applicable BMPs are verified as part of the County's permitting approval process, and construction plans would be required to demonstrate compliance with these regulations. Therefore, operation of the proposed Project would not conflict with or obstruct implementation of a water quality control plan. Thus, impacts related to water quality control plan or sustainable groundwater management plan would be less than significant.

Mitigation Measures:

None required.

LAND USE AND PLANNING

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. Land Use and Planning. Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Determination:

a) *Physically divide an established community?*

No Impact. This project site and adjacent areas are zoned OF and LI, respectively. Lands to the north and west of the project site are zoned OF, and lands to the east and south are zoned Light Industrial. The Specific Plan Antelope Valley Business Park is northeast of the project site, and further north of the project site is an area zoned Visitor Commercial. Further on the east and south is Aerospace Industrial zoning. No residences are within 3,000 feet of the project site. No community would be divided.

In addition, the Project would not change roadways or pedestrian bridges or install any infrastructure that would result in physical barriers to accessibility. Thus, the proposed

Project would not result in impacts related to the physical division of 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?**

No Impact. The Project represents a logical continuation of existing vicinity land use designations applicable zoning regulations. The Project would be consistent with existing surrounding zoning; would be compatible with existing and planned surrounding land uses and would be consistent with the land use designations and policies of the General Plan. Potential impacts in these regards would be less than significant.

The Project would have no conflict with any applicable plan or regulation. The project site is zoned appropriately for the planned project. Currently there are no habitat conservation or natural community conservation plans that cover this area.

The project will be conditioned to comply with PMC Chapter 14.

Therefore, because the Project would not 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 and have no impact.

Mitigation Measures:

None required.

MINERAL RESOURCES

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. Mineral Resources. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Determination:

- a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?**

No Impact. No loss of known mineral resources would occur due to the development of this site. Mineral resources of concern are located east of 62nd Street East (City of Palmdale

2022). Because the site is not located within an area known for mineral resources that are of value to the region and the residents of the State, no impact would occur.

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?

No Impact. The Project site is not located within an area designated by the State Mining and Geology Board as being of regional or Statewide significance. As described in part a), the Project site and surrounding areas do not contain known mineral resources. Therefore, no impacts related to the loss of availability of a locally important mineral resource recovery site, as delineated on a local general plan, specific plan, or other land use plan, would occur as a result of the Project.

Mitigation Measures:

None required.

NOISE

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Noise. Would the Project result in:				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive ground borne vibration or ground borne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Regulatory Setting:

California

The State of California does not promulgate statewide standards for environmental noise but requires each city and county to include a noise element in its general plan [California Government Code Section 65302(f)]. In addition, Title 4 of the CCR has guidelines for

evaluating the compatibility of various land uses as a function of community noise exposure. In general, the guidelines require that community noise standards:

- Protect residents from the harmful and annoying effects of exposure to excessive noise;
- Prevent incompatible land uses from encroaching upon existing or programmed land uses likely to create significant noise impacts; and
- Encourage the application of state-of-the-art land use planning methodologies in the area of managing and minimizing potential noise conflicts.

Construction vibration is regulated at the state level in accordance with standards established by the Transportation and Construction-Induced Vibration Guidance Manual issued by Caltrans in 2004. Continuous sources include the use of vibratory compaction equipment and other construction equipment that creates vibration other than in single events. Transient sources create a single isolated vibration event, such as blasting. Thresholds for continuous sources are 0.5 and 0.1 inch per second PPV for structural damage and annoyance, respectively. Thresholds for transient sources are 1.0 and 0.9 PPV for structural damage and annoyance, respectively (Caltrans 2020).

City of Palmdale General Plan – Noise Element

The Noise Element of the City of Palmdale General Plan contains criteria to determine the compatibility of proposed developments. The State Recommended Noise Level Guidelines referenced in the City of Palmdale General Plan Noise Element lists land use categories and the acceptable and unacceptable levels of community noise exposure. The compatibility criteria provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels (City 1993). For industrial land uses, an L_{dn} or CNEL limit (threshold) of 70 A-weighted decibel (dBA) is considered “Normally Acceptable” and 70-80 dBA is considered “Conditionally Acceptable.”

City of Palmdale Municipal Code – Chapters 8.28 and 9.18

For this Project, the City of Palmdale Municipal Code, Sections 8.28.030, 8.28.040, 8.28.060, and 9.18.010 contain the applicable evaluation criteria (City 1986).

PMC Section 8.28.030 states that no person shall perform any construction or repair work on any Sunday, or any other day after 8:00 p.m. or before 6:30 a.m., in any residential zone or within 500 feet of any residence, hotel, motel or recreational vehicle park.

PMC Section 8.28.40 allows for 8.28.030 to not apply to any person who performs the construction, repair, excavation, or earth moving work involved pursuant to the express written permission of the City Engineer to perform such work at times prohibited in PMC Section 8.28.030.

PMC Section 8.28.060 states that provisions of PMC Section 8.28.030 do not apply to the construction, repair, or excavation during prohibited hours as may be necessary for the preservation of life or property when such necessity arises during such hours as the offices of the City are closed, or where such necessity requires immediate action prior to the time at which it would be possible to obtain a permit pursuant to PMC Section 8.28.040, if the

person doing such construction, repair or excavation obtains a permit therefor within 1 day after the office of the City Engineer is first opened subsequent to the making of such construction, repair or excavation.

PMC Section 9.18.010 states that it is prohibited for any person to willfully make or continue, or cause or permit to be made or continued, any loud, unnecessary, or unusual noise which unreasonably disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

Environmental Setting:

Appendix A contains a technical report prepared by Yorke dated September 25, 2023, with additional information regarding noise and the details of the noise study.

Noise is typically described as any dissonant, unwanted, or objectionable sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity, the dBA. In most situations, a 3-dBA change in sound pressure is considered a “just detectable” difference. A 5-dBA change (either louder or quieter) is readily noticeable, and a 10-dBA change is a doubling (if louder) or halving (if quieter) of the subjective loudness. Sound from a small, localized source (a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (drops off) at a rate of 6 dBA for each doubling of the distance.

The duration of noise and the time period at which it occurs are important factors in determining the impact of noise on sensitive receptors. A single number called the equivalent continuous noise level (L_{eq}) may be used to describe sound that is changing in level. It is also used to describe the acoustic range of the noise source being measured, which is accomplished through the maximum L_{eq} (L_{max}) and minimum L_{eq} (L_{min}) indicators.

In determining the daily measure of community noise, it is important to account for the difference in human response to daytime and nighttime noise. Noise is more disturbing at night than during the day, and noise indices have been developed to account for the varying duration of noise events over time, as well as community response to them. The Community Noise Equivalent Level (CNEL) adds a 5-dB penalty to the “nighttime” hourly noise levels (HNLs) (i.e., 7:00 p.m. to 10:00 p.m.) and the Day-Night Average Level (L_{dn}) adds a 10-dB penalty to the evening HNLs (Caltrans 2020, FTA 2006).

Construction Noise

The proposed Project includes the development of a 15-unit light industrial building comprising of a combination warehouse and office spaces with a parking lot. Most noise would occur during the site preparation, grading, and building construction when heavy equipment would be operating. During construction, equipment will be staged and stored on a centrally located portion of the project site when practical. The nearest sensitive receptors are located approximately 960 meters from the project site. This long attenuation distance would effectively mitigate construction (and operational) noise emanating from the project site to the west. Additionally, there are buildings or

a freeway between the project site and the nearest sensitive receptors, which would attenuate the noise by about 20 dBA. As mentioned above, there is no numerical standard in the PMC for construction activities; however, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment provides an eight-hour construction noise level threshold of 80 dBA Leq during the daytime at residential (noise-sensitive) uses and 85 dBA during the daytime at commercial uses. Therefore, noise impacts for the proposed project are evaluated against the FTA noise standards. As shown in Table 4, the proposed construction activities are not expected to raise the ambient noise levels for the nearest sensitive receptors, and the aggregated average construction noise would be well below the 80 dBA FTA noise level threshold at nearest sensitive receptors.

Operation Noise

Upon completion of construction, on-site operational noise would be generated mainly by trucks, trash compactors, and HVAC equipment. Large HVAC systems could result in noise levels that average between 50 and 65 dBA Leq at 50 feet from the equipment. Trucks and trash compactors would generate noise levels of approximately 71 dBA (Leq) and 66 dBA (Leq) at 50 feet (15 meters) reference distance, respectively. The nearest permanent residential receptor is located approximately 960 meters northwest from these types of sources. With the HVAC equipment, three trucks loading, and one trash compactor operating at any given time, the existing ambient noise levels for the nearest sensitive receptors are not expected to increase. As shown in Table 4 for industrial land uses, an Ldn or CNEL limit (threshold) of 70 dBA is considered “Normally Acceptable.” The proposed project will be in compliance with the 70 dBA industrial noise standard set by the City of Palmdale. Thus, no adverse impacts are expected from, and no special noise control measures would be required for, the operation of the proposed Project. Therefore, the operational noise impacts of the proposed Project would be less than significant.

Environmental Determination:

- 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?*

Less Than Significant Impact. Table 4 shows a comparison of Federal Highway Administration (FHWA) screening-level estimated exterior noise impacts for both construction and operational activities at nearby receptors with respect to the applicable thresholds.

Table 4: Estimated Peak Activity Daytime Noise Impacts - Sensitive Receptors

Construction Phases	Normal Acceptance Criteria			
	Modeled Noise Level (Leq dBA) ^{a, b}	CalEEMod Duration (days)	Significance Threshold (CNEL dBA) ^c	Exceeds Threshold (Yes/No)?
Background	65	-	-	No
Site Preparation	65	5	80	No
Grading	65	8	80	No
Building Construction	65	230	80	No

Construction Phases	Normal Acceptance Criteria			
	Modeled Noise Level (Leq dBA) ^{a, b}	CalEEMod Duration (days)	Significance Threshold (CNEL dBA) ^c	Exceeds Threshold (Yes/No)?
Paving	65	18	80	No
Architectural Coating	65	18	80	No
Long-Term Impact	65	-	70	No

Sources: CalEEMod version 2022.1.1.18, FHWA 2006, Broch 1971, Plog 1988

Notes:

a. Exterior CNEL for residential land uses stated in the City of Palmdale General Plan Noise Element is assumed to be the existing ambient noise level

b. Combined noise levels at the nearest sensitive receptors are calculated using the distance from the receptor to the center of the construction zone.

c. FTA threshold for construction, City General Plan Noise Element threshold for operational phase (long-term)

Temporary construction noise would be limited to the City's allowable daytime construction hours. No construction activities will be performed outside these hours. Construction activities would permanently cease upon completion of construction. The proposed construction activities are not expected to raise the ambient noise levels for the nearest sensitive receptors, and aggregated average construction noise is not expected to exceed 80 dBA FTA noise level thresholds at nearby receptors. Therefore, temporary impacts on ambient noise levels during construction would be less than significant.

Operational noise sources for the Project, such as new HVAC equipment, are of quiet design per commercial standards. The noise from trucks and trash collection and compaction activities are not expected to substantially raise the ambient noise level at the receptor due to the long attenuation distance of about 960 meters northwest of the project site. Total operational noise levels will be well below the 70 dBA limit, which is considered "Normally Acceptable," for this land use. The interior noise levels will be maintained at current noise levels at nearby receptors. Therefore, the operational noise impacts of the proposed Project would be less than significant.

b) Generation of excessive ground borne vibration or ground borne noise levels?

Less Than Significant Impact. Construction plans do not include intense percussive actions (e.g., hard rock-breaking, large pile-driving). Therefore, no strong ground borne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants.

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?

Less Than Significant Impact. The project site is approximately two miles from the western ends of the Palmdale Regional Airport and Air Force Plant 42 runways. Based on the Airport Noise Contour map, the project site lies within the 65 dBA area. The City

considers the noise levels of 65 dBA acceptable for industrial land uses. Therefore, the total operational noise levels generated by the Palmdale Regional Airport and Air Force Plant 42 are not expected to expose people working in the project area to excessive noise levels. Therefore, the noise impacts on the proposed Project would be less than significant.

Mitigation Measures:

None required.

POPULATION AND HOUSING

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. Population and Housing. Would the Project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Determination:

- 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)?*

No Impact. No new homes are being proposed. This project is a relatively small business which would not generate substantial population growth.

In addition, the proposed Project would be served by the existing public roadways. The proposed Project would connect into the existing utility and infrastructure system. The proposed Project does not include, and would not result in, an extension of roads or other infrastructure outside of the Project area that could induce substantial population growth in the area. Therefore, the proposed Project would have no impact on unplanned population growth.

- b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*

No Impact. Presently, the Project site is a vacant lot, with no existing residential uses on-site. Therefore, the proposed Project would not result in the displacement of existing people or housing. Thus, no potential impacts associated with the displacement of a

substantial number of existing housing or people, necessitating the construction of replacement housing elsewhere would occur and no mitigation is required.

Mitigation Measures:

None required.

PUBLIC SERVICES

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. Public Services. Would the Project:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government 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:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Determination:

- a) *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?

No Impact. The project is compatible with the City's land designation and impacts on public services were evaluated for the General Plan (Rincon 2022, City of Palmdale 2022).

Construction would be required to meet all current fire codes. This facility is not expected to increase population levels that would impact or cause a need for new facilities.

The proposed Project would not result in an increase in residents and therefore would not increase the demand for fire and police protection, schools, parks, and public facilities within the City of Palmdale. Therefore, there would be no impact associated with the City's public services and no mitigation is required.

Mitigation Measures:

None required.

RECREATION

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. Recreation.				
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Determination:

- 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?*

No Impact. The proposed project is a relatively small business that would not have a significant impact on parks or other recreational facilities. As a result, the rate of physical deterioration to parks and other recreational facilities would not increase. Therefore, there would be no impact.

- 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?*

No Impact. The proposed Project would not require the expansion of existing recreational facilities. No recreational facilities nor the need for recreational facilities will occur due to development of this project site. Therefore, there would be no impact, and no mitigation is required.

Mitigation Measures:

None required.

TRANSPORTATION

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Transportation. Would the Project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Setting:

Minagar & Associates, Inc. (MA 2023) performed a Traffic Impact Analysis for the development of the proposed warehouse/office space. Appendix C contains the technical report prepared by MA dated August 22, 2023, with additional information regarding transportation and the details of the study.

It was determined that the Project passes the Project Size and Type Screening Criteria, which means that the Project is screened from further Vehicle Miles Traveled (VMT) analysis and a less than significant VMT impact can be presumed.

The Project would not have significant transportation impact on any study intersections in the Project vicinity and will not cause significant intersection delay or degradation of Level of Service (LOS).

It was determined that the intersection of West Avenue M-8 and 10th Street West does not meet the minimum traffic signal warrant requirements and therefore, installation of a traffic signal at the subject intersection is not warranted.

Therefore, after analyzing the VMT methodology, criteria, guidelines, and thresholds of the County, it was determined that the Project's employment VMT per employee of 11.0 (Antelope Region) passes the required VMT reduction threshold of 16.8 percent of the North County's baseline VMT (19.0). Thus, the Project site qualifies as a Low VMT Area and will not have a significant cumulative VMT impact.

Environmental Determination:

- a) *Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?*

Less Than Significant Impact. All study intersections will maintain an LOS of D or better under all three analysis scenarios, and thus do not require any mitigation. The proposed project will not have any adverse impact on traffic within the project vicinity. The proposed project would not conflict with any programs, plans, ordinances, or policies with respect to transportation systems, including bicycle and pedestrian facilities. Therefore, the Project would have a less than significant effect on traffic.

- b) *Would the project conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?*

Less Than Significant Impact. The project happens to be located in a Low VMT Area. It is concluded that the Project's employment VMT per employee of 11.0 (42 percent) in the Antelope Region will be more than 16.8 percent below the existing employment VMT per employee of 19.0 for the Baseline Area of North County.

Thus, the Project reaches the required minimum VMT reduction threshold of 16.8 percent and will not have a significant cumulative VMT impact. Therefore, the VMT analysis is complete and no further action is required and the Project would have a less than significant impact on traffic.

- c) *Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

Less Than Significant Impact. The proposed Project will not include any incompatible land uses such as farm equipment. Furthermore, the proposed Project does not have any geometric design features that may pose a hazard. Stop signs would be placed at project driveways and appropriate striping on-site would occur. Proposed drive aisles and driveways would be required to meet the minimum dimensions outlined by the City's engineering and building divisions. The on-site circulation would not incorporate any hazards. Circulation on-site would adequately serve vehicles without resulting in dangerous maneuvering due to geometric design features. Therefore, potential impacts associated with an increase hazard due to geometric design features or incompatible uses would be less than significant and no mitigation would be required.

- d) *Result in inadequate emergency access?*

Less Than Significant Impact. The Project would not affect emergency response routes. During Project construction, the site would be required to ensure emergency access in accordance with Section 503 of the California Fire Code (24 CCR Part 9), which would be ensured through the City's permitting process. Implementation of the proposed Project through the City's permitting process would ensure adherence to existing regulations and would reduce potential construction-related emergency access impacts to a less than significant level. The Project site plan was designed in compliance with all applicable City codes and approved by the City. Therefore, cumulative impacts related to emergency

access are less than significant. Therefore, the Project would result in a less than significant impact.

Mitigation Measures:

None required.

TRIBAL CULTURAL RESOURCES

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Tribal Cultural Resources. Would the Project:				
a) 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:				
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 section 5020.1(k), or	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Environmental Setting:

ArchaeoPaleo Resource Management, Inc. (APRM) performed a Phase 1 Archaeological and Paleontological Assessment of the 10th Street Warehouse project (Project). Appendix D contains the technical report prepared by APRM dated December 2023, with additional information regarding Tribal Cultural Resources and the details of the study.

APRM requested a Sacred Lands File Search and a Native American Contacts list for the proposed Project from the NAHC. The NAHC concluded the Project area to be negative for the presence of tribal resources. However, the absence of specific site information in the Sacred Lands File does not indicate the absence of cultural resources in the project area. Tribal entities from the Native

American Contact List were contacted by mail and through verbal correspondence. APRM received two responses requesting action on the project. The first, from Chairwoman Donna Yocum of the Fernandeano Tataviam Band of Mission Indians stated that the Project area, and Palmdale in general, is an extremely culturally sensitive area within their ancestral homeland, and that she requested AB 52 consultation with the City of Palmdale and the presence of a tribal monitor from NDNA Monitoring and Consulting, LLC during any ground-disturbing activities. The second, from Alexandra McCleary of the Yuhaaviatam of San Manuel Nation, stated that the Project lies within Serrano ancestral territory and requested AB 52 consultation.

As part of the AB 52 consultation, the Cultural Resources Management Division of the Fernandeano Tataviam Band of Mission Indians provided the three TCR mitigation measures presented below (FTBMI CRD 2024).

Environmental Determination:

- a) *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:*
 - 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 section 5020.1(k)*
 - 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.*

Less Than Significant with Mitigation Incorporated. As noted previously, the cultural research records search conducted by the SCCIC did not identify the presence of any previously recorded cultural (prehistoric/tribal/ historic) resources that were located within the direct Project area. The results of the record search included one prehistoric site, four historic sites, and three historic buildings within a 1-mile radius of the Project area, although none of the buildings are on the California or National Register and none have been locally designated.

The NAHC concluded the Project area to be negative for the presence of tribal resources. However, the absence of specific site information in the Sacred Lands File does not indicate the absence of cultural resources in the project area. Tribal entities from the Native American Contact List were contacted by mail and through verbal correspondence.

Mitigation measures are proposed to address potential historic and archaeological resources (and possibly human remains) discovered during construction. A copy of the Tribes' correspondence with the City is included in Appendix D.

Implementation of Mitigation Measures CUL-1 through CUL-13 under Cultural Resources and Mitigation Measures TCR-1 through TCR-3 below would reduce potentially significant impacts on TCRs to less than significant.

Mitigation Measures:

Mitigation Measure TCR-1: Full Time Monitoring, Initial Pass, (1) Monitor. The project applicant shall retain a professional Tribal Monitor procured by the Fernandeño Tataviam Band of Mission Indians (FTBMI) to observe all ground-disturbing activities including, but not limited to, clearing, grubbing, grading, excavating, digging, trenching, plowing, drilling, tunneling, quarrying, leveling, driving posts, auguring, blasting, stripping topsoil or similar activity during the initial pass (the first disturbance of all soil to the total depth of which it will be disturbed). If Cultural Resources are not encountered after observing the initial pass of all ground-disturbance, additional Tribal Monitoring is not required. If Cultural Resources are encountered during the initial pass, the Tribal Monitor(s) shall observe all remaining ground-disturbing activities, no matter the depth or frequency to which the soil was previously observed, until all ground-disturbing activities are complete. Tribal Monitoring Services will continue until confirmation is received from the project applicant, in writing, that all scheduled activities pertaining to Tribal Monitoring are complete, be it initial pass or all disturbance, dependent upon inadvertent discovery. If the Project's scheduled activities require the Tribal Monitor(s) to leave the Project for a period of time and return, confirmation shall be submitted to the Tribe by Client, in writing, upon completion of each set of scheduled activities and 5 days' notice (if possible) shall be submitted to the Tribe by project applicant, in writing, prior to the start of each set of scheduled activities. If cultural resources are encountered, the Tribal Monitor will have the authority to request that ground-disturbing activities cease within 60 feet of discovery and a qualified archaeologist meeting Secretary of Interior standards retained by the project applicant as well as the Tribal Monitor shall assess the find.

Mitigation Measure TCR-2: Disposition and Treatment of Inadvertent Discoveries. The Lead Agency and/or applicant shall, in good faith, consult with the FTBMI on the disposition and treatment of any Tribal Cultural Resource encountered during all ground disturbing activities.

Mitigation Measure TCR-3: In the Event of Inadvertent Discovery, Human Remains. 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 shall be enforced for the duration of the Project.

- a. Inadvertent discoveries of human remains and/or funerary object(s) are subject to California State Health and Safety Code §7050.5, and the subsequent disposition of those discoveries shall be decided by the Most Likely Descendant (MLD), as determined by the Native American Heritage Commission (NAHC), should those findings be determined as Native American in origin.

UTILITIES

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. Utilities and Service Systems. Would the Project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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 project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Determination:

- a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?*

Less Than Significant Impact. The proposed Project would develop the Project site and install new utility connections to the existing utility infrastructure. Drainage from the Project site will be collected and conveyed to a proposed on-site storm drain system. This on-site storm drain system will connect and drain to a proposed public storm drain system.

Analysis was accomplished on sewer and drainage issues as these were considered to be the most likely to have the opportunity for impacts. Adequately sized sewer lines and new manhole will be constructed for this project (Duke Engineering 2022a). An underground detention system, catch basin, pumps, and filters to clean and remove water during a storm event will be constructed for the project which will address drainage issues (Duke Engineering 2022b).

Construction of new utility facilities and infrastructure for the proposed Project may have a temporary impact on air quality due to the use of off-road construction equipment and onroad vehicles. Construction emissions impacts have been evaluated in the Air Quality Study included as Appendix A and discussed in Section 4.3.3. The Air Quality Study found that the emissions impacts related to project construction would have no impact.

- b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?***

Less Than Significant Impact. A significant impact would occur if the proposed Project would increase water consumption to such a degree that the capacity of facilities currently serving the Project site would be exceeded. The Project would not result in changes to the projected groundwater pumping that would decrease groundwater supplies, and the Project would not otherwise impede the sustainable groundwater management of the basin. Therefore, potential impacts associated with sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years would have no impact and no mitigation is required.

- 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 project's projected demand in addition to the provider's existing commitments?***

Less Than Significant Impact. The current capacity of the Lancaster Water Reclamation Plant has a capacity of 18 million gallons per day (mgd). It is currently using approximately 14.6 mgd [Los Angeles County Sanitation Districts (LACSD) 2022]. Since only 1.5-acre feet of water is projected to be used a year, it can be seen that wastewater generation by this project would be infinitesimal. Therefore, the project would have no impact related to wastewater treatment capacity.

- 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?***

Less Than Significant Impact. Sufficient landfill space is available for a project this size. This project is not expected to impact attainment of solid waste reduction goals. Recycling protocols are part of normal operating functions. The solid waste generated by the proposed Project is nominal; therefore, there would be no impact and no mitigation would be required.

- e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?***

Less Than Significant Impact. A significant impact could occur if a project would generate solid waste that was not disposed of in accordance with applicable regulations. These regulations include:

- California Integrated Waste Management Act of 1989 (AB 939). AB 939 requires cities and counties to reduce the amount of solid waste entering existing landfills through recycling, reuse, and waste prevention efforts. These efforts have included permitting procedures for waste haulers and handlers.
- The CALGreen Code, which is applicable to the construction of new buildings by addressing construction waste reduction, disposal, and recycling. Demolition and construction activities would recycle or reuse a minimum of 65 percent of the non-hazardous construction and demolition waste.
- AB 341 requires diversion of a minimum of 75 percent of operational solid waste.

The proposed Project would comply with federal, state, and local statutes and regulations relating to solid waste. The proposed Project would not have any adverse impacts on compliance. This new development would have to implement recycling programs with a 50 percent diversion of solid waste based on AB 939 and the County Integrated Waste Management Plan. The project will comply with all federal, state, local management and reduction statutes/regulations for solid waste.

Mitigation Measures:

None required.

WILDFIRES

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. Wildfire. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Environmental Determination:

- a) *Substantially impair an adopted emergency response plan or emergency evacuation plan?*

No Impact. The Project is not located in or near State responsibility areas or lands classified as very high fire hazard zones. Additionally, the Project site is located within an urbanized area of the City, does not include wildlands or high-fire-hazard terrain. As such, no impacts would occur, and no mitigation is required. Emergency access to and from the Project site would be provided in accordance with the requirements of the LAFD. Ongoing coordination with the local fire and police departments during construction would ensure that potential interference with emergency response and evacuation efforts are avoided. Therefore, the potential for the proposed Project to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, is considered to have no impact.

- 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?*

No Impact. The Project is not located in State responsibility areas or lands classified as very high fire hazard zones. In addition, the Project Site is located within an urbanized area of the City and does not include wildlands or high-fire-hazard terrain. As such, no impacts would occur, and no mitigation is required.

- 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?*

No Impact. According to the Cal Fire Hazard Severity Zone map, the Project site is not located within a high fire hazard zone (Cal Fire 2022). Compliance with applicable

wildfire hazard minimization and protection protocols stipulated under existing policies and regulations reduces potential wildfire hazards affecting adjacent off-site properties to levels that would have no impact.

Additionally, the proposed Project does not include any infrastructure that would exacerbate fire risks. The proposed Project would construct internal streets and install compliant fire suppression facilities (e.g., hydrants and sprinklers) that conform to the California Fire Code requirements, as verified through the County's permitting process. Further, electrical utilities inside the development would be underground, eliminating fire risks associated with overhead power lines. Therefore, impacts related to infrastructure that could exacerbate fire risks would have no impact.

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?

No Impact. A significant impact would occur if the proposed Project were implemented on a site that would be located in a hillside area.

The Project is not located in State responsibility areas or lands classified as very high fire hazard zones. The Project site is located within an urbanized area of the City and does not include wildlands or high-fire-hazard terrain. In addition, as previously discussed, the Project site is not susceptible to potential flooding or landslide, nor would the Project result in potential drainage changes. As such, no impacts would occur, and no mitigation is required.

Properties adjacent to the Project site are not at substantially different elevations and do not evidence slopes that would be subject to landslides or that would result in landslide impacts. Thus, through compliance with the California building code materials along with Fire Codes, the Project would have no impact.

Mitigation Measures:

None required.

MANDATORY FINDINGS OF SIGNIFIGANCE

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XXI. Mandatory Findings of Significance.				
a) Does the project have the potential to 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, 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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Environmental Determination:

- e) 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?*

Less Than Significant Impact with Mitigation Incorporated. There are no valuable habitats, plants, or wildlife within this project site and no examples of California history or prehistory. This site has been highly disturbed and no important examples of history, prehistory or natural features exist within the site.

As described in Biological Resources, with implementation of Mitigation Measures MM-BIO-1 through MM-BIO-2, the potential impact on wildlife species or their habitats

would be less than significant. Therefore, potential impacts related to plant or animal communities would be less than significant with implementation of the abovementioned mitigations.

As described in Cultural and Tribal Cultural Resources, the proposed Project would not cause a substantial adverse change in the significance of a historical resource. However, the site has the potential to contain archaeological resources. Thus, Mitigation Measures MM-CUL-1 through MM-CUL-13 have been included to require archaeological and TCR monitoring during initial ground-disturbance activities, which would reduce potential impacts to important examples of California prehistory to a less than significant level. Specifically, MM-TCR-1 through MM-TCR-3 have been included to require: 1) full-time professional Tribal monitoring and observation of all ground-disturbing activities, 2) proper disposition and treatment of inadvertent discoveries, and 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, where subsequent disposition of those discoveries shall be decided by the Most Likely Descendant (MLD), as determined by the Native American Heritage Commission (NAHC), should those findings be determined as Native American in origin.

Implementation of Mitigation Measures CUL-1 through CUL-13 under Cultural Resources and Mitigation Measures TCR-1 through TCR-3 would reduce potentially significant impacts on Tribal Cultural Resources to less than significant.

- f) ***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.)***

Less Than Significant. CEQA Guidelines Section 15065(a) states that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. Due to the nature of the proposed Project and consistency with environmental policies, incremental contributions to impacts are considered less than cumulatively considerable. The proposed Project would not contribute substantially to adverse cumulative conditions or create any substantial indirect impacts.

As described in the impact analyses above, there would be either no impacts or less than significant impacts across all topical areas with applicable BMPs implemented, except for Biological Resources, Cultural Resources, and Tribal Cultural Resources. The Mitigation Measures MM-BIO-1 and MM-BIO-2, MM-CUL-1 through MM-CUL-13, and MM-TCR-1 through MM-TCR-3, would be needed for achieving less than significant impacts.

All other pending, approved, and completed projects in the vicinity of the proposed Project would be subject to review in separate environmental documents and required to conform

to the County General Plan and Municipal Code, mitigate for project-specific impacts, and provide appropriate engineering to ensure the development meets all applicable federal, State, and local regulations and codes. As currently designed, and by complying with applicable codes and regulations, the proposed Project would not contribute to a cumulative impact. Thus, the cumulative impacts of pending, approved, and completed projects would be less than cumulatively considerable and have a less than significant impact.

g) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant. The ways in which people can be subject to adverse effects from the proposed Project include possible exposure to engine exhaust emissions and fugitive dust, possible exposure to hazardous materials, and possible exposure to noise and traffic hazards. The analyses of environmental issues contained in this IS indicate that the Project is not expected to have probable or substantial impacts on human beings, either directly or indirectly. No impact is predicted for this checklist item.

Mitigation Measures:

MM-BIO-1 and MM-BIO-2

MM-CUL-1 through MM-CUL-13

MM-TCR-1 through MM-TCR-3

Enclosures/Attachments (under separate covers):

1. Appendix A – Air Quality, Greenhouse Gas, and Noise Study
2. Appendix B – Biological Resources Study
3. Appendix C – Transportation Study
4. Appendix D – Cultural/Tribal Cultural Study
5. Appendix E – Geotechnical Study
6. Appendix F – Hydrology Study

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September 25, 2023

Mr. Juan Carlos Herrera, AIA
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Subject: Air Quality, Greenhouse Gas, and Noise Impacts Study for a Warehouse/Office Building Development in Palmdale, CA

Dear Mr. Herrera:

Yorke Engineering, LLC (Yorke) is pleased to provide this Air Quality (AQ), Greenhouse Gas (GHG), and Noise impacts analysis Letter Report. This Letter Report includes CalEEMod emissions estimates, criteria pollutant analysis, GHG analysis, and noise analysis for a proposed light industrial building comprising combination warehouse and office spaces in the City of Palmdale, California (the City). These evaluations will support a CEQA Categorical Exemption, Initial Study (IS), Negative Declaration (ND), or a Mitigated Negative Declaration (MND), as applicable.

PROJECT DESCRIPTION

SHL Engineering is assisting in the development of a 15-unit light industrial building comprising combination warehouse and office spaces (Units “A” through “O”). The project site is a vacant lot at the northwest corner of Avenue M-8 and 10th Street West [Assessor’s Parcel Numbers (APNs) 3111-012-083 and 3111-012-084] in the City of Palmdale, CA (the City) which is under the jurisdiction of the Antelope Valley Air Quality Management District (AVAQMD). The 4.31-acre parcel will be developed with one building totaling 53,233 square feet, including 38,473 total square feet of warehouse space and 14,760 total square feet for office use. The office spaces will face the front of the building, and the rear of the building will feature passage and roll-up doors for each unit. Paved parking areas will total 94,590 square feet, with 19,471 square feet of drought-tolerant landscaping. Other areas not paved with asphalt will total 20,353 square feet.

DATA SOURCES AND ASSUMPTIONS

The following lists sources of information used in developing the emission estimates for the proposed Project using the California Emissions Estimator Model[®] (CalEEMod). Not all CalEEMod defaults are listed, but some defaults which have a particularly important impact on the project are listed.

- The Applicant defined:
 - Basic project design features including size of the proposed project site;
 - Low VOC paints will be used; and

- During construction, any exposed soil and unpaved construction roadways will be watered a minimum of two times a day to control fugitive dust, and surface streets accessing the site will be swept to control trackout.
- CalEEMod defaults were used for:
 - Construction equipment count, load factor, and fleet average age; and
 - Architectural coating areas;
 - Operational vehicle fleet mixes; and
 - Average vehicle trip distances.

LIST OF TABLES

The project analyses and results are summarized in the following tables:

- Table 1: Land Use Data for CalEEMod Input
- Table 2: AVAQMD CEQA Thresholds of Significance
- Table 3: Construction Emissions Summary and Significance Evaluation
- Table 4: Operational Emissions Summary and Significance Evaluation
- Table 5: Greenhouse Gas Emissions Summary and Significance Evaluation
- Table 6: Typical Sound Level Characteristics
- Table 7: State Recommended Noise Level Guidelines
- Table 8: City of Palmdale Interior and Exterior Noise Standards
- Table 9: FHWA Noise Reference Levels and Usage Factors
- Table 10: Estimated Peak Activity Daytime Noise Impacts - Residential Receptors

AIR QUALITY AND GREENHOUSE GAS IMPACTS ANALYSES

In order to evaluate the potential for Air Quality and Greenhouse Gas impacts of a proposed project, quantitative significance criteria established by the local air quality agency, such as the AVAQMD, may be relied upon to make significance determinations based on mass emissions of criteria pollutants and GHGs, as presented in this report. As shown below, approval of the project would not result in any significant effects relating to air quality or greenhouse gases.

Project Emissions Estimation

The construction and operation analysis were performed using CalEEMod version 2022.1.1.18, the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and GHG emissions associated with both construction and operations of land use projects under CEQA. The model quantifies direct emissions from construction and operations (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The mobile source emission factors used in the model – published by the California Air Resources Board (CARB) – include the Pavley standards and Low Carbon Fuel standards. The model also identifies project design features, regulatory measures, and control measures to reduce

criteria pollutant and GHG emissions along with calculating the benefits achieved from the selected measures. CalEEMod was developed by the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the AVAQMD, the South Coast Air Quality Management District (SCAQMD), the Bay Area Air Quality Management District (BAAQMD), the San Joaquin Valley Air Pollution Control District (SJVAPCD), and other California air districts. Default land use data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) were provided by the various California air districts to account for local requirements and conditions. As the official assessment methodology for land use projects in California, CalEEMod is relied upon herein for construction and operational emissions quantification, which forms the basis for the impact analysis.

Based on information received from the Applicant, land use data for CalEEMod input is presented in Table 1. The AVAQMD quantitative significance thresholds shown in Table 2 were used to evaluate project emissions impacts (AVAQMD 2016).

Table 1: Land Use Data for CalEEMod Input				
Land Use Type	Land Use Subtype	Square Feet	Acreage (footprint)	Description
Industrial	Unrefrigerated Warehouse-No Rail	38,473	0.88	10th Street Building, Warehouse Section
Commercial	General Office Building	14,760	0.34	10th Street Building, Office Section
Parking	Other Non-Asphalt Surfaces	20,353	0.47	Plaza, trash area, and other non-asphalt surfaces
Parking	Parking Lot	94,590	2.17	Parking Areas (Concrete hardscape and asphalt paving)
Landscape Area		19,471	0.45	Landscape Area
Project Site		187,647	4.31	

Source: Applicant 2023, CalEEMod version 2022.1.1.18

Notes:

Electric Utility: Southern California Edison

Gas Utility: Southern California Gas

1 acre = 43,560 sf

Table 2: AVAQMD CEQA Thresholds of Significance		
Criteria Pollutant	Annual Threshold (tons)	Daily Threshold (lbs)
Greenhouse Gases (CO ₂ e)	100,000 (90,718 MT)	548,000
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NO _x)	25	137
Volatile Organic Compounds (VOC)	25	137
Oxides of Sulfur (SO _x)	25	137
Particulate Matter (PM ₁₀)	15	82
Particulate Matter (PM _{2.5})	12	65
Hydrogen Sulfide (H ₂ S)	10	54
Lead (Pb)	0.6	3

Source: AVAQMD 2016

Criteria Pollutants from Project Construction

A project's construction phase produces many types of emissions, but PM₁₀ (including PM_{2.5}) in fugitive dust and diesel engine exhaust are the pollutants of greatest concern. Fugitive dust emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle exhaust. Construction-related emissions can cause substantial increases in localized concentrations of PM₁₀, as well as affecting PM₁₀ compliance with ambient air quality standards on a regional basis. Particulate emissions from construction activities can lead to adverse health effects as well as nuisance concerns such as reduced visibility and soiling of exposed surfaces. The use of diesel-powered construction equipment emits ozone precursors oxides of nitrogen (NO_x) and reactive organic gases (ROG), and diesel particulate matter (DPM), the latter being a composite of toxic air contaminants (TACs) containing a variety of hazardous substances. Large construction projects using multiple large earthmoving equipment are evaluated to determine if operations may exceed the District's daily threshold for NO_x emissions and could temporarily expose area residents to hazardous levels of DPM. Use of architectural coatings and other materials associated with finishing buildings may also emit ROG and TACs. CEQA significance thresholds address the impacts of construction activity emissions on local and regional air quality. Thresholds are also provided for other potential impacts related to project construction, such as odors and TACs.

The AVAQMD's approach to CEQA analyses of fugitive dust impacts is to require implementation of effective and comprehensive dust control measures rather than to require detailed quantification of emissions. PM₁₀ emitted during construction can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors, making quantification difficult. Despite this variability in emissions, experience has shown that there are several feasible control measures that can be reasonably implemented to significantly reduce fugitive dust emissions from construction. For larger projects, the AVAQMD has determined that compliance with an approved fugitive dust control plan comprising Best Management Practices (BMPs), primarily through frequent water application, constitutes sufficient control to reduce PM₁₀ impacts to a level considered less than significant.

Criteria Pollutants from Project Operation

The term “project operations” refers to the full range of activities that can or may generate criteria pollutant, GHG, and TAC emissions when the project is functioning in its intended use. For projects, such as office parks, shopping centers, apartment buildings, residential subdivisions, and other indirect sources, motor vehicles traveling to and from the project represent the primary source of air pollutant emissions. For industrial projects and some commercial projects, equipment operation and manufacturing processes, i.e., permitted stationary sources, can be of greatest concern from an emissions standpoint. CEQA significance thresholds address the impacts of operational emission sources on local and regional air quality. Thresholds are also provided for other potential impacts related to project operations, such as odors.

Results of Criteria Emissions Analyses

CalEEMod outputs are in Attachment 1. It should be noted that although emissions are labeled as “mitigated”, these emissions reflect project design features, i.e., required BMPs. For this project, applicable AVAQMD and City Planning approved BMPs will be implemented as project design features. This is a standard Condition of Approval and pursuant to CEQA, is not considered mitigation.

Table 3 shows unmitigated and mitigated criteria construction emissions and evaluates mitigated emissions against AVAQMD significance thresholds.

Table 4 shows unmitigated and mitigated criteria operational emissions and evaluates mitigated emissions against AVAQMD significance thresholds.

As shown in Tables 3 and 4, mass emissions of criteria pollutants from construction and operation are below applicable AVAQMD significance thresholds.

PROJECTED IMPACT: Less Than Significant (LTS)

Table 3: Construction Emissions Summary and Significance Evaluation							
Criteria Pollutants	Unmitigated		Mitigated		Threshold		Significance
	Daily (lbs/day)	Annual (tons/yr)	Daily (lbs/day)	Annual (tons/yr)	Daily (lbs/day)	Annual (tons/yr)	
ROG (VOC)	19.1	0.18	19.1	0.18	137	25	LTS
NO _x	36.1	1.57	36.1	1.57	137	25	LTS
CO	34.2	1.97	34.2	1.97	548	100	LTS
SO _x	0.1	0.003	0.1	0.003	137	25	LTS
Total PM ₁₀	21.5	0.19	9.5	0.14	82	15	LTS
Total PM _{2.5}	11.6	0.11	5.5	0.09	65	12	LTS

Sources: AVAQMD 2016, CalEEMod version 2022.1.1.18

Notes:

lbs/day are winter or summer maxima for planned land use

Total PM₁₀ / PM_{2.5} comprises fugitive dust plus engine exhaust

LTS - Less Than Significant

Table 4: Operational Emissions Summary and Significance Evaluation

Criteria Pollutants	Unmitigated		Mitigated		Threshold		Significance
	Daily (lbs/day)	Annual (tons/yr)	Daily (lbs/day)	Annual (tons/yr)	Daily (lbs/day)	Annual (tons/yr)	
ROG (VOC)	2.75	0.41	2.75	0.41	137	25	LTS
NO _x	1.10	0.18	1.10	0.18	137	25	LTS
CO	9.85	1.22	9.85	1.22	548	100	LTS
SO _x	0.02	0.002	0.02	0.002	137	25	LTS
Total PM ₁₀	1.17	0.18	1.17	0.18	82	15	LTS
Total PM _{2.5}	0.32	0.05	0.32	0.05	65	12	LTS

Sources: AVAQMD 2016, CalEEMod version 2022.1.1.18

Notes:

lbs/day are winter or summer maxima for planned land use

Total PM₁₀ / PM_{2.5} comprises fugitive dust plus engine exhaust

LTS - Less Than Significant

Greenhouse Gas Emissions from Construction and Operation

Greenhouse gases – primarily carbon dioxide (CO₂), methane (CH₄), and nitrous (N₂O) oxide, collectively reported as carbon dioxide equivalents (CO₂e) – are directly emitted from stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources such as on-road vehicles and off-road construction equipment burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also, included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills. (CARB 2022)

California's Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2022 standards improved upon the 2019 standards for new construction of, and additions and alterations to, residential, commercial, and industrial buildings. The 2022 standards went into effect on January 1, 2023 (CEC 2022).

Since the Title 24 standards require energy conservation features in new construction (e.g., high-efficiency lighting, high-efficiency heating, ventilating, and air-conditioning (HVAC) systems, thermal insulation, double-glazed windows, water conserving plumbing fixtures, etc.), they indirectly regulate and reduce GHG emissions.

Using CalEEMod, direct onsite and offsite GHG emissions were estimated for construction and operation, and indirect offsite GHG emissions were estimated to account for electric power used by the proposed Project, water conveyance, and solid waste disposal.

Results of Greenhouse Gas Emissions Analyses

Table 5 shows unmitigated and mitigated GHG emissions and evaluates mitigated emissions against AVAQMD significance thresholds. Operational reduction measures incorporate typical code-required water conservation features. Off-site traffic impacts are included in these emissions estimates, along with construction emissions amortized over 30 years. It should be noted that although emissions are labeled as “mitigated”, these emissions reflect project design features, i.e., required BMPs. For this project, applicable AVAQMD and City Planning approved BMPs will be

implemented as project design features. This is a standard Condition of Approval and pursuant to CEQA, is not considered mitigation.

PROJECTED IMPACT: Less Than Significant (LTS)

Table 5: Greenhouse Gas Emissions Summary and Significance Evaluation				
Greenhouse Gases	Unmitigated (MT/yr)	Mitigated (MT/yr)	Threshold (MT/yr)	Significance
CO ₂	399.0	399.0	—	—
CH ₄	0.845	0.845	—	—
N ₂ O	0.0197	0.0197	—	—
R	0.345	0.345	—	—
CO ₂ e	426.3	426.3	90,718	LTS

Sources: AVAQM 2016, CalEEMod version 2022.1.1.18

Notes:

Comprises annual operational emissions plus construction emissions amortized over 30 years

LTS - Less Than Significant

NOISE IMPACTS ANALYSES

Noise Analysis Methodology

The screening-level noise analysis for project construction was completed based on methodology developed by the U.S. Department of Transportation Federal Highway Administration (DOT FHWA) at the John A. Volpe National Transportation Systems Center and other technical references consistent with CalEEMod outputs (equipment utilization). The DOT FHWA methodology uses actual noise measurement data collected during the Boston “Big Dig” project (1991-2006) as reference levels for a wide variety of construction equipment in common use, such as on the proposed project. This noise analysis did not include field measurements of ambient noise in the vicinity of the project site.

The FHWA noise model provides relatively conservative predictions because it does not account for site-specific geometry, dimensions of nearby structures, and local environmental conditions that can affect sound transmission, reflection, and attenuation. As a result, actual measured sound levels at receptors may vary somewhat from predictions, typically lower. Additionally, the impacts of noise upon receptors (persons) are subjective because of differences in individual sensitivities and perceptions.

Noise impacts are evaluated against community noise standards contained in the City or County General Plan or other state or federal agency as applicable to the vicinity of the project site. For this project, the City of Palmdale’s General Plan, Noise Element, and the Municipal Code, Chapters 8.28 and 9.18, contain the applicable evaluation criteria.

During construction activities, the project would generate noise due to operation of minimal off-road equipment, portable equipment, and vehicles at or near the project site. No significant increase in traffic is expected due to this relatively small project. No strong sources of vibrations are planned to be used during construction activities.

Since the project is near an urban street and a state highway, the incremental effect of project operation (possible slightly increased traffic) would not be quantifiable against existing traffic noise (background) in the project vicinity (i.e., less than significant impact).

The project site is within 1.8 miles of the Palmdale Regional Airport and therefore the “Airport Noise Contours - the airports in Los Angeles County” was reviewed for this study to evaluate the potential impacts on the people working in the project area.

Environmental Setting

Noise Descriptors

Noise is typically described as any dissonant, unwanted, or objectionable sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity, the A-weighted decibel scale (dBA). Table 6 lists common sources of sound and their intensities in dBA.

Table 6: Typical Sound Level Characteristics		
Pressure	Level	Sound Level Characteristic
N/m ²	dBA	
2000	160	Rocket Launch
600	150	Military Jet Plane Takeoff
200	140	Threshold of Pain
60	130	Commercial Jet Plane Takeoff
20	120	Industrial Chipper or Punch Press
6	110	Loud Automobile Horn
2	100	Passing Diesel Truck – Curb Line
0.6	90	Factory - Heavy Manufacturing
0.2	80	Factory - Light Manufacturing
0.06	70	Open Floor Office - Cubicles
0.02	60	Conversational Speech
0.006	50	Private Office - Walled
0.002	40	Residence in Daytime
0.0006	30	Bedroom at Night
0.0002	20	Recording or Broadcasting Studio
0.00006	10	Threshold of Good Hearing - Adult
0.00002	0	Threshold of Excellent Hearing - Child

Sources: Broch 1971, Plog 1988

Notes:

Reference Level $P_0 = 0.00002 \text{ N/m}^2 = 0.0002 \text{ } \mu\text{bar}$

N/m^2 = Newtons per square meter (the Newton is the unit of force derived in the metric system); it is equal to the amount of net force required to accelerate one kilogram of mass at a rate of one meter per second squared ($1 \text{ kg} \cdot 1 \text{ m/s}^2$) in the direction of the applied force.

In most situations, a 3-dBA change in sound pressure is considered a “just-detectable” difference. A 5-dBA change (either louder or quieter) is readily noticeable, and 10-dBA change is a doubling (if louder) or halving (if quieter) of the subjective loudness. Sound from a small, localized source (a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (drops off) at a rate of 6 dBA for each doubling of the distance.

The duration of noise and the time period at which it occurs are important factors in determining the impact of noise on sensitive receptors. A single number called the equivalent continuous noise level (L_{eq}) may be used to describe sound that is changing in level. It is also used to describe the acoustic range of the noise source being measured, which is accomplished through the maximum L_{eq} (L_{max}) and minimum L_{eq} (L_{min}) indicators.

In determining the daily measure of community noise, it is important to account for the difference in human response to daytime and nighttime noise. Noise is more disturbing at night than during the day, and noise indices have been developed to account for the varying duration of noise events over time, as well as community response to them. The Community Noise Equivalent Level (CNEL) adds a 5-dB penalty to the “nighttime” hourly noise levels (HNLs) (i.e., 7:00 p.m. to 10:00 p.m.) and the Day-Night Average Level (L_{dn}) adds a 10-dB penalty to the evening HNLs (Caltrans 2020, FTA 2006).

Vibration Descriptors

Vibration is a unique form of noise because its energy is carried through structures and the earth, whereas noise is carried through the air. Thus, vibration is generally felt rather than heard. Typically, ground borne vibration generated by construction activities attenuates rapidly as distance from the source of the vibration increases. Actual human and structural response to different vibration levels is influenced by a combination of factors, including soil type, distance between the source and receptor, duration, and the number of perceived events.

While not a direct health hazard, the energy transmitted through the ground as vibration may result in structural damage, which may be costly to repair and dangerous in the event of structural failure. To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of point peak velocity/peak particle velocity (PPV) in the vertical and horizontal directions (vector sum). A freight train passing at 100 feet may cause PPVs of 0.1 inch per second, while a strong earthquake may produce PPVs in the range of 10 inches per second. Minor cosmetic damage to buildings may begin in the range of 0.5 inch per second (Caltrans 2020, FTA 2006).

Regulatory Setting

California

The State of California does not promulgate statewide standards for environmental noise but requires each city and county to include a noise element in its general plan [California Government Code Section 65302(f)]. In addition, Title 4 of the CCR has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. In general, the guidelines require that community noise standards:

- Protect residents from the harmful and annoying effects of exposure to excessive noise;
- Prevent incompatible land uses from encroaching upon existing or programmed land uses likely to create significant noise impacts; and
- Encourage the application of state-of-the-art land use planning methodologies in the area of managing and minimizing potential noise conflicts.

Construction vibration is regulated at the state level in accordance with standards established by the *Transportation and Construction-Induced Vibration Guidance Manual* issued by Caltrans in

2004. Continuous sources include the use of vibratory compaction equipment and other construction equipment that creates vibration other than in single events. Transient sources create a single isolated vibration event, such as blasting. Thresholds for continuous sources are 0.5 and 0.1 inch per second PPV for structural damage and annoyance, respectively. Thresholds for transient sources are 1.0 and 0.9 PPV for structural damage and annoyance, respectively (Caltrans 2020).

City of Palmdale General Plan – Noise Element

The Noise Element of the City of Palmdale General Plan contains criteria to determine the compatibility of proposed developments. The State Recommended Noise Level Guidelines referenced in the City of Palmdale General Plan Noise Element lists land use categories and the acceptable and unacceptable levels of community noise exposure. The compatibility criteria shown on Table 7 provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels (City 1993).

As shown in Table 7, for industrial land uses, an L_{dn} or CNEL limit (threshold) of 70 dBA is considered “Normally Acceptable” and 70-80 dBA is considered “Conditionally Acceptable”.

Table 7: State Recommended Noise Level Guidelines

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE L_{eq} OR CNEL, dB					
	55	60	65	70	75	80
RESIDENTIAL - LOW DENSITY SINGLE FAMILY, DUPLEX, MOBILE HOMES						
RESIDENTIAL - MULTIFAMILY						
TRANSIENT LODGING - MOTELS, HOTELS						
SCHOOLS, LIBRARIES, CHURCHES, HOSPITALS, NURSING HOMES						
AUDITORIUMS, CONCERT HALLS, AMPHITHEATRES						
SPORTS ARENA, OUTDOOR SPECTATOR SPORTS						
PLAYGROUNDS, NEIGHBORHOOD PARKS						
GOLF COURSES, RIDING STABLES, WATER RECREATION, CEMETERIES						
OFFICE BUILDINGS, BUSINESS COMMERCIAL AND PROFESSIONAL						
INDUSTRIAL, MANUFACTURING UTILITIES, AGRICULTURE						

LEGEND

NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

CONSIDERATIONS IN DETERMINATION OF NOISE-COMPATIBLE LAND USE

A. NORMALIZED NOISE EXPOSURE INFORMATION DESIRED
Where sufficient data exists, evaluate land use suitability with respect to a "normalized" value of CNEL or L_{eq} . Normalized values are obtained by adding or subtracting the constants described in Table 1 to the measured or calculated value of CNEL or L_{eq} .

B. NOISE SOURCE CHARACTERISTICS
The land use-noise compatibility recommendations should be viewed in relation to the specific source of the noise. For example, aircraft and railroad noise is normally made up of higher single noise events than auto traffic but occurs less frequently. Therefore, different sources yielding the same composite noise exposure do not necessarily create the same noise environment. The State Aeronautics Act uses 65 dB CNEL as the criterion which airports must eventually meet to protect existing residential communities from unacceptable exposure to aircraft noise. In order to facilitate the purposes of the Act, one of which is to encourage land uses compatible with the 65 dB CNEL criterion wherever possible, and in order to facilitate the ability of airports to comply with the Act, residential uses located in Community Noise Exposure Areas greater than 65 dB should be discouraged and considered located within normally unacceptable areas.

C. SUITABLE INTERIOR ENVIRONMENTS
One objective of locating residential units relative to a known noise source is to maintain a suitable interior noise environment at no greater than 45 dB CNEL of L_{eq} . This requirement, coupled with the measured or calculated noise reduction performance of the type of structure under consideration, should govern the minimum acceptable distance to a noise source.

D. ACCEPTABLE OUTDOOR ENVIRONMENTS
Another consideration, which in some communities is an overriding factor, is the desire for an acceptable outdoor noise environment. When this is the case, more restrictive standards for land use compatibility, typically below the maximum considered "normally acceptable" for that land use category, may be appropriate.

Source: California Department of Health, Guidelines for the Preparation and Content of Noise Elements of The General Plan, February, 1976

Source: City of Palmdale General Plan 1993, Table N-1

The Noise Element of the City of Palmdale General Plan includes interior and exterior noise standards. These standards, shown in Table 8, were developed by the City using the State Recommended Noise Level Guidelines to ensure integrated planning compatibility between land uses and outdoor noise compatibility guidelines. The information is used to identify projects or activities which may require special treatment to minimize noise exposure (City 1993).

Table 8: City of Palmdale Interior and Exterior Noise Standards			
Land Use	Maximum Acceptable Levels		
	Exterior	Interior	Scale
Residential			
SFR	65	45	dBA CNEL
MFR	65	45	dBA CNEL
MHP	65	45	dBA CNEL
Commercial including, but not limited to: Retail Services Office	A noise level which does not jeopardize health, safety, and welfare of visitors.	55 55 55	Leq(h) Leq(h) Leq(h)
Institutional including, but not limited to: Schools Hospitals Nursing Homes	A noise level which does not jeopardize health, safety, and welfare of visitors.	45 45 45	Leq(h) Leq(h) Leq(h)
Industrial including, but not limited to: Industrial Park Business Park	A noise level which does not interfere with normal business activity.	65 65	Leq(h) Leq(h)
Quarry	Maximum 65 Leq(h) at the interface with residentially designated land.	N/A	
Leq(h) The A-weighted equivalent sound level averaged over a period of "h" hours. An example would be Leq(12) where the equivalent sound level is the average over a specified 12-hour period (such as 7 a.m. to 7 p.m.). Typically, time period "h" is defined to match the hours of operation of a given type of use.			

Source: City of Palmdale General Plan 1993, Table N-3

City of Palmdale Municipal Code – Chapters 8.28 and 9.18

For this Project, the City of Palmdale Municipal Code, Sections 8.28.030, 8.28.040, 8.28.060, and 9.18.010 contain the applicable evaluation criteria (City 1986).

Section 8.28.030 states that no person shall perform any construction or repair work on any Sunday, or any other day after 8:00 p.m. or before 6:30 a.m., in any residential zone or within 500 feet of any residence, hotel, motel or recreational vehicle park. For the purposes of this section, construction and repair work includes work of any kind upon any building or structure, earth excavating, filling, or moving, and delivery, preparation or operation of construction equipment, materials or supplies where any of the foregoing entails the use of an air compressor, jack hammer, power-driven drill, riveting machine, excavator, semi-truck, diesel power truck, tractor, cement truck, or earth moving equipment, hand hammer, or other machine, tool, device or equipment which makes loud noise which disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness sleeping or residing in the area.

Section 8.28.040 states that:

- A. The provisions of Section 8.28.030 do not apply to any person who performs the construction, repair, excavation or earth moving work involved pursuant to the express written permission of the City Engineer to perform such work at times prohibited in Section

8.28.030. Upon receipt of an application in writing therefor, stating the reasons for the request and the facts upon which such reasons are based, the City Engineer may grant such permission if he finds that:

1. The work proposed to be done is affected with the public interest; or
2. Hardship, injustice or unreasonable delay would result from the interruption thereof during the hours and days specified in Section 8.28.030; or
3. The building or structure involved is devoted or intended to be devoted to a use immediately incident to public defense.

Section 8.28.060 states that provisions of Section 8.28.030 do not apply to the construction, repair, or excavation during prohibited hours as may be necessary for the preservation of life or property when such necessity arises during such hours as the offices of the City are closed, or where such necessity requires immediate action prior to the time at which it would be possible to obtain a permit pursuant to Section 8.28.040, if the person doing such construction, repair or excavation obtains a permit therefor within one day after the office of the City Engineer is first opened subsequent to the making of such construction, repair or excavation.

Section 9.18.010 states that it is prohibited for any person to willfully make or continue, or cause or permit to be made or continued, any loud, unnecessary, or unusual noise which unreasonably disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

Construction Noise

The proposed Project can be characterized as development of a commercial site. Most noise would occur during the site preparation, grading, and building construction when heavy equipment would be operating.

During each of the five construction phases there would be a different mix of equipment operating and cumulative noise levels would vary based on the amount of equipment in operation and the location of each activity at the Project site. In general, use of off-road equipment and portable equipment would generate noise due to engine mechanicals, engine exhaust, driveline mechanicals, shaft-driven devices and accessories, hydraulics operation, ground friction and displacement, and gravity drops (dumping, unloading).

Since no intense percussive actions (e.g., hard rock-breaking, large pile-driving) are planned to occur during the site work, no strong ground-borne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants.

Project construction is expected to take approximately one year of planned work activities (i.e., from mobilization to substantial completion) comprising five construction phases:

- 1) Site preparation;
- 2) Grading;
- 3) Building construction;
- 4) Paving; and
- 5) Architectural coating.

Types of equipment (FHWA 2006) to be used during the project and noise-emitting characteristics (i.e., usage factors, reference dBA, and percussive source) are shown in Table 9 consistent with CalEEMod outputs (Attachment 1).

Table 9: FHWA Noise Reference Levels and Usage Factors						
CalEEMod Construction Detail			FHWA Equipment Type	Usage Factor	Ref. Level	Percussive Source
Phase Name	Equipment Description	Qty.		percent	dBA	Yes/No
Site Preparation	Rubber Tired Dozers	3	Tractor (rubber tire)	40%	84	No
	Tractors/Loaders/Backhoes	4	Backhoe (with loader)	40%	80	No
Grading	Graders	1	Grader	40%	85	No
	Excavators	1	Excavator (hydraulic)	40%	85	No
	Tractors/Loaders/Backhoes	3	Backhoe (with loader)	40%	80	No
	Rubber Tired Dozers	1	Tractor (rubber tire)	40%	84	No
Building Construction	Cranes	1	Crane	16%	85	No
	Forklifts	3	Forklift	40%	80	No
	Generator Sets	1	Generator (<25 KVA quiet design)	50%	70	No
	Welders	1	Welding Machine (arc welding)	50%	70	No
	Tractors/Loaders/Backhoes	3	Backhoe (with loader)	40%	80	No
Paving	Tractors/Loaders/Backhoes	1	Backhoe (with loader)	40%	80	No
	Cement and Mortar Mixers	2	All Other Equipment > 5 HP	50%	85	No
	Pavers	1	Paver (asphalt)	50%	85	No
	Paving Equipment	2	Paver (asphalt)	50%	85	No
	Rollers	2	Roller	20%	85	No
Architectural Coating	Air Compressors	1	Compressor (air)	40%	80	No

Source: CalEEMod version 2022.1.1.18, FHWA 2006

During construction, equipment will be staged and stored on a centrally located portion of the project site when practical. The nearest sensitive receptors are located approximately 530 meters from the project site. This long attenuation distance would effectively mitigate construction (and operational) noise emanating from the project site. Additionally, there are buildings between the project site and the nearest sensitive receptors, which would attenuate the noise by about 20 dBA. As mentioned above, there is no numerical standard in the Municipal Code for construction activities; however, the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment provides an 8-hour construction noise level threshold of 80 dBA Leq during the daytime at residential (noise-sensitive) uses and 85 dBA during the daytime at commercial uses. Therefore, noise impacts for the proposed project are evaluated against the FTA noise standards.

Table 10 shows a comparison of FHWA screening-level estimated daytime exterior noise impacts for peak construction activities at nearby receptors with respect to the threshold. If the threshold is not exceeded, then a project should be considered acceptable, i.e., Less Than Significant.

Table 10: Estimated Peak Activity Daytime Noise Impacts - Sensitive Receptors				
Construction Phases	Normal Acceptance Criteria			
	Modeled Noise Level (Leq dBA) ^{a, b}	CalEEMod Duration (days)	Significance Threshold (CNEL dBA) ^c	Exceeds Threshold (Yes/No)?
Background	65	-	-	No
Site Preparation	65	5	80	No
Grading	65	8	80	No
Building Construction	65	230	80	No
Paving	65	18	80	No
Architectural Coating	65	18	80	No
Long-Term Impact	65	-	70	No

Sources: CalEEMod version 2022.1.1.18, FHWA 2006, Broch 1971, Plog 1988

Notes:

^a Exterior CNEL for residential land uses stated in the City of Palmdale General Plan Noise Element is assumed to be the existing ambient noise level

^b Combined noise levels at the nearest sensitive receptors are calculated using the distance from the receptor to the center of the construction zone.

^c FTA threshold for construction, City General Plan Noise Element threshold for operational phase (long-term)

Noise levels generated by the proposed project construction are normally higher than ambient noise levels and may result in a temporary increase in the ambient noise levels. However, construction noise would stop once project construction is completed. Additionally, implementation of the standard conditions for construction, which include compliance with the construction hours specified in the City's Municipal Code, would further minimize the impact of construction activities on the nearest receptors. As shown in Table 10, the proposed construction activities are not expected to raise the ambient noise levels for the nearest sensitive receptors, and the aggregated average construction noise would be well below the 80 dBA FTA noise level threshold at nearest sensitive receptors.

Operational Noise

Upon completion of construction, on-site operational noise would be generated mainly by trucks, , trash compactors, and HVAC equipment. Large HVAC systems could result in noise levels that average between 50 and 65 dBA Leq at 50 feet from the equipment. Trucks and trash compactors would generate noise levels of approximately 71 dBA (Leq) and 66 dBA (Leq) at 50 feet (15 meters) reference distance, respectively. The nearest receptor is located over 530 meters from these types of sources. With the HVAC equipment, three trucks loading, and one trash compactor operating at any given time, the existing ambient noise levels for the nearest sensitive receptors are not expected to increase.

As shown in Table 7, for industrial land uses, an Ldn or CNEL limit (threshold) of 70 dBA is considered "Normally Acceptable". The proposed project will be in compliance with the 70 dBA industrial noise standard set by the City of Palmdale (Table 10). Thus, no adverse impacts are expected from, and no special noise control measures would be required for, the operation of the

proposed Project. Therefore, the operational noise impacts of the proposed Project would be less than significant.

Analysis of Noise Significance Criteria

This study predicts a less than significant impact in accordance with the City of Palmdale's Noise Regulation and General Plan. Would the project result in:

- 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?*

No. As shown in the above analysis, temporary construction noise would be limited to the City's allowable daytime construction hours. No construction activities will be performed outside these hours. Construction activities would permanently cease upon completion of construction. The proposed construction activities are not expected to raise the ambient noise levels for the nearest sensitive receptors, and aggregated average construction noise is not expected to exceed 80 dBA FTA noise level thresholds at nearby receptors. Operational noise sources for the Project, such as new HVAC equipment, are of quiet design per commercial standards. The noise from trucks and trash collection and compaction activities are not expected to substantially raise the ambient noise level at the receptor due to the long attenuation distance of over 530 meters. Total operational noise levels will be well below the 70 dBA limit, which is considered "Normally Acceptable", for this land use. The interior noise levels will be maintained at current noise levels at nearby receptors. Therefore, the operational noise impacts of the proposed Project would be less than significant.

PROJECTED IMPACT: Less Than Significant (LTS)

- b) *Generation of excessive groundborne vibration or groundborne noise levels?*

No. Construction plans do not include intense percussive actions (e.g., hard rock-breaking, large pile-driving). Therefore, no strong ground-borne vibrations are expected to be generated that could affect nearby structures or be noticeable to their occupants.

PROJECTED IMPACT: Less Than Significant (LTS)

- 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?*

The project site is within 1.8 miles of the Palmdale Regional Airport. Based on the Airport Noise Contour map, the project site lies within the 65 dBA area. The City considers the noise levels of 65 dBA acceptable for industrial land uses. Therefore, the total operational noise levels generated by the Palmdale Regional Airport are not expected to expose people working in the project area to excessive noise levels. Therefore, the noise impacts on the proposed Project would be less than significant.

PROJECTED IMPACT: Less Than Significant (LTS)

CLOSING

Thank you very much for the opportunity to be of assistance to SHL Engineering. Should you have any questions, please contact me at (949) 324-2909 (mobile) or Bradford Boyes at (805) 217-4947 (mobile).

Sincerely,



Ernesto Betancourt II

Engineer

Yorke Engineering, LLC

EBetancourt@YorkeEngr.com

cc: Bradford Boyes, Yorke Engineering, LLC
 Tina Darjazanie, Yorke Engineering, LLC
 Dolores Rodriguez, Yorke Engineering, LLC

Enclosures/Attachments:

1. Attachment 1 – CalEEMod Outputs

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ATTACHMENT 1 – CALEEMOD OUTPUTS

Warehouse/Office Building Development in Palmdale, CA Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Warehouse/Office Building Development in Palmdale, CA
Construction Start Date	1/1/2024
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	4.50
Precipitation (days)	13.0
Location	34.6390611485087, -118.14882130509532
County	Los Angeles-Mojave Desert
City	Palmdale
Air District	Antelope Valley AQMD
Air Basin	Mojave Desert
TAZ	3650
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.18

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
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Unrefrigerated Warehouse-No Rail	38.5	1000sqft	0.88	38,473	19,471	—	—	—
General Office Building	14.8	1000sqft	0.34	14,760	0.00	—	—	—
Other Non-Asphalt Surfaces	20.4	1000sqft	0.47	0.00	0.00	—	—	—
Parking Lot	94.6	1000sqft	2.17	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-12	Sweep Paved Roads

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.34	11.6	15.4	0.03	0.50	0.35	0.85	0.46	0.08	0.55	—	2,972	2,972	0.11	0.07	2.07	2,997
Mit.	1.34	11.6	15.4	0.03	0.50	0.35	0.85	0.46	0.08	0.55	—	2,972	2,972	0.11	0.07	2.07	2,997
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	19.1	36.1	34.2	0.05	1.60	19.9	21.5	1.47	10.2	11.6	—	5,525	5,525	0.23	0.07	0.05	5,546
Mit.	19.1	36.1	34.2	0.05	1.60	7.89	9.49	1.47	3.99	5.47	—	5,525	5,525	0.23	0.07	0.05	5,546
% Reduced	—	—	—	—	—	60%	56%	—	61%	53%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.99	8.59	10.8	0.02	0.37	0.66	1.03	0.34	0.27	0.61	—	2,081	2,081	0.08	0.05	0.61	2,097
Mit.	0.99	8.59	10.8	0.02	0.37	0.40	0.78	0.34	0.14	0.48	—	2,081	2,081	0.08	0.05	0.61	2,097
% Reduced	—	—	—	—	—	39%	25%	—	48%	21%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.18	1.57	1.97	< 0.005	0.07	0.12	0.19	0.06	0.05	0.11	—	345	345	0.01	0.01	0.10	347
Mit.	0.18	1.57	1.97	< 0.005	0.07	0.07	0.14	0.06	0.03	0.09	—	345	345	0.01	0.01	0.10	347
% Reduced	—	—	—	—	—	39%	25%	—	48%	21%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

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

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.34	11.6	15.4	0.03	0.50	0.35	0.85	0.46	0.08	0.55	—	2,972	2,972	0.11	0.07	2.07	2,997
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	3.74	36.1	34.2	0.05	1.60	19.9	21.5	1.47	10.2	11.6	—	5,525	5,525	0.23	0.07	0.05	5,546
2025	19.1	0.91	1.42	< 0.005	0.03	0.05	0.08	0.03	0.01	0.04	—	187	187	0.01	< 0.005	0.01	188

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.99	8.59	10.8	0.02	0.37	0.66	1.03	0.34	0.27	0.61	—	2,081	2,081	0.08	0.05	0.61	2,097
2025	0.94	0.04	0.07	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.31	9.31	< 0.005	< 0.005	0.01	9.37
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.18	1.57	1.97	< 0.005	0.07	0.12	0.19	0.06	0.05	0.11	—	345	345	0.01	0.01	0.10	347
2025	0.17	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.54	1.54	< 0.005	< 0.005	< 0.005	1.55

2.3. Construction Emissions by Year, Mitigated

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

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.34	11.6	15.4	0.03	0.50	0.35	0.85	0.46	0.08	0.55	—	2,972	2,972	0.11	0.07	2.07	2,997
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	3.74	36.1	34.2	0.05	1.60	7.89	9.49	1.47	3.99	5.47	—	5,525	5,525	0.23	0.07	0.05	5,546
2025	19.1	0.91	1.42	< 0.005	0.03	0.05	0.08	0.03	0.01	0.04	—	187	187	0.01	< 0.005	0.01	188
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.99	8.59	10.8	0.02	0.37	0.40	0.78	0.34	0.14	0.48	—	2,081	2,081	0.08	0.05	0.61	2,097
2025	0.94	0.04	0.07	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.31	9.31	< 0.005	< 0.005	0.01	9.37
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.18	1.57	1.97	< 0.005	0.07	0.07	0.14	0.06	0.03	0.09	—	345	345	0.01	0.01	0.10	347
2025	0.17	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.54	1.54	< 0.005	< 0.005	< 0.005	1.55

2.4. Operations Emissions Compared Against Thresholds

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

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.75	1.05	9.85	0.02	0.04	1.14	1.17	0.04	0.29	0.32	49.0	2,598	2,647	5.11	0.13	5.66	2,817
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.23	1.10	6.10	0.01	0.03	1.14	1.17	0.03	0.29	0.32	49.0	2,471	2,520	5.11	0.13	0.18	2,686
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.26	0.99	6.66	0.01	0.03	0.94	0.97	0.03	0.24	0.27	49.0	2,291	2,340	5.10	0.12	2.06	2,505
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.41	0.18	1.22	< 0.005	0.01	0.17	0.18	0.01	0.04	0.05	8.11	379	387	0.84	0.02	0.34	415

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.11	0.73	7.28	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,366	1,366	0.07	0.06	5.63	1,392
Area	1.62	0.02	2.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.52	9.52	< 0.005	< 0.005	—	9.55
Energy	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	1,124	1,124	0.08	0.01	—	1,128
Water	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Waste	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	2.75	1.05	9.85	0.02	0.04	1.14	1.17	0.04	0.29	0.32	49.0	2,598	2,647	5.11	0.13	5.66	2,817

Warehouse/Office Building Development in Palmdale, CA Detailed Report, 8/30/2023

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.97	0.80	5.85	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,248	1,248	0.07	0.07	0.15	1,270
Area	1.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	1,124	1,124	0.08	0.01	—	1,128
Water	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Waste	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	2.23	1.10	6.10	0.01	0.03	1.14	1.17	0.03	0.29	0.32	49.0	2,471	2,520	5.11	0.13	0.18	2,686
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.81	0.68	5.26	0.01	0.01	0.94	0.95	0.01	0.24	0.25	—	1,064	1,064	0.06	0.06	2.03	1,084
Area	1.43	0.01	1.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.70	4.70	< 0.005	< 0.005	—	4.71
Energy	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	1,124	1,124	0.08	0.01	—	1,128
Water	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Waste	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	2.26	0.99	6.66	0.01	0.03	0.94	0.97	0.03	0.24	0.27	49.0	2,291	2,340	5.10	0.12	2.06	2,505
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.15	0.12	0.96	< 0.005	< 0.005	0.17	0.17	< 0.005	0.04	0.04	—	176	176	0.01	0.01	0.34	180
Area	0.26	< 0.005	0.21	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.78	0.78	< 0.005	< 0.005	—	0.78
Energy	< 0.005	0.05	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	186	186	0.01	< 0.005	—	187
Water	—	—	—	—	—	—	—	—	—	—	3.65	16.3	20.0	0.38	0.01	—	32.1
Waste	—	—	—	—	—	—	—	—	—	—	4.45	0.00	4.45	0.44	0.00	—	15.6
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	0.41	0.18	1.22	< 0.005	0.01	0.17	0.18	0.01	0.04	0.05	8.11	379	387	0.84	0.02	0.34	415

2.6. Operations Emissions by Sector, Mitigated

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

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.11	0.73	7.28	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,366	1,366	0.07	0.06	5.63	1,392
Area	1.62	0.02	2.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.52	9.52	< 0.005	< 0.005	—	9.55
Energy	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	1,124	1,124	0.08	0.01	—	1,128
Water	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Waste	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	2.75	1.05	9.85	0.02	0.04	1.14	1.17	0.04	0.29	0.32	49.0	2,598	2,647	5.11	0.13	5.66	2,817
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.97	0.80	5.85	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,248	1,248	0.07	0.07	0.15	1,270
Area	1.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	1,124	1,124	0.08	0.01	—	1,128
Water	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Waste	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	2.23	1.10	6.10	0.01	0.03	1.14	1.17	0.03	0.29	0.32	49.0	2,471	2,520	5.11	0.13	0.18	2,686
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.81	0.68	5.26	0.01	0.01	0.94	0.95	0.01	0.24	0.25	—	1,064	1,064	0.06	0.06	2.03	1,084
Area	1.43	0.01	1.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.70	4.70	< 0.005	< 0.005	—	4.71
Energy	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	1,124	1,124	0.08	0.01	—	1,128
Water	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194

Waste	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	2.26	0.99	6.66	0.01	0.03	0.94	0.97	0.03	0.24	0.27	49.0	2,291	2,340	5.10	0.12	2.06	2,505
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.15	0.12	0.96	< 0.005	< 0.005	0.17	0.17	< 0.005	0.04	0.04	—	176	176	0.01	0.01	0.34	180
Area	0.26	< 0.005	0.21	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.78	0.78	< 0.005	< 0.005	—	0.78
Energy	< 0.005	0.05	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	186	186	0.01	< 0.005	—	187
Water	—	—	—	—	—	—	—	—	—	—	3.65	16.3	20.0	0.38	0.01	—	32.1
Waste	—	—	—	—	—	—	—	—	—	—	4.45	0.00	4.45	0.44	0.00	—	15.6
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	0.41	0.18	1.22	< 0.005	0.01	0.17	0.18	0.01	0.04	0.05	8.11	379	387	0.84	0.02	0.34	415

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	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	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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.49	0.45	< 0.005	0.02	—	0.02	0.02	—	0.02	—	72.5	72.5	< 0.005	< 0.005	—	72.8
Dust From Material Movement	—	—	—	—	—	0.27	0.27	—	0.14	0.14	—	—	—	—	—	—	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.09	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.0	12.0	< 0.005	< 0.005	—	12.1
Dust From Material Movement	—	—	—	—	—	0.05	0.05	—	0.03	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	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.12	1.26	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	229	229	0.01	0.01	0.03	—
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	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.23	3.23	< 0.005	< 0.005	0.01	—

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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.2. Site Preparation (2024) - Mitigated

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

Location	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	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.49	0.45	< 0.005	0.02	—	0.02	0.02	—	0.02	—	72.5	72.5	< 0.005	< 0.005	—	72.8

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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.09	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.0	12.0	< 0.005	< 0.005	—	12.1
Dust From Material Movement	—	—	—	—	—	0.02	0.02	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.12	1.26	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	229	229	0.01	0.01	0.03	—
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	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.23	3.23	< 0.005	< 0.005	0.01	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	—
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	—

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	—
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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	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	1.90	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	—	—	—	—	—	7.08	7.08	—	3.42	3.42	—	—	—	—	—	—	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.40	0.41	< 0.005	0.02	—	0.02	0.02	—	0.02	—	64.8	64.8	< 0.005	< 0.005	—	65.1
Dust From Material Movement	—	—	—	—	—	0.16	0.16	—	0.08	0.08	—	—	—	—	—	—	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.7	10.7	< 0.005	< 0.005	—	10.8

Dust From Material Movement	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.08	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	196	196	0.01	0.01	0.02	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.43	4.43	< 0.005	< 0.005	0.01	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.73	0.73	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.4. Grading (2024) - Mitigated

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

Location	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	1.90	18.2	18.8	0.03	0.84	—	0.84	0.77	—	0.77	—	2,958	2,958	0.12	0.02	—	2,969
Dust From Material Movement	—	—	—	—	—	2.76	2.76	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.40	0.41	< 0.005	0.02	—	0.02	0.02	—	0.02	—	64.8	64.8	< 0.005	< 0.005	—	65.1
Dust From Material Movement	—	—	—	—	—	0.06	0.06	—	0.03	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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.7	10.7	< 0.005	< 0.005	—	10.8
Dust From Material Movement	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.10	1.08	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	196	196	0.01	0.01	0.02	—
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.43	4.43	< 0.005	< 0.005	0.01	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.73	0.73	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.5. Building Construction (2024) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	7.07	8.26	0.01	0.31	—	0.31	0.29	—	0.29	—	1,511	1,511	0.06	0.01	—	1,516
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.29	1.51	< 0.005	0.06	—	0.06	0.05	—	0.05	—	250	250	0.01	< 0.005	—	251
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.13	2.21	0.00	0.00	0.27	0.27	0.00	0.06	0.06	—	308	308	0.01	0.01	1.30	—
Vendor	0.01	0.28	0.11	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	266	266	< 0.005	0.04	0.76	—
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	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.14	1.50	0.00	0.00	0.27	0.27	0.00	0.06	0.06	—	273	273	0.01	0.01	0.03	—
Vendor	0.01	0.29	0.11	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	267	267	< 0.005	0.04	0.02	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.07	0.09	1.06	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	177	177	0.01	0.01	0.36	—
Vendor	0.01	0.19	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	168	168	< 0.005	0.02	0.21	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.19	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.4	29.4	< 0.005	< 0.005	0.06	—
Vendor	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.8	27.8	< 0.005	< 0.005	0.03	—
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	—

3.6. Building Construction (2024) - Mitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	7.07	8.26	0.01	0.31	—	0.31	0.29	—	0.29	—	1,511	1,511	0.06	0.01	—	1,516

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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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.29	1.51	< 0.005	0.06	—	0.06	0.05	—	0.05	—	250	250	0.01	< 0.005	—	251
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.13	2.21	0.00	0.00	0.27	0.27	0.00	0.06	0.06	—	308	308	0.01	0.01	1.30	—
Vendor	0.01	0.28	0.11	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	266	266	< 0.005	0.04	0.76	—
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	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.14	1.50	0.00	0.00	0.27	0.27	0.00	0.06	0.06	—	273	273	0.01	0.01	0.03	—
Vendor	0.01	0.29	0.11	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	267	267	< 0.005	0.04	0.02	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.09	1.06	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	177	177	0.01	0.01	0.36	—
Vendor	0.01	0.19	0.07	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	168	168	< 0.005	0.02	0.21	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.19	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.4	29.4	< 0.005	< 0.005	0.06	—
Vendor	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	27.8	27.8	< 0.005	< 0.005	0.03	—
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	—

3.7. Paving (2024) - Unmitigated

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

Location	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	0.76	6.87	8.89	0.01	0.33	—	0.33	0.30	—	0.30	—	1,351	1,351	0.05	0.01	—	1,355
Paving	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.34	0.44	< 0.005	0.02	—	0.02	0.01	—	0.01	—	66.6	66.6	< 0.005	< 0.005	—	66.8
Paving	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.06	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.0	11.0	< 0.005	< 0.005	—	11.1
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.13	1.44	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	262	262	0.01	0.01	0.03	—
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	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.08	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.3	13.3	< 0.005	< 0.005	0.03	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.20	2.20	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.8. Paving (2024) - Mitigated

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

Location	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	0.76	6.87	8.89	0.01	0.33	—	0.33	0.30	—	0.30	—	1,351	1,351	0.05	0.01	—	1,355
Paving	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.34	0.44	< 0.005	0.02	—	0.02	0.01	—	0.01	—	66.6	66.6	< 0.005	< 0.005	—	66.8
Paving	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.06	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.0	11.0	< 0.005	< 0.005	—	11.1
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.13	1.44	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	262	262	0.01	0.01	0.03	—
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	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.08	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.3	13.3	< 0.005	< 0.005	0.03	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.20	2.20	< 0.005	< 0.005	< 0.005	—

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	—
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	—

3.9. Architectural Coating (2025) - Unmitigated

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

Location	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	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	18.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.58	6.58	< 0.005	< 0.005	—	6.61
Architectural Coatings	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.09	1.09	< 0.005	< 0.005	—	1.09

Architectu Coatings	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.28	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	53.7	53.7	< 0.005	< 0.005	0.01	—
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	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.72	2.72	< 0.005	< 0.005	0.01	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.45	0.45	< 0.005	< 0.005	< 0.005	—
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	—
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	—

3.10. Architectural Coating (2025) - Mitigated

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

Location	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	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	18.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.58	6.58	< 0.005	< 0.005	—	6.61
Architectural Coatings	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.09	1.09	< 0.005	< 0.005	—	1.09
Architectural Coatings	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.28	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	53.7	53.7	< 0.005	< 0.005	0.01	—
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	—
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	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.72	2.72	< 0.005	< 0.005	0.01	—
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	—
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	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.45	0.45	< 0.005	< 0.005	< 0.005	—
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	—
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	—

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	0.35	0.23	2.31	< 0.005	< 0.005	0.36	0.36	< 0.005	0.09	0.09	—	434	434	0.02	0.02	1.79	442

Warehouse/Office Building Development in Palmdale, CA Detailed Report, 8/30/2023

General Office Building	0.76	0.50	4.97	0.01	0.01	0.77	0.78	0.01	0.20	0.20	—	932	932	0.05	0.04	3.84	950
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.11	0.73	7.28	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,366	1,366	0.07	0.06	5.63	1,392
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	0.31	0.25	1.86	< 0.005	< 0.005	0.36	0.36	< 0.005	0.09	0.09	—	396	396	0.02	0.02	0.05	403
General Office Building	0.66	0.54	3.99	0.01	0.01	0.77	0.78	0.01	0.20	0.20	—	851	851	0.05	0.05	0.10	866
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.97	0.80	5.85	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,248	1,248	0.07	0.07	0.15	1,270
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	0.06	0.05	0.37	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	67.1	67.1	< 0.005	< 0.005	0.13	68.4
General Office Building	0.09	0.08	0.59	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	—	109	109	0.01	0.01	0.21	111

Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.15	0.12	0.96	< 0.005	< 0.005	0.17	0.17	< 0.005	0.04	0.04	—	176	176	0.01	0.01	0.34	180

4.1.2. Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	0.35	0.23	2.31	< 0.005	< 0.005	0.36	0.36	< 0.005	0.09	0.09	—	434	434	0.02	0.02	1.79	442
General Office Building	0.76	0.50	4.97	0.01	0.01	0.77	0.78	0.01	0.20	0.20	—	932	932	0.05	0.04	3.84	950
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.11	0.73	7.28	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,366	1,366	0.07	0.06	5.63	1,392
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	0.31	0.25	1.86	< 0.005	< 0.005	0.36	0.36	< 0.005	0.09	0.09	—	396	396	0.02	0.02	0.05	403

General Office Building	0.66	0.54	3.99	0.01	0.01	0.77	0.78	0.01	0.20	0.20	—	851	851	0.05	0.05	0.10	866
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.97	0.80	5.85	0.01	0.01	1.14	1.15	0.01	0.29	0.30	—	1,248	1,248	0.07	0.07	0.15	1,270
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	0.06	0.05	0.37	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	67.1	67.1	< 0.005	< 0.005	0.13	68.4
General Office Building	0.09	0.08	0.59	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	—	109	109	0.01	0.01	0.21	111
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.15	0.12	0.96	< 0.005	< 0.005	0.17	0.17	< 0.005	0.04	0.04	—	176	176	0.01	0.01	0.34	180

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

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

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

Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	262	262	0.02	< 0.005	—	263
General Office Building	—	—	—	—	—	—	—	—	—	—	—	383	383	0.02	< 0.005	—	385
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	121	121	0.01	< 0.005	—	121
Total	—	—	—	—	—	—	—	—	—	—	—	767	767	0.05	0.01	—	769
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	262	262	0.02	< 0.005	—	263
General Office Building	—	—	—	—	—	—	—	—	—	—	—	383	383	0.02	< 0.005	—	385
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	121	121	0.01	< 0.005	—	121
Total	—	—	—	—	—	—	—	—	—	—	—	767	767	0.05	0.01	—	769
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	43.5	43.5	< 0.005	< 0.005	—	43.6

General Office Building	—	—	—	—	—	—	—	—	—	—	—	63.5	63.5	< 0.005	< 0.005	—	63.7
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	20.0	20.0	< 0.005	< 0.005	—	20.1
Total	—	—	—	—	—	—	—	—	—	—	—	127	127	0.01	< 0.005	—	127

4.2.2. Electricity Emissions By Land Use - Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	262	262	0.02	< 0.005	—	263
General Office Building	—	—	—	—	—	—	—	—	—	—	—	383	383	0.02	< 0.005	—	385
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	121	121	0.01	< 0.005	—	121
Total	—	—	—	—	—	—	—	—	—	—	—	767	767	0.05	0.01	—	769
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unrefrigerated	—	—	—	—	—	—	—	—	—	—	—	262	262	0.02	< 0.005	—	263
General Office Building	—	—	—	—	—	—	—	—	—	—	—	383	383	0.02	< 0.005	—	385
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	121	121	0.01	< 0.005	—	121
Total	—	—	—	—	—	—	—	—	—	—	—	767	767	0.05	0.01	—	769
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	—	43.5	43.5	< 0.005	< 0.005	—	43.6
General Office Building	—	—	—	—	—	—	—	—	—	—	—	63.5	63.5	< 0.005	< 0.005	—	63.7
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	20.0	20.0	< 0.005	< 0.005	—	20.1
Total	—	—	—	—	—	—	—	—	—	—	—	127	127	0.01	< 0.005	—	127

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

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

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Unrefrigerated	0.01	0.20	0.17	< 0.005	0.02	—	0.02	0.02	—	0.02	—	238	238	0.02	< 0.005	—	238
General Office Building	0.01	0.10	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	120	120	0.01	< 0.005	—	120
Other Non-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
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	358	358	0.03	< 0.005	—	359
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	0.01	0.20	0.17	< 0.005	0.02	—	0.02	0.02	—	0.02	—	238	238	0.02	< 0.005	—	238
General Office Building	0.01	0.10	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	120	120	0.01	< 0.005	—	120
Other Non-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
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	358	358	0.03	< 0.005	—	359
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	39.3	39.3	< 0.005	< 0.005	—	39.5

General Office Building	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	19.9	19.9	< 0.005	< 0.005	—	19.9
Other Non-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
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	0.05	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	59.2	59.2	0.01	< 0.005	—	59.4

4.2.4. Natural Gas Emissions By Land Use - Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	0.01	0.20	0.17	< 0.005	0.02	—	0.02	0.02	—	0.02	—	238	238	0.02	< 0.005	—	238
General Office Building	0.01	0.10	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	120	120	0.01	< 0.005	—	120
Other Non-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
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	358	358	0.03	< 0.005	—	359
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unrefrigerated	0.01	0.20	0.17	< 0.005	0.02	—	0.02	0.02	—	0.02	—	238	238	0.02	< 0.005	—	238
General Office Building	0.01	0.10	0.08	< 0.005	0.01	—	0.01	0.01	—	0.01	—	120	120	0.01	< 0.005	—	120
Other Non-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
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.02	0.30	0.25	< 0.005	0.02	—	0.02	0.02	—	0.02	—	358	358	0.03	< 0.005	—	359
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	39.3	39.3	< 0.005	< 0.005	—	39.5
General Office Building	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	19.9	19.9	< 0.005	< 0.005	—	19.9
Other Non-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
Parking Lot	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	< 0.005	0.05	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	59.2	59.2	0.01	< 0.005	—	59.4

4.3. Area Emissions by Source

4.3.1. Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	1.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.38	0.02	2.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.52	9.52	< 0.005	< 0.005	—	9.55
Total	1.62	0.02	2.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.52	9.52	< 0.005	< 0.005	—	9.55
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	1.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.03	< 0.005	0.21	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.78	0.78	< 0.005	< 0.005	—	0.78
Total	0.26	< 0.005	0.21	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.78	0.78	< 0.005	< 0.005	—	0.78

4.3.2. Mitigated

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

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	1.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.38	0.02	2.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.52	9.52	< 0.005	< 0.005	—	9.55
Total	1.62	0.02	2.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.52	9.52	< 0.005	< 0.005	—	9.55
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	1.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	0.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscap Equipment	0.03	< 0.005	0.21	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.78	0.78	< 0.005	< 0.005	—	0.78
Total	0.26	< 0.005	0.21	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.78	0.78	< 0.005	< 0.005	—	0.78

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	17.0	76.6	93.7	1.75	0.04	—	150
General Office Building	—	—	—	—	—	—	—	—	—	—	5.03	22.0	27.0	0.52	0.01	—	43.7
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	17.0	76.6	93.7	1.75	0.04	—	150

General Office Building	—	—	—	—	—	—	—	—	—	—	5.03	22.0	27.0	0.52	0.01	—	43.7
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	2.82	12.7	15.5	0.29	0.01	—	24.8
General Office Building	—	—	—	—	—	—	—	—	—	—	0.83	3.64	4.48	0.09	< 0.005	—	7.23
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.65	16.3	20.0	0.38	0.01	—	32.1

4.4.2. Mitigated

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

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

Unrefrigerated Warehouse-No	—	—	—	—	—	—	—	—	—	—	17.0	76.6	93.7	1.75	0.04	—	150
General Office Building	—	—	—	—	—	—	—	—	—	—	5.03	22.0	27.0	0.52	0.01	—	43.7
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	17.0	76.6	93.7	1.75	0.04	—	150
General Office Building	—	—	—	—	—	—	—	—	—	—	5.03	22.0	27.0	0.52	0.01	—	43.7
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	22.1	98.6	121	2.27	0.05	—	194
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	2.82	12.7	15.5	0.29	0.01	—	24.8

General Office Building	—	—	—	—	—	—	—	—	—	—	0.83	3.64	4.48	0.09	< 0.005	—	7.23
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	3.65	16.3	20.0	0.38	0.01	—	32.1

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	19.5	0.00	19.5	1.95	0.00	—	68.2
General Office Building	—	—	—	—	—	—	—	—	—	—	7.40	0.00	7.40	0.74	0.00	—	25.9
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	19.5	0.00	19.5	1.95	0.00	—	68.2
General Office Building	—	—	—	—	—	—	—	—	—	—	7.40	0.00	7.40	0.74	0.00	—	25.9
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	3.23	0.00	3.23	0.32	0.00	—	11.3
General Office Building	—	—	—	—	—	—	—	—	—	—	1.22	0.00	1.22	0.12	0.00	—	4.29
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	4.45	0.00	4.45	0.44	0.00	—	15.6

4.5.2. Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	19.5	0.00	19.5	1.95	0.00	—	68.2
General Office Building	—	—	—	—	—	—	—	—	—	—	7.40	0.00	7.40	0.74	0.00	—	25.9
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	19.5	0.00	19.5	1.95	0.00	—	68.2
General Office Building	—	—	—	—	—	—	—	—	—	—	7.40	0.00	7.40	0.74	0.00	—	25.9
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	26.9	0.00	26.9	2.69	0.00	—	94.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unrefrigerated Warehouse-No Rail	—	—	—	—	—	—	—	—	—	—	3.23	0.00	3.23	0.32	0.00	—	11.3
General Office Building	—	—	—	—	—	—	—	—	—	—	1.22	0.00	1.22	0.12	0.00	—	4.29
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	4.45	0.00	4.45	0.44	0.00	—	15.6

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01

4.6.2. Mitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.04	0.04
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Office Building	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01

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)

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

4.7.2. Mitigated

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

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

4.8.2. Mitigated

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

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

4.9.2. Mitigated

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

Equipment Type	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	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	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	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

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

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

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

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

Land Use	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

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

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequeste red	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequeste red	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	1/2/2024	1/8/2024	5.00	5.00	—
Grading	Grading	1/9/2024	1/18/2024	5.00	8.00	—
Building Construction	Building Construction	1/19/2024	12/5/2024	5.00	230	—
Paving	Paving	12/6/2024	12/31/2024	5.00	18.0	—
Architectural Coating	Architectural Coating	1/2/2025	1/27/2025	5.00	18.0	—

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
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Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Cement and Mortar Mixers	Diesel	Average	2.00	6.00	10.0	0.56
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	6.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	6.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41

Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Cement and Mortar Mixers	Diesel	Average	2.00	6.00	10.0	0.56
Paving	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	6.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	6.00	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	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	20.9	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	8.72	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	20.0	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	4.18	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	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	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	20.9	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	8.72	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	20.0	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	4.18	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	79,850	26,617	6,897

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	—	—	7.50	0.00	—
Grading	—	—	8.00	0.00	—
Paving	0.00	0.00	0.00	0.00	2.64

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
Unrefrigerated Warehouse-No Rail	0.00	0%
General Office Building	0.00	0%
Other Non-Asphalt Surfaces	0.47	0%
Parking Lot	2.17	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
2025	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
Unrefrigerated Warehouse-No Rail	66.9	66.9	66.9	24,434	509	509	509	185,934
General Office Building	144	32.6	10.3	39,721	1,094	248	78.6	302,256
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Unrefrigerated Warehouse-No Rail	66.9	66.9	66.9	24,434	509	509	509	185,934
General Office Building	144	32.6	10.3	39,721	1,094	248	78.6	302,256
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

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	79,850	26,617	6,897

5.10.3. Landscape Equipment

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

5.10.4. Landscape Equipment - Mitigated

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

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Unrefrigerated Warehouse-No Rail	180,068	532	0.0330	0.0040	741,611
General Office Building	263,027	532	0.0330	0.0040	374,114
Other Non-Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00
Parking Lot	82,861	532	0.0330	0.0040	0.00

5.11.2. Mitigated

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

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Unrefrigerated Warehouse-No Rail	180,068	532	0.0330	0.0040	741,611
General Office Building	263,027	532	0.0330	0.0040	374,114
Other Non-Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00
Parking Lot	82,861	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)
Unrefrigerated Warehouse-No Rail	8,896,881	315,124
General Office Building	2,623,350	0.00
Other Non-Asphalt Surfaces	0.00	0.00
Parking Lot	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Unrefrigerated Warehouse-No Rail	8,896,881	315,124
General Office Building	2,623,350	0.00
Other Non-Asphalt Surfaces	0.00	0.00
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Unrefrigerated Warehouse-No Rail	36.2	—
General Office Building	13.7	—
Other Non-Asphalt Surfaces	0.00	—
Parking Lot	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Unrefrigerated Warehouse-No Rail	36.2	—
General Office Building	13.7	—
Other Non-Asphalt Surfaces	0.00	—
Parking Lot	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
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
General Office Building	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00

General Office Building	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
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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
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5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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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
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5.16.2. Process Boilers

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

Equipment Type	Fuel Type
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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
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5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

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

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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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	34.8	annual days of extreme heat
Extreme Precipitation	1.35	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	1.27	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 $\frac{3}{4}$ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	5	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	5	1	1	4
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

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

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	88.7
AQ-PM	6.78
AQ-DPM	14.3
Drinking Water	71.3

Lead Risk Housing	31.6
Pesticides	0.00
Toxic Releases	93.4
Traffic	74.1
Effect Indicators	—
CleanUp Sites	17.1
Groundwater	0.00
Haz Waste Facilities/Generators	44.7
Impaired Water Bodies	0.00
Solid Waste	9.67
Sensitive Population	—
Asthma	48.9
Cardio-vascular	53.2
Low Birth Weights	64.2
Socioeconomic Factor Indicators	—
Education	54.4
Housing	26.2
Linguistic	10.4
Poverty	23.2
Unemployment	60.6

7.2. Healthy Places Index Scores

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

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	61.47824971
Employed	58.03926601

Median HI	77.27447709
Education	—
Bachelor's or higher	53.18875914
High school enrollment	100
Preschool enrollment	95.7141024
Transportation	—
Auto Access	67.17567047
Active commuting	10.03464648
Social	—
2-parent households	49.59579109
Voting	58.56537919
Neighborhood	—
Alcohol availability	91.82599769
Park access	20.87771077
Retail density	35.77569614
Supermarket access	17.92634416
Tree canopy	64.87873733
Housing	—
Homeownership	96.15039138
Housing habitability	75.15719235
Low-inc homeowner severe housing cost burden	31.66944694
Low-inc renter severe housing cost burden	41.4731169
Uncrowded housing	89.4649044
Health Outcomes	—
Insured adults	50.3143847
Arthritis	59.3
Asthma ER Admissions	60.5

High Blood Pressure	54.9
Cancer (excluding skin)	47.4
Asthma	55.1
Coronary Heart Disease	69.4
Chronic Obstructive Pulmonary Disease	59.8
Diagnosed Diabetes	58.5
Life Expectancy at Birth	21.7
Cognitively Disabled	36.6
Physically Disabled	21.0
Heart Attack ER Admissions	37.4
Mental Health Not Good	51.7
Chronic Kidney Disease	73.0
Obesity	45.5
Pedestrian Injuries	71.2
Physical Health Not Good	55.3
Stroke	64.5
Health Risk Behaviors	—
Binge Drinking	30.9
Current Smoker	51.2
No Leisure Time for Physical Activity	66.1
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	76.4
Elderly	31.8
English Speaking	78.8
Foreign-born	24.9

Outdoor Workers	64.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	94.1
Traffic Density	52.6
Traffic Access	23.0
Other Indices	—
Hardship	26.5
Other Decision Support	—
2016 Voting	54.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	40.0
Healthy Places Index Score for Project Location (b)	68.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Construction: Construction Phases	No demolition, vacant lot

ATTACHMENT B

**Focused Survey for Agassiz's Desert Tortoise, Habitat Assessments for
Burrowing Owl and Mohave Ground Squirrel, and
General Biological Resource Assessment for a
4.1-acre± Site (APNs 3111-012-083 & -084) in the City of Lancaster,
Los Angeles County, California**

(U.S. Geological Survey 7.5' Lancaster West quadrangle, Township 6 North, Range 12
West, a portion of the SE ¼ of the NW ¼ of Section 4, S.B.B.&M.)

Job#: 22-010

Prepared by:

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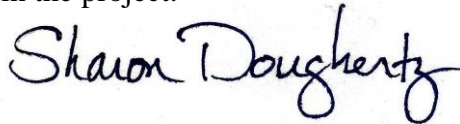
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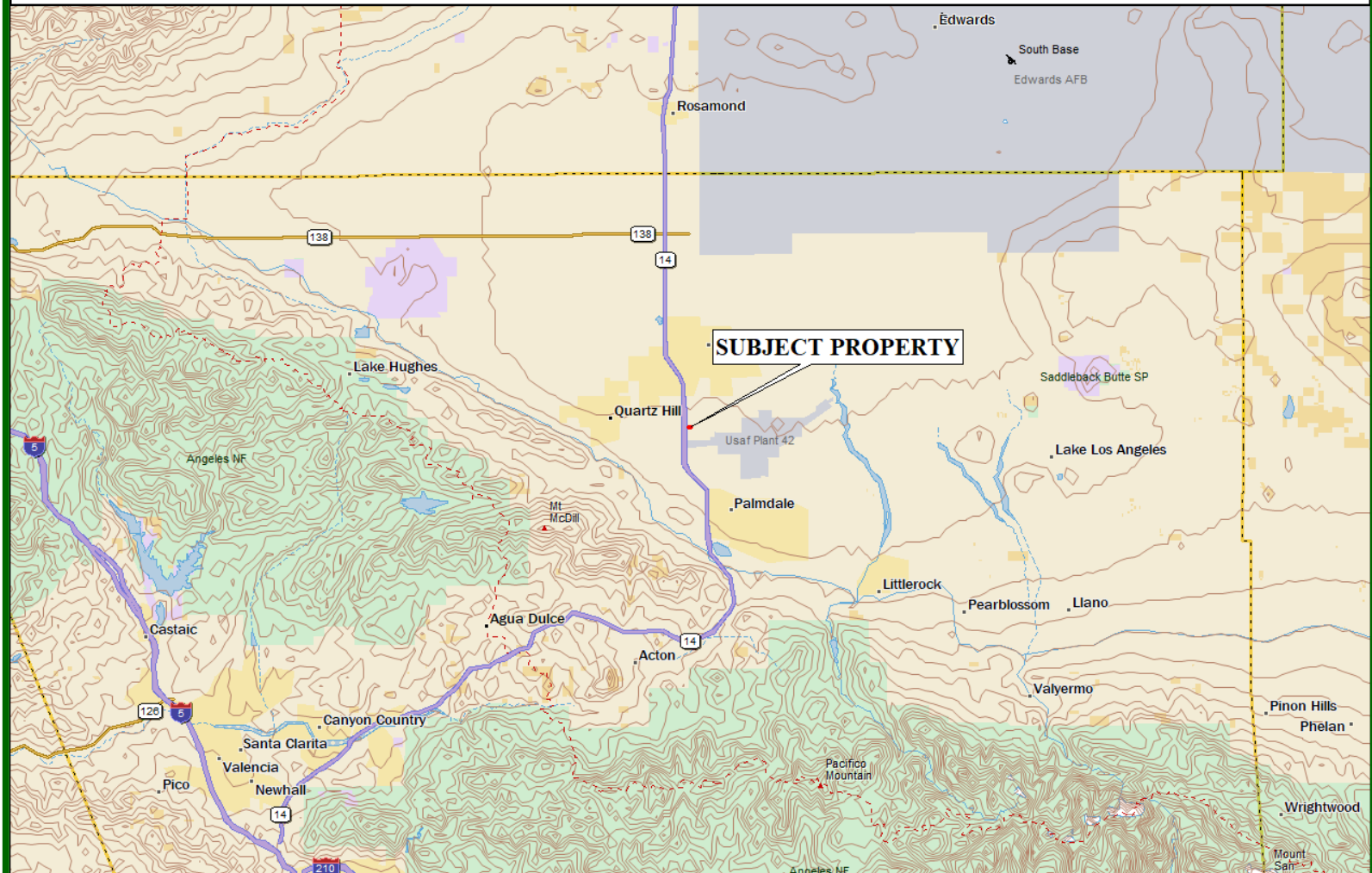
I hereby certify that the statements furnished herein, including attached exhibits, present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a nondisclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that I have no financial interest in the project.



Circle Mountain Biological Consultants, Inc.
Author and Field Investigator: Sharon E. Dougherty

March 2022

Figure 1. APNs 3111-012-083 & -084: Vicinity Map



Map produced by Circle Mountain Biological Consultants, Inc. March 2022



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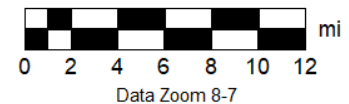
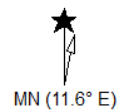
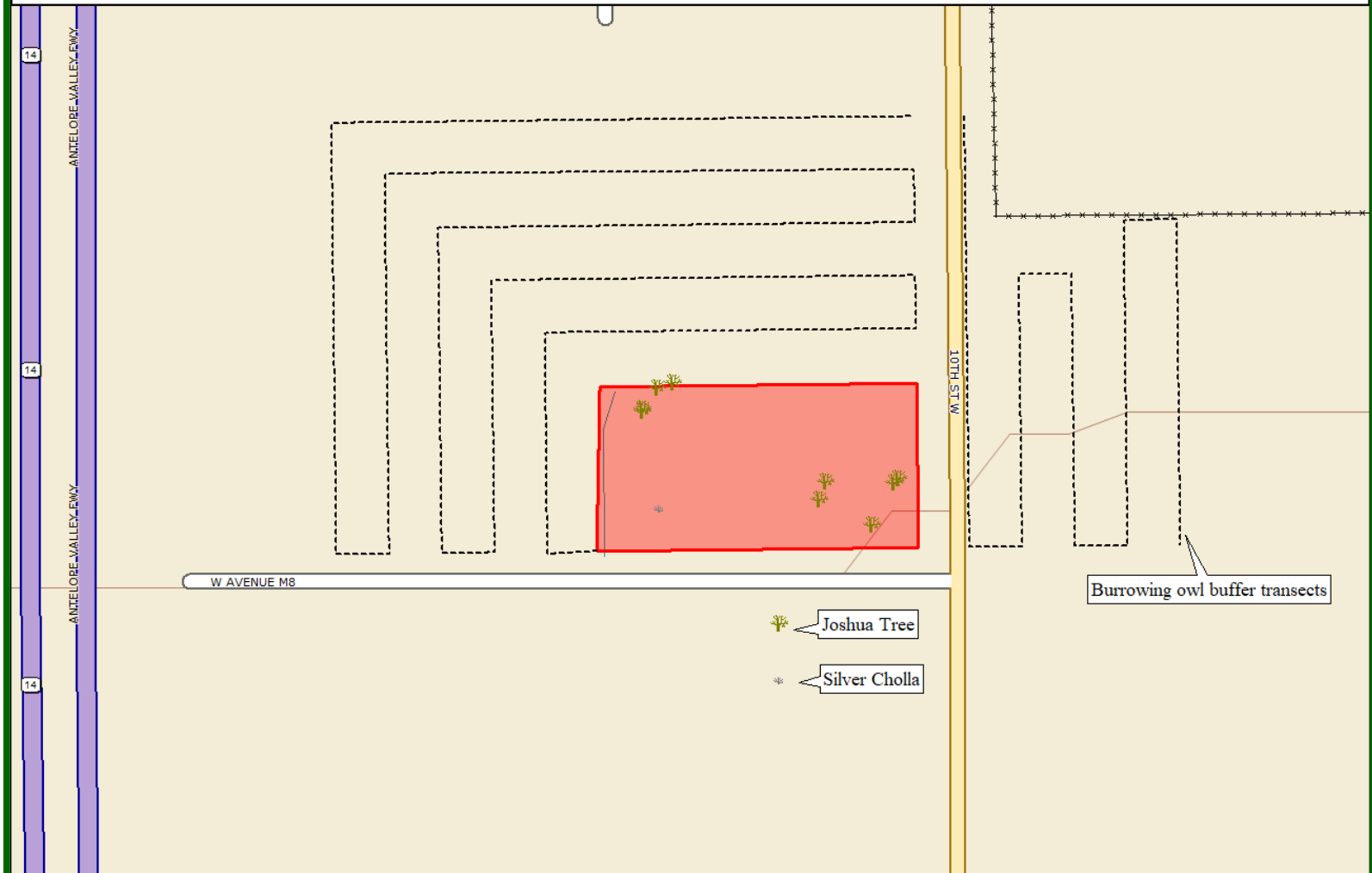


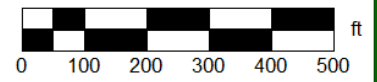
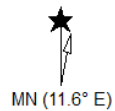
Figure 2. APNs 3111-012-083 & -084: Site Map



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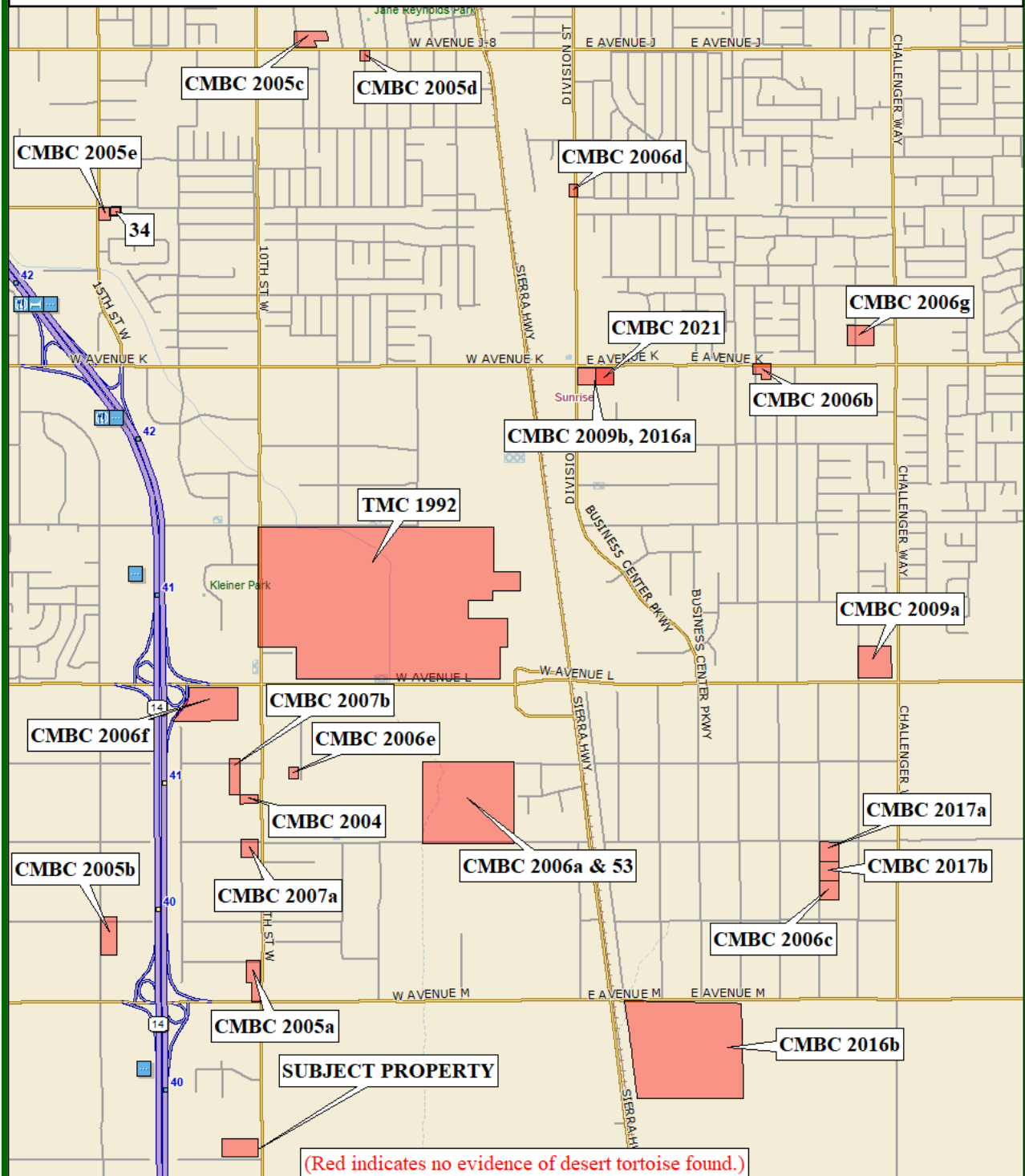
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Data Zoom 16-0

Figure 3. Results of Desert Tortoise Surveys from 1992 to 2022



Map produced by Circle Mountain Biological Consultants, Inc. March 2022



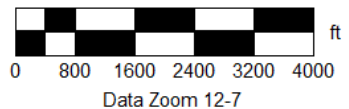
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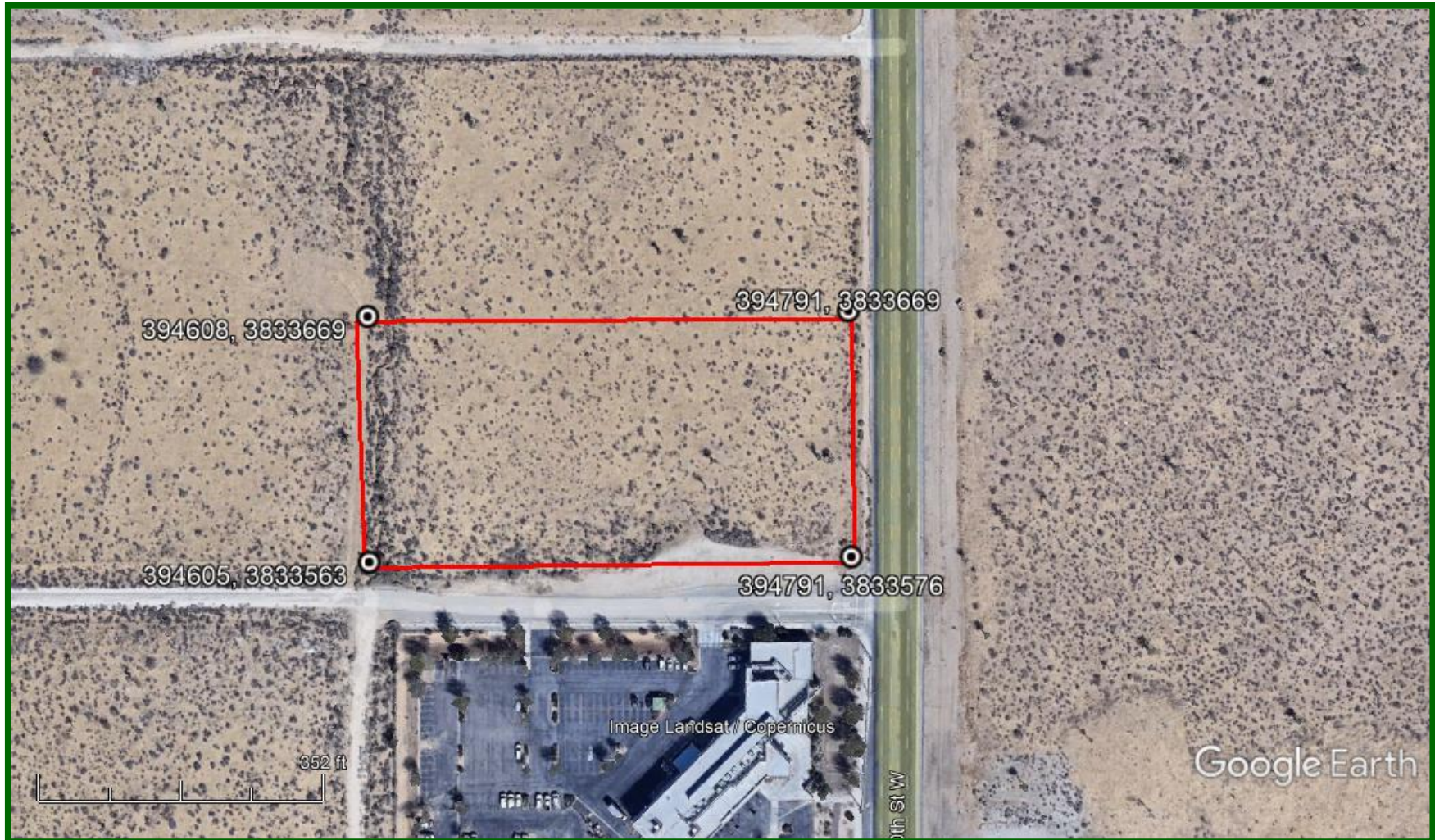


Figure 4. APNs 3111-012-083 &-084: Aerial Photograph (©2022 Google™ Earth)

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Executive Summary

Circle Mountain Biological Consultants, Inc. was contracted by SHL Engineering on behalf of Takvoryan Investments LLC (Proponent) to perform a focused survey for Agassiz's desert tortoise, habitat assessment for burrowing owl, and a general biological resource assessment on a parcel located in Lancaster, California (see Figures 1 and 2). APN 3111-012-083 is a 2.73-acre± parcel, less city rights-of-way, located at the northwest corner of Avenue M-8 and 10th Street West in the City of Lancaster. APN 3111-012-084 is located immediately to the north of the first parcel, and comprises 2.27 acres, less city rights-of-way. The legal description for the subject property is Township 6 North, Range 12 West, a portion of the SE ¼ of the NW ¼ of Section 4, S.B.B.&M. A mixed-use warehouse and office development is planned for the site.

For a total of 3 hours, between 1035 and 1335 on 1 March 2022, Sharon Dougherty of CMBC surveyed the site and adjacent areas as described herein. This entailed a survey of 10 transects, spaced at 10-meter (30-foot) intervals and oriented along an east-west axis throughout the 4.1-acre± site. As depicted in Figure 2, 5 zone of influence transects were surveyed for detection of burrowing owls at 30-meter (100-foot) intervals to the west, north, and east.

Based on DeLorme Topo USA© 10.0 software, elevations on the subject property range from approximately 781 meters (2,561 feet) at the southeast corner down to 779 meters (2555 feet) at the northwest corner. Terrain is relatively flat. Soils are sandy loam, non-alkaline, and well drained. No blue-line streams designated by the U.S. Geological Survey (USGS) occur on-site, but a drainage channel for urban run-off is present on the western boundary of the site. The common plant and animal species identified during the survey are listed in Appendices A and B, respectively.

Based on the absence of tortoise sign onsite and in adjacent areas, and available information reviewed for this habitat assessment, CMBC concludes that tortoises are absent from the subject property. As such, no impacts are expected, and no mitigation measures are recommended.

Based on the field survey and habitat assessment, CMBC concludes that none of the following special status species reported from the region will be adversely affected by site development: Lancaster milkvetch, alkali mariposa lily, Parry's spineflower, Rosamond eriastrum, Soledad shoulderband snail, tricolored blackbird, ferruginous hawk, Swainson's hawk, burrowing owl, and merlin. CMBC concludes that Mohave ground squirrel is absent from the site and that protocol trapping surveys are not warranted. As such, no adverse impacts have been identified and no mitigation measures are recommended for the above species.

Those species either identified during the current survey or for which suitable habitats are present include Joshua tree, white pigmy-poppy, Crotch bumble bee, northern California legless lizard, coast horned lizard, sharp-shinned hawk, Cooper's hawk, loggerhead shrike, LeConte's thrasher. Potential impacts to the other special-status species that have potential to occur on the site may include loss of individual plants or animals if present; loss of approximately 4 acres of suitable habitat; and/or temporary disturbance.

The California Department of Fish and Wildlife should be contacted to determine what avoidance, salvage, and/or mitigation measures are appropriate for the Joshua trees found on the site.

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**Focused Survey for Agassiz's Desert Tortoise, Habitat Assessments for
Burrowing Owl and Mohave Ground Squirrel, and
General Biological Resource Assessment for a
4.1-acre± Site (APNs 3111-012-083 & -084) in the City of Lancaster,
Los Angeles County, California**

1.0. Introduction

1.1. Purpose and Need for Study. Circle Mountain Biological Consultants, Inc. (CMBC) was contacted by Juan Carlos Herrera, of SHL Engineering on behalf of Takvoryan Investments LLC (Proponent) to perform a focused survey for Agassiz's desert tortoise (*Gopherus agassizii*), habitat assessments for burrowing owl (*Athene cunicularia*) and Mohave ground squirrel (*Xerospermophilus mohavensis*), and a general biological resource assessment on a 4.1-acre± site located in the city of Lancaster, Los Angeles County, California (see Figures 1 and 2). Since the city planning department does not have a specified protocol for biological technical reports, this report has been prepared, in part, according to County of San Bernardino's *Report Protocol for Biological Assessment Reports* (County of San Bernardino 2006), which is considered an appropriate, comprehensive format to report results of the field survey and habitat evaluation.

As the California Environmental Quality Act (CEQA) Lead Agency, the city of Lancaster planning department (City) is required to complete an initial study to determine if site development will result in any adverse impacts to rare biological resources. The information may also be useful to federal and State regulatory agencies, including U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), respectively, if the Lead Agency asks them to assess impacts associated with proposed development. Results of CMBC's focused tortoise survey, burrowing owl and Mohave ground squirrel habitat assessments, and general biological resource assessment are intended to provide sufficient baseline information to these agencies to determine if significant impacts will occur and to identify mitigation measures, if any, to offset those impacts.

1.2. Project Description. APN 3111-012-083 is a 2.73-acre± parcel (1.99 acres after deducting city rights of way) located at the northwest corner of Avenue M-8 and 10th Street West in the City of Lancaster. APN 3111-012-084 is located immediately to the north of the first parcel and comprises 2.27 acres less city rights-of-way (2.13 acres). The legal description for the subject property is Township 6 North, Range 12 West, a portion of the SE ¼ of the NW ¼ of Section 4, S.B.B.&M. A mixed-use warehouse and office development is planned for the site.

2.0. Methods

2.1. Literature Review. CMBC consulted materials included in our library to determine the nearest tortoise locations and other special status plant and animal species that have been reported from the vicinity of the subject property. Of relevance given their proximity to the subject property are 23 focused tortoise surveys completed on 21 sites,

located between approximately 2,277 feet north (Circle Mountain Biological Consultants, Inc. 2005a) and 3.5 miles north of the parcel (Circle Mountain Biological Consultants, Inc. 2005c), between 1992 (Tierra Madre Consultants 1992) and 2017 (r Circle Mountain Biological Consultants, Inc. 2017b), which, along with the subject property, are mapped in Figure 3. These and other materials used in the completion of this report are listed in Section 5.0, below.

In accordance with *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009), CMBC also consulted the latest version of the California Natural Diversity Data Base (CDFW 2022a) for rare plant (and animal) records reported from the USGS 7.5' Lancaster West quadrangle, which encompasses the site.

2.2. Field Survey.

2.2.1. *Survey and Habitat Assessment Protocols.* A significant paper was published in June 2011 (Murphy et al. 2011) whereby the “desert tortoise” of the Mojave Desert was split into two species, including *Gopherus agassizii*, referred to as “Agassiz’s desert tortoise,” and a newly described species, *G. morafkai*, referred to as “Morafka’s desert tortoise,” which occurs in the Sonoran Desert. According to Murphy et al. (2011), “...this action reduces the distribution of *G. agassizii* to only 30% of its former range. This reduction has important implications for the conservation and protection of *G. agassizii*, which may deserve a higher level of protection.” Then in 2016 (Edwards et al. 2016), a third species of tortoise was described, referred to as the “Goode’s Thornscrub Tortoise” (*Gopherus evgoodei*), which further reduced the perceived range of Morafka’s desert tortoise. Agassiz’s desert tortoise is the threatened species that occurs in the region surrounding the subject property.

For **Agassiz’s desert tortoise**, CMBC followed the presence-absence survey protocol first developed by the USFWS in 1992 and recently revised in 2019. USFWS (2019) protocol recommends surveying transects at 10-meter (30-foot) intervals throughout all portions of a given parcel and its associated action area. The *action area* is defined by regulation as all areas to be affected directly or indirectly by proposed development and not merely the immediate area involved in the action (50 CFR §402.02). For this site, the action area is the same as the subject property. Since the site is smaller than 500 acres, it may be surveyed year-round but there is no opportunity to estimate the density of tortoises on the 4.1-acre± subject property (USFWS 2019), particularly for this site where no tortoise sign was found.

For **burrowing owl**, although the formal habitat assessment does not specify a given interval to survey a site (Appendix C in CDFG 2012), subsequent breeding and nonbreeding studies identify that transects are surveyed at 7 to 20 meters (23 to 65 feet) apart, with five additional transects surveyed at 30-meter intervals out to 150 meters (500 feet) in adjacent areas in potential habitat (i.e., excluding areas substantially developed for commercial, residential, and/or industrial purposes) (Appendix D in CDFG 2012). With its narrower transect intervals, the tortoise survey is sufficient to cover the site for

burrowing owl. The focus of the survey is to find and inspect all burrows sufficiently large to be used by burrowing owls. Importantly, this methodology is considered a formal *habitat assessment* for presence of burrowing owls, which can be conducted any time of the year. Had burrowing owl sign been found, which it was not, it would have then been necessary to perform breeding burrowing owl surveys during the spring and summer as outlined in CDFG (2012).

For **Joshua tree**, in October 2020, the California Fish and Game Commission accepted as complete a petition to list Joshua tree as a California Endangered Species. The Commission had a year to consider the petition and publish its determination, which was expected in October 2021 and has been extended for another six months. Dougherty recorded locations of 9 Joshua trees using a Garmin GPS unit, which has a horizontal accuracy of 2 to 3 meters. Additional information taken for each tree included number of trunks, height(s), range of heights from the shortest to tallest trunks, and a general health assessment of poor, moderate, or good based on the color of leaves (i.e., spikes), necrosis on the leaves, posture (i.e., erect versus leaning), dead versus live branches on each tree, and adherence of bark to the trunk(s). The tabulated information for each Joshua tree is included in Appendix E.

For **Mohave ground squirrel**, some jurisdictions require that habitat assessments be performed by individuals certified by CDFW for trapping the species. Ed LaRue who performed the fieldwork and drafted this assessment possesses a Mohave ground squirrel Memorandum of Understanding with CDFW, dated January 21, 2020, as an attachment to scientific collecting permit (SC-001544), which expires on December 31, 2022. The primary assessment herein asks the following questions: (1) Is the site within the range of the species? (2) Is there native habitat with a relatively diverse shrub component? And (3) is the site surrounded by development and therefore isolated from potentially occupied habitat?

2.2.2. Field Survey Methods. For a total of 3 hours, between 1035 and 1335 on 1 March 2022, Sharon Dougherty of CMBC surveyed the site and adjacent areas as described herein. This entailed a survey of 10 transects, spaced at 10-meter (30-foot) intervals and oriented along an east-west axis throughout the 4.1-acre± site. As depicted in Figure 2, 5 zone of influence transects were surveyed for detection of burrowing owls at 30-meter (100-foot) intervals to the west, north, and east. (Development to the south precluded surveys in that direction.) Copies of CMBC's data sheet completed in the field and USFWS' (2019) pre-project survey data sheet are included in this report (see Appendix C).

As the site was surveyed, Dougherty kept tallies of observable human disturbances encountered on the 10 transects she surveyed. The results of this method provide *encounter rates* for observable human disturbances. For example, two roads observed on each of 10 transects yields a tally of 20 roads (i.e., two roads encountered 10 times). Habitat quality, adjacent land uses, and this disturbance information are discussed below in Section 3.2 relative to the potential occurrence of Agassiz's desert tortoise and other special status species on and adjacent to the subject property.

Weather conditions recorded at the beginning and ending of the survey included temperatures measured approximately 5 centimeters (2 inches) above the ground, percent cloud cover, and wind speeds measured by a hand-held Kestrel® weather and wind speed meter, as reported in Table 1.

Table 1. Weather Summary Data for the Survey			
Date 2022	Begin to End = 3 Total hours*	Weather Conditions	
		Beginning	Ending
3-1-22	1035 to 1335 = 3hrs	70°F, 1 ↑ 2 mph, 5% cloud	85°F, 4 ↑ 6 mph, 15% cloud

All plant and animal species identified during the survey were recorded in field notes. Garmin® hand-held, global positioning system (GPS) units were used to survey straight-line transects and record Universal Transverse Mercator (UTM) coordinates (North American Datum – NAD 83) for property boundaries, rare species locations, and other pertinent information (Appendix C). A digital camera was used to take representative photographs (Appendix D), with locations and directions of exhibits shown in Figure 6. ©2022 Google™ Earth was accessed via the internet to provide available aerial photographs of the subject property and surrounding areas (Figure 4).

3.0. Results

3.1. Common Biological Resources. The common plant and animal species identified during the survey are listed in Appendices A and B, respectively. Based on DeLorme Topo USA® 10.0 software, elevations on the subject property range from approximately 781 meters (2,561 feet) at the southeast corner down to 779 meters (2,555 feet) at the northwest corner. Terrain is relatively flat. Soils are sandy loam, non-alkaline, and well drained. No blue-line streams designated by the U.S. Geological Survey (USGS) occur on-site, but a drainage channel for urban run-off is present on the western boundary of the site.

3.1.1. *Common Flora*. The 24 plant species identified during the survey are listed in Appendix A. The site has notably sparser and less diverse vegetation than that present immediately to the east, on the opposite side of 10th Street West, indicating that the site may have been disturbed in the past. (See Figure 4.) The plant community present is best described as ***Artemisia tridentata* shrubland alliance** according to the system devised by Sawyer, Keeler-Wolf, and Evens (2008) for the California Native Plant Society. Dominant perennials present include Great Basin sagebrush (*Artemisia tridentata*), California buckwheat (*Eriogonum fasciculatum*), and rubber rabbitbrush (*Ericameria nauseosa*). Other common perennials present include Anderson's boxthorn (*Lycium andersoni*), peachthorn (*L. cooperi*), and Nevada joint-fir (*Ephedra nevadensis*). Joshua trees (*Yucca brevifolia*) are present on the site and are discussed later in this report.

Few annual species were detectable at the time of the survey since most local annuals had not germinated or were at very early stages of growth. Those present on the site or in surrounding areas include primarily non-native weed species such as Saharan mustard (*Brassica tourneforti*), red-stemmed filaree (*Erodium cicutarium*), split-grass (*Schismus*

sp.), and cheat grass (*Bromus tectorum*). Several native annual species adapted to disturbed conditions are also present and include rancher's fiddleneck (*Amsinckia tresselata*) and dove weed (*Croton setiger*).

3.1.2. *Common Fauna*. The 1 reptile, 6 bird, and 5 mammal species identified during the survey are listed in Appendix B. These are typical Mojave desert species for the most part. Northern mockingbirds and rock doves are typically associated with human development. The western bluebird observed on the site was likely an early spring migrant.

Other locally common reptile species that may occur include zebra-tailed lizard (*Callisaurus draconoides*), long-nosed leopard lizard (*Gambelia wislizenii*), desert horned lizard (*Phrynosoma platyrhinos*), desert night lizard (*Xantusia vigilis*), red racer (*Masticophis flagellum*), glossy snake (*Arizona elegans*), gopher snake (*Pituophis melanoleucus*), long-nosed snake (*Rhinocheilus lecontei*), and various rattlesnake species (*Crotalus* spp.).

3.2. Uncommon Biological Resources.

3.2.1. *Agassiz's Desert Tortoise*. No tortoise sign was found either on-site or in adjacent areas during this focused, protocol survey for the species (USFWS 2019). Based on the absence of tortoise sign on the subject property, in adjacent areas, and reported from the region (see Figure 3), CMBC concludes that Agassiz's desert tortoise is absent from the subject property. Also, there is no likelihood of wild tortoises entering the site from adjacent areas, either to pass through the site or establish residency.

Thirteen vehicle tracks and ten dump sites (which mostly were comprised of household trash, broken cement and asphalt) were encountered during the site survey.

As depicted in Figure 3, CMBC personnel have surveyed 21 sites within approximately 3 ½ miles of the subject property. No evidence of tortoises has been found on any of these surveys. In fact, no evidence of *living* tortoises has been found on any of the 76 focused surveys completed by CMBC personnel in the Palmdale-Lancaster area between 1991 and 2022. In June and July 1991, LaRue and two other tortoise biologists surveyed 342 linear miles of transects on 90 square miles within the city limits and sphere of influence of the city of Lancaster (Tierra Madre Consultants, Inc. 1991). No tortoise sign was found. Another team of two biologists simultaneously evaluating 122 square miles for Mohave ground squirrel in the same area found three tortoise carcasses. Dr. Kristin Berry, then with the Bureau of Land Management, judged that these tortoises had died between 1971 and 1989 (personal communication to LaRue in July 1991). On 19 July 2007, Brian Ludicke with the City indicated that no tortoises have been reported on any focused surveys within the city limits since the 1991 surveys.

With the publication of the Bureau of Land Management's (BLM) Record of Decision (BLM 2016), the Desert Renewable Energy Conservation Plan (DRECP) revised the 1980 California Desert Conservation Area Plan (CDCA Plan; BLM 1980) in significant

ways for the conservation and recovery of desert tortoises in the California Deserts. Although desert tortoise critical habitat was not changed (USFWS 1994a), Desert Wildlife Management Areas (DWMAs; USFWS 1994b) and Multiple Use Classes on BLM lands were eliminated. In addition to critical habitat, the two main designated areas under the DRECP CDCA Plan amendment that provide for tortoise conservation and recovery are Areas of Critical Environmental Concern (ACECs) and California Desert National Conservation Lands (CDNCLs). The subject property is not found within any of these conservation areas.

The subject property is approximately 17 miles west of the nearest CDNCL-designated lands in the West Desert and Eastern Slopes CDNCL subarea. As per the official DRECP website (www.drcp.org) and Appendix B, which depicts boundaries of management areas, the subject property is located approximately 17 miles west of the nearest desert tortoise ACEC, which is the Fremont-Kramer ACEC. The site is not found within Agassiz's desert tortoise critical habitat, which was designated in 1994 (U.S. Fish and Wildlife Service 1994a). The nearest critical habitat area is the Fremont-Kramer Critical Habitat Unit, which is located approximately 17 miles east of the site.

3.2.2. *Other Special Status Species.* U.S. Fish and Wildlife Service (2008), California Department of Fish and Wildlife [CDFW 2022a for California Natural Diversity Data Base; 2022b for Special Plant Species list; 2022c for Special Animal Species list; and California Native Plant Society (CNPS 2022)] maintain lists of animals and/or plants considered rare, threatened, or endangered, which are herein collectively referred to as “special status species.” No regulatory agency-designated special status species other than Joshua tree were identified during the current survey. Life history and occurrence information for rare species recorded in the California Natural Diversity Data Base (2022) or on one or more of the sites depicted in Figure 3 are given in the next few subsections. (See Appendix F for the CNDDDB Summary Table Report for the Lancaster West quadrangle. Figure 7 shows approximate locations for the closest records. Habitat descriptions included below are from the CNDDDB.)

As described earlier, the **Joshua tree** is currently a candidate for listing as a California Endangered Species. Nine Joshua trees were detected on the site, with a range of one to nine trunks per tree, all in good condition. These trees have been mapped in Figure 2. Specific information for each Joshua tree is included in Appendix E.

Lancaster milkvetch (*Astragalus preussi* var. *laxiflorus*) has been recorded once in the CNDDDB within the Lancaster West quadrangle. The record was from 1902 and the location given was non-specific. Habitat for this species consists of “chenopod scrub...alkaline clay flats or gravelly or sandy washes and along draws in gullied badlands. 700-735 m in California.” Habitat on the subject property is not suitable for this species, as soils are not alkaline.

Alkali mariposa lily (*Calochortus striatus*) has been recorded ten times in the CNDDDB within the Lancaster West quadrangle. The closest record was from 2016, 3.0 miles north-northwest of the subject property. for this species consists of “chaparral, chenopod

scrub, Mojavean desert scrub, meadows and seeps.” Habitat on the subject property is not suitable for this species since soils are well-drained and not alkaline.

White pigmy-poppy (*Canbya candida*) has been recorded once in the CNDDDB within the Lancaster West quadrangle. The closest record was from before 1922, with only a general location of Lancaster. Habitat for this species consists of “Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland...[in] gravelly, sandy, granitic places. 600-1460 m.” Habitat on the subject property appears suitable for this species.

Parry’s spineflower (*Chorizanthe parryi* var. *parryi*) has been recorded once in the CNDDDB within the Lancaster West quadrangle. The closest record was from 1896, with no specific location. This species is more typically found in coastal areas in chaparral or oak woodland. Habitat on the subject property is not suitable for this species.

Rosamond eriastrum (*Eriastrum rosamondense*) has been recorded twice in the CNDDDB within the Lancaster West quadrangle. The closest record was from 1993, approximately 6.6 miles north-northeast of the site. Habitat for this species consists of “chenopod scrub, vernal pools... alkali pool beds separated by very low hummocks with open chenopod scrub. Often sandy soil. 700-720 m.” Habitat on the subject property is not suitable for this species.

Crotch bumble bee (*Bombus crotchii*) has been recorded once in the CNDDDB within the Lancaster West quadrangle. The record was from 1971, approximately 4.5 miles NW of the site. Crotch bumble bees are known from “coastal California east to the Sierra-Cascade crest and south into Mexico....food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.” Habitat for this species may be present on the site.

Soledad shoulderband snail (*Helminthoglypta fontiphila*) has been recorded once in the CNDDDB within the Lancaster West quadrangle. No specific location or year is provided. This species is “known from type locality, Little Rock Creek Cyn on north side of San Gabriels; west to Santa Clarita in Soledad Cyn; east to the vicinity of Big Rock Creek; and north to Elizabeth Lake Cyn in the Sierra Pelona Mtns. ...Frequently found in riparian habitat (springs, seeps, along streams). May be found in rock piles, flood-borne debris, or under dead yuccas where other cover is not available.” Habitat on the subject property is not suitable for this species.

Northern California legless lizard (*Anniella pulchra*) has been recorded five times in the CNDDDB within the Lancaster West quadrangle. The closest record was 0.8 miles west-northwest of the site in 1988. Habitat on the subject property is not suitable for this species. Habitat for this species consists of “sandy or loose loamy soils under sparse vegetation. ... soil moisture is essential. they prefer soils with a high moisture content.”

Coast horned lizard (*Phrynosoma blainvillii*) has been recorded twice in the CNDDDB within the Lancaster West quadrangle. The closest record was 1.7 miles northeast of the site in 1964. This species “frequents a wide variety of habitats, most common in lowlands

along sandy washes with scattered low bushes... [It requires] open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.” Habitat on the subject property is suitable for this species.

Tricolored blackbird (*Agelaius tricolor*) has been recorded once in the CNDDDB within the Lancaster West quadrangle. It was observed 4.9 miles west-northwest of the site in 2011. This is a “highly colonial species, most numerous in Central Valley and vicinity. largely endemic to California. ...[It] requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.” Habitat on the subject property is not suitable for this species.

Ferruginous hawk (*Buteo regalis*) has been recorded twice in the CNDDDB within the Lancaster West quadrangle. The closest record was 7.2 miles northwest of the site in 1999. Habitat for this species consists of “open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats.” It is a winter resident of southern California and does not nest in the region.

Swainson’s hawk (*Buteo swainsoni*) has been recorded twice in the CNDDDB within the Lancaster West quadrangle. The closest record was 6.8 miles north-northeast of the site in 2016. This species “breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees...[It] requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.” Habitat on the subject property is not suitable for this species.

Cooper’s hawk (*Accipiter cooperi*) has not been recorded in the CNDDDB within the Lancaster West quadrangle. CMBC observed this species in 2006 (CMBC 2006a) approximately 1.3 miles west-northeast of the subject property. This species is commonly seen in wooded areas and feeds on birds and small mammals. It is a tree-nesting species. Cooper’s hawks would not be expected to nest on the site but could forage in the area and nest in neighboring landscaped areas.

Merlin (*Falco columbarius*) has been recorded once in the CNDDDB within the Lancaster West quadrangle. That record was 7.5 miles north-northwest of the site in 2010. This species is a very rare migrant or winter resident in southern California. There may be foraging habitat on the subject property, but merlins would not nest on the site.

Loggerhead shrike (*Lanius lanoviciania*) has not been recorded in the CNDDDB within the Lancaster West quadrangle. CMBC observed this species in 2006 (CMBC 2006a) approximately 1.3 miles west-northeast of the subject property. This species is commonly seen in grasslands and open areas. It hunts from perch sites such as Joshua trees, fence posts and utility poles, preying on insects, birds, lizards, and small mammals. Habitat on the site is suitable for the species.

LeConte’s thrasher (*Toxostoma lecontei*) has not been recorded in the CNDDDB within the Lancaster West quadrangle. CMBC observed this species in 2006 (CMBC 2006a) approximately 1.3 miles west-northeast of the subject property. LeConte’s thrashers may nest in several cactus species, particularly silver cholla (*Cylindropuntia echinocarpa*),

and in larger streamside shrubs. Habitat on the site is somewhat suitable for the species, although LeConte's thrashers are more typically found in higher quality habitat than that present on the subject property.

Burrowing owl is designated as a California Species of Special Concern by CDFW (2022c), as a Bird of Conservation Concern by the USFWS (2008) and is considered Sensitive by the BLM (CDFW 2022a). It is one of the focal species specifically sought during field surveys, and is usually detected by distinctive feathers, zygodactyl (x-shaped) tracks, and whitewash (fecal material deposited away from burrows may be from other bird species). Although pellets and feathers are sufficiently distinctive that they may be identified away from burrows, it is one or more of these signs at sufficiently large burrows that are the most definitive means of determining burrowing owl use of a given site.

In the case of the subject property, there was no evidence of burrowing owl. Burrowing owls do not create their own burrows; rather they find existing burrows, which they may slightly modify in order to occupy. Typical existing burrows used by burrowing owls include abandoned kit fox dens, both active and inactive tortoise burrows, deeper badger digs, and inactive California ground squirrel burrows. No such burrows were found on the site. This may be one of the reasons no burrowing owl sign was found.

Burrowing owls have been observed or detected at least four times by CMBC or in the CNDDDB for the Lancaster West quadrangle. The closest record is 1.2 miles northeast of the site, where CMBC located an active burrowing owl burrow (CMBC 2006a).

Mohave ground squirrel is designated as a Threatened species by the California Fish and Game Commission and is not federally listed. Despite two petitions, one in 1993 and another in 2005, to list the Mohave ground squirrel as a federally Endangered species, the USFWS ruled in both instances that listing was not warranted at those times. In recent years, the CDFW has considered three criteria in assessing potential impacts to the Mohave ground squirrel: (1) Is the site within the range of the species? (2) Is there native habitat with a relatively diverse shrub component? (3) Is the site surrounded by development and therefore isolated from potentially occupied habitats?

Figure 5 shows known locations of Mohave ground squirrels relative to the subject property (CDFW 2022a) and the extrapolated range of the species (Gustafson 1993; U.S. Bureau of Land Management 2005). The nearest reported occurrence was approximately 2.9 miles north-northeast where a squirrel was found in 1984. Other proximate occurrences have been 3.4 miles south-southeast (1944), 6.3 miles southeast (1977), and 6.6 miles east (1973). Numerous surveys performed in the surrounding region in much more suitable habitats (Leitner 2008) have failed to capture the species.

When a line is drawn to connect the known occurrences to determine the approximate range of the species (the "red line" in Figure 5 from U.S. Bureau of Land Management 2005), the site is approximately 1.2 miles west of the extrapolated western boundary, or approximately 1.2 miles outside the suspected species range.

Mohave ground squirrel has been reported between 550 meters (1,800 feet) and 1,710 meters (5,620 feet) elevation from a wide range of habitats including creosote bush scrub, saltbush scrub, Joshua tree woodland, juniper woodland, and Mohave mixed woody scrub (U.S. Bureau of Land Management 2005). Although at 785 meters (2,576 feet) elevation, the site is within the known elevational range of the species, habitat has been subject to disturbance. There is a relatively low level of diversity of native perennial plants, with only six shrub species identified.

Based on studies by Phil and Barbara Leitner (as summarized in U.S. Bureau of Land Management 2005), in the northern part of the range, winterfat and spiny hopsage are ecologically important shrubs for Mohave ground squirrel. Winterfat and spiny hopsage did not occur on the subject property, although both species were present in more intact habitats to the north. In any case, the presence of these plants does NOT imply that the Mohave ground squirrel occurs. There are no data to suggest that these plants are important to the species in the south as they appear to be in the Coso Range, near the northern extent of the Mohave ground squirrel known range.

Finally, contiguous lands are a patchwork of developed and undeveloped lands. State Highway 14 is located only 0.16 mile to the west of the site. 10th Street West, which is to the immediate east of the property is a 4-lane, heavily travelled road with speed limits of 55 mph.

Given the above information, CMBC concludes that the Mohave ground squirrel is likely absent from the subject property.

3.3. Other Protected Biological Resources.

3.3.1. *Stream Courses.* Stream courses provide relatively important resources to animals and plants. In dry years, and particularly during prolonged drought, annual plants may only germinate in the vicinity of washes where the water table is relatively near the surface. Perennial shrubs adjacent to washes are often the only plants that produce flowers and fruit, which in turn are important to insects and the avian predators that feed on them. Shrubs also tend to be somewhat taller and denser alongside washes, which provides cover for medium and larger sized animals that may use them as travel corridors. Biodiversity is generally enhanced by washes, and there are often both annual and perennial plants that are either restricted to or mostly associated with wash margins. There are both anecdotal accounts and published literature on washes being important to tortoises, which use them as travel corridors and access to nearby annual forage.

There are no natural drainages on the site, but a deeply eroded run-off channel has formed on the western boundary of the site. (See Exhibits 5 & 6.)

3.3.2. *Protected Plant Species*. At the State level, the 1998 Food and Agricultural Code, Division 23: California Desert Native Plants Act, Chapter 3: Regulated Native Plants, Section 80073 states: The following native plants, or any parts thereof, may not be harvested except under a permit issued by the commissioner or the sheriff of the county in which the native plants are growing:

- (a) All species of the family Agavaceae (century plants, nolin, yuccas).
- (b) All species of the family Cactaceae (cacti), except for the plants listed in subdivisions (b) and (c) of Section 80072 (i.e., saguaro and barrel cacti), which may be harvested under a permit obtained pursuant to that section.
- (c) All species of the family Fouquieriaceae (ocotillo, candlewood).
- (d) All species of the genus *Prosopis* (mesquites).
- (e) All species of the genus *Cercidium* (palo verdes).
- (f) *Acacia greggii* (catclaw acacia).
- (g) *Atriplex hymenelytra* (desert holly).
- (h) *Dalea (Psoralea) spinosa* (smoke tree).
- (i) *Olneya tesota* (desert ironwood), including both dead and live desert ironwood.

Silver cholla and Joshua trees are the plant species included in one or both above lists that were observed on the subject property.

4.0. Conclusions and Recommendations

4.1. Impacts to Agassiz's Desert Tortoise and Proposed Mitigation. Based on the absence of tortoise sign on-site and in adjacent areas, and available regional information reviewed for this habitat assessment, CMBC concludes that tortoises are absent from the subject property. As such, no impacts are anticipated, and no mitigation measures are recommended.

Whereas USFWS survey protocols historically indicated that the results of a given survey were valid for the period of only one year (USFWS 2010 and 2018), according to the revised, 2019 USFWS pre-project survey protocol, "*If the survey data are more than a year old, we encourage project proponents to contact us at the earliest possible time to allow us to assess the specific circumstances under which the data were collected (e.g., time of year, drought/rainfall conditions, size and location of the site, etc.) and to discuss whether additional surveys would be appropriate. Spatial information can be provided in pdf and GIS formats.*" At the time of this writing, At the time of this writing, the Palm Springs office of the USFWS would be the appropriate office to contact [(760) 322-2070] to determine if another survey should be performed prior to ground disturbance if it does not occur before 1 March 2023.

Regardless of survey results and conclusions given herein, tortoises are protected by applicable State and federal laws, including the California Endangered Species Act and Federal Endangered Species Act, respectively. As such, if a tortoise is found on-site at the time of construction, all activities likely to affect that animal(s) should cease and the City contacted to determine appropriate steps.

Importantly, nothing given in this report, including recommended mitigation measures, is intended to authorize the incidental take of tortoises during site development. Such authorization must come from the appropriate regulatory agencies, including CDFW (i.e., authorization under section 2081 of the Fish and Game Code) and USFWS [i.e., authorization under section 10(a)(1)(B) of the Federal Endangered Species Act].

4.2. Impacts to Other Biological Resources and Proposed Mitigation.

4.2.1 *Other Special Status Species.* Based on the field survey and habitat assessment, CMBC concludes that none of the following special status species reported from the region will be adversely affected by site development: Lancaster milkvetch, alkali mariposa lily, Parry's spineflower, Rosamond eriastrum, Soledad shoulderband snail, tricolored blackbird, ferruginous hawk, Swainson's hawk, burrowing owl, and merlin. As such, no adverse impacts have been identified and no mitigation measures are recommended for these species.

Those species either identified during the current survey or for which suitable habitats are present include Joshua tree, white pigmy-poppy, Crotch bumble bee, northern California legless lizard, coast horned lizard, sharp-shinned hawk, Cooper's hawk, loggerhead shrike, LeConte's thrasher.

The California Department of Fish and Wildlife should be contacted to determine what avoidance, salvage, and/or mitigation measures are appropriate for the Joshua trees found on the site.

Potential impacts to the other special-status species that have potential to occur on the site may include:

- loss of individual plants or animals if present;
- loss of approximately 4 acres of suitable habitat;
- temporary disturbance.

Although a focused Mohave ground squirrel trapping survey was not performed, CMBC assessed habitats and reviewed available information to provide a professional opinion as to the presence or absence of this species on the subject property. Given the information discussed herein, CMBC concludes that habitat loss and degradation onsite and isolation of the site from the west and south have significantly diminished the likelihood of occurrence, and judges that Mohave ground squirrel is absent from the site and that protocol trapping surveys are not warranted. The County/City and/or CDFW would need to concur with this determination (or not) before the conclusion and decision not to trap are considered final.

4.2.2. *Other Protected Biological Resources.*

4.2.2.a. Stream Courses. Fish and Game Code section 1602 requires any person, state or local governmental agency, or public utility to notify CDFW before beginning any activity that will do one or more of the following: (1) substantially divert or obstruct the natural flow of any river, stream or lake; (2) substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or (3) deposit

or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. Fish and Game Code section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state, including many dry washes in desert regions.

The consultant will generally collect data along each potential jurisdictional stream course, including measurements of the channels; dominant plants comprising the forb, shrub, and tree strata; and photographs at regular intervals, depending on how long the course is (100-foot intervals works well). If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Streambed Alteration Agreement will be prepared. The Agreement includes reasonable conditions necessary to protect those resources and must comply with CEQA. The proponent may proceed with the activity in accordance with the final Agreement. The form is available at <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3754&inline=1>. The completed form is sent along with the field baseline data to CDFW, Inland Deserts Region, Streambed Alteration, 3602 Inland Empire Boulevard, Suite C-220, Ontario, California 91764.

The drainage channel at the western boundary of the property does not appear to be a natural drainage, but rather has been created due to run-off from developed property to the south. The installation of a culvert under Avenue M-8 has concentrated that run-off and feeds into an east-west oriented drainage channel located approximately 350 feet north of the site.

It is likely that any site development can avoid impacts to the run-off drainage. If not, California Department of Fish and Wildlife should be contacted to determine whether section 1602 applies.

4.2.2.b. Protected Plants. Besides the Joshua trees discussed previously, a single silver cholla is the only protected plant found on the site. If possible, CMBC recommends that this cactus should be avoided or salvaged.

4.2.2.c. Bird Nests. Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests, including raptors and other migratory nongame birds (As listed under the Migratory Bird Treaty Act). Typically, CDFW requires that vegetation not be removed from a project site between March 15 and September 15 to avoid impacts to nesting birds. If it is necessary to commence project construction between March 15 and September 15, a qualified biologist should survey all shrubs and structures within the project site for nesting birds, prior to project activities (including construction and/or site preparation).

Surveys should be conducted at the appropriate time of day during the breeding season, and surveys would end no more than three days prior to clearing. CDFW is typically notified in writing prior to the start of the surveys. Documentation of surveys and findings should be submitted to the CDFW within ten days of the last survey. If no nesting birds were observed project activities may begin. If an active bird nest is located, the plant in which it occurs should be left in place until the birds leave the nest. No construction is allowed near active bird nests of threatened or endangered species.

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Appendix A. Plant Species Detected

The following plant species were identified on-site during the focused floral inventory described in this report. Protected plant species are highlighted in red and signified by “(PPS)” following the common names. The seven species found only in adjacent areas are signified by “+.”

GNETAE

Ephedraceae

Ephedra nevadensis

GNETAE

Joint-fir family

Nevada joint-fir

ANGIOSPERMAE: DICOTYLEDONES

DICOT FLOWERING PLANTS

Asteraceae

Artemisia tridentata

+*Baccharis emoryi*

Ericameria (Chrysothamnus) nauseosus

+*Lasthenia* sp.

+*Tetradymia stenolepis*

Sunflower family

Great Basin sagebrush

Emory baccharis

Rubber rabbitbrush

Goldfields

Mohave horsebrush

Boraginaceae

Amsinckia tessellata

Pectocarya penicillata

Borage family

Fiddleneck

Slender combseed

Brassicaceae

**Brassica tournefortii*

Mustard family

Saharan mustard

Cactaceae

Cylindropuntia echinocarpa

Cactus family

Silver cholla (PPS)

Chenopodiaceae

+*Grayia spinosa*

+*Krascheninnikovia lanata*

Goosefoot family

Spiny hopsage

Winterfat

Cuscutaceae

Cuscuta sp.

Dodder family

Dodder

Euphorbiaceae

Croton setiger

Spurge family

Croton

Geraneaceae

**Erodium cicutarium*

Geranium family

Red-stemmed filaree

Polygonaceae

Eriogonum fasciculatum

Buckwheat family

California buckwheat

Eriogonum gracile

Buckwheat

Solanaceae

Lycium andersonii

Lycium cooperi

Nightshade family

Anderson's box-thorn

Peach thorn

Zygophyllaceae

+*Larrea tridentata*

Caltrop family

Creosote bush

ANGIOSPERMAE: MONOCOTYLEDONES

MONOCOT FLOWERING PLANTS

Liliaceae

Yucca brevifolia

Lily family

Joshua tree (PPS)

Poaceae

**Bromus tectorum*

**Schismus* sp.

+*Stipa (Achnatherum) speciosa*

Grass family

Cheat grass

Split-grass

Desert needlegrass

* - indicates a non-native (introduced) species.

c.f. - compares favorably to a given species when the actual species is unknown.

Some species may not have been detected because of the seasonal nature of their occurrence. Common names are taken from Beauchamp (1986), Hickman (1993), Jaeger (1969), and Munz (1974).

Appendix B. Animal Species Detected

The following animal species were detected during the general biological inventory described in this report. **Special status animal species are highlighted in red and signified by “(SSA)” following the common names.** Those only found in adjacent areas are signified by “+.”

REPTILIA

Iguanidae

Uta stansburiana

AVES

Columbidae

Columba livia

Tyrannidae

Sayornis saya

Corvidae

Corvus corax

Muscicapidae

Sialia mexicana

Mimidae

Mimus polyglottos

Fringillidae

Carpodacus mexicanus

MAMMALIA

Leporidae

Sylvilagus audubonii

Sciuridae

+*Otospermophilus beecheyi*

Heteromyidae

+*Dipodomys* sp.

Canidae

Canis latrans

REPTILES

Iguanids

Common side-blotched lizard

BIRDS

Pigeons and doves

Rock dove (Pigeon)

Tyrant flycatchers

Say's phoebe

Crows and jays

Common raven

Thrushes and allies

Western bluebird

Mockingbirds and thrashers

Northern mockingbird

Finches

House finch

MAMMALS

Hares and rabbits

Audubon cottontail

Squirrels

California ground squirrel

Pocket mice

Kangaroo rat

Foxes, wolves, and coyotes

Coyote

Felidae*Lynx rufus***Cats**

Bobcat

Nomenclature follows Stebbins, *A Field Guide to Western Reptiles and Amphibians* (2003), third edition; Sibley, National Audubon Society, the Sibley Guide to Birds (2000), first edition; and Ingles, *Mammals of the Pacific States* (1965), second edition.

Appendix C. Field Data Sheets Completed on 1 March 2022

The USFWS and County recommend that consultants include copies of field data from which the results and conclusions given in their reports are derived. As such, copies of the data sheet completed by Sharon Dougherty on 1 March 2022 follows.

2022 Field Season

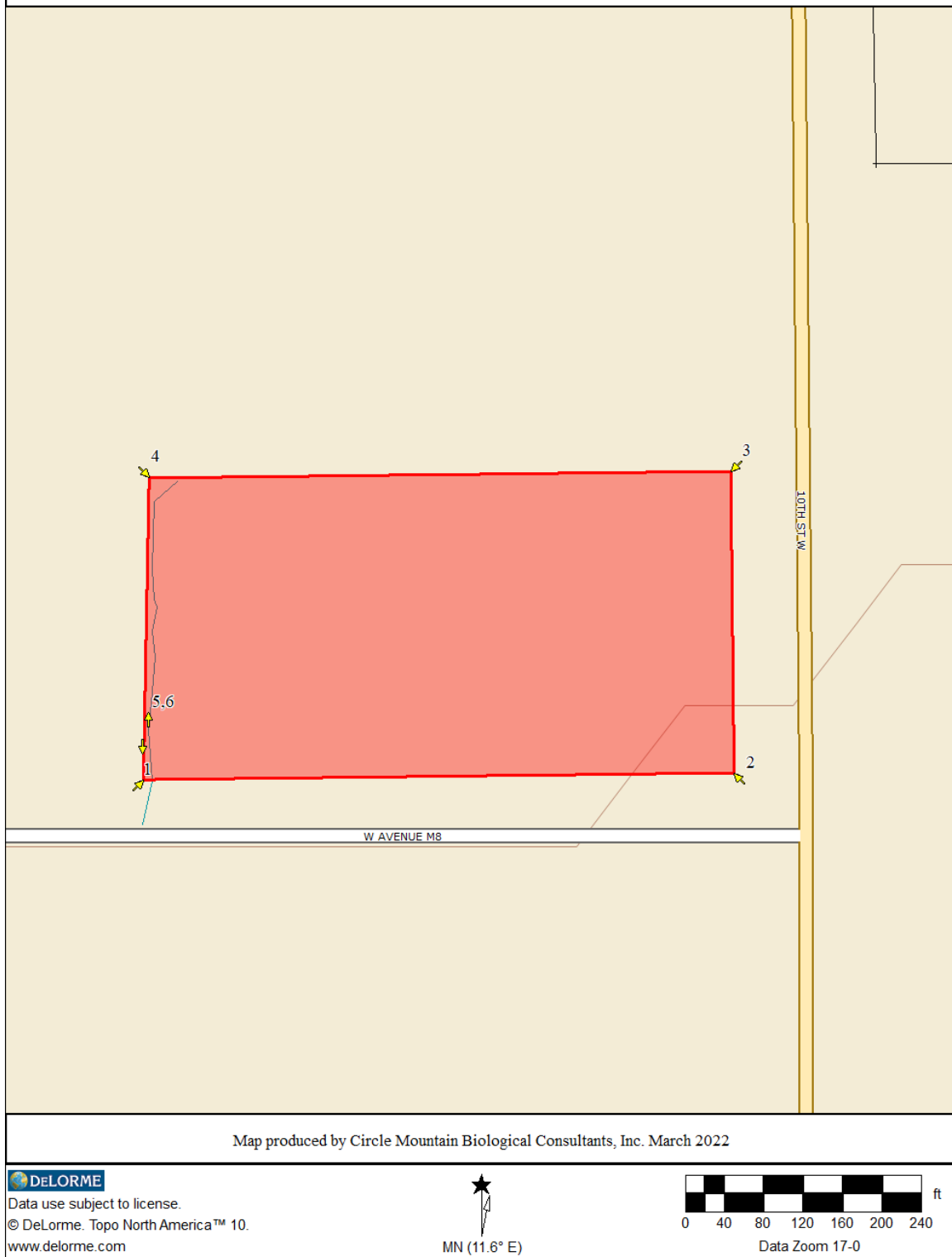
Page 1 of 1

JOB #/NAME		DATE	DRIVE TIME		MILES	FIELD TIME		SURVEYORS	
22-010		3-1-22	TO	FROM	90	BEGIN	END	SD	
WEATHER CONDITIONS (Start/End)					UTM (NAD 83) (circle starting corner)				
TEMP: 70°F WIND X: 1 ↑ 2 NSEW CLOUD: 5%					NE→ NW→ SE→ SW→				
TEMP: 85°F WIND X: 4 ↑ 6 NSEW CLOUD: 15%					0394 791 0394 608 0394 791 0394 608				
					3823 669 3833 669 3833 576 3833 576				
PLANT COMMUNITY			ANNUAL PLANTS			BIRDS		HERP	MAM
Joshua Tree Woodland			Erocr			NO MO		SBL1	AUCO
Perennial Plants			Batac			CORA			COYO
Yuc bre	Cylech		Sch sp			SAPH			B. OBL
Erifas			Cusc sp			RODO (N)			CAGS
Ephnev			Creset			WEBB (N)			KRAT
Chrnaw			Eri gra			HOFI (E)			
Lyc and			Amstet						
Lyc ccc			Brotec						
Staspe			Per pen						
Tet ste									
Lar tri									
Kralan									
Las sp.									
Grasp1									
Soils									
Sandy loam									
Photographs									
1 SW → NE									
2 SE → NW									
3 4 Drainage → N, → S									
5 6 Pecto cary									
7 NE → SW									
8 NW → SE									
OBSERVABLE HUMAN DISTURBANCES									
T#	East	North	OHV	Road	Dog	Dump	S Gun	Rifle	Target
1	-4610	-3575	*			::			10' good 1 trunk
2	-4791	-3585	1'			::			4764 -3588
3	-4610	-3595	1'			::			6 2', 15' good 2 trunks
4	-4791	-3605	1'			::			-4734 -3603
5	-4610	-3615	1'			::			6 3x1, 15' good 4 trunks
6	-4791	-3625	*			::			-4738 -3613
7	-4610	-3635							8 1', 3x3, 6', 7', 10', 17' good 9 trunks
8	-4791	-3645							-4777 -3612
9	-4610	-3655							5 15', good 1 trunk
10	-4791	-3665							-4779 -3614
30 W	-4580	-3575		30 E	-4820	-3820			6 2', 3', 15' good, 3 trunks
30 N	-4580	-3700		60 E	-4880	-3575			-4634 -3655
60 N	-4791	-3730		90 E	-4880	-3730			7 3x1, 6' good 4 trunks
60 W	-4580	-3730		120 E	-4910	-3575			-4634 -3654
90 W	-4520	-3575		150 E	-4940	-3760 (fence)			8 4', 1', 2', 4', 5' good 6 trunks
90 N	-4520	-3760							-4652 -3670
120 N	-4791	-3790							9 <1', 4x1', 2', 11', 14' good 8 trunks
120 W	-4490	-3790							-4643 -3667
150 W	-4460	-3575							Cyl ech -4645 -3601
150 N	-4410	-3820							

Run-off drainage along W boundary
Coyote den (inactive) -4612, -3652

Appendix D. Photographic Exhibits

Figure 6. APNs 3111-012-083 & -084: Photo points



Locations of the 6 photographic exhibits on the next 3 pages are depicted in Figure 6.



Exhibit 1. View from the SW corner of the parcel, facing NE (see Figure 6 for locations and directions of photographs).



Exhibit 2. View from the SE corner of the parcel, facing NW



Exhibit 3. View from the NE corner of the parcel, facing SW.



Exhibit 4. View from the SE corner of the parcel, facing NW.



Exhibit 5. View of run-off drainage facing north.



Exhibit 6. View of run-off drainage , facing south, towards culvert.

[illegible]

APPENDIX F. Records of Special-Status Species



Summary Table Report California Department of Fish and Wildlife California Natural Diversity Database



Query Criteria: Quad IS (Lancaster West (3411862))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Agelaius tricolor</i> tricolored blackbird	G1G2 S1S2	None Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	2,415 2,415	955 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Anniella pulchra</i> Northern California legless lizard	G3 S3	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	2,347 2,564	383 S:5	0	1	1	0	0	3	3	2	5	0	0
<i>Astragalus preussii</i> var. <i>laxiflorus</i> Lancaster milk-vetch	G4T2 S1	None None	Rare Plant Rank - 1B.1	2,400 2,400	5 S:1	0	0	0	0	1	0	1	0	0	1	0
<i>Athene cunicularia</i> burrowing owl	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	2,330 2,370	2011 S:4	0	2	0	0	2	0	0	4	2	1	1
<i>Bombus crotchii</i> Crotch bumble bee	G3G4 S1S2	None None		2,350 2,350	437 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Buteo regalis</i> ferruginous hawk	G4 S3S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	2,360 2,370	107 S:2	0	2	0	0	0	0	2	0	2	0	0
<i>Buteo swainsoni</i> Swainson's hawk	G5 S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	2,332 2,400	2541 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Calochortus striatus</i> alkali mariposa-lily	G3? S2S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	2,300 2,370	113 S:10	0	3	1	2	2	2	1	9	8	1	1

Commercial Version -- Dated February, 27 2022 -- Biogeographic Data Branch
Report Printed on Wednesday, March 02, 2022

Page 1 of 2
Information Expires 8/27/2022

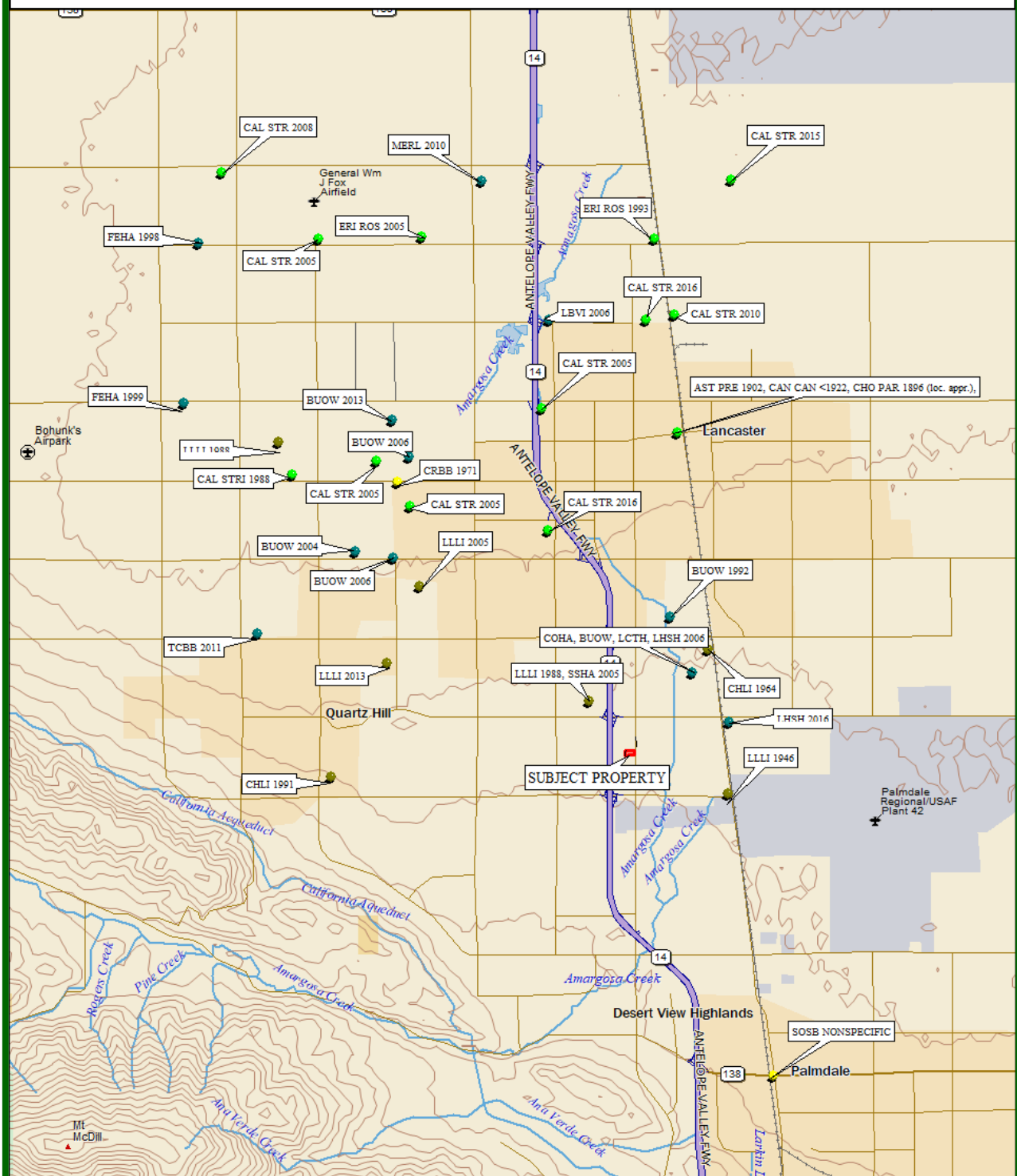


Summary Table Report
California Department of Fish and Wildlife
California Natural Diversity Database



Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Canbya candida</i> white pygmy-poppy	G3G4 S3S4	None None	Rare Plant Rank - 4.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	2,400 2,400	30 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Chorizanthe parryi</i> var. <i>parryi</i> Parry's spineflower	G3T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	2,350 2,350	150 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Eriastrum rosamondense</i> Rosamond eriastrum	G1? S1?	None None	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	2,316 2,325	8 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Falco columbarius</i> merlin	G5 S3S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	2,320 2,320	37 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Helminthoglypta fontiphila</i> Soledad shoulderband	G1 S1	None None		2,660 2,660	12 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Phrynosoma blainvillii</i> coast horned lizard	G3G4 S3S4	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	2,480 2,585	784 S:2	0	0	1	0	0	1	2	0	2	0	0
<i>Vireo bellii pusillus</i> least Bell's vireo	G5T2 S2	Endangered Endangered	IUCN_NT-Near Threatened NABCI_YWL-Yellow Watch List	2,316 2,316	503 S:1	0	0	0	1	0	0	0	1	1	0	0
<i>Xerospermophilus mohavensis</i> Mohave ground squirrel	G2G3 S2S3	None Threatened	BLM_S-Sensitive IUCN_VU-Vulnerable	2,440 2,440	432 S:1	0	0	0	0	0	1	1	0	1	0	0

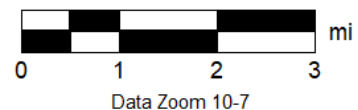
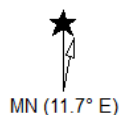
Figure 7. Records of Special-Status Species



Map produced by Circle Mountain Biological Consultants, Inc. March 2022



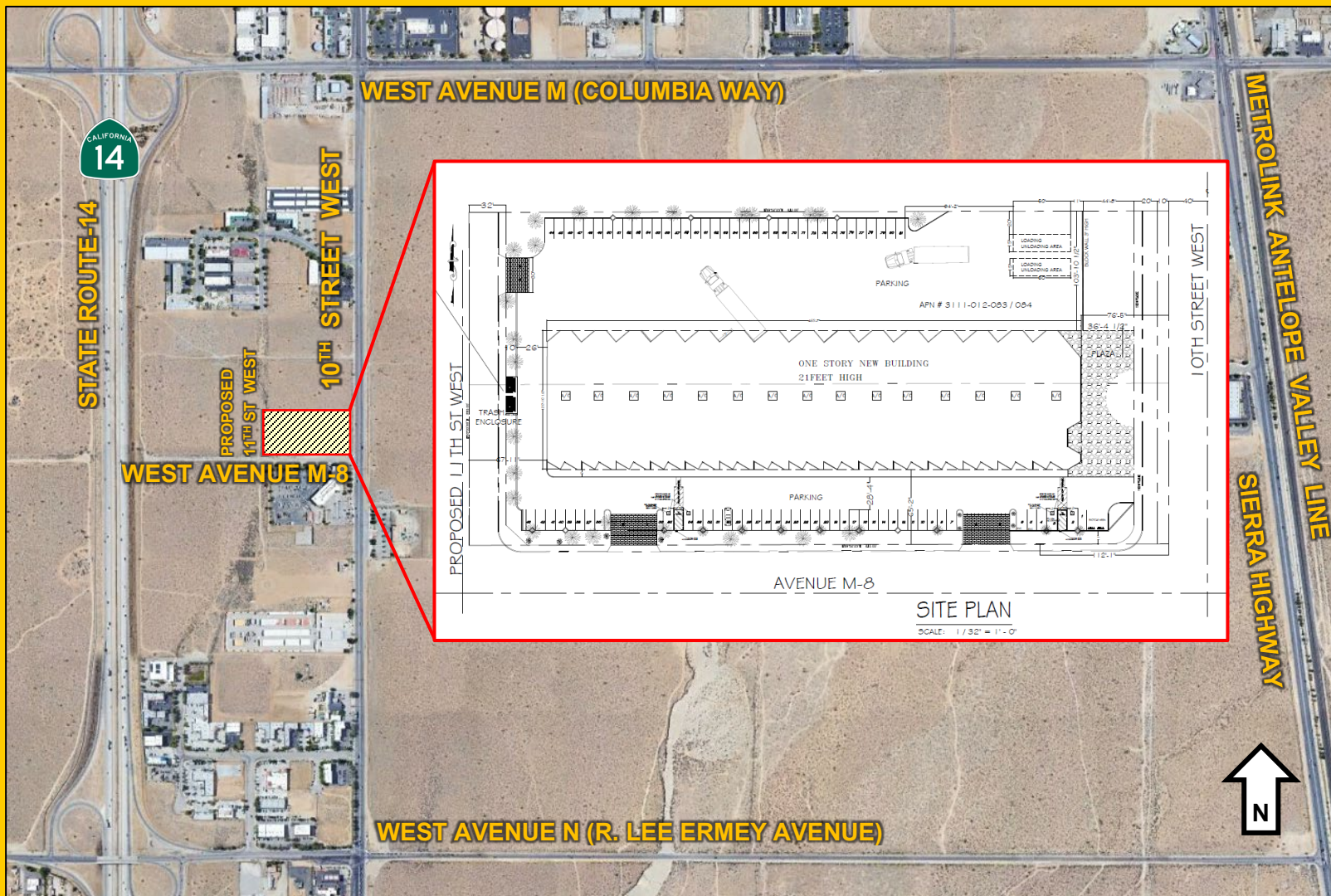
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for

Development of Warehouse/Office Space

at

Northwest Corner of 10th Street West & West Avenue M-8**Palmdale, CA 93551****APN: 3111 -012-083/3111 -012-084****PREPARED FOR:****CITY OF PALMDALE****Public Works Department**38250 Sierra Highway
Palmdale, CA 93550**PREPARED BY:****MINAGAR & ASSOCIATES, INC.**Traffic/Civil/Electrical Engineering – ITS – Transportation Planning – CEM
23282 Mill Creek Drive, Suite 120, East Tower
Laguna Hills, CA 92653**August 22, 2023**

TRAFFIC IMPACT ANALYSIS (TIA)

FOR

DEVELOPMENT OF WAREHOUSE/OFFICE SPACE

ON THE NORTHWEST CORNER OF 10TH STREET WEST & WEST AVENUE M-8

IN

CITY OF PALMDALE

PRESENTED TO:



CITY OF PALMDALE

Public Works Department

38250 Sierra Highway
Palmdale, CA 93550

PREPARED BY:



MINAGAR & ASSOCIATES, INC.

Traffic/Civil/Electrical Engineering - ITS - Transportation Planning - CEM

23282 Mill Creek Drive, Suite 120, East Tower
Laguna Hills, CA 92653
Tel: (949) 707-1199



AUGUST 22, 2023



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- Appendix A: Traffic Counts (TMC) Data Sheets**
- Appendix B: LOS and Intersection Delay Worksheets**
- Appendix C: Traffic Signal Warrant Analysis Worksheets**





1.0 – Project Description

This Traffic Impact Analysis (TIA) has been prepared to assess and identify the potential circulation impacts of the proposed development of a 53,233 square-foot light industrial warehouse/office space building (the “Project”) at the northwest corner of the intersection of 10th Street West and West Avenue M-8 in the city of Palmdale, California.

The traffic analysis is performed in accordance with the policies set in the *Los Angeles County Transportation Impact Analysis Guidelines* (July 2020) and the California Department of Transportation (Caltrans) traffic impact requirements.

1.1 – Site Location

The proposed Project Site is located at the northwest corner of the intersection of 10th Street West and West Avenue M-8 intersection in the City of Palmdale, California. The Project Site is bordered by 10th Street West to the east, West Avenue M-8 to the south, vacant land to the west and north. The Project Site location and surrounding vicinity are shown in **Figure 1**.

1.2 – Existing Project Site

The Project Site encompasses 187,647 square feet and is currently vacant. Vehicular access to the Project Site is only available through West Avenue M-8. The Site Plan is shown in **Figure 2**.

1.3 – Proposed Project Description

The Project proposes the development and construction of a 53,233 square foot light industrial building of a warehouse and office space.



TRAFFIC IMPACT ANALYSIS (TIA) for APN: 3111 -012-083/3111 -012-084
Development of Warehouse/Office Space at NWC of 10th St West & West Ave M-8
PALMDALE, CA

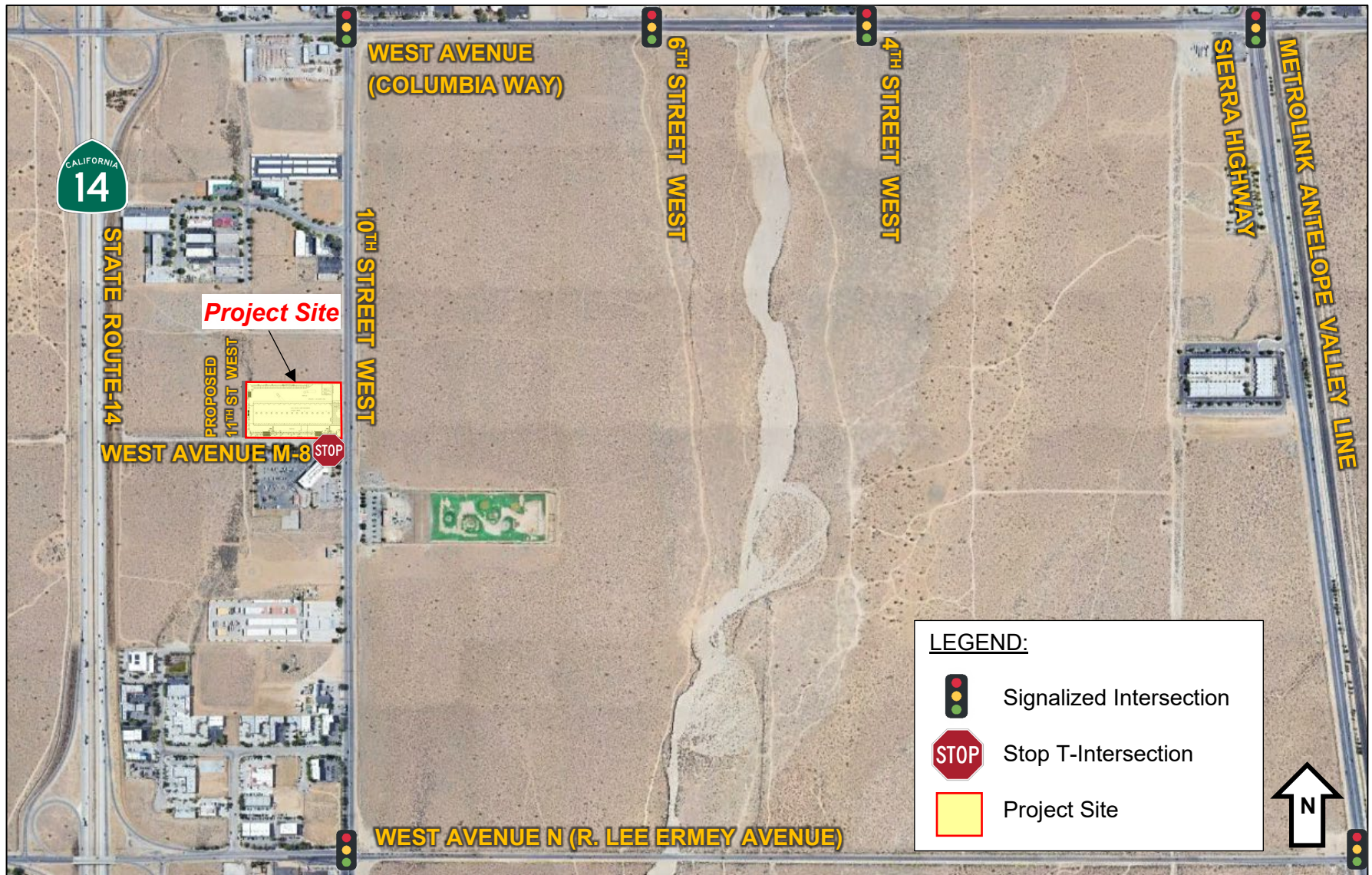


Figure 1: Project Site and Vicinity Map





TRAFFIC IMPACT ANALYSIS (TIA) for APN: 3111 -012-083/3111 -012-084
Development of Warehouse/Office Space at NWC of 10th St West & West Ave M-8
PALMDALE, CA

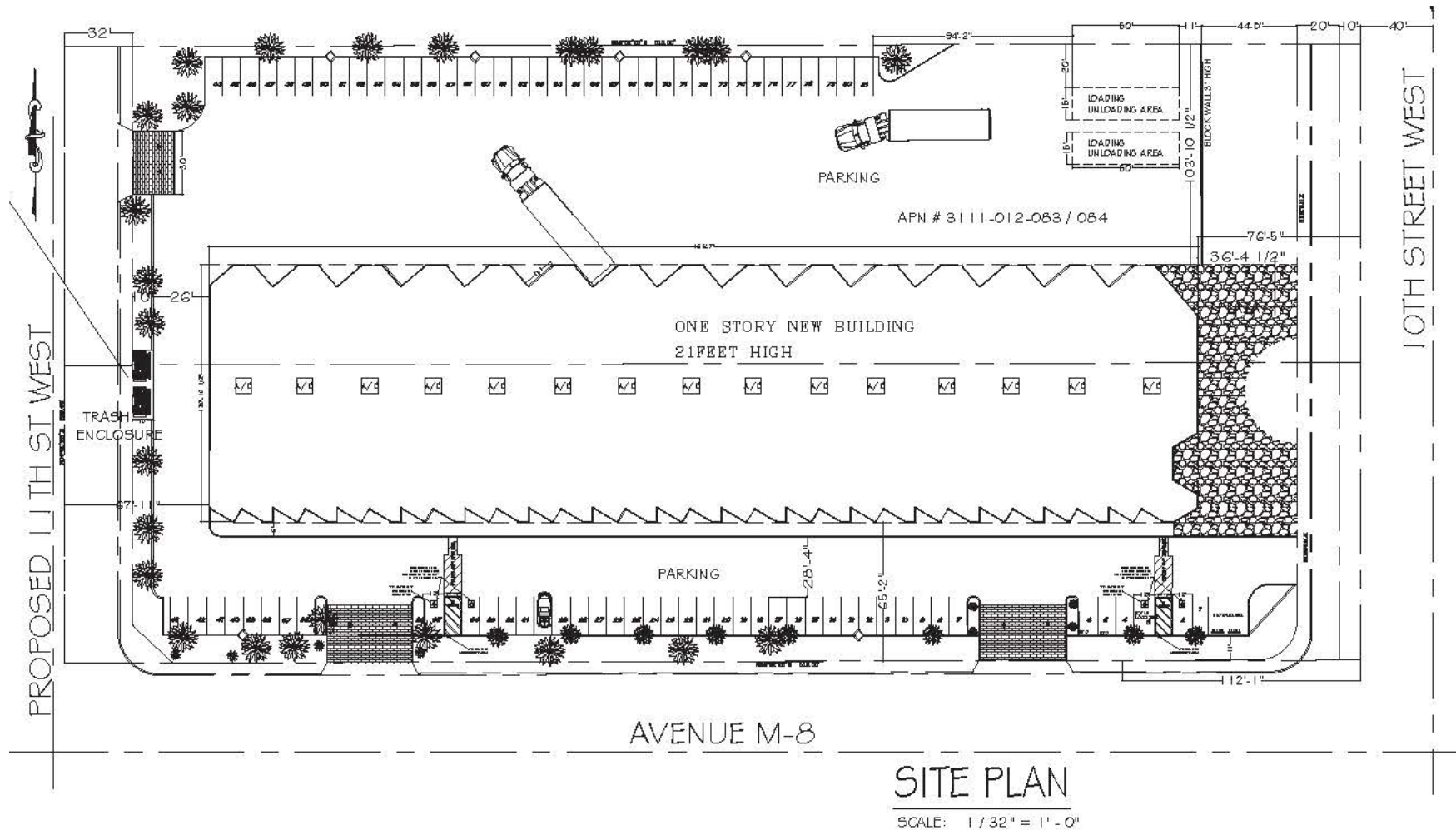


Figure 2: Project Site Plan





2.0 – Existing Street System

2.1 – Existing Regional Highway System

Regional access to the Project Site is provided by State Route 14 (SR-14) Antelope Freeway.

(SR-14) Antelope Freeway is a north–south state highway in the U.S. state of California that connects Los Angeles to the northern Mojave Desert. The route connects Interstate-5 (I-5, Golden State Freeway) on the border of the city of Santa Clarita to the north and the Los Angeles neighborhoods of Granada Hills and Sylmar to the south, with U.S. Route 395 (US-395) near Inyokern. SR-14 on- and off-ramps are located approximately 0.48 miles northwest and 0.55 miles southwest of the Project Site.

SR-14 is accessible from the Project site by utilizing either West Avenue N to 10th Street West to West Avenue M-8 or West Avenue M to 10th Street West to West Avenue M-8.

2.2 – Existing Local Bikeways and Transit Routes

Opportunities for sustainable transportation via bike and transit are available within the vicinity of the Project.

West Avenue M, located approximately 0.53 miles northwest of the project site, does not have designated/marked bike lanes in each direction but is currently a proposed bike lane on LA County Bicycle Master Plan. West Avenue N, located approximately 0.67 miles southwest of the Project Site, does not have designated/marked bike lanes in each direction, but is currently a proposed bike route on LA County Bicycle Master Plan. **Figure 3** displays further information on bikeways in the Project vicinity.

The Project Site does have convenient access to bus stops where the closest northbound bus stop is 0.13 miles and the closest southbound bus stop is 0.14 miles away from the project site. Therefore, the project site does have convenient access to the Antelope Valley Transit Authority (AVTA) route 1 through Palmdale and Lancaster. The Project Site's location relative to AVTA bus routes is shown in **Figure 4**. Other than a nearby business located across the street south from the Project Site and a bus stop approximately 640 feet away from the Project Site, the Project site is bounded by mostly vacant land to the north, east, and west.





Figure 3: Bikeways in the Project Vicinity

LEGEND

— Proposed Bike Lane





TRAFFIC IMPACT ANALYSIS (TIA) for APN: 3111 -012-083/3111 -012-084
Development of Warehouse/Office Space at NWC of 10th St West & West Ave M-8
PALMDALE, CA

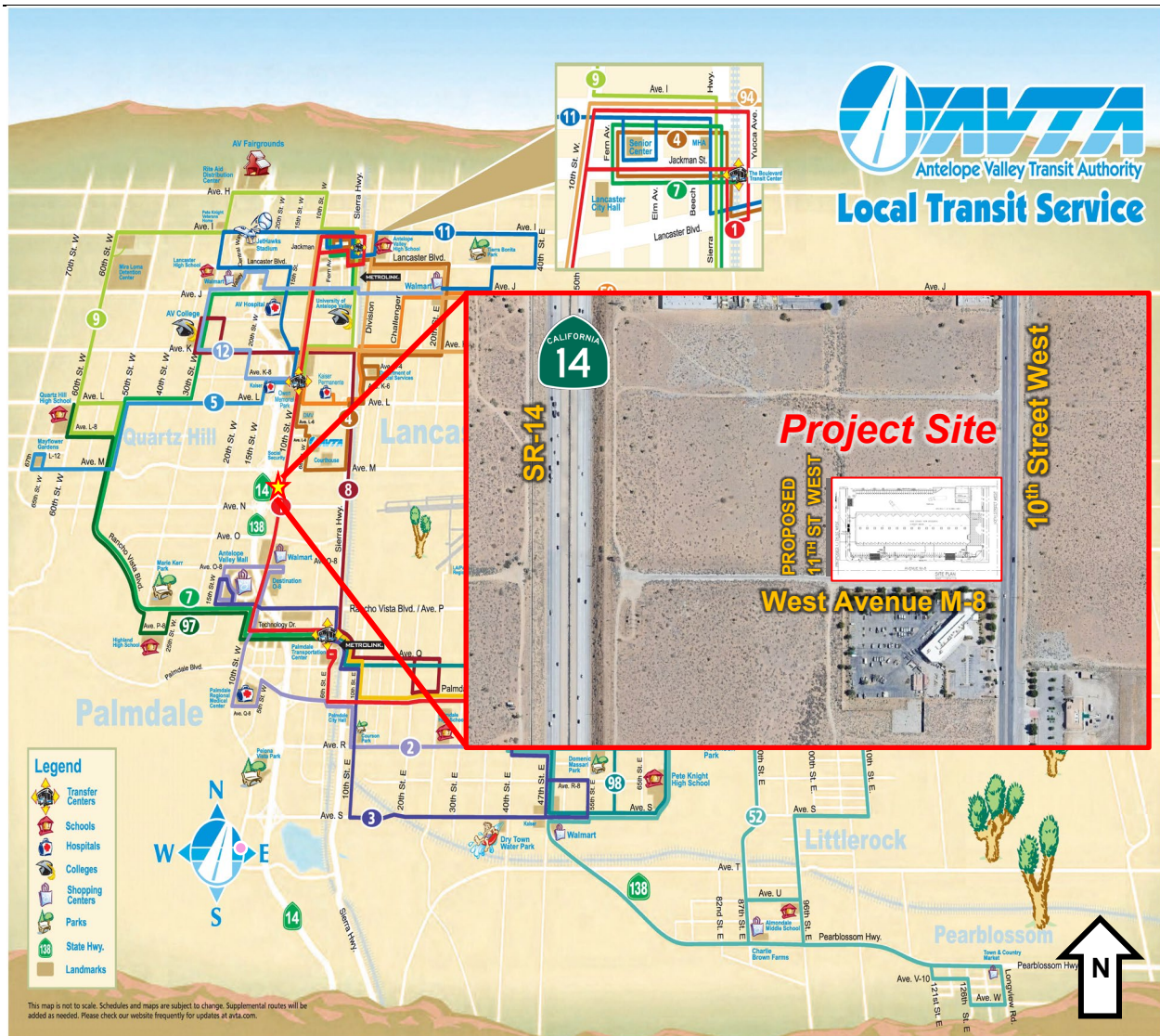


Figure 4: Antelope Valley Transit Authority (AVTA) Bus Routes in Antelope Valley





2.3 –Existing Local Roadway Systems

Immediate access to the Project Site is currently provided by West Avenue M-8 is shown in **Figure 3** above. West Avenue M-8 is an east-west roadway bordering the south boundary of the Project Site allowing two-way travel. To the east of the Project Site is 10th Street West, a north-south roadway. West Avenue M-8 Drive allows one lane of travel in each direction and 10th Street West allows two lanes of travel in each direction. Both roadways are shown in the images below.



West Avenue M-8 (Facing West)



10th Street West (Facing North)



TRANFFIC IMPACT ANALYSIS (TIA) for APN: 3111 -012-083/3111 -012-084
Development of Warehouse/Office Space at NWC of 10th St West & West Ave M-8
PALMDALE, CA

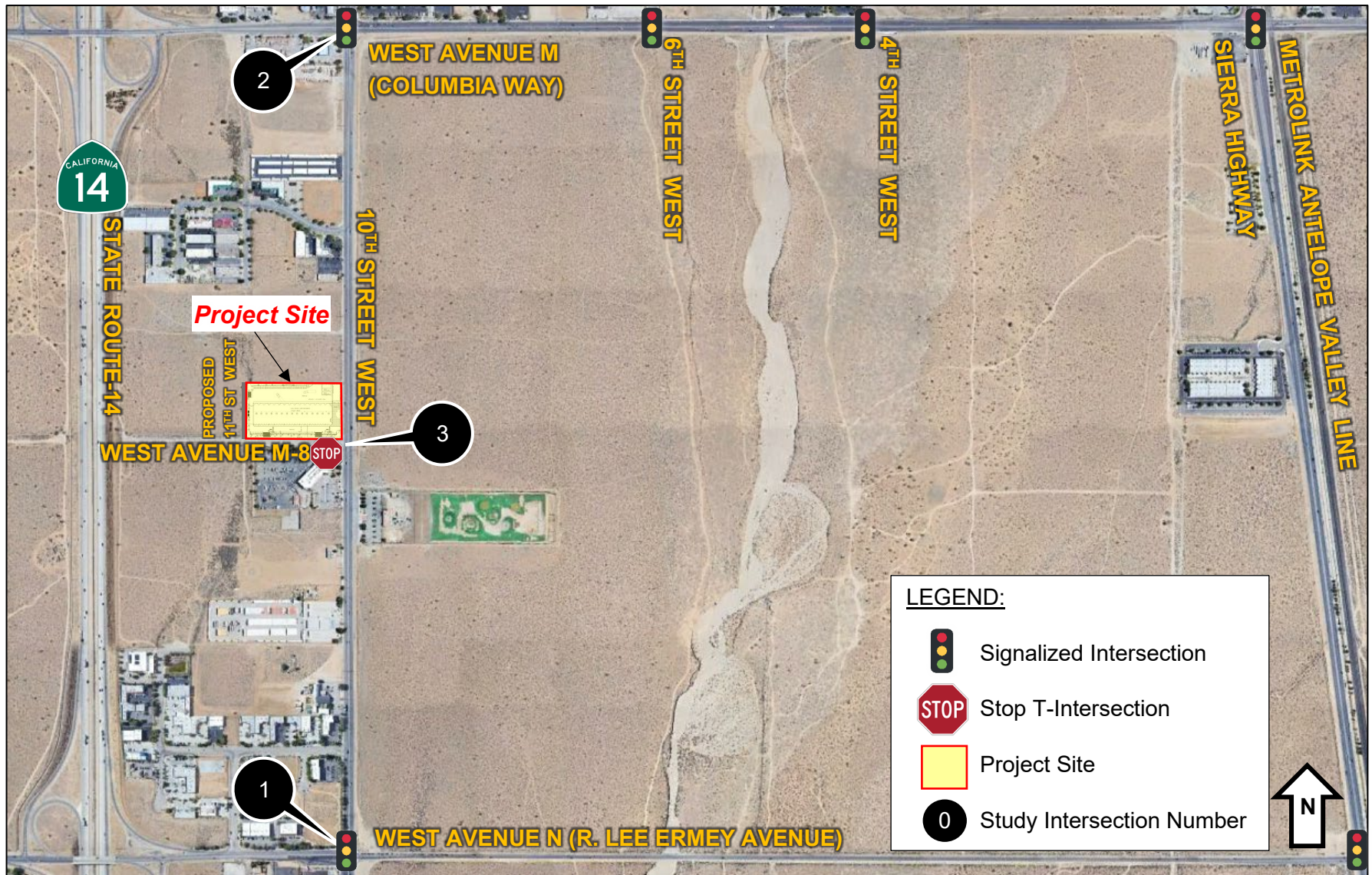


Figure 5: Study Intersection Location Map





3.0 – Analysis, Discussion, and Results

Turning Movement Counts (TMCs) were collected for three (3) existing intersections within the Project vicinity during the AM and PM peak hours on the typical weekday of Wednesday, August 9, 2023. The AM peak hour is defined as the one hour of highest traffic volumes between 7:00-10:00AM, while the PM peak hour is defined as the one hour of highest traffic volume between 3:00-6:00PM. These study intersections are shown above in **Figure 5**.

1. West Avenue N & 10th Street West (Signalized)
2. West Avenue M & 10th Street West (Signalized)
3. West Avenue M-8 & 10th Street West (Stop-controlled)

3.1 – Intersection Delay and Level of Service (LOS) Analysis

The HCM 7th Edition methodology describes the operation signalized and unsignalized intersections using a range of levels of service (LOS) from LOS A (free-flow conditions) to LOS F (severely congested conditions), as shown in **Table 1** below.

This transportation impact analysis report calculates and analyses LOS for relevant intersections in the project vicinity utilizing the Transportation Research Board (TRB) Highway Capacity Manual (HCM) 7th Edition, 2022, methodology under the following scenarios:

1. Existing (2023) Without Project Traffic Conditions
2. Opening Year (2024) Without Project Traffic Conditions
3. Opening Year (2024) With Project Traffic Conditions

An ambient growth rate of 1.5% was applied to existing volumes to calculate opening year volumes. LOS of each intersection was calculated using the latest Synchro software, Synchro 11, and depended on the average control delay in seconds.

Table 1: Signalized Intersection Level of Service Criteria

LOS	Description	Signalized Control Delay (sec/vehicle)	Unsignalized Delay (sec/vehicle)
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10	≤ 10
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	> 10 - 20	> 10 - 15
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	> 20 - 35	> 15 - 25
D	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues. This level is typically associated with design practice for peak periods.	> 35 - 55	> 25 - 35
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	> 55 - 80	> 35 - 50
F	Forced flow. Represents jammed conditions. Backups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	> 80	> 50





The County's *Transportation Impact Analysis Guidelines* establishes the minimum "acceptable" LOS to be LOS D or better. Any intersection that is operating at LOS "E" or "F" will be considered deficient and will require additional feasible measures to mitigate the project's impact under all project scenario conditions.

3.1.1 – Existing (2023) Without Project Traffic Conditions

Turning movement counts were collected on the typical weekday of Wednesday, August 9, 2023, and analyzed for all three study intersections as listed previously. Full turning movement count data for each intersection is provided in **Appendix A**.

As mentioned previously, the County guidelines define any intersection operating at LOS E or F to be deficient; these intersections would require additional feasible measures to mitigate project impact under all project scenario conditions.

As shown in the following table, all study intersections function at LOS D or higher during AM and PM Peak Hours under Existing (2023) Without Project Traffic Conditions; thus, they are not deficient and do not require additional mitigation. Detailed intersection delay and LOS worksheets for each intersection and analysis scenario are provided in **Appendix B**.

Table 2: Existing (2023) Without Project Traffic Conditions - Intersection Delay and LOS

Traffic Analysis Scenario	Inter-section #	Time Frames Analyzed						Deficient LOS?
		AM Peak Hour			PM Peak Hour			
		Delay (sec)	LOS	Change in Delay (sec)	Delay (sec)	LOS	Change in Delay (sec)	
1. Existing (2023) Without Project	1	17.1	B	-	40.6	D	-	NO
	2	17.0	B	-	28.3	C	-	NO
	3	12.1	B	-	16.5	C	-	NO



3.1.2 – Opening Year (2024) Without Project Traffic Conditions

An ambient growth rate of 1.5% was applied to existing traffic volumes to determine intersection delay and LOS under Opening Year (2024) without Project Traffic Conditions.

Although some intersections see an increase in delay as compared to Existing Conditions, all study intersections function at LOS D or higher during AM and PM Peak Hours under Opening Year (2024) Without Project Traffic Conditions; thus, they are not deficient and do not require additional mitigation.

Table 3: Opening Year (2024) Conditions - Intersection Delay and LOS

Traffic Analysis Scenario	Inter-section #	Time Frames Analyzed						Deficient LOS?
		AM Peak Hour			PM Peak Hour			
		Delay (sec)	LOS	Change in Delay (sec)	Delay (sec)	LOS	Change in Delay (sec)	
2. Opening Year (2024) Without Project	1	17.2	B	+0.1	42.5	D	+1.9	NO
	2	17.1	B	+0.1	29.3	C	+1.0	NO
	3	12.1	B	+0.0	16.7	C	+0.2	NO

3.1.3 – Opening Year (2024) With Project Traffic Conditions

An ambient growth rate of 1.5% was applied to existing traffic volumes, Trip Generation inbound and outbound distribution peak hour vehicle trips were also added to determine intersection delay and LOS under Opening Year (2024) With Project Traffic Conditions. **Figure 6** shows the Project Trip Distribution Map of the generated inbound and outbound vehicle trip percentages. Details on Project Trip Generation calculations are provided in **Table 5** of **Section 3.2 – Vehicle Miles Traveled (VMT) Analysis**.

As shown in the following table, all study intersections function at LOS D or higher during AM and PM Peak Hours; thus, they are not deficient and do not require additional mitigation.

Table 4: Opening Year With (2024) Conditions - Intersection Delay and LOS

Traffic Analysis Scenario	Inter-section #	Time Frames Analyzed						Deficient LOS?
		AM Peak Hour			PM Peak Hour			
		Delay (sec)	LOS	Change in Delay (sec)	Delay (sec)	LOS	Change in Delay (sec)	
3. Opening Year (2024) With Project	1	17.2	B	+0.0	42.6	D	+0.1	NO
	2	17.1	B	+0.0	29.5	C	+0.2	NO
	3	12.4	B	+0.3	17.2	C	+0.5	NO



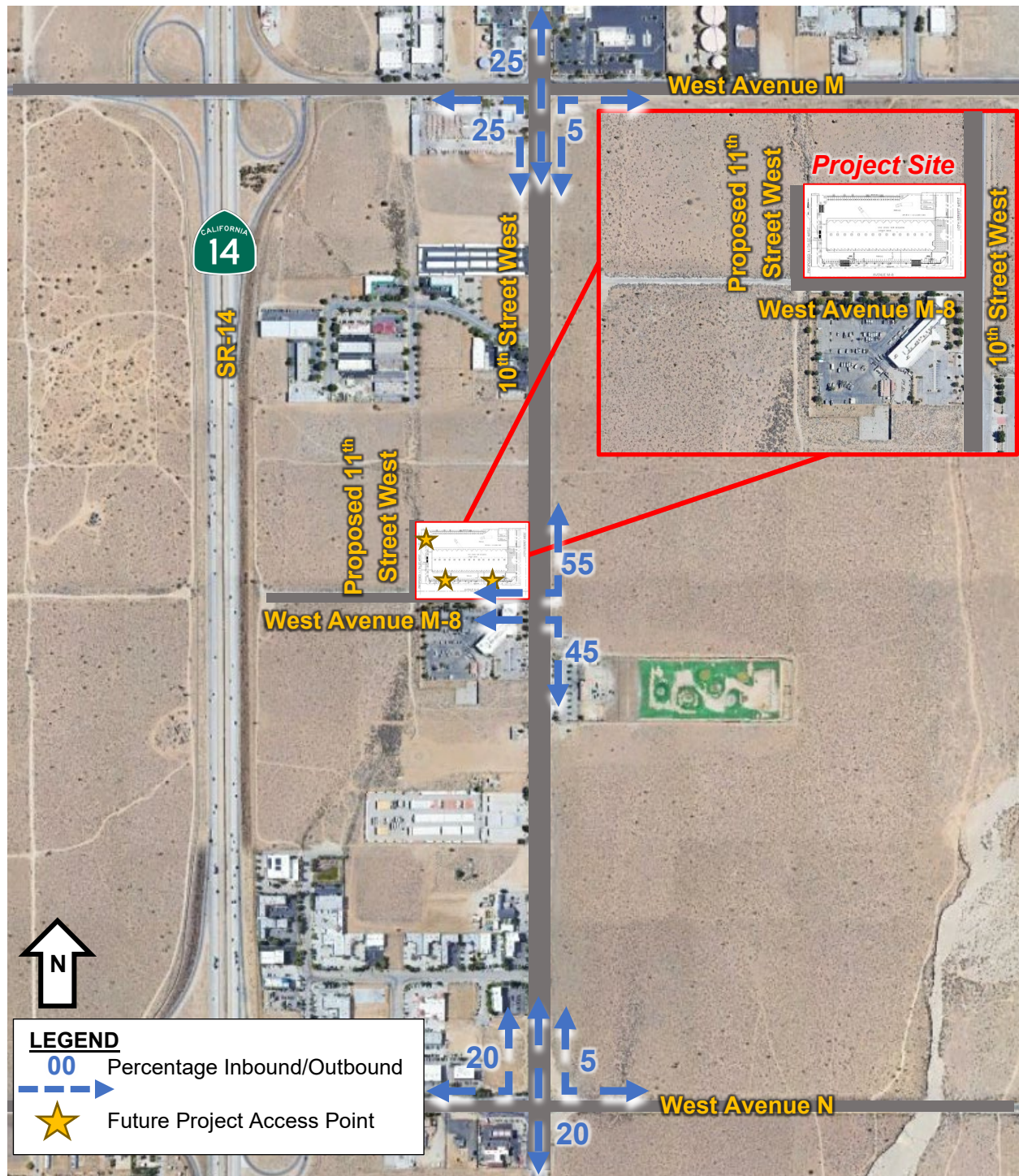


Figure 6: Project Trip Percentage Distribution Map





3.2 – Vehicle Miles Traveled (VMT) Analysis

3.2.1 – Project Size and Type Screening Criteria

To develop the traffic characteristics of the proposed Project, trip-generation statistics published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition, September 2021) for the following land use was utilized:

- Warehousing – ITE Land Use Code 150

The project was found to generate a total of 91 daily vehicle trips, as shown in **Table 5** below. As this is lower than the threshold of 110 daily trips stated in the County's *Senate Bill (SB) 743 Implementation and CEQA Updates Report* (June 2020), the Project was found to be **exempt** from further VMT Analysis based on the Project Size and Type screening criteria.

Table 5: Project Trip Generation Summary

Land Use	Warehousing
ITE LU Code	150
Units	1000 Square Feet of Gross Floor Area
Quantity (X)	53.233 TSF (Thousand Square Feet)

Project Trip Generation Rates ²							
	A.M. Peak Hour			P.M. Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
Rate (%)	0.13	0.04	0.17	0.05	0.13	0.18	1.71
Vehicle Trips (T)	7	2	9	3	7	10	91

3.2.2 – Transit Proximity Screening Criteria

A Project can be exempt from further VMT analysis if the Project has a close proximity (within ½ mile) to a High-Quality Transit Corridor. Per California Public Resources Code – PRC Division 13 – Environmental Quality Chapter 2.5 - Section 21064.3, this is defined as “a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during morning and afternoon peak commute periods. Furthermore, the exemptions may not be appropriate if the project is falls under any of the following criteria: 1) Has a floor area ratio of less than 0.75 2) Includes more parking than required by the county 3) Is inconsistent with the applicable SCAG SCS (as determined by the County) 4) Replaces affordable residential units with a smaller number of moderate- or high-income residential units. As shown on **Figure 7**, the Project does not qualify since it is not within ½ mile (3.75 miles) to a High-Quality Transit Corridor.

Thus, the Project it is **NOT exempt** using the Transit Proximity Criteria.





TRAFFIC IMPACT ANALYSIS (TIA) for APN: 3111 -012-083/3111 -012-084
Development of Warehouse/Office Space at NWC of 10th St West & West Ave M-8
PALMDALE, CA

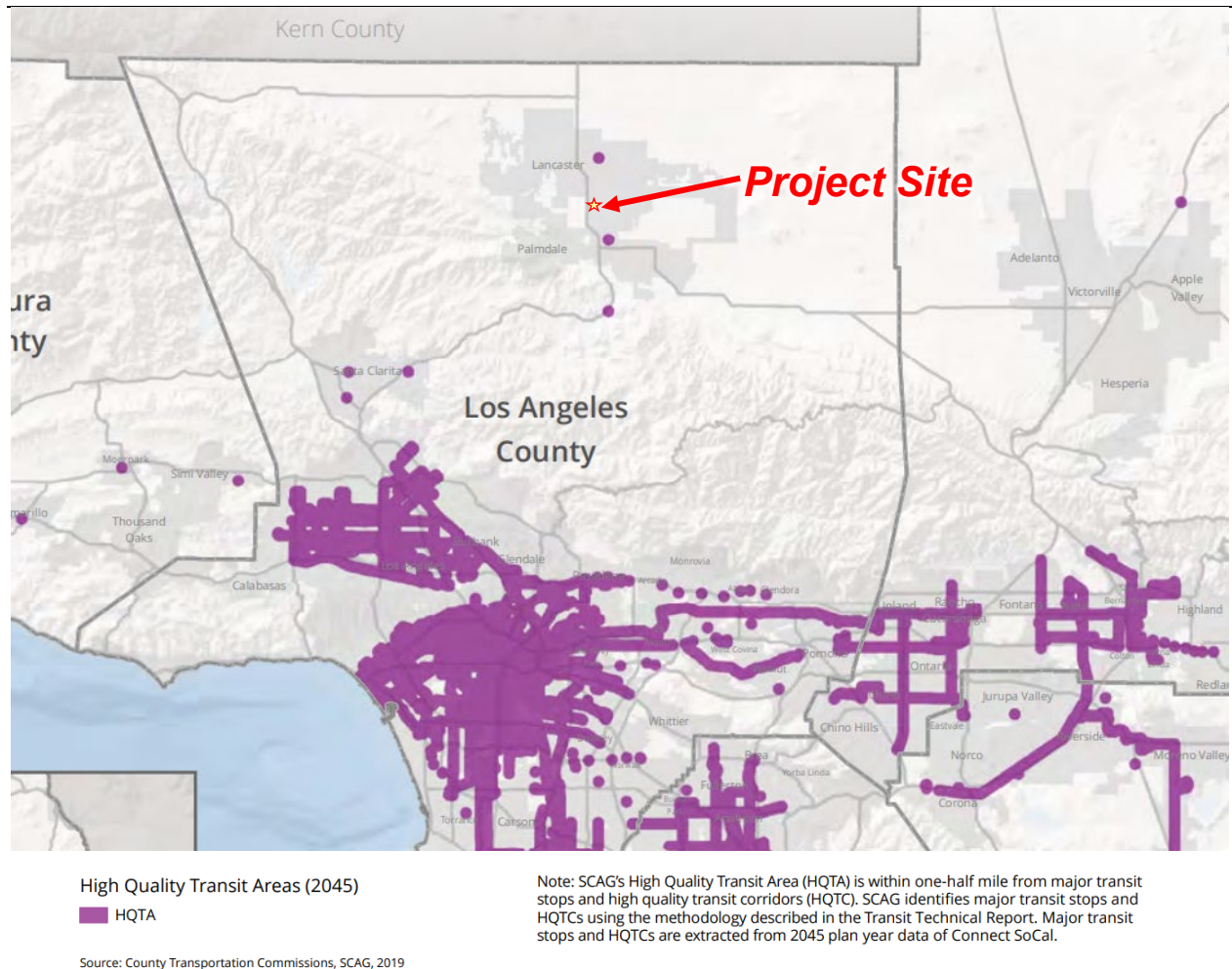


Figure 7: SCAG High Quality Transit Area Map (2045)

3.2.3 – Affordable Housing Screening Criteria

OPR guidance suggests that affordable housing projects in infill locations improve jobs-housing match and that affordable housing generates less VMT than market-rate housing, and therefore does not require a VMT analysis. This screening option aligns with County and State goals to streamline affordable housing projects. The Project does not apply to affordable housing.

Thus, the Project is NOT exempt using the Affordable Housing Screening Criteria. As the Project does not qualify for any of the screening criteria, further VMT analysis is required.





3.3 – Summary of Impact Criteria

The project also happens to be in a Low VMT Area, as shown in **Figure 8**. It is concluded that the Project's employment VMT per employee of 11.0 (42%) in the Antelope Region will be more than 16.8% below the existing employment VMT per employee of 19.0 for the Baseline Area of North County, shown on **Tables 6 and 7**.

Thus, the Project reaches the required minimum VMT reduction threshold of 16.8% and **WILL NOT** have a significant cumulative VMT impact. Therefore, the VMT analysis is complete and no further action is required.

Table 6: North and South County Baseline VMT

Region	Total VMT per Service Population	Residential VMT per Capita	Employment VMT per Employee
North County	43.1	22.3	19.0
South County	31.1	12.7	18.4

Table 7: Regional Planning Area VMT Metrics

Planning Area	Total VMT per Service Population	Residential VMT per Capita	Employment VMT per Employee
Antelope	41.0	21.0	11.0
Santa Clarita	43.7	24.1	22.1
San Fernando	30.6	13.4	17.4
Santa Monica Mountains	48.5	21.9	25.7
Westside	30.7	9.0	17.6
E San Gabriel	37.6	18.1	21.7
W San Gabriel	33.8	14.1	19.5
Metro	25.3	9.8	17.5
Gateway	32.6	13.3	18.7
South Bay	32.0	13.1	18.6



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PALMDALE, CA

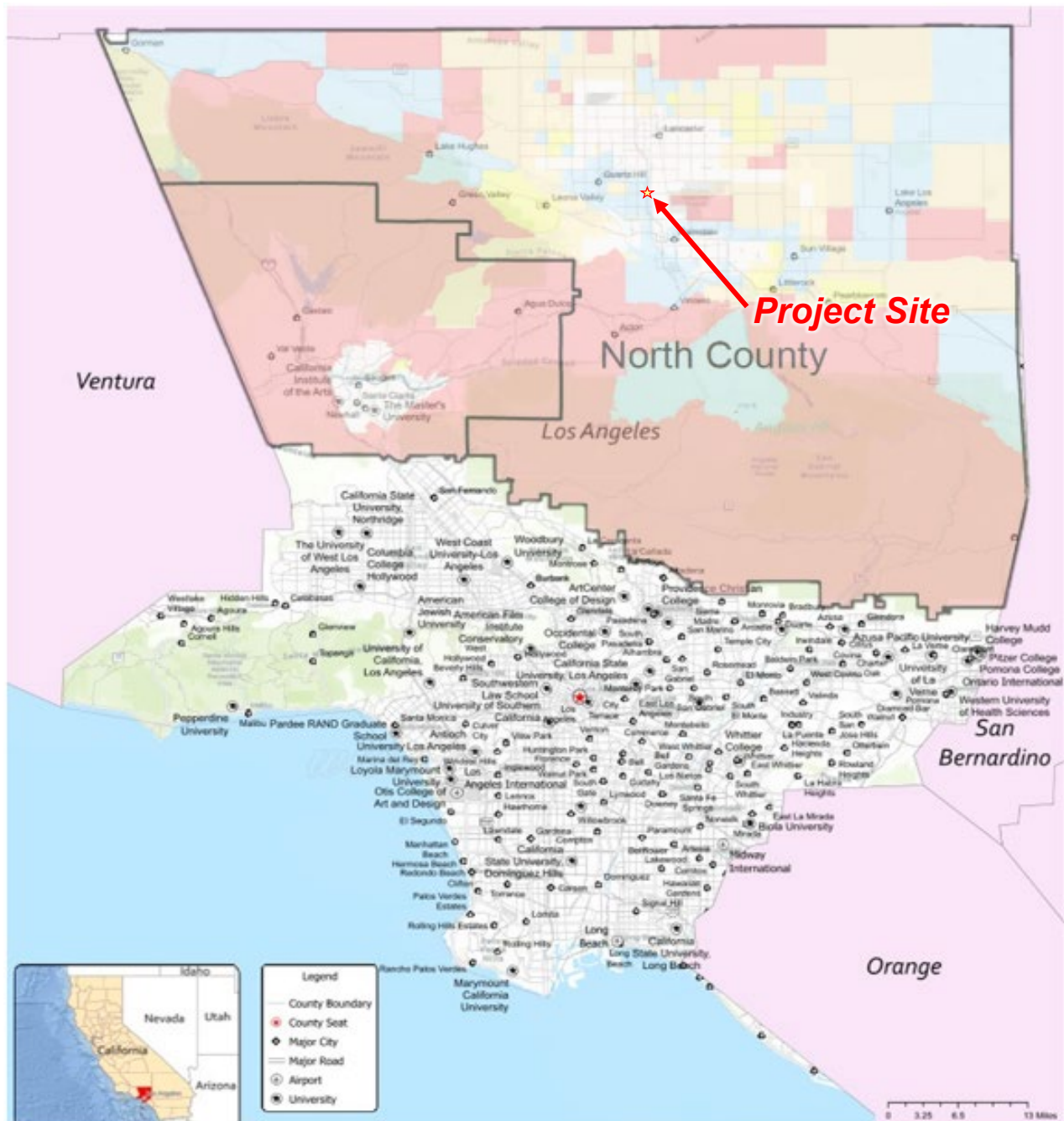


Figure 8: Home-Based Work VMT per Employee Compared to the North LA County Baseline VMT

LEGEND

- No Population
- Less than 16.8% below North Avg
- 0 to 16.8% below North Avg
- Higher than North Avg





3.4 – Results Summary

Peak hour operations at three intersections,

1. West Avenue N & 10th Street West (Signalized)
2. West Avenue M & 10th Street West (Signalized)
3. West Avenue M-8 & 10th Street West (Stop-controlled)

were assessed with Synchro 11 Software based on the HCM 6th Edition (2020) methodology for the following analysis scenarios during AM and PM Weekday Peak Hours:

1. Existing (2023) Without Project Traffic Conditions
2. Opening Year (2024) Without Project Traffic Conditions
3. Opening Year (2024) With Project Traffic Conditions

If the addition of project trips to existing conditions is deemed to degrade the Level of Service (LOS) of the intersection to an unacceptable level, traffic signal warrant analyses may follow. **The study found that NONE of the intersections would have a deficient Level of Service under any scenarios.** As shown in **Table 8**, all study intersections maintain an LOS of D or higher under all three analysis scenarios, and thus do not require any mitigation. ***The proposed project will NOT have any adverse impact on traffic within the project vicinity.***

Table 8: Intersection Delay and LOS Summary

Traffic Analysis Scenario	Inter-section #	Time Frames Analyzed						Deficient LOS?
		AM Peak Hour			PM Peak Hour			
		Delay (sec)	LOS	Change in Delay (sec)	Delay (sec)	LOS	Change in Delay (sec)	
1. Existing (2023) Without Project	1	17.1	B	-	40.6	D	-	NO
	2	17.0	B	-	28.3	C	-	NO
	3	12.1	B	-	16.5	C	-	NO
2. Opening Year (2024) Without Project	1	17.2	B	+0.1	42.5	D	+1.9	NO
	2	17.1	B	+0.1	29.3	C	+1.0	NO
	3	12.1	B	+0.0	16.7	C	+0.2	NO
3. Opening Year (2024) with Project	1	17.2	B	+0.0	42.6	D	+0.1	NO
	2	17.1	B	+0.0	29.5	C	+0.2	NO
	3	12.4	B	+0.3	17.2	C	+0.5	NO



4.0 – Signal Warrant Assessment

Per the request of the City of Palmdale City Traffic Engineer, a traffic signal warrant study was conducted to determine if an installation of a traffic signal is warranted at the West Avenue M-8 and 10th Street West intersection.

The California Manual on Uniform Traffic Control Devices (CA MUTCD 2014 Rev. 7) identifies various factors which may be utilized in considering the need for installing intersection traffic control devices such as traffic signals, including vehicular volumes, traffic collisions, traffic speeds, and other physical and operational characteristics of the subject location. These criteria are organized into various "warrants" in the CAMUTCD. Using the available traffic data, Minagar & Associates, Inc. conducted an analysis to determine if the installation of a traffic signal is warranted under the existing and fully operational conditions at the West Avenue M-8 and 10th Street West intersection.

The following is a summary of findings for the CAMUTCD traffic signal warrant assessment for the subject intersection:

Warrant	2023 Existing without Project	Opening Year (2024) with Project
Warrant 1: Eight-Hour Vehicular Volume	Not Met	Not Met
Warrant 2: Four-Hour Vehicular Volume	Not Met	Not Met
Warrant 3: Peak Hour	Not Met	Not Met
Warrant 4: Pedestrian Volume	Not Applicable	Not Applicable
Warrant 5: School Crossing	Not Applicable	Not Applicable
Warrant 6: Coordinated Signal System	Not Applicable	Not Applicable
Warrant 7: Crash Experience	Not Met	Data Not Available
Warrant 8: Roadway Network	Not Applicable	Not Applicable
Warrant 9: Grade Crossing	Not Applicable	Not Applicable
Supplemental Warrants (e.g., School Xing FYB, bicycle signal)	Not Applicable	Not Applicable

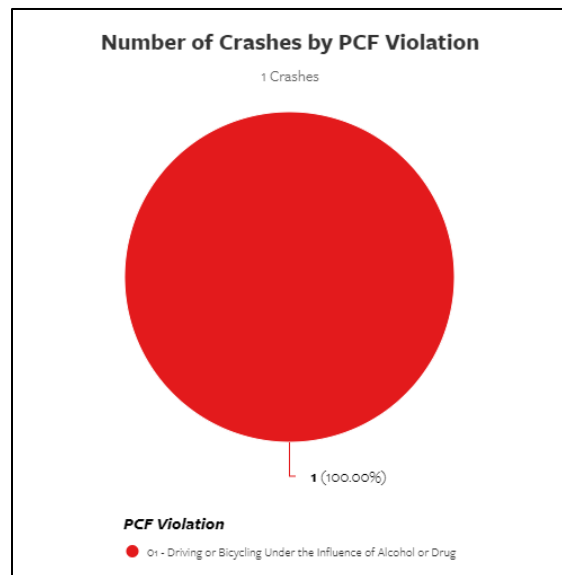
CAMUTCD Warrants 1, 2, and 3 were applied to the analysis based on the posted and prima facie speed limits of each roadway; the number of approach lanes available; assumption of a "Rural" classification of roadways based on prevailing travel speeds, adjacent land use and community characteristics; eight-hour vehicular counts; field observations of roadway; and lane geometries. The traffic signal warrant analysis sheets for each warrant and scenario are provided in **Appendix C**.

Collision history for the project intersection was investigated from January 1, 2018, to December 31, 2022, via *TIMS* (Transportation Injury Mapping System) *Berkeley*. In this five-year period, only one (1) collision occurred within the vicinity due to the primary collision factor of driving or bicycling under the influence of alcohol or drug, which was not due to the absence of a traffic signal. **Figure 7** breaks down the collision factor responsible during the five-year period.





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PALMDALE, CA



**Figure 7: Number of Crashes by Primary Collision Factor (PCF) Violation
(January 1, 2018 to December 31, 2022)**

Subsequently, the criteria for the Crash Experience warrant were also not met. Since there was than 5 crashes reported within a twelve (12) month period susceptible to correction by a traffic signal, Warrant 7 – Crash Experience Warrant is not met for the 2023 existing without project or the 2024 opening year with project conditions.

Based on the results of the analysis, Minagar & Associates, Inc. has determined that the intersection of West Avenue M-8 and 10th Street West **does not meet the minimum warrant requirements** based on traffic volumes under both current and fully operational conditions.





5.0 – Conclusion

It is determined that the Project passes the Project Size and Type Screening Criteria, which means that the Project is screened from further VMT analysis and a less than significant VMT impact can be presumed.

The Project does not have significant transportation impact on any study intersections in the Project vicinity and will not cause significant intersection delay or degradation of LOS.

It was determined that the intersection of West Avenue M-8 and 10th Street West does not meet the minimum traffic signal warrant requirements and therefore, installation of a traffic signal at the subject intersection is not warranted.

Therefore, after analyzing the VMT methodology, criteria, guidelines, and thresholds of the County, it is determined that the Project's employment VMT per employee of 11.0 (Antelope Region) passes the required VMT reduction threshold of 16.8% of the North County's baseline VMT (19.0). Thus, the Project site qualifies as a Low VMT Area and will not have a significant cumulative VMT impact.



APPENDIX A
Traffic Counts (TMC) Data Sheets

INTERSECTION TURNING MOVEMENT COUNTS

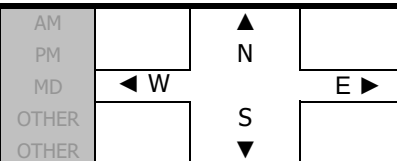
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:
Wed, Aug 9, 23

LOCATION: Palmdale
NORTH & SOUTH: 10th
EAST & WEST: Avenue N

PROJECT #: SC4151
LOCATION #: 1
CONTROL: SIGNAL

NOTES:



	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	10th			10th			Avenue N			Avenue N			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL

U-TURNS				
NB 0	SB 0	EB 0	WB 0	TTL

AM	7:00 AM	22	50	4	3	48	3	17	56	14	4	20	3	244
	7:15 AM	23	60	2	4	40	7	23	52	17	0	21	10	259
	7:30 AM	16	102	5	5	35	7	27	49	12	2	30	9	299
	7:45 AM	29	110	1	4	55	15	58	46	29	7	39	14	407
	8:00 AM	25	89	1	4	55	16	42	58	43	3	38	5	379
	8:15 AM	29	83	3	6	72	5	37	44	24	3	31	14	351
	8:30 AM	32	94	3	2	73	6	33	36	24	2	40	9	354
	8:45 AM	37	97	2	8	71	13	30	28	20	1	39	4	350
	VOLUMES	213	685	21	36	449	72	267	369	183	22	258	68	2,643
	APPROACH %	23%	75%	2%	6%	81%	13%	33%	45%	22%	6%	74%	20%	
PM	APP/DEPART	919	/	970	557	/	669	819	/	426	348	/	578	0
	BEGIN PEAK HR	7:45 AM												
	VOLUMES	115	376	8	16	255	42	170	184	120	15	148	42	1,491
	APPROACH %	23%	75%	2%	5%	81%	13%	36%	39%	25%	7%	72%	20%	
	PEAK HR FACTOR	0.891			0.943			0.829			0.854			0.916
	APP/DEPART	499	/	558	313	/	397	474	/	208	205	/	328	0
	4:00 PM	68	140	2	16	144	37	66	47	34	3	82	5	644
	4:15 PM	66	190	3	9	172	25	75	47	28	7	75	4	701
	4:30 PM	73	168	4	11	180	33	32	40	26	7	85	6	665
	4:45 PM	58	149	2	8	146	41	58	50	32	7	98	6	655
PM	5:00 PM	75	202	4	24	194	34	38	43	31	11	79	6	741
	5:15 PM	68	148	5	17	168	22	63	48	35	4	69	8	655
	5:30 PM	68	149	5	19	165	20	56	43	27	9	71	1	633
	5:45 PM	58	155	2	8	116	9	47	31	24	2	64	1	517
	VOLUMES	534	1,301	27	112	1,285	221	435	349	237	50	623	37	5,211
	APPROACH %	29%	70%	1%	7%	79%	14%	43%	34%	23%	7%	88%	5%	
	APP/DEPART	1,862	/	1,710	1,618	/	1,601	1,021	/	488	710	/	1,412	0
	BEGIN PEAK HR	4:15 PM												
	VOLUMES	272	709	13	52	692	133	203	180	117	32	337	22	2,762
	APPROACH %	27%	71%	1%	6%	79%	15%	41%	36%	23%	8%	86%	6%	
	PEAK HR FACTOR	0.884			0.870			0.833			0.881			0.932
	APP/DEPART	994	/	903	877	/	858	500	/	245	391	/	756	0

0	0	3	0	3
3	0	8	0	11
0	0	5	0	5
4	0	7	0	11
2	0	8	0	10
1	0	6	0	7
0	0	9	0	9
5	0	4	0	9
15	0	50	0	65

3	0	9	0	12
4	0	4	0	8
7	0	8	0	15
2	0	12	0	14
4	0	7	0	11
3	0	11	0	14
4	0	4	0	8
2	0	8	0	10
29	0	63	0	92

INTERSECTION TURNING MOVEMENT COUNTS

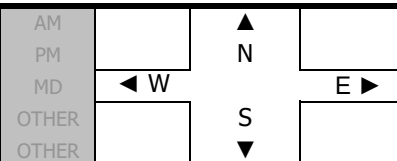
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:
Wed, Aug 9, 23

LOCATION: Palmdale
NORTH & SOUTH: 10th
EAST & WEST: Avenue M

PROJECT #: SC4151
LOCATION #: 2
CONTROL: SIGNAL

NOTES:



	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	10th			10th			Avenue M			Avenue M			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	2	0	1	2	1	1	2	1	1	2	1	

U-TURNS				
NB	SB	EB	WB	TTL
0	0	0	0	

AM	7:00 AM	5	41	12	9	32	28	35	133	8	17	105	32	457
	7:15 AM	10	35	15	21	45	15	26	143	12	9	126	21	478
	7:30 AM	4	77	30	21	50	15	45	169	13	14	120	24	582
	7:45 AM	6	109	33	28	68	15	53	216	38	24	109	36	735
	8:00 AM	12	96	33	21	59	22	63	179	28	19	81	39	652
	8:15 AM	6	82	17	20	73	18	47	168	10	23	122	32	618
	8:30 AM	17	96	18	15	67	21	54	123	13	21	111	38	594
	8:45 AM	7	84	17	23	68	41	52	146	15	12	125	41	631
	VOLUMES	67	620	175	158	462	175	375	1,277	137	139	899	263	4,747
	APPROACH %	8%	72%	20%	20%	58%	22%	21%	71%	8%	11%	69%	20%	
	APP/DEPART	862	/	1,234	795	/	738	1,789	/	1,605	1,301	/	1,170	0
PM	BEGIN PEAK HR	7:45 AM												
	VOLUMES	41	383	101	84	267	76	217	686	89	87	423	145	2,599
	APPROACH %	8%	73%	19%	20%	63%	18%	22%	69%	9%	13%	65%	22%	
	PEAK HR FACTOR	0.887			0.962			0.808			0.925			0.884
	APP/DEPART	525	/	727	427	/	443	992	/	867	655	/	562	0
	4:00 PM	39	173	28	27	130	69	51	99	18	52	205	34	925
	4:15 PM	42	167	31	30	152	63	36	86	9	30	247	34	927
	4:30 PM	47	176	33	32	139	86	67	105	17	51	222	45	1,020
	4:45 PM	31	159	27	27	156	62	54	104	17	32	270	42	981
	5:00 PM	49	173	46	32	147	101	52	103	12	39	224	39	1,017
	5:15 PM	38	178	31	33	167	70	46	77	5	27	227	18	917
	5:30 PM	43	152	33	21	135	76	31	100	9	36	165	26	827
	5:45 PM	26	135	24	28	107	52	56	101	7	14	197	25	772
	VOLUMES	315	1,313	253	230	1,133	579	393	775	94	281	1,757	263	7,386
	APPROACH %	17%	70%	13%	12%	58%	30%	31%	61%	7%	12%	76%	11%	
	APP/DEPART	1,881	/	1,944	1,942	/	1,508	1,262	/	1,251	2,301	/	2,683	0
	BEGIN PEAK HR	4:15 PM												
	VOLUMES	169	675	137	121	594	312	209	398	55	152	963	160	3,945
	APPROACH %	17%	69%	14%	12%	58%	30%	32%	60%	8%	12%	76%	13%	
	PEAK HR FACTOR	0.915			0.917			0.876			0.927			0.967
	APP/DEPART	981	/	1,033	1,027	/	801	662	/	651	1,275	/	1,460	0

0	0	1	0	1
0	0	0	0	0
0	1	3	0	4
0	0	7	0	7
0	1	6	0	7
0	1	4	0	5
0	2	5	0	7
0	0	3	0	3
0	5	29	0	34

0	1	2	0	3
0	2	1	0	3
0	0	7	0	7
0	1	4	0	5
0	2	4	0	6
0	0	7	0	7
0	0	0	0	0
0	1	7	0	8
0	7	32	0	39

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:
Wed, Aug 9, 23

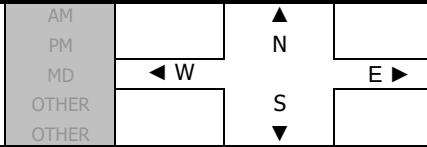
LOCATION:
NORTH & SOUTH:
EAST & WEST:

Palmdale
10th
Avenue M-8

PROJECT #:
LOCATION #:
CONTROL:

SC4151
3
STOP E

NOTES:



	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	10th			10th			Avenue M-8			Avenue M-8			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	2	X	X	2	0	1	X	1	X	X	X	

U-TURNS				
NB	SB	EB	WB	TTL
0	0	0	0	

AM	7:00 AM	4	60	0	0	50	4	0	0	1	0	0	0	119
	7:15 AM	2	81	0	0	60	3	1	0	0	0	0	0	147
	7:30 AM	9	125	0	0	68	6	0	0	0	0	0	0	208
	7:45 AM	5	156	0	0	92	8	1	0	0	0	0	0	262
	8:00 AM	2	131	0	0	94	4	0	0	0	0	0	0	231
	8:15 AM	1	110	0	0	93	0	4	0	0	0	0	0	208
	8:30 AM	0	117	0	0	89	0	0	0	0	0	0	0	206
	8:45 AM	1	124	0	0	95	0	0	0	1	0	0	0	221
	9:00 AM	1	120	0	0	103	0	0	0	1	0	0	0	225
	9:15 AM	1	93	0	0	104	1	2	0	2	0	0	0	203
	9:30 AM	3	120	0	0	125	0	1	0	0	0	0	0	249
	9:45 AM	4	113	0	0	129	4	4	0	2	0	0	0	256
VOLUMES		33	1,350	0	0	1,102	30	13	0	7	0	0	0	2,536
APPROACH %		2%	98%	0%	0%	97%	3%	65%	0%	35%	0%	0%	0%	
APP/DEPART		1,384	/	1,363	1,132	/	1,110	20	/	0	0	/	63	0
BEGIN PEAK HR		9:00 AM												
VOLUMES		9	446	0	0	461	5	7	0	5	0	0	0	934
APPROACH %		2%	98%	0%	0%	99%	1%	58%	0%	42%	0%	0%	0%	
PEAK HR FACTOR		0.927												0.912
APP/DEPART		456	/	453	466	/	467	12	/	0	0	/	14	0
PM	03:00 PM	0	201	0	0	150	1	0	0	0	0	0	0	352
	3:15 PM	0	200	0	0	165	0	0	0	1	0	0	0	366
	3:30 PM	1	236	0	0	210	0	1	0	0	0	0	0	448
	3:45 PM	1	210	0	0	175	0	1	0	0	0	0	0	387
	4:00 PM	0	219	0	0	218	0	4	0	6	0	0	0	447
	4:15 PM	0	273	0	0	191	0	0	0	1	0	0	0	465
	4:30 PM	0	186	0	0	218	0	3	0	0	0	0	0	407
	4:45 PM	1	233	0	0	206	1	2	0	3	0	0	0	446
	5:00 PM	0	229	0	0	225	0	2	0	3	0	0	0	459
	5:15 PM	0	249	0	0	215	0	1	0	0	0	0	0	465
	5:30 PM	0	212	0	0	192	0	0	0	2	0	0	0	406
	5:45 PM	1	187	0	0	117	0	1	0	1	0	0	0	307
VOLUMES		4	2,635	0	0	2,282	2	15	0	17	0	0	0	4,956
APPROACH %		0%	100%	0%	0%	100%	0%	47%	0%	53%	0%	0%	0%	
APP/DEPART		2,639	/	2,651	2,285	/	2,299	32	/	0	0	/	6	0
BEGIN PEAK HR		4:15 PM												
VOLUMES		1	897	0	0	864	1	8	0	6	0	0	0	1,777
APPROACH %		0%	100%	0%	0%	100%	0%	57%	0%	43%	0%	0%	0%	
PEAK HR FACTOR		0.822												0.955
APP/DEPART		898	/	905	865	/	870	14	/	0	0	/	2	0

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1
0	0	0	0	0
0	0	0	0	0
1	0	0	0	1

0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

PROJECT #: SC4151
LOCATION #: 3
CONTROL: STOP E

AM		▲	
PM		N	
MD	◀ W		E ▶
OTHER		S	
OTHER		▼	

U-TURNS				
NB	SB	EB	WB	TTL
0	0	0	0	

[illegible]






















APPENDIX B

LOS and Intersection Delay Worksheets

HCM 6th Signalized Intersection Summary
1: 10th St West & West Avenue N

Minagar & Associates, Inc.

08/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	184	120	15	148	42	115	376	8	16	255	42
Future Volume (veh/h)	170	184	120	15	148	42	115	376	8	16	255	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870
Adj Flow Rate, veh/h	185	200	130	16	161	46	125	409	9	17	277	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	569	904	766	523	676	193	461	1481	33	410	1324	217
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1175	1870	1585	1050	1399	400	1057	3555	78	969	3178	521
Grp Volume(v), veh/h	185	200	130	16	0	207	125	204	214	17	160	163
Grp Sat Flow(s),veh/h/ln	1175	1870	1585	1050	0	1798	1057	1777	1856	969	1848	1851
Q Serve(g_s), s	9.8	5.6	4.2	0.8	0.0	6.0	7.7	6.8	6.8	1.1	5.0	5.1
Cycle Q Clear(g_c), s	15.9	5.6	4.2	6.4	0.0	6.0	12.8	6.8	6.8	7.9	5.0	5.1
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.04	1.00		0.28
Lane Grp Cap(c), veh/h	569	904	766	523	0	869	461	740	773	410	770	771
V/C Ratio(X)	0.33	0.22	0.17	0.03	0.00	0.24	0.27	0.28	0.28	0.04	0.21	0.21
Avail Cap(c_a), veh/h	569	904	766	523	0	869	461	740	773	410	770	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	13.5	13.1	15.3	0.0	13.6	20.9	17.3	17.3	19.9	16.8	16.8
Incr Delay (d2), s/veh	1.5	0.6	0.5	0.1	0.0	0.6	1.4	0.9	0.9	0.2	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.1	1.4	0.2	0.0	2.2	1.9	2.6	2.7	0.2	2.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	14.0	13.6	15.4	0.0	14.2	22.3	18.2	18.2	20.1	17.4	17.4
LnGrp LOS	B	B	B	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	515			223			543			340		
Approach Delay, s/veh	16.0			14.3			19.2			17.5		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	42.0			48.0			42.0			48.0		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	37.5			43.5			37.5			43.5		
Max Q Clear Time (g_c+I1), s	14.8			17.9			9.9			8.4		
Green Ext Time (p_c), s	2.5			2.0			1.6			1.1		
Intersection Summary												
HCM 6th Ctrl Delay	17.1											
HCM 6th LOS	B											

HCM 6th Signalized Intersection Summary

2: 10th St West & West Avenue M

Minagar & Associates, Inc.







08/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	686	89	87	423	145	41	383	101	84	267	76
Future Volume (veh/h)	217	686	89	87	423	145	41	383	101	84	267	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	236	746	97	95	460	158	45	416	110	91	290	83
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	469	1955	872	361	1955	872	375	975	255	286	1244	555
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	805	3554	1585	653	3554	1585	1009	2786	730	877	3554	1585
Grp Volume(v), veh/h	236	746	97	95	460	158	45	264	262	91	290	83
Grp Sat Flow(s),veh/h/ln	805	1777	1585	653	1777	1585	1009	1777	1739	877	1777	1585
Q Serve(g_s), s	19.3	10.8	2.6	8.7	6.0	4.5	3.0	10.2	10.4	8.0	5.2	3.2
Cycle Q Clear(g_c), s	25.3	10.8	2.6	19.5	6.0	4.5	8.2	10.2	10.4	18.4	5.2	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	469	1955	872	361	1955	872	375	622	609	286	1244	555
V/C Ratio(X)	0.50	0.38	0.11	0.26	0.24	0.18	0.12	0.42	0.43	0.32	0.23	0.15
Avail Cap(c_a), veh/h	469	1955	872	361	1955	872	375	622	609	286	1244	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	11.5	9.7	17.1	10.5	10.1	23.6	22.3	22.4	29.4	20.7	20.1
Incr Delay (d2), s/veh	3.8	0.6	0.3	1.8	0.3	0.5	0.7	2.1	2.2	2.9	0.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	3.6	0.8	1.3	2.0	1.4	0.7	4.1	4.1	1.8	2.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.8	12.1	10.0	18.9	10.8	10.6	24.2	24.4	24.6	32.3	21.1	20.6
LnGrp LOS	C	B	A	B	B	B	C	C	C	C	C	C
Approach Vol, veh/h	1079			713			571			464		
Approach Delay, s/veh	13.8			11.8			24.5			23.2		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	36.0			54.0			36.0			54.0		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	31.5			49.5			31.5			49.5		
Max Q Clear Time (g_c+I1), s	12.4			27.3			20.4			21.5		
Green Ext Time (p_c), s	2.7			6.5			1.8			4.1		






















Intersection Summary

HCM 6th Ctrl Delay	17.0
HCM 6th LOS	B

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	5	9	446	461	5
Future Vol, veh/h	7	5	9	446	461	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	5	10	485	501	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	767	253	506	0	-	0
Stage 1	504	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	339	746	1055	-	-	-
Stage 1	572	-	-	-	-	-
Stage 2	757	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	336	746	1055	-	-	-
Mov Cap-2 Maneuver	443	-	-	-	-	-
Stage 1	567	-	-	-	-	-
Stage 2	757	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.9	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1055	-	443	746	-	-
HCM Lane V/C Ratio	0.009	-	0.017	0.007	-	-
HCM Control Delay (s)	8.4	-	13.3	9.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

HCM 6th Signalized Intersection Summary
1: 10th St West & West Avenue N

Minagar & Associates, Inc.
08/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	180	117	32	337	22	272	709	13	52	692	133
Future Volume (veh/h)	203	180	117	32	337	22	272	709	13	52	692	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870
Adj Flow Rate, veh/h	221	196	127	35	366	24	296	771	14	57	752	145
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	423	904	766	527	839	55	222	1488	27	256	1288	248
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	994	1870	1585	1057	1736	114	621	3571	65	689	3090	596
Grp Volume(v), veh/h	221	196	127	35	0	390	296	384	401	57	450	447
Grp Sat Flow(s),veh/h/ln	994	1870	1585	1057	0	1850	621	1777	1859	689	1848	1838
Q Serve(g_s), s	16.9	5.4	4.1	1.8	0.0	12.4	20.6	14.5	14.5	6.0	16.9	16.9
Cycle Q Clear(g_c), s	29.3	5.4	4.1	7.2	0.0	12.4	37.5	14.5	14.5	20.5	16.9	16.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.03	1.00		0.32
Lane Grp Cap(c), veh/h	423	904	766	527	0	894	222	740	774	256	770	766
V/C Ratio(X)	0.52	0.22	0.17	0.07	0.00	0.44	1.33	0.52	0.52	0.22	0.58	0.58
Avail Cap(c_a), veh/h	423	904	766	527	0	894	222	740	774	256	770	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	13.4	13.1	15.5	0.0	15.2	38.4	19.5	19.5	27.2	20.2	20.2
Incr Delay (d2), s/veh	4.6	0.6	0.5	0.2	0.0	1.5	177.1	2.6	2.5	2.0	3.2	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	2.1	1.3	0.4	0.0	4.8	15.6	5.7	5.9	1.0	7.0	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.4	14.0	13.5	15.7	0.0	16.8	215.5	22.1	22.0	29.1	23.5	23.5
LnGrp LOS	C	B	B	B	A	B	F	C	C	C	C	C
Approach Vol, veh/h	544				425				1081			
Approach Delay, s/veh	20.1				16.7				75.0			
Approach LOS	C				B				E			
Timer - Assigned Phs	2				4				6			
Phs Duration (G+Y+Rc), s	42.0				48.0				42.0			
Change Period (Y+Rc), s	4.5				4.5				4.5			
Max Green Setting (Gmax), s	37.5				43.5				37.5			
Max Q Clear Time (g_c+I1), s	39.5				31.3				22.5			
Green Ext Time (p_c), s	0.0				1.9				4.7			
Intersection Summary												
HCM 6th Ctrl Delay	40.6											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

2: 10th St West & West Avenue M

Minagar & Associates, Inc.







08/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	398	55	152	963	160	169	675	137	121	594	312
Future Volume (veh/h)	209	398	55	152	963	160	169	675	137	121	594	312
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	227	433	60	165	1047	174	184	734	149	132	646	339
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	245	1955	872	521	1955	872	197	1030	209	164	1244	555
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	457	3554	1585	904	3554	1585	571	2943	597	629	3554	1585
Grp Volume(v), veh/h	227	433	60	165	1047	174	184	443	440	132	646	339
Grp Sat Flow(s),veh/h/ln	457	1777	1585	904	1777	1585	571	1777	1763	629	1777	1585
Q Serve(g_s), s	32.6	5.6	1.6	10.3	16.9	5.0	18.5	19.4	19.4	12.1	13.0	15.9
Cycle Q Clear(g_c), s	49.5	5.6	1.6	15.9	16.9	5.0	31.5	19.4	19.4	31.5	13.0	15.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	245	1955	872	521	1955	872	197	622	617	164	1244	555
V/C Ratio(X)	0.92	0.22	0.07	0.32	0.54	0.20	0.93	0.71	0.71	0.80	0.52	0.61
Avail Cap(c_a), veh/h	245	1955	872	521	1955	872	197	622	617	164	1244	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.1	10.4	9.5	14.5	12.9	10.2	39.1	25.3	25.3	41.2	23.2	24.2
Incr Delay (d2), s/veh	40.9	0.3	0.2	1.6	1.1	0.5	48.4	6.8	6.9	32.8	1.6	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	1.9	0.5	2.0	5.7	1.5	6.5	8.4	8.3	4.3	5.1	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.0	10.6	9.6	16.1	14.0	10.8	87.5	32.1	32.2	73.9	24.8	29.1
LnGrp LOS	E	B	A	B	B	B	F	C	C	E	C	C
Approach Vol, veh/h	720			1386			1067			1117		
Approach Delay, s/veh	30.5			13.8			41.7			31.9		
Approach LOS	C			B			D			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	36.0			54.0			36.0			54.0		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	31.5			49.5			31.5			49.5		
Max Q Clear Time (g_c+I1), s	33.5			51.5			33.5			18.9		
Green Ext Time (p_c), s	0.0			0.0			0.0			9.5		

Intersection Summary























HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	6	1	897	864	1
Future Vol, veh/h	8	6	1	897	864	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	7	1	975	939	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1430	470	940	0	-	0
Stage 1	940	-	-	-	-	-
Stage 2	490	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	125	540	725	-	-	-
Stage 1	340	-	-	-	-	-
Stage 2	581	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	125	540	725	-	-	-
Mov Cap-2 Maneuver	247	-	-	-	-	-
Stage 1	340	-	-	-	-	-
Stage 2	581	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.5	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	725	-	247	540	-	-
HCM Lane V/C Ratio	0.001	-	0.035	0.012	-	-
HCM Control Delay (s)	10	-	20.1	11.7	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

HCM 6th Signalized Intersection Summary
1: 10th St West & West Avenue N

Minagar & Associates, Inc.

08/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	187	122	16	155	44	117	382	8	16	259	43
Future Volume (veh/h)	173	187	122	16	155	44	117	382	8	16	259	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870
Adj Flow Rate, veh/h	188	203	133	17	168	48	127	415	9	17	282	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	561	904	766	519	676	193	457	1482	32	407	1323	218
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1165	1870	1585	1044	1399	400	1051	3556	77	963	3176	523
Grp Volume(v), veh/h	188	203	133	17	0	216	127	207	217	17	163	166
Grp Sat Flow(s),veh/h/ln	1165	1870	1585	1044	0	1798	1051	1777	1856	963	1848	1851
Q Serve(g_s), s	10.2	5.7	4.3	0.9	0.0	6.3	7.9	6.9	6.9	1.1	5.1	5.2
Cycle Q Clear(g_c), s	16.5	5.7	4.3	6.5	0.0	6.3	13.1	6.9	6.9	8.0	5.1	5.2
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.04	1.00		0.28
Lane Grp Cap(c), veh/h	561	904	766	519	0	869	457	740	774	407	770	771
V/C Ratio(X)	0.34	0.22	0.17	0.03	0.00	0.25	0.28	0.28	0.28	0.04	0.21	0.22
Avail Cap(c_a), veh/h	561	904	766	519	0	869	457	740	774	407	770	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	13.5	13.1	15.4	0.0	13.7	21.0	17.3	17.3	20.0	16.8	16.8
Incr Delay (d2), s/veh	1.6	0.6	0.5	0.1	0.0	0.7	1.5	0.9	0.9	0.2	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.2	1.4	0.2	0.0	2.3	1.9	2.7	2.8	0.2	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	14.1	13.6	15.5	0.0	14.3	22.5	18.3	18.2	20.2	17.4	17.5
LnGrp LOS	C	B	B	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h		524			233			551			346	
Approach Delay, s/veh		16.1			14.4			19.2			17.6	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		42.0		48.0		42.0		48.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		37.5		43.5		37.5		43.5				
Max Q Clear Time (g_c+I1), s		15.1		18.5		10.0		8.5				
Green Ext Time (p_c), s		2.6		2.1		1.7		1.2				
Intersection Summary												
HCM 6th Ctrl Delay				17.2								
HCM 6th LOS				B								












HCM 6th Signalized Intersection Summary







2: 10th St West & West Avenue M

Minagar & Associates, Inc.

08/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	696	90	88	429	147	42	389	103	85	271	77
Future Volume (veh/h)	220	696	90	88	429	147	42	389	103	85	271	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	239	757	98	96	466	160	46	423	112	92	295	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	465	1955	872	356	1955	872	372	975	256	282	1244	555
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	799	3554	1585	646	3554	1585	1004	2785	731	870	3554	1585
Grp Volume(v), veh/h	239	757	98	96	466	160	46	268	267	92	295	84
Grp Sat Flow(s),veh/h/ln	799	1777	1585	646	1777	1585	1004	1777	1739	870	1777	1585
Q Serve(g_s), s	19.9	11.0	2.7	9.0	6.1	4.5	3.1	10.4	10.6	8.2	5.3	3.3
Cycle Q Clear(g_c), s	26.0	11.0	2.7	20.0	6.1	4.5	8.4	10.4	10.6	18.8	5.3	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	465	1955	872	356	1955	872	372	622	609	282	1244	555
V/C Ratio(X)	0.51	0.39	0.11	0.27	0.24	0.18	0.12	0.43	0.44	0.33	0.24	0.15
Avail Cap(c_a), veh/h	465	1955	872	356	1955	872	372	622	609	282	1244	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	11.6	9.7	17.3	10.5	10.1	23.7	22.4	22.5	29.7	20.7	20.1
Incr Delay (d2), s/veh	4.0	0.6	0.3	1.9	0.3	0.5	0.7	2.2	2.3	3.1	0.4	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	3.6	0.8	1.3	2.0	1.4	0.7	4.2	4.2	1.8	2.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	12.2	10.0	19.1	10.8	10.6	24.4	24.6	24.7	32.7	21.2	20.7
LnGrp LOS	C	B	A	B	B	B	C	C	C	C	C	C
Approach Vol, veh/h	1094					722		581		471		
Approach Delay, s/veh	13.9					11.8		24.6		23.3		
Approach LOS	B					B		C		C		
Timer - Assigned Phs	2		4			6		8				
Phs Duration (G+Y+Rc), s	36.0		54.0			36.0		54.0				
Change Period (Y+Rc), s	4.5		4.5			4.5		4.5				
Max Green Setting (Gmax), s	31.5		49.5			31.5		49.5				
Max Q Clear Time (g_c+I1), s	12.6		28.0			20.8		22.0				
Green Ext Time (p_c), s	2.8		6.6			1.8		4.2				
Intersection Summary												
HCM 6th Ctrl Delay	17.1											
HCM 6th LOS	B											

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	5	9	453	468	5
Future Vol, veh/h	7	5	9	453	468	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	5	10	492	509	5

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	778	257	514	0	-	0
Stage 1	512	-	-	-	-	-
Stage 2	266	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	333	742	1048	-	-	-
Stage 1	567	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	330	742	1048	-	-	-
Mov Cap-2 Maneuver	438	-	-	-	-	-
Stage 1	561	-	-	-	-	-
Stage 2	754	-	-	-	-	-























Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1048	-	438	742	-	-
HCM Lane V/C Ratio	0.009	-	0.017	0.007	-	-
HCM Control Delay (s)	8.5	-	13.4	9.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

HCM 6th Signalized Intersection Summary
1: 10th St West & West Avenue N

Minagar & Associates, Inc.

08/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	183	119	34	354	23	276	720	13	53	702	135
Future Volume (veh/h)	206	183	119	34	354	23	276	720	13	53	702	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870
Adj Flow Rate, veh/h	224	199	129	37	385	25	300	783	14	58	763	147
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	408	904	766	524	840	55	218	1488	27	252	1288	248
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	976	1870	1585	1052	1737	113	613	3572	64	682	3091	595
Grp Volume(v), veh/h	224	199	129	37	0	410	300	389	408	58	456	454
Grp Sat Flow(s),veh/h/ln	976	1870	1585	1052	0	1850	613	1777	1859	682	1848	1838
Q Serve(g_s), s	17.8	5.5	4.1	1.9	0.0	13.2	20.3	14.7	14.7	6.3	17.2	17.2
Cycle Q Clear(g_c), s	31.0	5.5	4.1	7.4	0.0	13.2	37.5	14.7	14.7	21.0	17.2	17.2
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.03	1.00		0.32
Lane Grp Cap(c), veh/h	408	904	766	524	0	894	218	740	775	252	770	766
V/C Ratio(X)	0.55	0.22	0.17	0.07	0.00	0.46	1.37	0.53	0.53	0.23	0.59	0.59
Avail Cap(c_a), veh/h	408	904	766	524	0	894	218	740	775	252	770	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.7	13.4	13.1	15.6	0.0	15.4	38.6	19.6	19.6	27.5	20.3	20.3
Incr Delay (d2), s/veh	5.2	0.6	0.5	0.3	0.0	1.7	194.9	2.7	2.6	2.1	3.3	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.1	1.4	0.4	0.0	5.1	16.4	5.8	6.1	1.1	7.1	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	14.0	13.6	15.9	0.0	17.1	233.5	22.3	22.2	29.6	23.7	23.7
LnGrp LOS	C	B	B	B	A	B	F	C	C	C	C	C
Approach Vol, veh/h	552				447				1097		968	
Approach Delay, s/veh	20.8				17.0				80.0		24.0	
Approach LOS	C				B				E		C	
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	42.0			48.0			42.0			48.0		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	37.5			43.5			37.5			43.5		
Max Q Clear Time (g_c+I1), s	39.5			33.0			23.0			15.2		
Green Ext Time (p_c), s	0.0			1.8			4.7			2.3		
Intersection Summary												
HCM 6th Ctrl Delay	42.5											
HCM 6th LOS	D											












HCM 6th Signalized Intersection Summary







2: 10th St West & West Avenue M

Minagar & Associates, Inc.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	404	56	154	977	162	172	685	139	123	603	317
Future Volume (veh/h)	212	404	56	154	977	162	172	685	139	123	603	317
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	230	439	61	167	1062	176	187	745	151	134	655	345
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	1955	872	517	1955	872	194	1030	209	161	1244	555
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	450	3554	1585	898	3554	1585	563	2943	596	621	3554	1585
Grp Volume(v), veh/h	230	439	61	167	1062	176	187	450	446	134	655	345
Grp Sat Flow(s),veh/h/ln	450	1777	1585	898	1777	1585	563	1777	1763	621	1777	1585
Q Serve(g_s), s	32.2	5.7	1.6	10.6	17.3	5.1	18.3	19.8	19.8	11.7	13.2	16.3
Cycle Q Clear(g_c), s	49.5	5.7	1.6	16.3	17.3	5.1	31.5	19.8	19.8	31.5	13.2	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	241	1955	872	517	1955	872	194	622	617	161	1244	555
V/C Ratio(X)	0.95	0.22	0.07	0.32	0.54	0.20	0.96	0.72	0.72	0.83	0.53	0.62
Avail Cap(c_a), veh/h	241	1955	872	517	1955	872	194	622	617	161	1244	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	10.4	9.5	14.6	13.0	10.3	39.4	25.5	25.5	41.5	23.3	24.3
Incr Delay (d2), s/veh	47.2	0.3	0.2	1.7	1.1	0.5	55.3	7.1	7.2	37.6	1.6	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	1.9	0.5	2.1	5.8	1.6	6.9	8.6	8.5	4.5	5.2	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.9	10.7	9.6	16.2	14.1	10.8	94.7	32.6	32.7	79.1	24.9	29.5
LnGrp LOS	F	B	A	B	B	B	F	C	C	E	C	C
Approach Vol, veh/h	730		1405				1083		1134			
Approach Delay, s/veh	32.7		13.9				43.3		32.7			
Approach LOS	C		B				D		C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	36.0		54.0		36.0		54.0					
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5					
Max Green Setting (Gmax), s	31.5		49.5		31.5		49.5					
Max Q Clear Time (g_c+I1), s	33.5		51.5		33.5		19.3					
Green Ext Time (p_c), s	0.0		0.0		0.0		9.6					
Intersection Summary												
HCM 6th Ctrl Delay			29.3									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	6	1	910	877	1
Future Vol, veh/h	8	6	1	910	877	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	7	1	989	953	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1451	477	954	0	-	0
Stage 1	954	-	-	-	-	-
Stage 2	497	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	122	534	716	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	122	534	716	-	-	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	335	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.7	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	716	-	244	534	-	-
HCM Lane V/C Ratio	0.002	-	0.036	0.012	-	-
HCM Control Delay (s)	10	-	20.3	11.8	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

HCM 6th Signalized Intersection Summary
1: 10th St West & West Avenue N

Minagar & Associates, Inc.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	187	122	16	155	44	117	382	8	16	259	43
Future Volume (veh/h)	174	187	122	16	155	44	117	383	8	16	259	43
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870
Adj Flow Rate, veh/h	189	203	133	17	168	48	127	416	9	17	282	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	561	904	766	519	676	193	457	1482	32	407	1323	218
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	1165	1870	1585	1044	1399	400	1051	3557	77	962	3176	523
Grp Volume(v), veh/h	189	203	133	17	0	216	127	208	217	17	163	166
Grp Sat Flow(s),veh/h/ln	1165	1870	1585	1044	0	1798	1051	1777	1857	962	1848	1851
Q Serve(g_s), s	10.2	5.7	4.3	0.9	0.0	6.3	7.9	6.9	7.0	1.1	5.1	5.2
Cycle Q Clear(g_c), s	16.6	5.7	4.3	6.5	0.0	6.3	13.1	6.9	7.0	8.0	5.1	5.2
Prop In Lane	1.00		1.00	1.00		0.22	1.00		0.04	1.00		0.28
Lane Grp Cap(c), veh/h	561	904	766	519	0	869	457	740	774	407	770	771
V/C Ratio(X)	0.34	0.22	0.17	0.03	0.00	0.25	0.28	0.28	0.28	0.04	0.21	0.22
Avail Cap(c_a), veh/h	561	904	766	519	0	869	457	740	774	407	770	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	13.5	13.1	15.4	0.0	13.7	21.0	17.3	17.3	20.0	16.8	16.8
Incr Delay (d2), s/veh	1.6	0.6	0.5	0.1	0.0	0.7	1.5	0.9	0.9	0.2	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.2	1.4	0.2	0.0	2.3	1.9	2.7	2.8	0.2	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	14.1	13.6	15.5	0.0	14.3	22.5	18.3	18.3	20.2	17.4	17.5
LnGrp LOS	C	B	B	B	A	B	C	B	B	C	B	B
Approach Vol, veh/h	525				233				552			
Approach Delay, s/veh	16.1				14.4				19.2			
Approach LOS	B				B				B			
Timer - Assigned Phs	2				4				6			
Phs Duration (G+Y+Rc), s	42.0				48.0				42.0			
Change Period (Y+Rc), s	4.5				4.5				4.5			
Max Green Setting (Gmax), s	37.5				43.5				37.5			
Max Q Clear Time (g_c+I1), s	15.1				18.6				10.0			
Green Ext Time (p_c), s	2.6				2.1				1.7			
Intersection Summary												
HCM 6th Ctrl Delay	17.2											
HCM 6th LOS	B											

HCM 6th Signalized Intersection Summary

2: 10th St West & West Avenue M

Minagar & Associates, Inc.







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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	696	90	88	429	147	42	389	103	85	271	77
Future Volume (veh/h)	220	696	92	88	429	147	43	390	103	85	273	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	239	757	100	96	466	160	47	424	112	92	297	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	465	1955	872	356	1955	872	371	975	255	282	1244	555
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	799	3554	1585	644	3554	1585	1002	2786	729	869	3554	1585
Grp Volume(v), veh/h	239	757	100	96	466	160	47	269	267	92	297	84
Grp Sat Flow(s),veh/h/ln	799	1777	1585	644	1777	1585	1002	1777	1739	869	1777	1585
Q Serve(g_s), s	19.9	11.0	2.7	9.0	6.1	4.5	3.1	10.4	10.6	8.2	5.3	3.3
Cycle Q Clear(g_c), s	26.0	11.0	2.7	20.0	6.1	4.5	8.5	10.4	10.6	18.8	5.3	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	465	1955	872	356	1955	872	371	622	609	282	1244	555
V/C Ratio(X)	0.51	0.39	0.11	0.27	0.24	0.18	0.13	0.43	0.44	0.33	0.24	0.15
Avail Cap(c_a), veh/h	465	1955	872	356	1955	872	371	622	609	282	1244	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	11.6	9.7	17.3	10.5	10.1	23.8	22.4	22.5	29.7	20.7	20.1
Incr Delay (d2), s/veh	4.0	0.6	0.3	1.9	0.3	0.5	0.7	2.2	2.3	3.1	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	3.6	0.8	1.3	2.0	1.4	0.7	4.3	4.3	1.8	2.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	12.2	10.0	19.1	10.8	10.6	24.5	24.6	24.8	32.7	21.2	20.7
LnGrp LOS	C	B	A	B	B	B	C	C	C	C	C	C
Approach Vol, veh/h	1096			722			583			473		
Approach Delay, s/veh	13.9			11.8			24.7			23.3		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	36.0			54.0			36.0			54.0		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	31.5			49.5			31.5			49.5		
Max Q Clear Time (g_c+I1), s	12.6			28.0			20.8			22.0		
Green Ext Time (p_c), s	2.8			6.6			1.8			4.2		

Intersection Summary

HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B























Intersection							
Int Delay, s/veh	0.3						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	7	5	9	453	468	5	
Future Vol, veh/h	9	5	11	453	468	9	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	-	100	75	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	10	5	12	492	509	10	
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	784	260	519	0	-	0	
Stage 1	514	-	-	-	-	-	
Stage 2	270	-	-	-	-	-	
Critical Hdwy	6.84	6.94	4.14	-	-	-	
Critical Hdwy Stg 1	5.84	-	-	-	-	-	
Critical Hdwy Stg 2	5.84	-	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.22	-	-	-	
Pot Cap-1 Maneuver	330	739	1043	-	-	-	
Stage 1	565	-	-	-	-	-	
Stage 2	751	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	326	739	1043	-	-	-	
Mov Cap-2 Maneuver	435	-	-	-	-	-	
Stage 1	558	-	-	-	-	-	
Stage 2	751	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s	12.2		0.2		0		
HCM LOS	B						
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1043		-	435	739	-	-
HCM Lane V/C Ratio	0.011		-	0.022	0.007	-	-
HCM Control Delay (s)	8.5		-	13.5	9.9	-	-
HCM Lane LOS	A		-	B	A	-	-
HCM 95th %tile Q(veh)	0		-	0.1	0	-	-

HCM 6th Signalized Intersection Summary

1: 10th St West & West Avenue N

Minagar & Associates, Inc.

08/18/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	183	119	34	354	23	276	720	13	53	702	135
Future Volume (veh/h)	207	183	119	34	354	23	276	721	13	53	703	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1945	1870
Adj Flow Rate, veh/h	225	199	129	37	385	25	300	784	14	58	764	148
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	408	904	766	524	840	55	218	1488	27	252	1286	249
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	976	1870	1585	1052	1737	113	612	3572	64	681	3087	598
Grp Volume(v), veh/h	225	199	129	37	0	410	300	390	408	58	457	455
Grp Sat Flow(s),veh/h/ln	976	1870	1585	1052	0	1850	612	1777	1859	681	1848	1838
Q Serve(g_s), s	17.9	5.5	4.1	1.9	0.0	13.2	20.2	14.8	14.8	6.3	17.3	17.3
Cycle Q Clear(g_c), s	31.1	5.5	4.1	7.4	0.0	13.2	37.5	14.8	14.8	21.0	17.3	17.3
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.03	1.00		0.33
Lane Grp Cap(c), veh/h	408	904	766	524	0	894	218	740	775	252	770	766
V/C Ratio(X)	0.55	0.22	0.17	0.07	0.00	0.46	1.38	0.53	0.53	0.23	0.59	0.59
Avail Cap(c_a), veh/h	408	904	766	524	0	894	218	740	775	252	770	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	13.4	13.1	15.6	0.0	15.4	38.6	19.6	19.6	27.5	20.3	20.3
Incr Delay (d2), s/veh	5.3	0.6	0.5	0.3	0.0	1.7	196.6	2.7	2.6	2.1	3.4	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.1	1.4	0.4	0.0	5.1	16.4	5.8	6.1	1.1	7.1	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	14.0	13.6	15.9	0.0	17.1	235.2	22.3	22.2	29.6	23.7	23.7
LnGrp LOS	C	B	B	B	A	B	F	C	C	C	C	C
Approach Vol, veh/h	553				447				1098		970	
Approach Delay, s/veh	20.8				17.0				80.4		24.1	
Approach LOS	C				B				F		C	
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	42.0			48.0			42.0			48.0		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	37.5			43.5			37.5			43.5		
Max Q Clear Time (g_c+I1), s	39.5			33.1			23.0			15.2		
Green Ext Time (p_c), s	0.0			1.8			4.8			2.3		
Intersection Summary												
HCM 6th Ctrl Delay	42.6											
HCM 6th LOS	D											












HCM 6th Signalized Intersection Summary







2: 10th St West & West Avenue M

Minagar & Associates, Inc.

08/18/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	404	56	154	977	162	172	685	139	123	603	317
Future Volume (veh/h)	212	404	57	154	977	162	174	687	139	123	604	317
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	230	439	62	167	1062	176	189	747	151	134	657	345
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	1955	872	517	1955	872	194	1031	208	160	1244	555
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	450	3554	1585	897	3554	1585	562	2945	595	620	3554	1585
Grp Volume(v), veh/h	230	439	62	167	1062	176	189	451	447	134	657	345
Grp Sat Flow(s),veh/h/ln	450	1777	1585	897	1777	1585	562	1777	1763	620	1777	1585
Q Serve(g_s), s	32.2	5.7	1.6	10.6	17.3	5.1	18.2	19.9	19.9	11.6	13.3	16.3
Cycle Q Clear(g_c), s	49.5	5.7	1.6	16.3	17.3	5.1	31.5	19.9	19.9	31.5	13.3	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	241	1955	872	517	1955	872	194	622	617	160	1244	555
V/C Ratio(X)	0.95	0.22	0.07	0.32	0.54	0.20	0.97	0.72	0.72	0.84	0.53	0.62
Avail Cap(c_a), veh/h	241	1955	872	517	1955	872	194	622	617	160	1244	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	10.4	9.5	14.6	13.0	10.3	39.5	25.5	25.5	41.5	23.3	24.3
Incr Delay (d2), s/veh	47.2	0.3	0.2	1.7	1.1	0.5	58.4	7.2	7.3	38.1	1.6	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	1.9	0.5	2.1	5.8	1.6	7.1	8.6	8.6	4.5	5.2	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.9	10.7	9.6	16.2	14.1	10.8	97.9	32.7	32.7	79.6	24.9	29.5
LnGrp LOS	F	B	A	B	B	B	F	C	C	E	C	C
Approach Vol, veh/h	731		1405				1087		1136			
Approach Delay, s/veh	32.7		13.9				44.0		32.8			
Approach LOS	C		B				D		C			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	36.0		54.0		36.0		54.0					
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5					
Max Green Setting (Gmax), s	31.5		49.5		31.5		49.5					
Max Q Clear Time (g_c+I1), s	33.5		51.5		33.5		19.3					
Green Ext Time (p_c), s	0.0		0.0		0.0		9.6					
Intersection Summary												
HCM 6th Ctrl Delay			29.5									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	6	1	910	877	1
Future Vol, veh/h	12	8	3	910	877	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	9	3	989	953	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1456	478	956	0	-	0
Stage 1	955	-	-	-	-	-
Stage 2	501	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	121	534	715	-	-	-
Stage 1	334	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	121	534	715	-	-	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	333	-	-	-	-	-
Stage 2	574	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	715	-	242	534	-	-
HCM Lane V/C Ratio	0.005	-	0.054	0.016	-	-
HCM Control Delay (s)	10.1	-	20.7	11.9	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.1	-	-

APPENDIX C

Traffic Signal Warrant Analysis Worksheets



Traffic Signal Installation Warrant Assessment

Existing 2023
Without Project

Location: 10th Street West at West Avenue M-8

Agency: City of Palmdale

DIST: 7
CO: Los Angeles
RTE:/PM: N/A

Calculated by: PN
Checked by: FM
Data Day: Wednesday

Date: 8/18/2023
Date: 8/18/2023
Data Date: 8/9/2023

Intersection: 10th Street West at West Avenue M-8

Major Street: 10th Street West

Minor Street: West Avenue M-8

Approach Speed: 55 MPH Posted

Approach Speed: 25 MPH Unposted

2 Critical Approach Lanes (10th Street West):

1 Critical Approach Lanes (West Avenue M-8):

Critical speed of major street traffic > 40 MPH (64 Km/H):

Yes

Area Type (Rural/Urban)*: Rural

In built-up area of isolated community of < 10,000 population:

* Rural: either one satisfied; Urban: neither two satisfied

WARRANT 1 - Eight Hour Vehicular Volume

(Condition A or Condition B or combination of A and B must be satisfied)



YES



NO

Condition A - Minimum Vehicle Volume

100% Satisfied: No (0/8)

• Each of any eight (8) 60-minute periods of an average day satisfying the requirement:

80% Satisfied: No (0/8)

Type:	Rural	Rural	1st Hr.	2nd Hr.	3rd Hr.	4th Hr.	5th Hr.	6th Hr.	7th Hr.	8th Hr.
Approach Lanes:	1	≥ 2	7-8A	8-9A	9A-10A	11-12P	12-1P	3-4P	4-5P	5-6P
Both Approaches	350	420	733	861	921	1,176	1,387	1,550	1,746	1,627
Major Street	(280)	(336)	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x
Highest Approach	105	140	3	5	12	23	15	3	19	10
Minor Street	(84)	(112)								

Condition B - Interruption of Continuous Traffic

100% Satisfied: No (0/8)

• Each of any eight (8) 60-minute periods of an average day satisfying the requirement:

80% Satisfied: No (0/8)

Type:	Rural	Rural	1st Hr.	2nd Hr.	3rd Hr.	4th Hr.	5th Hr.	6th Hr.	7th Hr.	8th Hr.
Approach Lanes:	1	≥ 2	7-8A	8-9A	9A-10A	11-12P	12-1P	3-4P	4-5P	5-6P
Both Approaches	525	630	733	861	921	1,176	1,387	1,550	1,746	1,627
Major Street	(420)	(504)	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x
Highest Approach	53	70	3	5	12	23	15	3	19	10
Minor Street	(42)	(56)								

Condition C - Combination of Conditions A & B

Satisfied: No

• Conditions A and B satisfied to 80% or better:

Condition A: No (0/8)

Condition B: No (0/8)

AND • An adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Traffic signals should not be installed unless one or more of these nine warrants are satisfied. Because these are minimum requirements, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Delay, congestion, crash experience, confusion, or other evidence of the need for signal-controlled right-of-way assignment must be shown.



MINAGAR & ASSOCIATES, INC.

8/21/2023



Traffic Signal Installation Warrant Assessment

Existing 2023
Without Project

Location: 10th Street West at West Avenue M-8

Agency: City of Palmdale

DIST: 7
CO: Los Angeles
RTE: /PM N/A

Calculated by: PN
Checked by: FM
Data Day: Wednesday

Date: 8/18/2023
Date: 8/18/2023
Data Date: 8/9/2023

Intersection: 10th Street West at West Avenue M-8

Major Street: 10th Street West

Minor Street: West Avenue M-8

Approach Speed: 55 MPH

Posted

Approach Speed: 25 MPH

Unposted

2 Critical Approach Lanes (10th Street West):

1 Critical Approach Lanes (West Avenue M-8):

Critical speed of major street traffic > 40 MPH (64 Km/H):

Yes

Area Type (Rural/Urban)*: Rural

In built-up area of isolated community of < 10,000 population:

Yes

* Rural: either one satisfied; Urban: neither two satisfied

WARRANT 2 - Four Hour Vehicular Volume

☐
YES

☒
NO

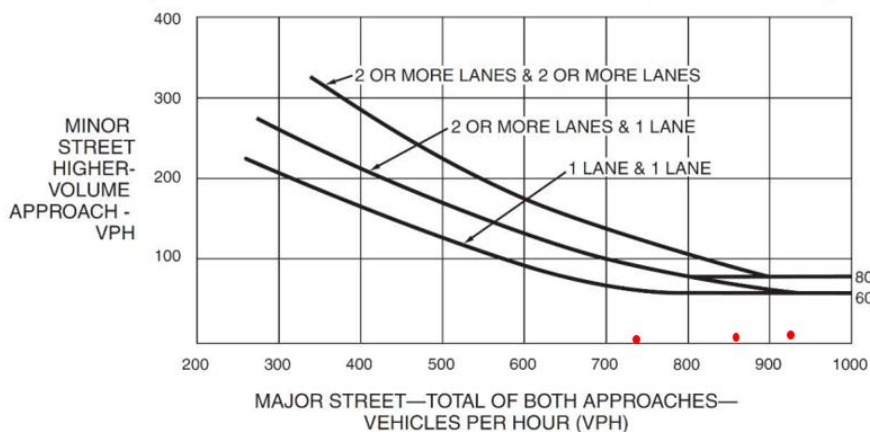
• All plotted points of traffic for each of any four 60-minute periods fall above the curve on Figure 4C-1 (U) or 4C-2 (R)

Satisfied: No (0/4)

Type:	Rural	Rural	1st Hr.	2nd Hr.	3rd Hr.	4th Hr.	5th Hr.	6th Hr.	7th Hr.	8th Hr.
Approach Lanes:	1	≥ 2	7-8A	8-9A	9A-10A	11-12P	12-1P	3-4P	4-5P	5-6P
Both Approaches Major Street		✓	733	861	921	1,176	1,387	1,550	1,746	1,627
Highest Approach Minor Street	✓		3	5	12	23	15	3	19	10
Does plotted point fall above curve?			No	No	No	No	No	No	No	No

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic signals should not be installed unless one or more of these nine warrants are satisfied. Because these are minimum requirements, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Delay, congestion, crash experience, confusion, or other evidence of the need for signal-controlled right-of-way assignment must be shown.





Traffic Signal Installation Warrant Assessment

Existing 2023
Without Project

Location: 10th Street West at West Avenue M-8

Agency: City of Palmdale

DIST: 7
CO: Los Angeles
RTE:/PM: N/A

Calculated by: PN
Checked by: FM
Data Day: Wednesday

Date: 8/18/2023
Date: 8/18/2023
Data Date: 8/9/2023

Intersection: 10th Street West at West Avenue M-8

Major Street: 10th Street West

Minor Street: West Avenue M-8

Approach Speed: 55 MPH

Posted

Approach Speed: 25 MPH

Unposted

2 Critical Approach Lanes (10th Street West):

1 Critical Approach Lanes (West Avenue M-8):

Critical speed of major street traffic > 40 MPH (64 Km/H):

Yes

Area Type (Rural/Urban)*: Rural

In built-up area of isolated community of < 10,000 population:

Yes

* Rural: either one satisfied; Urban: neither two satisfied

WARRANT 3 - Peak Hour (Part A or Part B must be satisfied)

☐
YES

☒
NO

Part A

(All parts 1,2, and 3 below must be satisfied for the same
one hour, for any four consecutive 15-minute periods)

☐
YES

☒
NO

- 1 The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach; and
- 2 The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes; and
- 3 The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches

☐
YES

☐
NO

☐
YES

☒
NO

☐
YES

☐
NO

Part B

☐
YES

☒
NO

Approach Lanes	One	2 or More	4:00 PM
Both Approaches- Major Street		X	1746
Both Approaches- Minor Street	X		19

The plotted point falls above applicable curve in Figure 4C-3 (Urban Areas)

Yes

No

X

OR, The plotted point falls above the applicable curve in Figure 4C-4 (Rural Areas)

Yes

No

X

Traffic signals should not be installed unless one or more of these nine warrants are satisfied. Because these are minimum requirements, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Delay, congestion, crash experience, confusion, or other evidence of the need for signal-controlled right-of-way assignment must be shown.





Traffic Signal Installation Warrant Assessment

Existing 2023
Without Project

Location: 10th Street West at West Avenue M-8

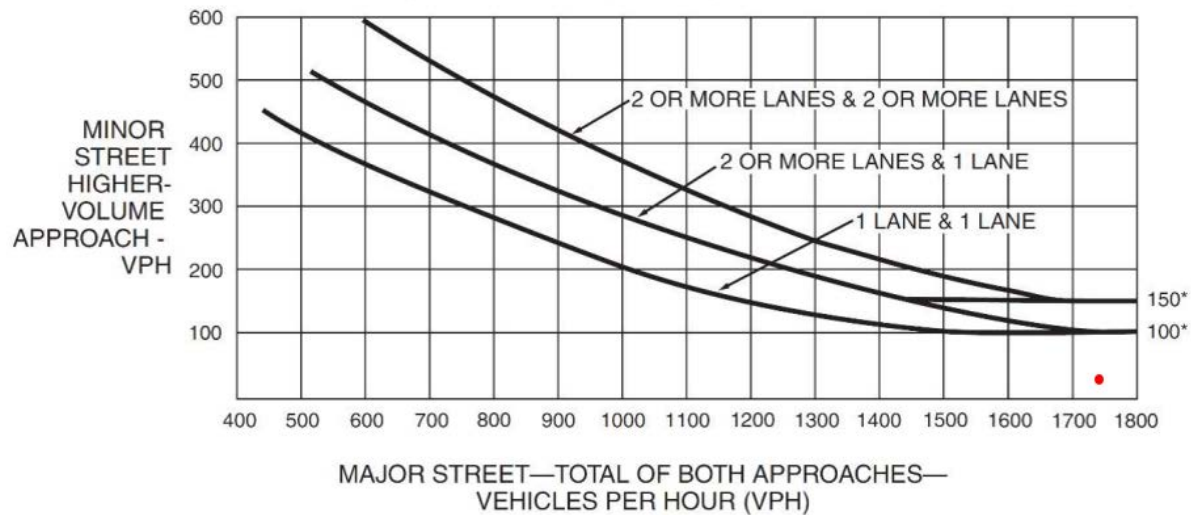
Agency: City of Palmdale

WARRANT 3 - Peak Hour Continued...

☐
YES

☒
NO

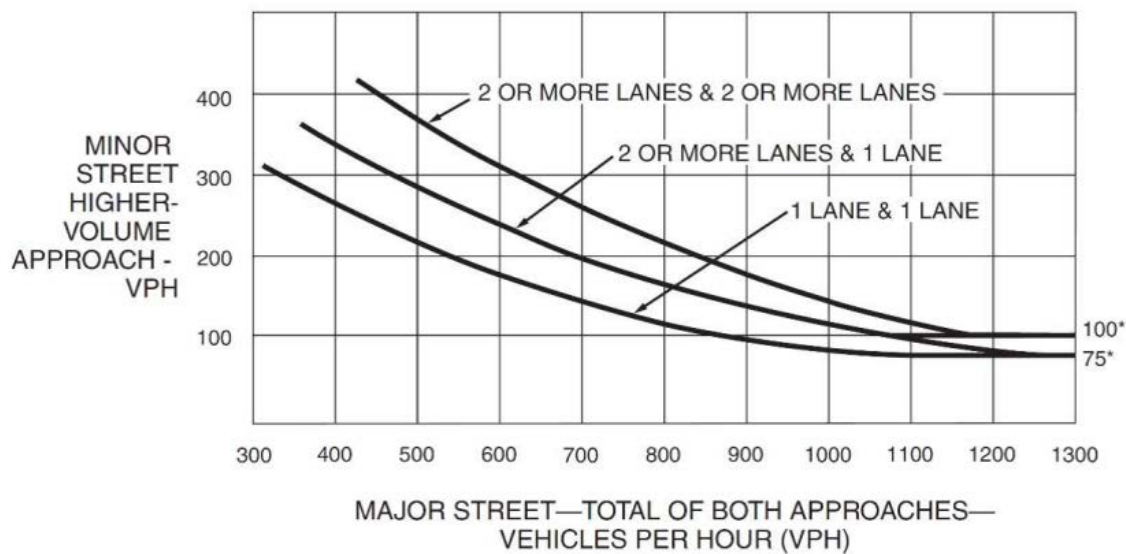
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

The plotted point falls above applicable curve in Figure 4C-3 (Urban Areas)

Yes

No

☒

OR, The plotted point falls above the applicable curve in Figure 4C-4 (Rural Areas)

Yes

No

☒

Traffic signals should not be installed unless one or more of these nine warrants are satisfied. Because these are minimum requirements, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Delay, congestion, crash experience, confusion, or other evidence of the need for signal-controlled right-of-way assignment must be shown.





Traffic Signal Installation Warrant Assessment

Opening Year 2024
With Project

Location: 10th Street West at West Avenue M-8

Agency: City of Palmdale

DIST: 7
CO: Los Angeles
RTE:/PM: N/A

Calculated by: PN
Checked by: FM
Data Day: Wednesday

Date: 8/18/2023
Date: 8/18/2023
Data Date: 8/9/2023

Intersection: 10th Street West at West Avenue M-8

Major Street: 10th Street West

Minor Street: West Avenue M-8

Approach Speed: 55 MPH Posted

Approach Speed: 25 MPH Unposted

2 Critical Approach Lanes (10th Street West):

1 Critical Approach Lanes (West Avenue M-8):

Critical speed of major street traffic > 40 MPH (64 Km/H):

Yes

Area Type (Rural/Urban)*: Rural

In built-up area of isolated community of < 10,000 population:

Yes

* Rural: either one satisfied; Urban: neither two satisfied

WARRANT 1 - Eight Hour Vehicular Volume

(Condition A or Condition B or combination of A and B must be satisfied)



YES



NO

Condition A - Minimum Vehicle Volume

100% Satisfied: No (0/8)

• Each of any eight (8) 60-minute periods of an average day satisfying the requirement:

80% Satisfied: No (0/8)

Type:	Rural	Rural	1st Hr.	2nd Hr.	3rd Hr.	4th Hr.	5th Hr.	6th Hr.	7th Hr.	8th Hr.
Approach Lanes:	1	≥ 2	7-8A	8-9A	9A-10A	11-12P	12-1P	3-4P	4-5P	5-6P
Both Approaches	350	420	744	874	941	1,194	1,408	1,573	1,776	1,651
Major Street	(280)	(336)	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x
Highest Approach	105	140	3	5	14	23	15	3	25	10
Minor Street	(84)	(112)								

Condition B - Interruption of Continuous Traffic

100% Satisfied: No (0/8)

• Each of any eight (8) 60-minute periods of an average day satisfying the requirement:

80% Satisfied: No (0/8)

Type:	Rural	Rural	1st Hr.	2nd Hr.	3rd Hr.	4th Hr.	5th Hr.	6th Hr.	7th Hr.	8th Hr.
Approach Lanes:	1	≥ 2	7-8A	8-9A	9A-10A	11-12P	12-1P	3-4P	4-5P	5-6P
Both Approaches	525	630	744	874	941	1,194	1,408	1,573	1,776	1,651
Major Street	(420)	(504)	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x	(x) x
Highest Approach	53	70	3	5	14	23	15	3	25	10
Minor Street	(42)	(56)								

Condition C - Combination of Conditions A & B

Satisfied: No

• Conditions A and B satisfied to 80% or better:

Condition A: No (0/8)

Condition B: No (0/8)

AND • An adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Traffic signals should not be installed unless one or more of these nine warrants are satisfied. Because these are minimum requirements, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Delay, congestion, crash experience, confusion, or other evidence of the need for signal-controlled right-of-way assignment must be shown.





Traffic Signal Installation Warrant Assessment

Opening Year 2024
With Project

Location: 10th Street West at West Avenue M-8

Agency: City of Palmdale

DIST: 7
CO: Los Angeles
RTE/PM: N/A

Calculated by: PN
Checked by: FM
Data Day: Wednesday

Date: 8/18/2023
Date: 8/18/2023
Data Date: 8/9/2023

Intersection: 10th Street West at West Avenue M-8

Major Street: 10th Street West

Minor Street: West Avenue M-8

Approach Speed: 55 MPH Posted

Approach Speed: 25 MPH Unposted

2 Critical Approach Lanes (10th Street West):

1 Critical Approach Lanes (West Avenue M-8):

Critical speed of major street traffic > 40 MPH (64 Km/H):

Yes

Area Type (Rural/Urban)*: Rural

In built-up area of isolated community of < 10,000 population:

Yes

* Rural: either one satisfied; Urban: neither two satisfied

WARRANT 2 - Four Hour Vehicular Volume



YES



NO

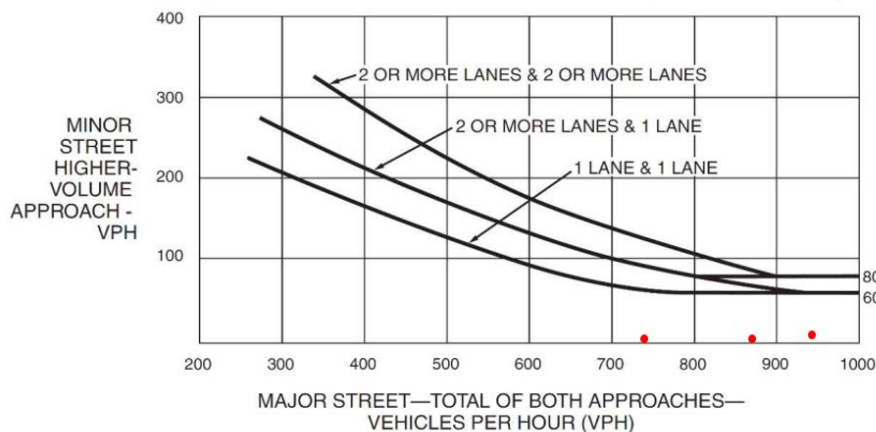
• All plotted points of traffic for each of any four 60-minute periods fall above the curve on Figure 4C-1 (U) or 4C-2 (R)

Satisfied: No (0/4)

Type:	Rural	Rural	1st Hr.	2nd Hr.	3rd Hr.	4th Hr.	5th Hr.	6th Hr.	7th Hr.	8th Hr.
Approach Lanes:	1	≥ 2	7-8A	8-9A	9A-10A	11-12P	12-1P	3-4P	4-5P	5-6P
Both Approaches Major Street		✓	744	874	941	1,194	1,408	1,573	1,776	1,651
Highest Approach Minor Street	✓		3	5	14	23	15	3	25	10
Does plotted point fall above curve?			No	No	No	No	No	No	No	No

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Traffic signals should not be installed unless one or more of these nine warrants are satisfied. Because these are minimum requirements, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Delay, congestion, crash experience, confusion, or other evidence of the need for signal-controlled right-of-way assignment must be shown.





Traffic Signal Installation Warrant Assessment

Opening Year 2024
With Project

Location: 10th Street West at West Avenue M-8

Agency: City of Palmdale

DIST: 7
CO: Los Angeles
RTE:/PM: N/A

Calculated by: PN
Checked by: FM
Data Day: Wednesday

Date: 8/18/2023
Date: 8/18/2023
Data Date: 8/9/2023

Intersection: 10th Street West at West Avenue M-8

Major Street: 10th Street West

Minor Street: West Avenue M-8

Approach Speed: 55 MPH

Posted

Approach Speed: 25 MPH

Unposted

2 Critical Approach Lanes (10th Street West):

1 Critical Approach Lanes (West Avenue M-8):

Critical speed of major street traffic > 40 MPH (64 Km/H):

Yes

Area Type (Rural/Urban)*: Rural

In built-up area of isolated community of < 10,000 population:

Yes

* Rural: either one satisfied; Urban: neither two satisfied

WARRANT 3 - Peak Hour (Part A or Part B must be satisfied)

☐
YES

☒
NO

Part A

(All parts 1,2, and 3 below must be satisfied for the same
one hour, for any four consecutive 15-minute periods)

☐
YES

☒
NO

- 1 The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach; and
- 2 The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes; and
- 3 The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches

☐
YES

☐
NO

☐
YES

☒
NO

☐
YES

☐
NO

Part B

☐
YES

☒
NO

Approach Lanes One 2 or More 4:00 PM

Both Approaches- Major Street	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1776
Both Approaches- Minor Street	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25

The plotted point falls above applicable curve in Figure 4C-3 (Urban Areas)

Yes

☐

No

☒

OR, The plotted point falls above the applicable curve in Figure 4C-4 (Rural Areas)

Yes

☐

No

☒

Traffic signals should not be installed unless one or more of these nine warrants are satisfied. Because these are minimum requirements, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Delay, congestion, crash experience, confusion, or other evidence of the need for signal-controlled right-of-way assignment must be shown.





Traffic Signal Installation Warrant Assessment

Opening Year 2024

With Project

Location: 10th Street West at West Avenue M-8

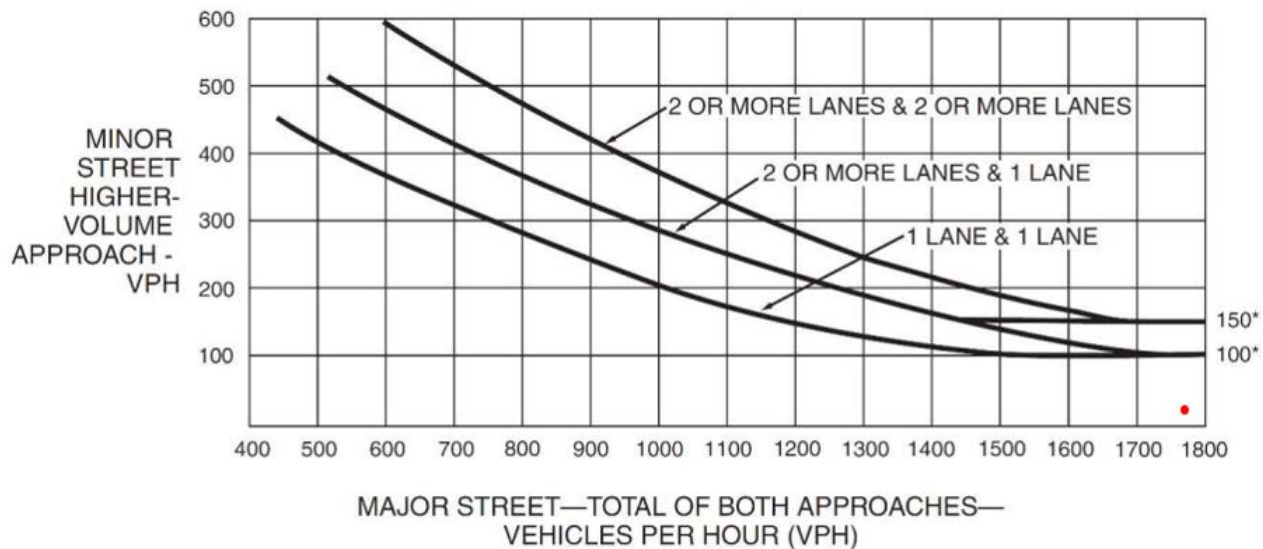
Agency: City of Palmdale

WARRANT 3 - Peak Hour Continued...

☐ YES

☒ NO

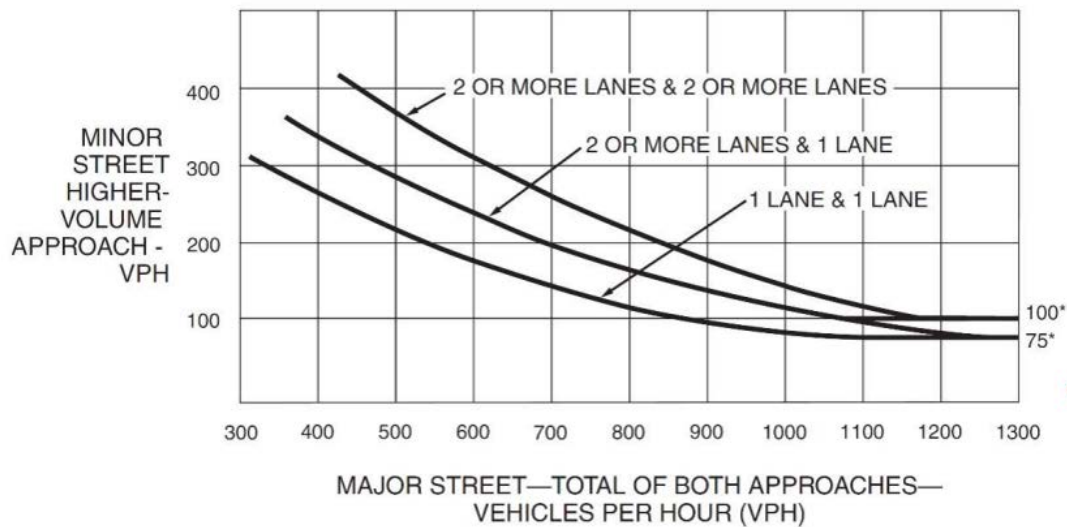
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

The plotted point falls above applicable curve in Figure 4C-3 (Urban Areas)

Yes

No

X

OR, The plotted point falls above the applicable curve in Figure 4C-4 (Rural Areas)

Yes

No

X

Traffic signals should not be installed unless one or more of these nine warrants are satisfied. Because these are minimum requirements, satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Delay, congestion, crash experience, confusion, or other evidence of the need for signal-controlled right-of-way assignment must be shown.





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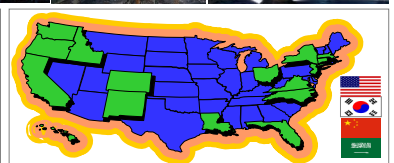
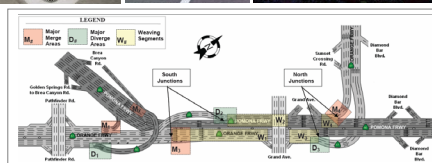
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	2009	Winner of the ASCE's Outstanding Private Sector Civil Engineering Project in Metropolitan Los Angeles	
	2009	Winner of the Caltrans' 2009 Excellence in Transportation Award in the State of California	
	2007	Winner of the ASCE's Outstanding Public/Private Sector Civil Engineering Project in Metropolitan Los Angeles	
	2005	Winner of the APWA's Best Traffic Congestion Mitigation Project of the Year in Southern California	
	2004	Top Nominee of Transportation Foundation's Highway Management Program in the State of California	
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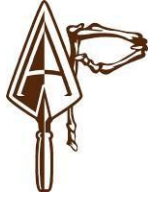
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ATTACHMENT D



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Phase 1 Archaeological and Paleontological Resources Assessment for the 10th Street Warehouse Project, City of Palmdale, Los Angeles County, California

Prepared for:

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38300 Sierra Highway
Palmdale, CA 93550

And

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Date: December 2023

Key Word(s): CEQA, City of Palmdale, 10th Street Warehouse, USGS 7.5' Topographic Quadrangle:
Lancaster West, Lancaster CA, 2023

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EXECUTIVE SUMMARY

ArchaeoPaleo Resource Management, Inc. (APRMI) was contracted by Takvoryan Investments LLC, to perform a Phase 1 Archaeological and Paleontological Assessment of the 10th St. Warehouse project (Project). The Project proponent plans to construct a 1-story, 21-foot-high building in the City of Palmdale, Los Angeles County, CA. This Project is mostly comprised of a mixed-use warehouse and office space. The total lot area is 187,647 SQ.FT., and will be comprised of the building area, warehouse, office area, trash area, parking area, and landscape. To determine the archaeological and paleontological sensitivity of the Project area, APRMI conducted the following research methods: an archaeological and paleontological field reconnaissance survey, paleontological records check from the Natural History Museum of Los Angeles County, a cultural resources records search from the South-Central Coastal Information Center and a Sacred Lands File Search and Native American Contacts list from the Native American Heritage Commission. Additional archival research was also performed for the Project.

The field reconnaissance survey determined that the Project area was an undeveloped desert property. Observed flora included 20 Joshua Trees, Sage brush, Creosote bushes, Desert Cholla, Turkey Mullein, Wire Lettuce, as well as other desert grasses and wildflowers. Observed fauna included cotton-tail rabbits, lizards, birds, and a burrow that is potentially home to a desert tortoise. The south side of Project area has been used as a scattered trash dump and vehicle tracks though the east project area show that it has been previously disturbed by cars and or trucks. Paleontological or Native American cultural resources were not observed, but a historic manmade rock feature was observed along the west site border, just East of the drainage ditch. Potential historic trash items included miscellaneous rusted metal cans, glass bottles/jars, and other unidentifiable rusted metal objects. Although no paleontological or Native American resources were observed during survey, the potential for uncovering such resources during Project related ground disturbing activities still exists.

The paleontological record search results did not identify any known fossil localities within the Project site, but Dr. Alyssa Bell, the Natural History Museum of Los Angeles County Collections Manager states that there are four vertebrate fossil sites that have been recorded in the City of Palmdale within similar sedimentary deposits to those which may found within the Project boundaries. These soils include both Holocene and Pleistocene alluvial sediments. The Pleistocene alluvial deposits that may be present on the Project area derive from the Anaverde and Harold Formations, as confirmed by the 2008 geologic map of the Lancaster & Alpine Butte quadrangles. Since there is a high possibility that Harold Formation sediments may be present, and there is a precedent set by the fossils identified by Dr. Bell, there exists the potential to uncover paleontological resources during excavation of soil on the property.

The cultural research records search conducted by the South Central Coastal Information Center (SCCIC) did not identify the presence of any previously recorded cultural (prehistoric/tribal/historic) resources that were located within the direct Project area. The results of the record search included one prehistoric site, four historic sites, and three historic buildings within a one-mile

radius of the Project area, although none of the buildings are on the California or National Register and none have been locally designated. An analysis of the reports provided by the SCCIC indicates that two more prehistoric sites, one more prehistoric isolate, and seven more historic sites (largely trash deposits) are located within a one-mile radius of the Project area. This indicates that there is a high potential for the discovery of cultural resources during ground-disturbing activities.

APRMI requested a Sacred Lands File Search and a Native American Contacts list for the proposed Project from the Native American Heritage Commission (NAHC). The NAHC concluded the Project area to be negative for the presence of tribal resources. However, the absence of specific site information in the Sacred Lands File does not indicate the absence of cultural resources in the project area. Tribal entities from the Native American Contact List were contacted by mail and through verbal correspondence. APRMI received two responses requesting action on the project. The first, from Chairwoman Donna Yocum of the San Fernando Band of Mission Indians stated that the Project area, and Palmdale in general, is an extremely culturally sensitive area within their ancestral homeland, and that she requested AB 52 consultation with the City of Palmdale and the presence of a tribal monitor from NDNA Monitoring and Consulting, LLC during any ground-disturbing activities. The second, from Alexandra McCleary of the Yuhaaviatam of San Manuel Nation, stated that the Project lies within Serrano ancestral territory and requested AB 52 consultation.

This report outlines the contextual history for the Project region, the research methodology, and results of the research conducted for this assessment. Attached are the recommended mitigation measures that would reduce the impacts on cultural, paleontological, and tribal resources to a less than significant level.

ACRONYMS

AB	Assembly Bill
AF	Artificial Fill
AMSL	Above Mean Sea Level
APRMI	ArchaeoPaleo Resource Management, Inc.
BCE	Before Common Era
BP	Before Present
bgs	Below Ground Surface
CCR	California Code of Regulations
CE	Common Era
CEQA	California Environmental Quality Act
CHL	California Historic Landmarks
CHRIS	California Historical Resources Information System
CPHI	California Points of Historical Interest
CRHR	California Register of Historical Resources
CRM	Cultural Resource Management
CPR	Common Pool Resource
GIS	Geographic Information Systems
GBCBP	Great Basin Concave Base Point
HCM	Historic Cultural Monument
HRI	Historic Resources Inventory
HSC	California Health and Safety Code
HTMC	Historic Topographic Map Collection
IP	Invertebrate Paleontology
mya	Million Years Ago
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NHMLA	Natural History Museum of Los Angeles County
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
Qa	Quaternary Alluvium
PRC	Public Resources Code
RPA	Registered Professional Archaeologist
SOI	Secretary of the Interior
SCCIC	South Central Coastal Information Center
SFMBI	San Fernando Band of Mission Indians
SVP	Society for Vertebrate Paleontology
USGS	United States Geologic Service
VP	Vertebrate Paleontology
YSMN	Yuhaaviatam of San Manuel Nation

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INTRODUCTION

1.1 Project Description

Takvoryan Investments LLC proposes to use a 4.3-acre plot of land to construct 10th St. Warehouse (Project), a 1-story, 21-foot high building containing mixed-use warehouse and office space. The total lot area is 187,647 SQ.FT., and will be comprised of building area, warehouse, office area, trash area, parking area, and landscape. Takvoryan Investments LLC has contracted APRMI to perform a Phase 1 Paleontological and Archaeological Assessment of the Project.

The purpose of this assessment is to determine the paleontological and archaeological sensitivity of the Project area. As part of this assessment, APRMI conducted a pedestrian field survey to identify the presence of any palaeontologic, archaeologic, or tribal resources that may be within the Project area. Informational methods included requesting a palaeontologic resources records check from the Natural History Museum of Los Angeles County, a cultural resources record search from the South Central California Information Center, and a Scared Lands File records search from state repositories. Additional information was obtained from local historic societies, on-line sources, and libraries. This Phase 1 Paleontological and Archaeological Assessment report outlines the methods, results, and mitigation recommendations in further detail in the following sections.

1.2 Project Location

The Project area is located east of SR-14, in the north-west corner of the intersection between West Avenue M-8 and 10th Street West, within the City of Palmdale, Los Angeles County. The assessor's parcel numbers are: 3111-012-083 / 3111-012-084. It is within the township and range of 6N 12W. Maps and a satellite view of the location can be viewed in Figures 1-3.

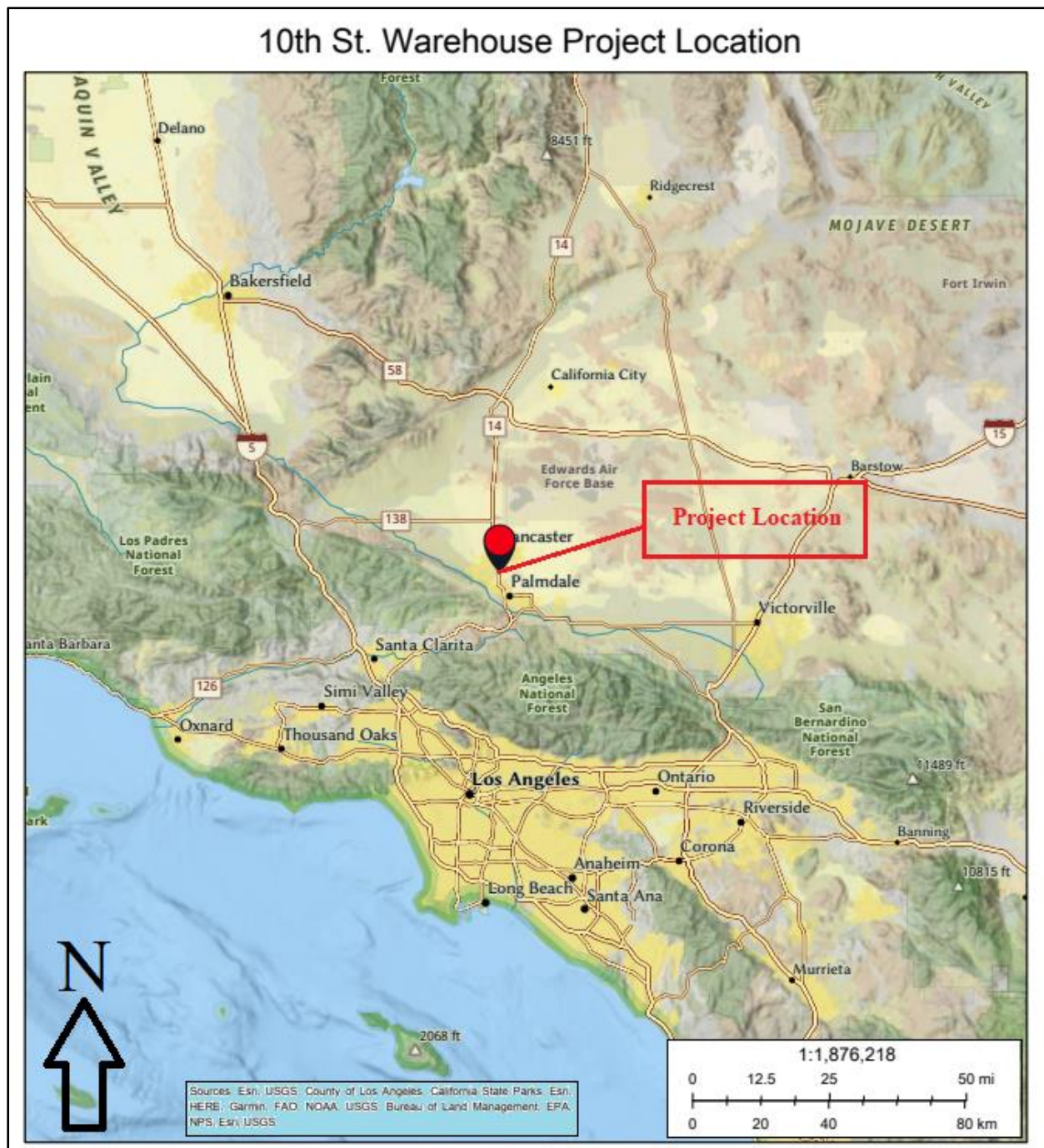


Figure 1. Topographic regional overview of the Project area illustrated by red pin. Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, 2023.

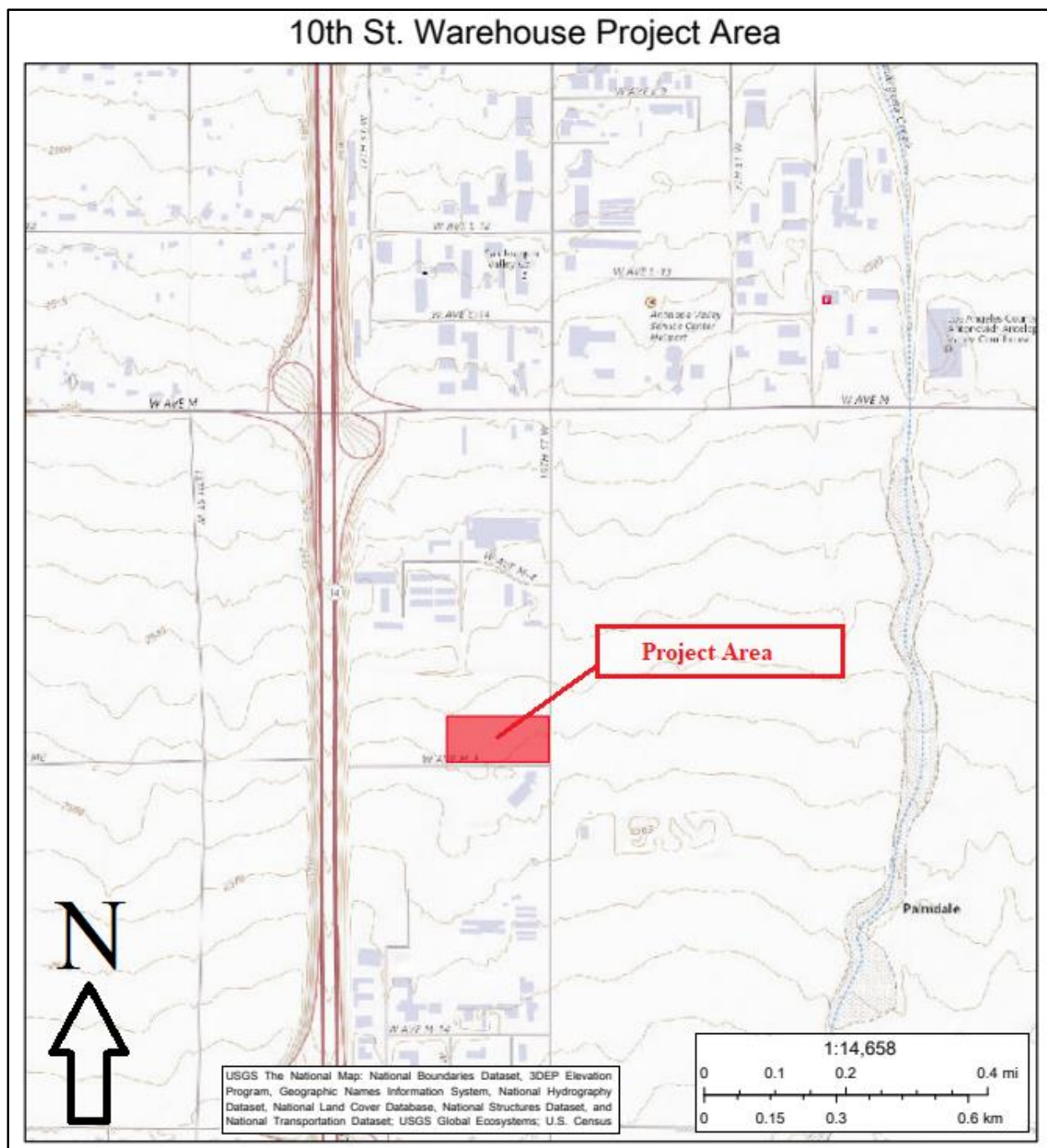


Figure 2. Topographic overview of the Project area in box shaded red. Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, 2023.

Satellite View of 10th St. Warehouse Project Area

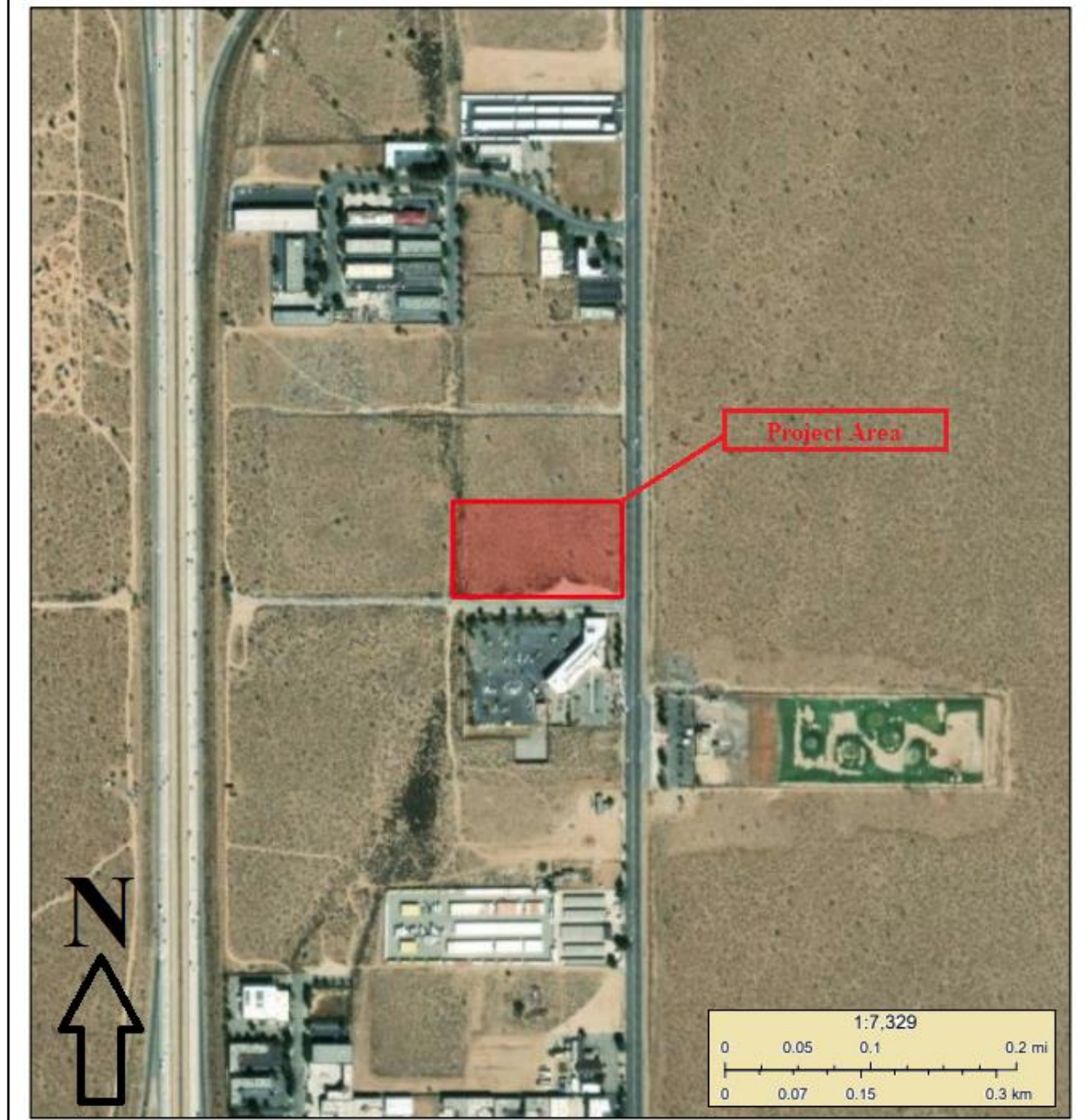


Figure 3. Satellite overview of Project area in box shaded red. Source: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, 2023.

1.3 Natural Setting

Palmdale is located in the Antelope Valley near the Mojave desert's westernmost point. Palmdale is 62 miles north of downtown Los Angeles and is geographically isolated from suburban Los Angeles by the San Gabriel Mountains of the Angeles National Forest in part of the Transverse Range Geomorphic Province of California (east-west orientation). The City of Palmdale has three seasonal streams running through it, consisting of the Anaverde Creek, Amargosa Creek, and Littlerock Wash. Additionally, there are multiple other small drainages that flow from the San Gabriel mountains and the Littlerock reservoir into Palmdale. The floor of the valley can be subject to shallow flooding, as sheet flow runoff from the San Gabriel's collects in the low-lying valley. Water flows from the mountains towards Palmdale via undefined streams and drainage channels, and during heavy rain events these channels are susceptible to random sheet flow patterns. The most common biotic/floral communities of the Palmdale desert landscape include annual grasslands, mixed chaparral, desert scrub, sagebrush/bitterbrush, and Joshua Trees. Fauna of this area generally includes large and small to medium size mammals such as rodents, rabbits, deer, coyotes, and bobcats. The area is also a host to migrating birds, perching birds and raptors, as well as reptiles such as skinks, lizards, and snakes (City of Palmdale 2020).

1.4 Project Personnel

Robin Turner, M.A. is the Principal Investigator and President for APRMI. She holds a Master of Arts degree in Anthropology, with an emphasis on Public Archaeology, from California State University, Northridge. Ms. Turner has over 30 years of experience in the Cultural Resource Management (CRM) and the paleontological fields and has conducted major field and technical investigations throughout southern California. She meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology and is a qualified professional paleontologist per the Society of Vertebrate Paleontology's guidelines. Ms. Turner is a Research Associate at the Natural History Museum of Los Angeles County and at the George C. Page Museum of La Brea Discoveries, as well as a Scientific Advisor to the Buena Vista Museum of Natural History and Sciences in Bakersfield. She is also a past Planning Commissioner for the City of Culver City and is a past museum chair for the Culver City Historical Society. Ms. Turner served as the Principal Investigator and Project Manager for this project as well as section writer and the final editor of this report.

John (Jack) Flynn, B.A. is a Staff Archaeologist for APRMI. Mr. Flynn has a Bachelor of Arts in Anthropology from the University of California, Merced, and has seven years of experience excavating, analyzing, and monitoring archaeological and paleontological materials. His work includes participating as a student researcher in the Heritage, Interpretation, Visualization, and Experience (HIVE) lab at UC Merced, collecting historical, cultural, and natural data through archival research and fieldwork for the John Muir Geotourism Application Project, and participated in an archaeological field school in Belize, Central America, studying Maya Archaeology. His field and laboratory work emphasized archaeological and paleontological contexts, such as historic and prehistoric architecture, osteology, ceramics, lithic analysis, site mapping, and reconnaissance. Mr. Flynn performed the field reconnaissance and contributed to

the writing of this report.

Rachelle Oppel, B.S., is a Staff Archaeologist with APRMI. Ms. Oppel has five years of experience excavating, analyzing, and monitoring paleontological and archaeological materials. Her work includes the George C. Page Museum of Tar Pit Discoveries, survey work with the United States Forest Service, geological survey, environmental consulting, and human remains recovery projects. Her extensive field and laboratory work emphasized forensic and archaeological contexts, such as human and non-human bone recovery and processing, and a Certificate in Forensic Identification from California State University, Chico. Ms. Oppel has extensive experience with DPR forms, records searches, GIS mapping, and cultural resources technical reports. Mrs. Oppel performed field reconnaissance and contributed to this report.

Sam Parekh, B.A., is a Staff Historian for APRMI. He has a Bachelor of Arts in History and a second Bachelor of Arts in Government & Politics from the University of Maryland, College Park, in addition to a commission from the California Army National Guard. He has four years of experience cataloguing and inventorying artifacts for both the Wende Museum in Culver City, California and the Garstang Museum in Liverpool, England, and has assisted in conducting site surveys and testing for APRMI. He is experienced with historical research, computer data entry and formatting, and the preparation of OHP/DPR forms. Sam Parekh contributed to the writing of this report.

2.0 REGULATORY SETTING

Although Federal laws do not currently apply to this Project, they are listed in the event they become applicable during construction operations.

2.1 Federal Laws

2.1.1 Antiquities Act of 1906

The Antiquities Act of 1906 (16 USC § 431 *et seq.*) provides for the establishment and preservation of national monuments, historic landmarks, and historic or prehistoric structures, or other items of interest on federally owned lands. Additionally, Section 433 of this act prohibits the purposeful taking, excavation, damage, and destruction of historic or prehistoric ruins, monuments, or other objects of antiquity on federally owned lands. Other “objects of antiquity” are interpreted to include paleontological remains.

2.1.2 National Environmental Policy Act of 1969

The National Environmental Policy Act (NEPA) of 1969, specifically P.L. 91-190, 83 Stat. 852, 42 USC §§ 4321-4327, mandates the preservation of “important historic, cultural, and natural aspects of our national heritage” (§101.b4). In addition, NEPA is interpreted as providing for the protection and preservation of paleontological remains.

2.1.3 Section 106 of the National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) mandates the following:

The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register [of Historic Places (NRHP)]. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation [The Council], established under Title II of this Act, reasonable opportunity to comment with regard to such an undertaking. [16 U.S.C. § 470f]

An effect, or “adverse effect,” as defined by 36 CFR § 800.5 (a)(1), occurs

when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register [NRHP] in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.

To further clarify the meaning of what constitutes an adverse effect, 36 CFR § 800.5 (a)(2) identifies the following: physical destruction, alteration that is not in keeping with the *Secretary of the Interiors Standards for the Treatment of Historic Properties* per 36 CFR §68, removal, change of use, alteration of property setting, relocation, application of intrusive elements, neglect, and change of ownership (federal to non-federal).

The NHPA (16 U.S.C. § *et seq.*) defines a historic resource as significant if eligible for inclusion in the NRHP as defined by one of four eligibility criteria set forth in 36 CFR § 60.4A. Determination of historic resource significance is carried out via implementation of the Section 106 process of the NHPA, as set forth by the Council per 36 CFR § 800 “Protection of Historic Properties.” Such significant historic resources can include archaeological sites of pre-historic or historic context, historic buildings, structures, or objects of state, local, or federal importance that retain integrity of location, design, setting, feeling, association, material, and/or workmanship and

- (A) Are associated with events which have made a significant contribution to the broad patterns of our history, or
- (B) Are associated with the lives of persons significant in our past, or
- (C) Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or are representative of significant and distinguishable entity of which the component may lack individual distinction, or
- (D) Yield, or are likely to yield, data important to our understanding of prehistory and/or

history.

2.1.4 Native American Graves Protection and Repatriation Act (25 USC Section 3001 et seq.)

The discovery of human remains is always a possibility during construction-related disturbances. The Native American Graves Protection and Repatriation Act, or NAGPRA, was enacted November 16, 1990. It states that the “ownership or control of Native American cultural items,” which include human remains, funerary objects, sacred objects, and objects of cultural patrimony, that are “excavated or discovered on Federal or tribal lands” after the law went into effect is held by the lineal descendants of the Native American (or Hawaiian) to whom the objects originally belonged. If the lineal descendants cannot be found, then their ownership is conferred to the “Indian” tribe or Native Hawaiian organization on whose land the objects or remains were discovered or that has the closest cultural affiliation.

2.2 State Laws

2.2.1 California Register of Historical Resources (PRC §5024.1)

The California State Historical Resources Commission enacted Public Resources Code §5024.1, which established the California Register of Historical Resources (CRHR). The statute encourages public recognition and protection of resources of architectural, historical, archaeological, and cultural significance. The register itself is a listing of all properties considered to be significant historical resources in the state. Resources are considered significant (and thus eligible for the register) if they retain integrity and meet one of the following criteria:

- 1) Associated with events which have made a significant contribution to the broad patterns of California’s history and historical heritage
- 2) Associated with the lives of persons significant in California’s past
- 3) Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or
- 4) Yield, or are likely to yield, information important in prehistory or history.

The California Register specifically provides that historical resources listed, determined eligible for listing on the California Register by the State Historical Resources Commission, or resources that meet the California Register criteria are resources, which must be given consideration under CEQA (see below). Other resources, such as resources listed on local registers or in local surveys, may be listed if they are determined by the State Historic Resources Commission to be significant in accordance with criteria and procedures to be adopted by the Commission and are nominated; their listing in the California Register is not automatic.

According to the federal laws to which the State of California defers when its own laws do not apply to a situation, historical resources are evaluated if they are 50 years or older, unless they are exceptional according to a set of criteria considerations. The Instructions for Recording Historical

Resources (California Office of Historic Preservation [OHP] 1995:2) states that “[a]ny physical evidence of human activities over 45 years old may be recorded for purposes of inclusion in the OHP’s filing system.” This five-year difference is to compensate for the amount of time that usually occurs between a resource’s discovery and its official documentation as well as the implementation of any mitigation procedures.

2.2.2 California Environmental Quality Act

The California Environmental Quality Act (CEQA) is a statute that requires state and local agencies to identify significant environmental impacts of their actions, including damages to cultural or historical resources, in order to avoid or mitigate those adverse impacts or changes. §5020.1 of CEQA establishes “substantial adverse change” as the “demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired” (see below for the definition of *historical resource*). The “threshold of significance” is the level at which a lead agency finds the effects of a Project to be significant.

The destruction of unique, non-renewable cultural resources is a significant impact on the environment that requires mitigation of the impact. Construction excavation in archaeologically sensitive deposits that underlie a Project Area is a significant impact that could be prevented, minimized, or mitigated through the development of project alternatives (e.g., avoidance of the cultural resource) or mitigation measures for the purpose of recovering data that might otherwise be destroyed (e.g. archaeological excavation prior to construction excavation and archaeological monitoring of construction excavation of a known site; or archaeological monitoring of construction excavation of an archaeologically sensitive area). Even if a historical resource, an archaeological site, or human remains cannot be identified within a project area before project implementation (i.e., if the resources are not visible on the surface during a Phase 1 survey, or if Extended Phase II testing does not reveal subsurface archaeological material), the area may still be archaeologically sensitive, based on the characteristics of the environmental background of the area or its current environmental setting, and that said resources are predicted to exist within the project area/remains could be present within the project area. Mitigation measures to avoid project impacts to as-yet undiscovered historical resources or human remains may be employed by the Lead Agency, even if these resources have not been identified within or adjacent to the project area. A study must consider a project’s current baseline environmental setting and physical conditions so that the lead agency can determine whether project impacts would cause a significant change to that environment.

§15091(a) and (d) of the CEQA Guidelines require the Lead Agency to adopt a program for reporting on or monitoring the changes—that it has either required for the project or has made a condition of approval—in order to avoid or substantially lessen significant environmental effects. A Mitigation Monitoring and Reporting Program (MMRP) provides for the monitoring of mitigation measures that may be required by a project’s Environmental Impact Report (EIR), if the EIR identifies potentially significant adverse impacts and mitigation measures to reduce those impacts to a less-than-significant level. An archaeological resources/built environment data recovery or monitoring plan may be part of an MMRP if archaeological resources/built

environment will be affected.

A significant historical resource, as defined by CEQA, is referred to as a “Historical Resource.” Such Historical Resources have been determined eligible for inclusion in the CRHR per Title 14, California Code of Regulations (CCR), §15064.5(a)(3), and include historic properties eligible for inclusion on the National Register of Historic Places (NRHP) per PRC §5024.1, or are historically significant at a local level, such as a city, town, community, or county.

Paleontological resources are protected by Appendix G (Part V) of CEQA, which indicates that the destruction of unique, non-renewable paleontological resources is a significant impact on the environment that requires mitigation of the impact. It specifically asks whether a project would “directly or indirectly destroy a unique paleontological resource or site or unique geological feature.” Excavations in paleontologically sensitive deposits that underlie a project area is a significant impact that can be mitigated via the salvage and identification of excavated fossils from the deposit.

2.2.3 California Administrative Code

Title 14, Section 4307 of the California Administrative Code states that “no person shall remove, injure, deface, or destroy any object of paleontological, archaeological, or historical interest or value.”

2.2.4 Public Resources Code

Section 5097.5 and Section 30244. of the California Public Resources Code (PRC) protects both cultural and paleontological resources. Section 5097.5 states that

“a person shall not knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over the lands.”

Section 5097.5 also states that “a violation of this section is a misdemeanor, punishable by a fine not exceeding ten thousand dollars (\$10,000), or by imprisonment in a county jail not to exceed one year, or by both that fine and imprisonment.” This section defines public lands as “lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.”

Section 30244 states that “where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.”

2.2.5 Native American Heritage Act

The Native American Heritage Act, passed by California in 1976, established the Native American Heritage Commission (NAHC) for the purpose of protecting Native American religious values on state property (PRC §5097.9). The NAHC not only protects the heritage of California Native Americans, but also ensures their participation in matters concerning heritage sites. The commission's duty is to assist both federal and state agencies in protecting Native American sacred places and provide recommendations concerning Native American heritage in accordance with environmental law and policy. As required by Government Codes §65352.3 and §65562.5, for purposes of consultation with California Native American Tribes, the NAHC maintains a list of California Native American Tribes with whom local governments and public agencies must consult.

The act also protects burials from disturbance, vandalism, and accidental destruction. It stipulates what specific procedures, laid out in the California Health and Safety Code (HSC), must be implemented if a Native American burial is uncovered during project construction or archaeological data recovery.

2.2.6 Senate Bill 18

The California Senate Bill 18, passed in 2004, establishes a procedure to help California indigenous tribes and jurisdictions define tribal cultural resources and sacred areas more clearly as well as incorporate their protection into a General or Specific Plan prior to its adoption or amendment. The law also requires that California cities and counties contact and consult with California Native American tribes prior to designating land as open space. By involving tribes in local land use decisions, impacts to sites of cultural significance can be mitigated.

2.2.7 Assembly Bill 52

Assembly Bill (AB) 52, was approved and passed on September 25, 2014, by California State Governor Gerry "Jerry" Brown, Jr. The act has amended California PRC Section 5097.94, and added PRC Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3, relating to California's Native American populations. Assembly Bill 52 applies to projects in which a Notice of Preparation (NOP) or a Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration (MND) would be filed on or after July 1, 2015. This bill recognizes California Native American tribes' expertise regarding cultural resources and provides a method for agencies to incorporate tribal knowledge into their CEQA environmental review and decision-making processes. California Native American tribes can now establish a standing request to consult with a lead agency regarding any proposed project subject to CEQA in the geographic area with which the tribe is traditionally and culturally affiliated. The definition of tribal cultural resources, as per PRC Section 21074(a)(1) and (2), are considered as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe" that are included or determined to be eligible for inclusion in the California Register or included in a local register of historical resources. A tribal cultural resource may also be determined by a lead agency, in its discretion and supported by substantial evidence. PRC

section 21080.3.1(a-e) outlines and defines the initial consultation process required from the lead agency as follows:

21080.3.1(a): The Legislature finds and declares that California Native American tribes traditionally and culturally affiliated with a geographic area have expertise concerning their tribal cultural resources.

21080.3.1(b): Prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report for a project, the lead agency shall begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if:

(1) The California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe, and

(2) The California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation. When responding to the lead agency, the California Native American tribe shall designate a lead contact person. If the California Native American tribe does not designate a lead contact person, or designates multiple lead contact people, the lead agency shall defer to the individual listed on the contact list maintained by the Native American Heritage Commission for the purposes of Chapter 905 of the Statutes of 2004. For purposes of this section and Section 21080.3.2, “consultation” shall have the same meaning as provided in Section 65352.4 of the Government Code.

21080.3.1(c): To expedite the requirements of this section, the Native American Heritage Commission shall assist the lead agency in identifying the California Native American tribes that are traditionally and culturally affiliated with the project area.

21080.3.1(d): Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

21080.3.1(e): The lead agency shall begin the consultation process within 30 days of receiving a California Native American tribe’s request for consultation.

Under PRC section 21080.3.2 (a) the following topics are potential consultation discussions:

- The type of environmental review necessary
- The significance of tribal cultural resources

- The significance of the project's impacts on the tribal cultural resources
- Project alternatives
- Appropriate measures for preservation
- Mitigation measures

Consultation is considered complete if the parties agree to measure(s) to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource, or if a party acting in good faith and after reasonable effort, concludes that a mutual agreement cannot be reached (PRC 2108.3.2(b) (1-2)). This section does not limit the ability of a California Native American tribe or the public to submit information to the lead agency regarding the significance of the tribal cultural resources, the significance of the project's impact on tribal cultural resources, or any appropriate measures to mitigate the impact. This section also does not limit the ability of the lead agency or project proponent to incorporate changes and additions to the project as a result of the consultation, even if not legally required. If the project proponent or its consultants participate in the consultation, those parties shall respect the principles set forth in this section.

PRC section 21082.3(a)(b) requires any mitigation measures agreed upon in the consultation conducted pursuant to PRC section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact on tribal cultural resources. If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following: (1) Whether the proposed project has a significant impact on an identified tribal cultural resource. (2) Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource.

Any information including, but not limited to, the location, description, and the use of the tribal cultural resources, that is submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public without the prior consent of the tribe that provided the information. If the lead agency publishes any information submitted by a California Native American tribe during the consultation or environmental review process, that information shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public (PRC section 21082.3(c)). If a California Native American tribe has requested consultation pursuant to PRC section 21080.3.1 and has failed to provide comments to the lead agency, failed to engage in the consultation process, or if the lead agency has complied with PRC section 21080.3.1(d) and the California Native American tribe has failed to request consultation within 30 days, the lead agency may certify an Environmental Impact Report or adopt a Mitigated Negative Declaration.

Suggested mitigation measures after lead agencies determine that a project may cause a substantial adverse change to tribal cultural resources are outlined under PRC section 21084.3 as follows:

- Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
- Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
 - Protecting the cultural character and integrity of the resource.
 - Protecting the traditional use of the resource.
 - Protecting the confidentiality of the resource.
- Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
- Protecting the resource.

2.2.8 California Health and Safety Code

Section 7050.5 of the HSC states that if human remains are found, construction and/or excavation must cease within the general vicinity, and the remains must be inspected by the county coroner. If the coroner determines that they are Native American in origin, then the coroner must contact the NAHC. The NAHC will then determine and notify a Most Likely Descendant (MLD). The MLD must complete inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

Sections 8010-8011 of the HSC establish a state repatriation policy that is consistent with and facilitates implementation of NAGPRA. NAGPRA was passed in 1990 and required that museums and federal agencies document all Native American human remains within their collections, or uncovered on projects, as well as their cultural ties. These agencies must then notify any tribe that may be affiliated with the remains and provide the opportunity for their repatriation along with any associated cultural items (grave goods). The California state version (Cal NAGPRA) mandates publicly funded agencies (state and local government agencies) and museums to repatriate human remains and associated cultural items to California Native American Tribes, not just federally recognized tribes within California, and establishes penalties for noncompliance.

2.3 Local Laws and Policies

2.3.1 County of Los Angeles General Plan

Los Angeles County considers its “historic, cultural, and paleontological resources [as] non-renewable and irreplaceable” (County of Los Angeles 2014:155). In order to protect these resources, the County is guided by federal and state laws regarding such resources. The County’s goal (C/NR 14) is to “[m]itigate all impacts from new development on or adjacent to historic, cultural, and paleontological resources to the greatest extent feasible” and to “[e]nsure proper notification and recovery processes are carried out for development on or near historic, cultural,

and paleontological resources.” The County also has policies to “[s]upport the preservation and rehabilitation of historic buildings” and to “[e]nsure proper notification procedures to Native American tribes in accordance with Senate Bill 18 (2004)” (County of Los Angeles 2014:159). One method the County has employed to successfully preserve historic, cultural, and paleontological resources is maintaining a “local registry or landmarks commission” that identifies historic, cultural, and paleontological resources that are not identified by state and federal programs (County of Los Angeles 2014:158). This registry, known as the Los Angeles County Historical Landmarks and Records Commission “reviews and recommends cultural heritage resources in the unincorporated areas for inclusion in the State Historic Resources Inventory” (County of Los Angeles 2014:155).

2.3.2 City of Palmdale General Plan

GOAL ER7: Protect historical and culturally significant resources which contribute to the community's sense of history.

Objective ER7.1: Promote the identification and preservation of historic structures, historic sites, archaeological sites, and paleontological resources in the City.

Policy ER7.1.1: Identify and recognize historic landmarks from Palmdale's past.

Policy ER7.1.2: Promote maintenance, rehabilitation, and appropriate reuse of identified landmarks where feasible.

Policy ER7.1.3: Require that new development protect significant historic, paleontological, or archaeological resources, or provide for other appropriate mitigation.

Policy ER7.1.4: Develop and maintain a cultural sensitivity map. Require special studies/surveys to be prepared for any development proposals in areas reasonably suspected of containing cultural resources, or as indicated on the sensitivity map.

Policy ER7.1.5: When human remains, suspected to be of Native American origin are discovered, cooperate with the Native American Heritage Commission and any local Native American groups to determine the most appropriate disposition of the human remains and any associated grave goods.

Policy ER7.1.6: Cooperate with private and public entities whose goals are to protect and preserve historic landmarks and important cultural resources.

Policy ER7.1.7: Promote recognition, understanding and enjoyment of unique historical resources within the community by identifying resources through the use of landmark designation plaques, directional signage, self-guided tours, school curriculum, programs and events. (General Plan Amendment 04-01, adopted by City Council April 14, 2004.)

Policy ER7.1.8: Discourage historic landmark properties from being altered in such a manner as to significantly reduce their cultural value to the community. (General Plan Amendment 04-01, adopted by City Council April 14, 2004.)

3.0 GEOLOGIC SETTING

Stratigraphic divisions found in rock sequences reflect geologic changes, and thus have provided the basis for determining geologic time scales. Geologic eons are divided into eras, which are divided into periods, which are divided into series or epochs. Table 1 outlines the geologic eras, periods, and series discussed in this report and is based on one created by the USGS Geologic Names Committee (2007). Geologic eras previous to those discussed in this report are not included in the table.

Table 1. Divisions of Recent Geologic Time, *Changes to time scale since 2007 (USGS Names Committee 2018).

EONOTHEM / EON	ERATHEM / ERA	SYSTEM, SUBSYSTEM / PERIOD, SUBPERIOD	SERIES / EPOCH	Age estimates of boundaries in mega-annum (Ma) unless otherwise noted
Phanerozoic	Cenozoic (Cz)	Quaternary (Q)	Holocene	11,700 ±99 yr*
			Pleistocene	
		Tertiary (T)	Pliocene	2.588*
			Miocene	5.332 ±0.005
				23.03 ±0.05
			Oligocene	33.9 ±0.1
			Eocene	55.8 ±0.2
			Paleocene	65.5 ±0.3

Approximately 17 to 18 million years ago in the early Miocene, the North American tectonic plate collided with the Pacific Plate due to the constant movement of plate tectonics. Prior to this

collision, Los Angeles County was once above water, but the movement of the Pacific plate northward relative to the North American plate caused the area to submerge (Quinn 2001). In the middle Miocene Epoch, the Los Angeles County area was part of a deep submarine basin that quickly divided into the Ventura Basin, the San Gabriel Basin, the San Fernando Basin (now Valley), and the Los Angeles Basin. These deep, narrow, rapidly subsiding basins were formed when the tectonic blocks that make up today's mountains that have rotated up to 90 degrees clockwise in response to a shear along the San Andreas Fault called the Big Bend (Luyendyk et al. 1985). The Transverse Range Geomorphic Province of California, which are oriented west to east, include the Orocochia Mountains, the San Gabriel Mountains, the Santa Ynez Mountains, the Santa Monica Mountains, and the Channel Islands, although the San Gabriel Mountains actually lie east of the San Andreas. As crustal blocks pivoted, they separated in places to create fault-bounded chasms. These steep-sided basins accumulated huge thicknesses of deep-water marine shales and sandstones, as well as deposits of siliceous shale and diatomites (formed from diatoms, or single-celled algae with cell walls made of silica) (Conrey 1967; Crowell 1981; Fritsche et al. 2001; Luyendyk et al. 1985; Schwartz and Colburn 1987; Woodford et al. 1954). Marine sediment over 6 miles deep accumulated in what is now the Los Angeles County, in only 6 million years (Luyendyk et al. 1985) and would become to be known as the Los Angeles Basin.

This basin continued to subside through the early Pliocene but was still separated from the open ocean by a submarine ridge (Quinn 2001). Most of the buildup of mountains and marine sediments occurred in the last two million years since the Pliocene (Schoenherr 1992). The sediment buildup continued through the Pleistocene, but sea level fluctuated due to the alternating glacial and interglacial episodes (Quinn 1992). During these phases, the area underwater expanded and contracted, and the inland stratigraphic layers (not including the coast and the Santa Monica Plain) alternate between marine and continental sediments (Woodford et al. 1954). There was also an overall decrease in local oceanic depth over time during the interglacial periods. This decrease, coupled with increasing deposition, resulted in the eventual termination of the submarine central Los Angeles Basin. Continuous non-marine deposition commenced in the later Quaternary period whereby alluvial stream deposits accumulated on top of the earlier marine deposits and was only interrupted by erosion (Quinn 1992). These alluvial stream deposits originated from the floodwaters that were transported from the surrounding mountains by the Los Angeles, San Gabriel, and Santa Ana rivers (Schoenherr 1992). The Los Angeles Basin experienced one last (shallow) marine episode during the late Pleistocene prior to the most recent glaciation period. This glaciation period saw an increase in precipitation and subsequent acceleration in erosion of the Santa Monica Mountains. The resultant increased deposition of fluvial sediments in the basin constitutes the latest stage of the Pleistocene and is often referred to as the Rancholabrean age (Quinn 1992). This designation is named after the fauna recovered from Rancho La Brea and is applied to the later Pleistocene epoch of North America.

The Project site itself is in the City of Palmdale, located in the Antelope Valley, within the Western Mojave Desert. Palmdale is located in the Transverse Range Geomorphic Province of California, which is characterized by east-west trending mountains and faults. Sedimentary basins within the Transverse Range Geomorphic Province include the Ventura, Soledad, and Ridge Basins, and the San Fernando Valley that continue to accumulate alluvial sediments because of the continuous

shifting of the San Andreas Fault and the Transverse Range fault systems. In fact, in the southwestern portion of Palmdale, the San Andreas Fault runs south of Palmdale Boulevard at the Anaverde Creek to north of the Sierra Pelona Mountains.

The Antelope Valley is a basin that contains a pan-and-dune complex that is fed by water sources such as the Amargosa Creek, Little Rock Wash, and other mountain run-off. The area is shaped by the east/west trending San Gabriel Mountains located to the south, the Tehachapi and El Paso Mountains to the north, and to the west and south are the Sierra Pelona Mountains. The geology of the area is comprised of alluvial sedimentary deposits of the Tertiary and Quaternary age. The Project area is overlain with Quaternary alluvial (Qa) which consists of Holocene aged unconsolidated alluvial sediments comprised of alluvial gravel, sand, and silt. The thickness of the Qa sedimentary deposit is unknown and it's possible that Pleistocene sediments may underlay the property. Additionally, the NHMLA paleontological results indicate that the Harold Formation can be found within the Project vicinity. The Harold Formation is the oldest Quaternary unit exposed in the Antelope Valley. The unit is composed of alluvial sand and gravel, the lower portion of the unit is characterized by a distinctive green coloration and is approximately 100 to 200 feet in thickness and the vertebrate fossils recovered from these sediments date to the early Pleistocene (Beeby et al., 2010). Therefore, APRMI determined that the Project site has the potential to be sensitive for paleontological resources. Further discussion of this item is outlined in detail in Section 7.1.

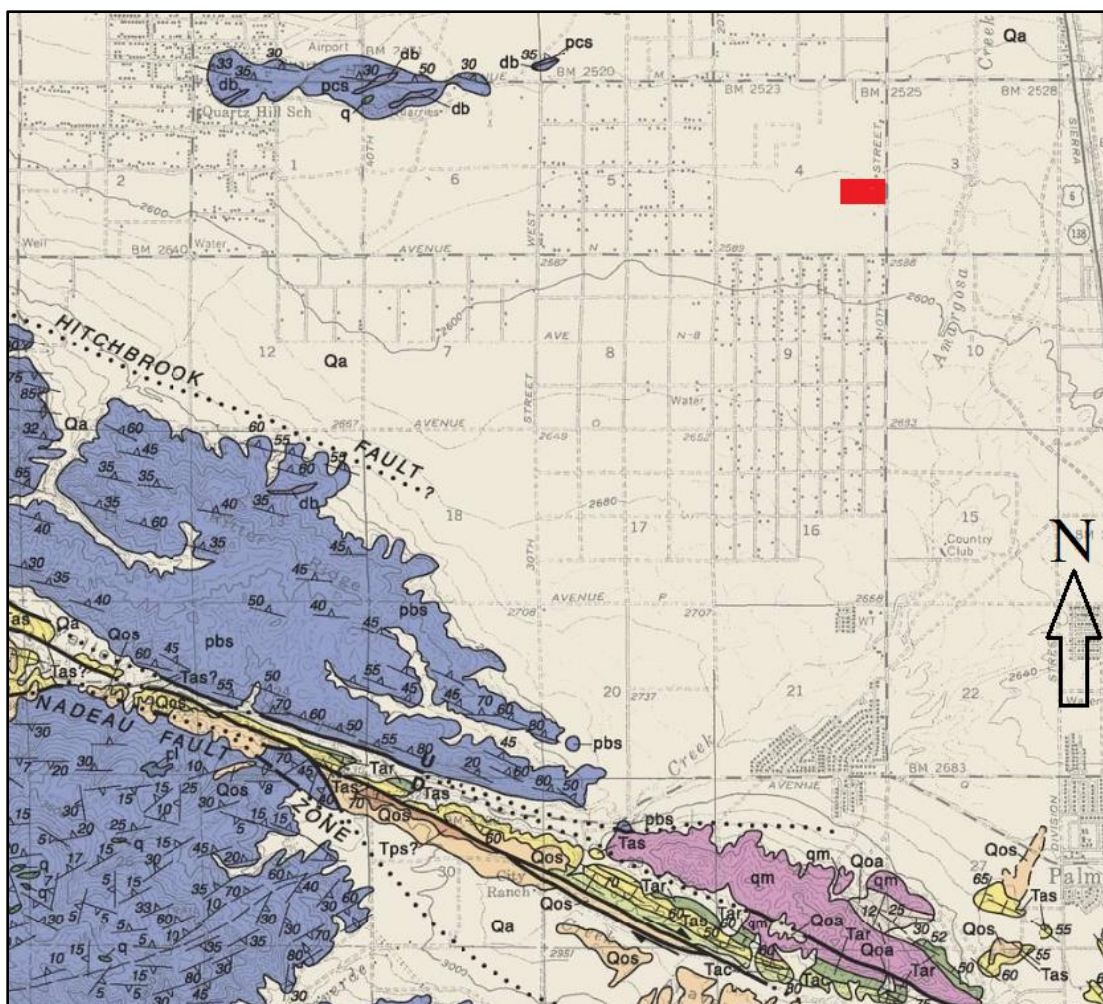


Figure 4. Geologic map of the Lancaster & Alpine Butte quadrangles, Los Angeles County, California, Project area represented by the red rectangle (Dibblee, T.W., and Ehrenspeck, H.E., ed. 2008).

4.0 CULTURAL SETTING

4.1 Prehistoric Background

The prehistoric period is divided into traditions, which generally represent the presence of a cultural group across space and time. These are further subdivided into patterns, which generally indicate a more specific geographic area and cultural sub-group, and phases, which indicate a more specific time period. Chronological organization and absolute dating of patterns and phases is a difficult process, and the information presented here represents the best estimation based on available data rather than complete certainty.

4.1.1 Mojavean Tradition, Lakebed Pattern, Phases I-II (13,200 – 12,000 BP / 11,200 – 10,000 BCE)

The Mojavean Tradition and Lakebed Pattern are themselves subsets of the Clovis culture, originally thought to represent the first human occupation of the Americas. Although several sites and artifacts have been proposed as evidence of pre-Clovis occupation of the Mojave Desert, these dates are highly speculative and are generally considered non-credible (Sutton 2023, 10). It must be noted that during this period the area known as the Mojave Desert had not yet become a desert. Lakes, streams, and springs were common, and portions of the region were in fact wetland environments. Evidence of occupation of the Mojave Desert during the period of the Lakebed Pattern is restricted to the former shores and channels of China Lake, perhaps because other lakes further east and south were less large and economically productive at the time of humans' arrival in the area, or because mammoths were only present in the northwest of the region during this period. However, isolated finds of Lakebed artifacts throughout the Mojave Desert indicate that the people of this Pattern at least occasionally traveled across it, perhaps in the course of hunting trips (Sutton 2023, 13). The Lakebed Pattern economy was likely lacustrine- and hunting-focused, with marsh plants and lake animals being easily accessible. The remains of mammoths have also been found in general association with Lakebed artifacts, and it seems likely that other terrestrial animals were hunted as well (Sutton 2023, 13). Lakebed Phase I is distinguished by the exclusive presence of the Western Fluted Point, which have a lanceolate outline, a plano-convex cross-section, concave bases, thinned basal edges produced through grinding, and are fluted on either one or both sides. Blade edges and general shape were produced through pressure flaking (Yohe and Gardner 2016 - RECENTLY DISCOVERED CLOVIS POINTS CHINA LAKE). Other stone tools found in Lakebed Pattern sites include scrapers, choppers, and hammerstones of various varieties. Notably absent are any implements for the grinding or milling of plants, likely because the marsh plants which made up the vegetal portion of the diet could be processed by hand without difficulty (Justice 2002, 73-74; Sutton 2023, 11). Lakebed Phase II, which begins circa 12,900, is distinguished by the addition of the Great Basin Concave Base Point (GBCBP), a smaller version of the Western Fluted Point. The use of the GBCBP perhaps represents the greater focus of Lakebed Phase II people on smaller (but still relatively large) even-toed ungulates as the mammoth population decreased (Sutton 2023, 14). Both fluted points, who's lack of shoulders and extension past the haft of a spear would minimize friction through fur and flesh, were likely intended for close-range ambush tactics targeting very large animals, in which the high potential penetration depth of a thrown or thrust spear was the most important criteria. The vitals of mammoths, for example, were generally buried deeply within its body, and killing such a target before it can effectively retaliate would be crucial for a hunting party's safety. Durability of the point is a less important factor, as the chances of a spear missing and impacting on rock is relatively low (Vierra 2012, 190). It should be noted that the distinction between Western Fluted Points and GBCBPs is contested, and many archaeologists group the categories together in the far more general categories of "Clovis" or "Western Clovis" points, both of which also include points from many other regions of North America (Yohe and Gardner 2016).

4.1.2 Mojavean Tradition, Lake Mojave Pattern, Phases I-II (12,000 – 8,500 BP / 10,000 – 6,500 BCE)

The Lake Mojave Pattern represents the significant expansion of the occupation zone in the

Mojave Desert to other lacustrine, riparian, and spring environments present throughout the region. This perhaps was spurred by the extinction of the mammoth in the northwest of the Mojave Desert, or a gradual fading of the area's productivity to a level equivalent to the rest of the region, either of which could have removed the features which made the northwest uniquely attractive to Lakebed peoples (Sutton 2023, 15-16). The entirety of the period saw a gradual decline in water levels, the productivity of lacustrine environments, and a reduction in the average size of animals in the region. As the mammoth disappeared, so did the tools used for hunting it - the Western Fluted Point was no longer utilized by the time of Lake Mojave Phase I, and the GBCBP disappeared during Phase II, circa 9,300 BP. In their place, tools for the hunting of even-toed ungulates, along with smaller mammals and reptiles, became more highly developed, and Phase I is marked by the introduction of the Great Basin Stemmed Point, which in turn is divided into the subtypes of Lake Mojave and Silver Lake points. Lake Mojave points are a stemmed lanceolate design, with weak shoulders and a biconvex cross-section. Most points of this type were likely originally elongated and slender, but many are found after a series of resharpening episodes and so are much reduced in size, with the stem longer than the blade. Initial reduction of preforms occurred through percussion, with final shaping and sharpening occurring through pressure flaking. Stems were shaped through pressure flaking from the lateral margins, with little to no thinning of the basal edge (Justice 2002, 89-90). Silver Lake points are typically short, with wider stems in comparison to the blade and relatively strong shoulders, although these have sometimes been worn away through resharpening. Weak side notches at the shoulder/stem junction are present in some examples, but most others, especially in Southern California, have wider, straight-sided stems with round, square, or slightly indented bases. Manufacture is through a similar process to the Lake Mojave point, with preforms being made through percussion shaping and final shaping and sharpening occurring through random pressure flaking (Justice 2002, 98). As the earlier close-range ambush tactic was abandoned due to a lack of prey, longer-distance hunting of a wider range of targets was likely adopted (Vierra 2012, 190-191). Shoulders increased the chance that a thrown dart would remain inside the animal, slowing it during a chase and presumably increasing the chance of a dart's recovery. Crescents and stone grinding/milling tools also appear during Lake Mojave Phase I. The exact use case and the typology of crescents is heavily debated, but they are generally divided into Lunate Crescents (also known as Great Transverse points), Winged Crescents, and Eccentric Crescents (Justice 2002, 116 f.). Lunate and Winged Crescents may have been used as atlatl dart points, designed for hunting birds and waterfowl, since their wider area would aid in bringing down flying targets and their relatively blunt edge would suffice to stun birds without damaging the meat. They may have also served as multipurpose knives, similar to ulus, or scrapers. Eccentric Crescents may have had a ritual purpose, having been attached to the top of a staff. (Moss and Erlandson 2013, 186 f.). The stone grinding and milling tools indicate that as the productivity of Lake Mojave peoples had expanded their foraging from purely marsh plants to riparian and desert species as well, adding flowers, seeds, roots, and possibly mesquite pods to the diet (Sutton 2023, 16).

4.1.3 Mojavean Tradition, Pinto Pattern, Phases I-III (8,500 – 4,000 BP / 6,500 – 2000 BCE)

The Pinto Pattern represents a series of adaptations to the increasingly desiccated Mojave Desert. During Phase I, the lakes which had previously been the centers of human habitation became too

saline to support life, or even dried up altogether, and occupation zones constricted to the remaining streams and springs. As the large animals and marsh plants which had previously made up much of the diet of Mojavean Tradition peoples became more scarce, utilization of desert and riparian plants was increased to compensate, and the stone milling equipment required to process them became more common, whereas the crescents theorized to hunt lacustrine bird populations disappeared (Sutton 2023, 19). Pinto Points, the introduction of which marks the beginning of Pinto Phase I, are characterized by bifurcate bases and robust basal ears, and were manufactured through soft hammer percussion of bifaces, slabs, and flake blanks followed by varying degrees pressure flaking. Points of this type were manufactured with either horizontal or downwards-projecting shoulders, but continual resharpening often wore these away either completely or into a variety of other forms (Justice 2002, 126 f.). Pinto points likely evolved from Silver Lake points, and both of these types, along with Lake Mojave points, were used together until Pinto Phase II, circa 7,500 BP. What advantage Pinto points provided over Silver Lake points is somewhat unclear, but the bifurcate bases may have eased the hafting process or provided the point a stronger attachment to the dart shaft. The area of occupation and size of human population further decreased during Pinto Phase II as the region suffered greater desiccation, lakes completely dried up, and the size of streams was reduced. The tribes of earlier periods likely fragmented into small familial units, although some association between them was likely maintained for trading and marriage purposes. By the end of Phase II, in circa 5,000 BP, the social and economic system of the Mojave Desert had completely collapsed, and with the possible exception of a few outlying settlements around springs which still produced water, surviving Pinto Pattern peoples relocated into the foothills of the mountains surrounding the Mojave Desert. Pinto Phase III is defined by the abandonment of the desert, with only occasional forays being made into the area. Most productive activities likely took place either in the montane environments of the foothills or further upslope, in the mountains proper (Sutton 2023, 20).

4.1.4 Montane Tradition, Northern Mojave Pattern, Montane Phase I, Koehn Lake Phase, and Montane Phase II (5,000 – 200 BP / 3,000 BCE – 1800 CE)

The possible continuity of the Montane Tradition with the peoples of the Mojavean Tradition is as yet undetermined. Conventional linguistic models indicate that Northern-Uto-Aztecan, the language group which Montane Tradition groups belong to, originally evolved in Mexico before moving northwards into the Mojave Desert circa 5,000 BP, indicating that Montane Tradition peoples absorbed or replaced the remnants of the Mojavean Tradition peoples surviving in the foothills, signified archaeologically by the final replacement of Pinto points by Elko and Gypsum points around 4,000 BP (Sutton 2023, 31). However, an alternate model by Merrill et al. suggests that instead Proto-Uto-Aztecan groups arrived in the Mojave Desert circa 8,500 BP, and then diverged into Northern-Uto-Aztecan, which remained in the area, and Southern-Uto Aztecan which then moved southwards into Mexico, represented archaeologically by the coexistence and gradual replacement of Silver Lake and Lake Mojave points with Pinto points around 7,500 BP (Merrill et al. 2009). This theory would recategorize the Pinto Pattern into the Montane Tradition. Northern Mojave Pattern Peoples primarily occupied the foothills of the mountains bordering the north and west of the Mojave Desert, including the southern Sierra Nevadas, Tehachapi Mountains, Sierra Pelona Mountains, and Coso Range. It should be noted that the San Gabriel and San Bernadino mountains were already occupied by Greven Knoll groups, to be discussed below.

The Mojave Desert itself was utilized as a Common Pool Resource (CPR) zone, and a few exceptions, was not the location of permanent settlements. The Northern Mojave Pattern in general is characterized by the relatively abundant presence of shell beads, brought by traders from the Pacific Coast, and large cemeteries or “mass-burials” (Sutton 2023, 31 f.). Settlements during Montane Phase I were generally small villages, located around springs in the foothills. Occasional sites have been found on the desert floor, but these were likely occupied for at most a few days at a time by specialized resource gathering expeditions. (Sutton 2023, 33). The diet during this phase included acorns, pinyon nuts, and other assorted montane plants, in addition to medium-sized and small game, such as antelope, rodents, and lagomorphs (rabbits and their close relatives). As discussed above, Montane Phase I is marked by the introduction of Elko and Gypsum points. Elko points are divided into two subtypes – Elko Eared and Elko Corner-Notched. Both subtypes, however, possess narrow and deep corner-notches with basal ears and wide shoulder barbs, and are in fact distinguished by the bases, which are indented or concave in the case of Elko Eared points and straight in the case of Elko Corner Notched points. Both subtypes were manufactured from trianguloid preforms through an initial percussion shaping followed by substantial amounts of pressure flaking. (Justice 2002, 298-9). Gypsum points are relatively ill-defined categories, being distinguished only by their triangular form and their contracting stem, which is widest at the intersection of the haft and blade of the point. They are manufactured through a combination of percussion and pressure flaking, with the flaking being the predominant method for shaping. (Justice 2002, 291). It is possible some “Gypsum” points within the Mojave Desert in fact Coastal Contracting Stem points, which are highly morphologically similar to the Gypsum points but likely originated independently along the Southern California coast and were manufactured through a different process. It has also been proposed that Gypsum points are in fact a third subtype of Elko points, and they should instead be named Elko Contracting Stem points, although this has not gathered much traction. Towards the end of Montane Phase I, circa 1,800 BP, Rose Spring points also appear in the record, signifying the adoption of the bow and arrow. Rose Spring points are generally significantly smaller than preceding points, and are narrow and triangular, with corner notches at the junction of stem and blade and semi-pronounced shoulders, although errors in manufacturing or damaged during use sometimes broke one or both shoulders away (Justice 2002, 320-1). Montane Phase I is followed in the Antelope Valley by the Koehn Lake Phase, which began circa 1,300 BP and is marked by the disappearance of Elko and Gypsum Points together with the appearance of Cottonwood points and brown ware pottery. Cottonwood points are an extremely broad category, but can be loosely defined as small, unnotched, lightweight, triangular points intended for use on arrows (Justice 2002, 367). Points during this phase were generally manufactured from the obsidian found in the Coso Range. The Koehn Lake Phase involved settlements on a larger scale than the relatively small villages of Montane Phase I, and a limited return to occupation of the desert floor, as a few lakes, including the eponymous Koehn Lake, refilled. The diet of people during this phase expanded to include mesquite and placed a greater emphasis on the hunting of lagomorphs than previously (Sutton 2023, 33). The Koehn Lake Phase is followed by Montane Phase II in 600 BP, during which the temporary return of a wet climate to the Mojave Desert ends, and the settlements on the desert floor are once again abandoned. Most pictographic petroglyphs in the Mojave Desert are tentatively dated to this phase, and it is distinguished technologically by the introduction of glass beads and Desert Side-Notched points. Desert Side-Notched points are similar to Cottonwood Triangulars, with the addition of two

typically narrow and deep side notches which are placed towards the basal edge of the blade, leaving angular ears. The pre-forms are manufactured through percussion, and then finished with extensive pressure flaking (Justice 2002, 379). Use of obsidian for point manufacture declines during this phase, shifting instead to silicate stone (Sutton 2023, 37). This phase continues until the first arrival of Europeans in the area during the early 1800s.

4.1.5 Encinitas Tradition, Greven Knoll Pattern, Phases I-III (9,400 – 1,000 BP / 7,400 BCE – 1,000 CE)

The Encinitas Tradition (formerly known as the Millingstone Horizon) represents the culture of coastal tribal groups in Southern California prior to circa 3500 BP. It was notably conservative, and relatively little about the technology and diet of its people changed from the beginning to the end of the tradition. The Greven Knoll Pattern is its more inland form, which survived longer than other patterns and primarily existed southwards of the Transverse Ranges but extended into the San Gabriel and San Bernadino Mountains and the southern edges of the western Mojave Desert as well (Sutton and Gardner 2006, 25 f.). This pattern is primarily distinguished by an abundance of manos and metates, used for grinding seeds and grains. Settlement sites were generally intensely occupied and located next to streams and springs on valley floors. Mortuary practices are typically flexed inhumations, with the body buried in the fetal position under a cairn, although cremations were also used (Sutton and Gardner 2006, 31). Cogged stones and discoidals, which are typical markers of this tradition, are rare in the Greven Knoll pattern and disappear entirely by Phase III, perhaps indicating significant cultural influence from other contemporary Mojave Desert and Transverse Range groups (Sutton 2023, 23 f.). Projectile points are also rare, and are typically Pinto points during Phase I, although it may be possible that these were only adopted after the Greven Knoll entered the desert and very early sites contained stemmed projectile points of an uncertain type. Phase II, beginning circa 4,000 BP, is distinguished by the replacement of Pinto points by Elko points, and Phase III (formerly known as the Sayles Complex), beginning circa 3,000 BP, is marked by the addition of scraper planes and roasting pits, likely representing the addition of yucca to the diet (Sutton and Gardner 2006, 29 f.). Greven Knoll sites sometimes overlay Pinto III sites and are in turn consistently overlaid by Palomar Tradition sites, establishing a fairly clear chronology of cultural adoption which aligns with that of other Encinitas Tradition patterns by Palomar Tradition groups further west.

4.1.6 Palomar Tradition, Southern Mojave Pattern, Transverse Range Phase (1,000 – 200 BP / 1000 CE – 1800 CE)

While genetics indicate that the actual population of previously Greven-Knoll occupied areas changed little, tribal groups in these areas significantly altered their material culture and diets around 1,000 BP and adopted subsistence strategies and cultural traits from the Takic groups which had migrated south from the Sierra Nevadas to occupy the southern Californian coast around 3,500 BP (Sutton 2023 41). This eastern mountain-and-desert branch of the Takic language and cultural group is named Serrano and discussed in somewhat more detail in Section 4.2 below. This process is distinguished archaeologically by the presence of bedrock mortars, large dark middens, obsidian, shell, and steatite artifacts, rock pictographs, and Desert Side-Notched points. These points are small and triangular, with a straight to concave base and two narrow and deep side notches which are placed towards the basal edge of the blade, leaving angular ears. The pre-forms are

manufactured through percussion, and then finished with extensive pressure flaking (Justice 2002, 379). The diet expanded to include pinyon nuts, and mortuary practices shifted from predominantly inhumations to predominantly cremations (Sutton 2023, 42). Settlement patterns possessed significant continuity with Greven Knoll III, however, as did the relative abundance of manos and metates, indicating that gathering of wild nuts and seeds likely still formed the primary method of subsistence.

4.2 Ethnographic Background

The Project area is located in the western portion of the Antelope Valley, a region in which the prehistoric cultural history is poorly documented and/or understood (Kroeber 1925; Hanks 1971; King 1974; Moratto 1984; Sutton 1996). At the time of the arrival of the Spanish, the Native American people, referred to as the Tataviam, included the southern Antelope Valley as part of their homeland. The Kitanemuk inhabited the land to north, more specifically the Tehachapi Mountains and further northward. However, various other Native American culture groups including the Chumash, the Serrano/Vanyume, and the Tongva may have included this area as part of their homeland as well. According to Sutton (1988; 1996), archaeological evidence of regional trade suggests that, on a limited basis, other Western Mojave culture groups, such as the Mojave or the Chemehuevi, and others from Arizona, may have utilized and/or passed through this area.

Ethnographically, little data exists describing the life way of the Tataviam or the Kitanemuk; both are Serrano, a subdivision of the Takic language and cultural group. (Kroeber 1925). Within the past few years, new construction projects in the southwestern section of Antelope Valley have uncovered new archaeological sites that have contributed greatly to the earlier data that is known about the Native American population. With the help of their descendants, a greater understanding is beginning to occur regarding the lifeways of the original Antelope Valley residents.

Originally, the anthropological literature referenced these groups as using the name that the Hokan speaking Chumash people used: Alliklik or I'alliklik (Kroeber 1925). The Kitanemuk were known by several names, including Mayaintalap (Yokut), Witanghatal (Tübatulabal), Chemheuevis, Nawiyat Mohave, Kuvahaivima, Cuabajai (the Spanish Explorer Garces' identification), the "Tejon Indians" by the Americans, and the Haminant by their modern-day immediate neighbors.

4.2.1 Tataviam-Ethnographic History

At the time of European contact Tataviam territory may have ranged east of Piru, within the entire upper Santa Clara River region, northwards to Pastoria Creek and east to Mt. Gleason. It appears that the Tataviam lived in close contact with their eastern Chumash and Tongva neighbors to the south (Hanks 1971; King and Blackburn 1978; Moratto 1984) as hunter and gatherers. Like many California cultural groups known as hunter/gatherers, the Tataviam lived in small villages and satellite camps near water sources originating in the local mountains, foothills, and adjacent desert areas. Evidence suggests that during the later periods many of these groups displayed a chiefdom level of social complexity. Their subsistence consisted primarily of plants and animals found in the foothills, such as acorns, seeds, berries, deer and rabbit. Many other plants were also utilized,

such as yucca, cactus, and screw beans (King 1974; Moratto 1984; Robinson 1987; Sutton 1996). Seasonal settlement and resource exploitation rounds may have included the lake beds of the Antelope Valley (Lake Rosamond and Lake Rogers), and natural spring areas as well as the foothill creeks that drain into Soledad Canyon, and onto the Antelope Valley floor. These hunter/gatherer groups were prolific lithic tool manufacturers and basket makers, as evinced in the archaeological record.

The Tataviam people were a socially complex hunter/gatherer group that occupied the area. Culturally, they were very similar to their Chumash and Tongva neighbors. Unfortunately, most of the culturally significant information, such as religious beliefs, traditions, oral histories, and folklore of the Tataviam and Gabrielino/Tongva people was lost during the Mission Period. This was the result of forced cultural assimilation by the Spanish, and the decline of population due to the introduction of European diseases to the region.

4.2.2 Kitanemuk-Ethnographic History

The Kitanemuk are considered a Serrano division of the Shoshonean group, yet the term Serrano (Spanish for mountain people) or perhaps even Vanyume is somewhat of a misnomer for the “Kitanemuk do not know themselves as Serranos, but extend the epithet to their neighbors the Kawaiisu, quite correctly in an etymological sense, since these people happen to live higher in the mountains than they” (Kroeber 1925).

As with much of the Antelope Valley, little written archaeological or ethnographic data exists (Blackburn and Bean, 1978; Harrington 1917 as cited; Kroeber, 1925). The Kitanemuk are known to have occupied the western Antelope Valley (a contentious sharing of territory with their southerly neighbors the Tataviam), as well as the Tehachapi Mountains, and eastern High Sierras. The Kitanemuk were “primarily mountain dwellers, although during [the] cooler season of the year they did range into the arid lowlands to the south [Antelope Valley]” (Blackburn and Bean 1978). Spanish Explorer Francisco Garcés is believed to have visited a Kitanemuk village in 1776 (Coues 1900; as cited in Blackburn and Bean 1978), although this is of debate given conflicting accounts in the early 20th Century ethnographer John P. Harrington’s notes of 1917. Further, the Kitanemuk are believed to have been forcibly relocated to San Fernando, San Gabriel and San Buenaventura (Ventura) missions during the Spanish colonization and missionization efforts of the mid-18th Century. Later in the mid- century, they were documented as residing at Fort Tejon and the Tule River Reservation (Blackburn and Bean 1978). In 1917, Harrington indicated that the cultural affiliation of the Kitanemuk was one of amicable trade and ceremony between them and the Chumash and Tubatulabal as well as the Mohave and Quechan tribes, but they had a relationship of enmity with the Yokut and the Tataviam tribes. The Kitanemuk, like other Takic groups, were hunter/gatherers, socially and culturally complex. The groups observed a patrilineal system of familial organization, exogamous marriage, practiced a chief system of tribal organization, possessed shamanism and ceremonial or religious leadership, and complex cosmology and belief systems, including gender moieties pertaining to puberty and marriage as well as practiced hunting magic and birth and death formalities (Blackburn and Bean 1978).

Akin to their Tataviam neighbors to the south, the Kitanemuk likely practiced a seasonal rounds-based system of subsistence. Their primary base camps and villages were probably mostly centered in the Tehachapi Mountains and foothills, as well as further north, thus allowing expected winter/spring exploitation of the Antelope Valley floor. As with other hunter and gatherer groups,

the Kitanemuk excelled at lithic tool manufacture, and were likely skilled basket makers as evidenced by the occurrence of basket-mortar hoppers cited in the archaeological record.

4.3 Historic Background

General standards of Cultural Resources history begins with the Historic Period, when the first Spanish explorers recorded in writing their observations of the area and its inhabitants. The Historic Period in California is divided into four general phases: The Exploration Period (1542 to 1769 CE), the Spanish Period (1769 to 1821 CE), the Mexican Period (1821 to 1846 CE), and the American Period (1846 CE to Present).

4.3.1 Exploration Period (1542 to 1769 CE)

European explorers made sporadic visits into the general Los Angeles area during the 16th Century. For example, Juan Rodríguez Cabrillo, an ethnic Portuguese explorer working for the Spanish crown, arrived at San Pedro Bay in 1542 (Chartkoff and Chartkoff 1984), although the bay was not named until 1602 by Sebastian Vizcaíno during his survey of the Pacific shore between Acapulco and Oregon (Gumprecht 1999). Extensive Spanish interaction with the Gabrieleño began in 1769 when Gaspar de Portolá led an overland expedition from San Diego across southern California with Franciscan Padre Juan Crespí as part of a plan to affirm Spanish control over California that was threatened by the Russians and the British. Juan Crespí recorded this particular expedition in diaries and records. According to interpretations of these documents, the expedition party traveled through present day Elysian Park during the beginning of August and was awed by a river that flowed from the northwest, past Elysian Park, and southward. It was Portolá who named the river El Rio de Nuestra Señora la Reina de los Angeles de Porciúncula, which translates to “The River of Our Lady Queen of the Angels of Porciúncula.” (The river Porciúncula is the present-day Los Angeles River, now mainly a concrete waterway.) The expedition travelers camped in that area. It is documented that they crossed the San Gabriel and Santa Ana Rivers as well. While much of the water of the Los Angeles and San Gabriel Rivers flows underground, the waters of the Los Angeles River were forced above the river sands at Griffith Park and Elysian Park by underground geological formations before they dropped again below the sands south of what is now downtown Los Angeles. Only during severe winter floods would there be substantial aboveground water that would appear in the riverbeds of all three rivers. Crespí described the Los Angeles River as only slightly smaller than the two other rivers. The Los Angeles River’s main riverbed, downstream from the Los Angeles area and Bunker Hill, may well have been near what is now Washington Boulevard and Ballona Creek as it was during the early 1800s, though Crespí’s chronicle indicates it following its more currently known southerly flow. A major flood in 1825 shifted its main course southward to join the San Gabriel River at one of that river’s old course alignments (Gumprecht 1999). The Portola expedition returned to Los Angeles during the winter on its way back to San Diego from the San Francisco Bay area, having missed its initial destination, Monterey Bay. Portolá would head another expedition through Los Angeles in the spring of 1770, again on the way to Monterey Bay (Starr 2005).

4.3.2 Spanish Period (1769 to 1821 CE)

Twelve years after Portola's voyages, an expedition organized by the Spanish Governor of California, Felipe de Neve, established a pueblo on the coastal plain of the Los Angeles River. This new town was one day's ride north of San Pedro and was dedicated on September 4, 1781. The town, like the river, was named after St. Francis of Assisi's first church, St. Mary of the Angels, or El Pueblo de (Nuestra Señora) la Reina de los Angeles (de Porciúncula). The company of settlers was recruited by de Neve from the Mexican states of Sonora and Sinaloa and was known as Los Pobladores (the "townspeople" or "populators"). The original group was led by Captain Fernando Javier Rivera y Moncada and was comprised of eleven families made up of 11 men, 11 women, and 22 children. The settlers were of various ethnicities including those of Spanish, African, and Native American descent, as well as some of mixed race (mulattos and mestizos). Over time, the area known as the Ciudad de Los Angeles became the "City of Angels," and on April 4, 1850, it became known as the City of Los Angeles (Mason 2004; Pitt and Pitt 1997).

The goal of the Spanish colonization effort was not only to create local populations of settling peasants and merchants, but also to include native peoples who already occupied the region into those populations. In order to incorporate the indigenous tribes, efforts were made to educate them and convert them to Christianity, turning them from "savages" into "intelligent beings—gente de razón" (Chartkoff and Chartkoff 1984: 258). It is for this reason that religious missions became the cornerstone of colonization. Padre Junípero Serra, who founded 21 missions in 52 years, directed the missionization of California (Chartkoff and Chartkoff 1984). Two of those missions were in Los Angeles: Misión del Santo Arcángel San Gabriel de los Temblores (San Gabriel Mission) now known as Mission Vieja established on September 8, 1771, by the Padres Angel Somera and Pedro Bonito Cambon, and San Fernando Rey de España Mission on September 8, 1797, by Padre Fermín Lasuén (Pitt and Pitt 1997). To support the Spanish settlements, missions attempted to convert the California Indians and used them to work on the farms and ranches on the mission grounds. Many of the Gabrieleño were gradually forced to move to the San Gabriel or San Fernando Missions to provide labor, and many of the Native Americans living on the coastal plains and inland valleys at the time were also transported to the missions, though small groups did escape this confinement (Bean and Smith 1978).

The interaction with the Spanish marked the beginning of the decline of the indigenous population, as a powerful force shaping the nature of the Los Angeles area. Their population was already declining, even before the arrival of a large number of Spanish, from diseases introduced by earlier explorers (Bean and Smith 1978). Mass conversions of the Gabrieleño people began in 1778 when certain village chiefs turned to Catholicism. These Gabrieleño assisted the Spanish, even though many other Gabrieleño resisted the colonization and started revolts. In 1796, the recruits used traditional Gabrieleño subsistence practices to feed the general population of the missions. By 1800, the original Gabrieleño villages were empty and the Gabrieleños and other Native Americans provided much of the labor for the European ranches, farms, and communities. The shift from hunting and gathering to a sort of feudal existence led to dietary deficiencies that eventually caused population reduction. The local population greatly suffered from the European epidemics as their population dwindled rapidly (Bean and Smith 1978). During this time, only

fragmentary ethnographic information was recorded.

4.3.3 Mexican Period (1821 to 1846 CE)

Mexico gained its independence from Spain in 1821, and the transfer of the area from Spanish control accelerated the end of the already deteriorating mission system. Prompted by the precipitous decline in new conversions to Christianity, and the complaints of settlers in Alta California who were unable to find good land not already claimed by missions, the Mexican Congress passed a secularization degree in 1833 which transferred control of the missions' former lands to governors so they could be distributed to colonists (Starr 2005). The Spanish authorities had only made 20 land grants before Mexico's Independence in 1821. In stark contrast, Mexican governors awarded approximately 800 land grants just between 1821 and 1847. The dramatic increase in the accessibility of land grants led to a period of thriving *ranchos* within California. *Rancho* was a general term covering farms, ranches, and settlements. Many of the land grants were or became cattle ranches, a major economic activity at that time. The Native American tribes supplied most of the labor (Starr 2005).

Individuals such as Jedidiah Smith, Kit Carson, and Ewing Young entered the area in the late 1820s. Joseph Redford Walker passed through the northern Antelope Valley in the 1830s. It is documented that he explored the deserts and mountains of Kern County. The northern most year-round pass in the High Sierra is named in his honor; Walker Pass (McKenna et al. 1993). During the Mexican Period, occupation of the Antelope Valley was virtually nonexistent. Occasionally, hunting parties concerned with the rounding up of runaway Indians ventured into the valley and the surrounding areas. At this time, it is estimated that very few indigenous people habituated the Antelope Valley on a regular basis.



Figure 5. Spanish and Mexican ranchos of Los Angeles County (Eddy, Gerald A. 1937)

4.3.4 American Period (A.D. 1848 to Present)

American officials in California had been intriguing to build support for an American annexation of the state since at least 1844, and Starr suggests that if the US had delayed its declaration of war by several years California may have joined the Union voluntarily. Regardless, the US did declare war in 1846, although neither of the first two American military units to fight in California had actually been informed of that fact when they initiated hostilities (Starr 2005). The war went extremely poorly for the Mexican government both in California and in general, and in February 1848, California (along with Nevada, Utah, and portions of Arizona, New Mexico, Colorado, and Wyoming) became U.S. territory with the signing of the Treaty of Guadalupe Hidalgo. In addition to ending the Mexican-American War and ceding Mexico's vast northern territories, this treaty guaranteed that land grants made by the Spanish and Mexican administrations would be honored by the U.S. government (Starr 2005). The discovery of gold in California the same year led to a massive influx of hopeful miners from the East, and the non-Native American population ballooned from an estimated 10,000 in 1848 to 255,000 in 1852 (Starr 2005, 80). California petitioned Congress for admission to the Union as a free state in 1849 and was admitted to the

Union as the 31st state on September 9, 1850 (Starr 2005).

While the Treaty of Guadalupe Hidalgo required the United States to grant citizenship to the Indians of former Mexican territories, the Constitution of California did not offer Indian's protection under the law, considering them non-persons (Cook 1971). At the first State Constitutional Convention, California Indians' right to vote was denied, and in 1850, the Act for the Government and Protection of Indians was passed by the State Legislature that greatly reduced the rights of Indians and enacted harsh punishments for any crimes committed by Indians. The Act practically legalized Indian slavery by allowing city officials to arrest Indians for vagrancy (drunkenness) and then sell them to ranchers and other people to serve as a private "labor force." The law was not repealed until 1866 in order to comply with the 14th Amendment of the U.S. Constitution. However, Native Californians did not gain citizenship until 1917 when the California Supreme Court declared them citizens. Subsequently, the Indian Citizenship Act was passed in 1924 granting Indians the right to vote, but it would be more than 50 years before Indians were guaranteed their "constitutional right of religion" (OHP 1988).

In 1851, the United States Congress authorized a commission to create treaties with California Indians with the goal of extinguishing all Indian land titles and instead establishing reservation land, as had been done in many other states. However, the State Senate objected to the treaties as the land that was to be used for reservations was good for agriculture and rich in minerals. As a result, the U.S. senators from California convinced the U.S. Senate to not ratify the treaties that were drawn. They were then filed with an injunction of secrecy that was not removed until 1905. The signed treaties became known as the "Lost 18 Treaties of 1852" (Castillo 1978; Johnston 1962; OHP 1988). Reservation land was still set up in California, under the leadership of Edward F. Beale and Benjamin D. Wilson, superintendent, and sub-agent of Indian Affairs for California, but no new treaties were negotiated. In addition, after the treaties were "rediscovered," legislation was passed to purchase small tracts of lands, later known as *rancherías*, in central and north central California for "landless Indians" in those areas. Therefore, some California Indians did manage to obtain reservation land by agreeing to move to specific locations. The quality of life on reservations, though, was sometimes poor because of limited resources. (OHP 1988).

The Homestead Act was passed in 1862, allowing individuals to claim up to 160 acres of undeveloped federal land for freehold title, provided that the claimant filed an application, improved the land, and then filed for title within five years (U.S. Congress 1863). The General Allotment Act of 1887, or the Dawes Act, was meant to provide California Indian families or individuals with lands. These lands were held in trust by the Bureau of Indian Affairs for 25 years, and if, after 25 years, the Indians had cultivated the land and become self-sufficient, they would gain title to the land. While the act appeared to benefit the Indians, it was designed to weaken the power of tribal governments. Many California Indians recognized the Act's ultimate goal and instead chose to either purchase land or fight for the lands they believed to be theirs in the courts. Most court cases eventually sided with American settlers, though, and most Indians were evicted (OHP 1988). As for the lands of which Indians did manage to gain ownership, most of them were taken away by laws enacted since 1900 (Chartkoff and Chartkoff 1984). The California Indian Jurisdictional Acts, or Lea Act, was passed in 1928 that allowed California Indians to either lay

claim to certain lands in court or gain recompense, however Indians gained few victories and were often left homeless (OHP 1988).

One of the reasons that it was difficult for California Indians to obtain land was due to the arrival of the railroads in the late 1800s and early 1900s, which brought in a new influx of immigrants. The rail lines initially only connected the Los Angeles area to the Pacific Ocean, but California would be connected to the rest of the country when Central Pacific and other major railroad companies started working on a southern transcontinental route across the United States known as the Sunset Route. This route was completed in 1883 and connected San Francisco to New Orleans. The portion of the route built through the Los Angeles area was constructed by Southern Pacific in the 1870s (see below). The Southern Pacific enjoyed a railroad monopoly in California until 1885 when the Atchison, Topeka, and Santa Fe (AT&SF) completed a line into southern California. The two railroads then “engaged each other in a fierce rate war” that drove passenger ticket prices to as low as one dollar (Tang 2003:5). This competition resulted in significant immigration to southern California, which was a large factor in the southern California land boom in the 1880s. New towns emerged on newly acquired land and on former cattle ranches both along the coast and in the valleys. With the advent of refrigerated cars, the railroads were able to transport perishable produce, including fresh fruit, to distant eastern cities.

This development enabled southern California to become a major agricultural center (Tang 2003, 2009), thus further depleting the land available to California Indians. Native Americans faced dangers beyond what they had experienced through missionization and loss of territory. (Castillo 1978). The last comprehensive survey of the Gabrielino people occurred in 1852. It found that most of the traditional communities had disappeared, the use of the indigenous language had declined, and many traditional ceremonies and practices had been abandoned (McCawley 1996). By 1900, they had “ceased to exist as a culturally identifiable group” (Bean and Smith 1978:540).

4.3.5 History of the Project Vicinity

As previously discussed, Native American tribes likely occupied winter/spring seasonal encampments on the floor of the Antelope Valley, retreating into the foothills and mountains during the hotter summer months (Blackburn and Bean 1978). Spanish and American settlers used the valley as a route between the coast and more eastern destinations, but permanent settlement of the Antelope Valley only began in the early 1870s, with the arrival of several sparsely dispersed homesteads (Norwood 1992). Large-scale settlement began in 1876 with the construction of the Southern Pacific Railroad through the area, when the town of Lancaster was established along a railroad siding. Palmdale was established 10 years later as the town of Palmenthal by German and Swiss colonists who had traveled from Nebraska and misidentified the area’s Joshua trees as palms. The settlement grew rapidly for several years, receiving its own rail station and Post Office in 1888, but a severe drought beginning in 1894 devastated both the town’s crops and the town itself, leaving the valley once again only sparsely populated by 1900 (McKenna and Langenwaller 1993). Palmenthal was renamed to Palmdale during this period, as few of the original German settlers remained in the area. Water supply continued to be a major concern for any settlement in the valley, and during 1918 and 1919 residents, who had formed the Palmdale Irrigation District,

dug an 8.6-mile irrigation canal, known as the Palmdale Ditch, from Littlerock Creek to the Littlerock Dam and Reservoir, which was finished in 1924 (Love 1989; Palmdale Water District). Despite numerous additions and revisions to the water system in subsequent years, the provision of enough water to meet irrigation requirements was still an uncertain thing, it usually was barely enough to meet the irrigation requirements of farmers already present in the area. This limited the Antelope Valley's potential for economic and population growth until WWII, when the area became a center of aerospace and defense industries, including Edwards Airforce Base and Airforce Plant 42 (McKenna and Langenwalter, 1993).

5.0 METHODOLOGY

5.1 Paleontological Resources Records Check

On August 22, 2023, APRMI requested a paleontological resources records check for the proposed Project from the Vertebrate Paleontology Department of the Natural History Museum of Los Angeles County (NHMLA). To determine the paleontological sensitivity of the Project area, this records check consisted of a thorough review of the museum's paleontology collection records of recorded fossil sites in and/or near the Project area.

5.2 Cultural Resources Records Search

On August 22, 2023, APRMI requested a cultural resource records and literature search from the South Central Coastal Information Center (SCCIC), the local repository for the California Historical Resources Information System (CHRIS), located on the campus of California State University Fullerton, in Fullerton, California, to identify any cultural resources on or near the Project site. A 1-mile search radius was utilized around the Project.

5.3 Archival Research

Additional research was conducted through different inventory databases and/or historic societies to acquire more information or knowledge of cultural resources within the City of Palmdale and the Antelope Valley. Archival records of the Project site were found within the City of Palmdale, the National Park Service, the Antelope Valley Indian Museum, and the libraries of the University of Maryland and the University of California, Los Angeles about cultural resources and the history of the area.

5.4 Field Reconnaissance Survey

The Field reconnaissance survey was conducted on August 28th, 2023. Ms. Robin Turner, Ms. Rachelle Oppel, and Mr. John Flynn conducted the field reconnaissance survey of the Project area to evaluate the presence of any cultural or paleontological resources to determine if the development of the Project would have any significant direct or indirect adverse impacts on such

resources. The entire Project area was fully accessible, apart from some areas along the western Project boundary's drainage ditch that were obscured by dense sage brush and creosote.

The Pedestrian site survey was conducted in 3 meter transects between the three surveyors. The pedestrian survey began in the north-east site corner, heading west, and when the western border was reached, each surveyor shifted 3 meters to the south, and covered a new transect while walking back to the east. A total of 12 North and South transects were walked between the three surveyors to thoroughly inspect and photograph the entire project area. Some areas with denser brush were circumnavigated, but ultimately large Joshua Trees could be used as markers to keep the transects relatively straight. No artifacts/ecofacts were collected during this survey.

6.0 RESULTS OF RECORDS SEARCHES

6.1 Paleontological Resources Records Check

The results of the paleontological resources records search, conducted by Dr. Alyssa Bell, the Los Angeles County Natural History Museum Collections Manager (see Appendix A) were received on September 3rd, 2023. Bell states that there are no known vertebrate fossil localities within the direct boundaries of the Project, but fossil localities have been found in similar sedimentary deposits that are also found in the Project area, either at the surface or at depth. As previously discussed in section 3.0 Geologic Setting, the Project area is overlain by Holocene sands, gravel, and silt, and underlying Pleistocene sediments. The thickness of each sedimentary deposit is unknown.

The paleontological results provided by the NHMLA indicate that four fossil localities have been recovered from Holocene and Pleistocene aged sediments at a depth varying from 0- 21 feet deep outside of the Project area. They will not be impacted by the Project. Most of these localities were found in unknown formations except the locality LACM VP CIT 451, which included Mastodon and horse family remains recovered from the Harold Formation, which consists of Pleistocene aged sediments. Other fossil localities found in Holocene and Pleistocene alluvial and fluvial sediments include various reptiles, rodents, and large mammals, including a Mastodon. For the complete list of paleontological results see Table 2. The absence of known paleontological localities within the Project site itself does not preclude the possibility of uncovering such resources at any depth during ground-disturbing activities.

Two reports (LA-08425 and LA-08427) provided to APRMI by the SCCIC included instances of previously unrecorded marine shell scatter (see 7.2.4 / Table 4).

Table 2. Results of Paleontological Resources Records Check

Locality Number	Location	Formation	Taxa	Depth
LACM VP CIT 451	Near intersection of E Barrel Springs Rd & 47th St E (Palmdale Quad)	Harold Formation	Mastodon (<i>Mammutidae</i>), horse family (<i>Equidae</i>)	unknown

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December 2023

10th St. Warehouse
Phase 1 Archaeological and
Paleontological Assessment

LACM VP 5942-5950	Along Avenue S from Palmdale to Lake Los Angeles	Unknown formation (Holocene)	Kingsnake (<i>Lampropeltis</i>), Lizard (<i>Lacertilia</i>), leopard lizard (<i>Gambelia</i>); snake (<i>Ophidia</i>), gopher snake (<i>Pituophis</i>); rabbit (<i>Lagomorpha</i>), rodent (<i>Rodentia</i>), Pocket gopher (<i>Thomomys</i>), pocket mouse (<i>Chaetodippus</i>), kangaroo rat (<i>Dipodomys</i>); birds (<i>Aves</i>)	0-9 feet bgs
LACM VP 7884	E of the SE corner of the intersection of East 3rd Street & East Avenue H-13	Unknown formation (Pleistocene; fluvial brown clayey silt)	Camel (<i>Camelops hesternus</i>)	4 feet bgs
LACM VP 7853	Waste Management of North America Lancaster Landfill	Unknown formation (Pleistocene; sandy loess under a dune deposit strand, sandy siltstone, siltstone to clayey siltstone)	Rabbit (<i>Sylvagus</i>), camel family (<i>Camelidae</i>), antelope squirrel (<i>Ammospermophilus</i>), kangaroo rat (<i>Dipodomys</i>), pocket mouse (<i>Perognathus</i>), pack rat (<i>Neotoma</i>), deer mouse (<i>Peromyscus</i>), vole family (<i>Microtinae</i>), iguana (<i>Dipsosaurus</i>), pocket gopher (<i>Thomomys</i>), spiny lizard (<i>Sceloporus</i>), side blotched lizard (<i>Uta</i>), colubrid snakes (<i>Trimorphodon</i> , <i>Masticophis</i> , <i>Phyllorhynchus</i>), night lizard (<i>Xantusia</i>), western alligator lizard (<i>Elgaria</i>), toothy skinks (<i>Plestiodon</i>), whiptail lizard (<i>Aspidocelis</i>), spiny lizards (<i>Phrynosomatidae</i>), smelt (<i>Osmeridae</i>)	3-11 feet bgs

6.2 Cultural Resources Records Search

Results of the cultural records search were received on September 28th, 2023. These results are discussed in full detail below and referenced as catalog numbers assigned by the SCCIC. Any building assessment and determinative information discussed below that state NRHP, CRHR, or HCM criterion/status were made by the identifier, author, or investigators of those specific assessments and not made by APRMI. National, State, and local designation criterion requirements may be viewed in 2.0 Regulatory Setting section. Letter request and results can be viewed in Appendix B.

6.2.1 Prehistoric Sites and Isolate(s)

SCCIC possessed one primary record for a prehistoric site within a one-mile radius. Analysis of

the reports indicates that at least four more prehistoric sites and isolates have been found within one mile of the Project site. Results of this search can be viewed in Table 3.

Table 3. Results of SCCIC Prehistoric Sites and Isolates

Primary Number	Resource Type	Description	Recorder(s) and Year(s)	NRHP/CRHR Status	Location
19-001999	Prehistoric seasonal encampment	1 granitic bifacially ground mano and 2 quartzite cores recovered by pedestrian survey.	C.E. Drover and D.M. Smith	None assigned	Within a 1-mile radius

6.2.2 Historic Sites

Historic sites and isolate results include a primary record for historic homesite, a primary record for a historic building site, and two primary records for historic trash deposits. Remnants of the homesite include a cement slab, an abandoned well, and an associated trash scatter. The trash scatter consists of sanitary cans, glass, hardware, and other household items in which some items dating back to approximately 1910. The historic building site consists of five pyramidal footings, arranged in an approximate circle. The original date and function of the former building is currently undetermined. These sites are outside of the Project area and will not be directly or indirectly impacted by the Project. Analysis of the reports provided by the SCCIC indicate that eight surveys found previously unrecorded historic sites, largely consisting of trash deposits. These findings are all located outside of the Project area and will not be affected. However, the prevalence of these findings indicates that previously unrecorded archaeological sites or isolates during ground disturbing activities of the Project remains a high possibility. The results and accompanying reports of the SCCIC records search can be viewed in Tables 3 through 6.

Table 4. Results of SCCIC Historic Sites

Primary Number	Resource Type	Description	Recorder(s) and Year(s)	NRHP/CRHR Status	Location
19-001692	Historic homesite	Cement slab, abandoned well, associated scatter of trash. Possibly circa 1915.	R. H. Norwood, 1989. Andrea Craft, 2007.	None assigned	Within a 1-mile radius
19-004110	Historic former building site	Five wooden and concrete pyramidal footings, arranged in a rough circle	Rebecca Orfila, 2010.	None assigned	Within a 1-mile radius
19-004791	Historic trash scatter	100+ rusted cans, 50-60 broken bottles, and assorted other trash items. Circa 1950.	Ivan Strudwick and Jack Sprague, 2015.	None assigned	Within a 1-mile radius
19-004792	Historic trash scatter	150+ rusted cans, fragments of glass, shotgun and .22 short shell casings, and assorted other trash items.	Ivan Strudwick and Jack Sprague, 2015.	None assigned	Within a 1-mile radius

6.2.3 Built Environment

The SCCIC has primary records of three historic buildings within a one-mile radius of the Project area. None have been found eligible for the National or California Register or recommended for local designation.

Table 5. Results of SCCIC Built Environment Check

Primary Number	Resource Type	Description	Recorder(s) and Year(s)	NRHP/CRHR Status	Location
19-187582	Historic building	1 story shop/garage in heavily deteriorated condition	Ronald Zega and Mary Zega, 2004	None assigned	Within a 1-mile radius
19-188274	Historic building	1 story Vernacular style residential building currently used as a trucking office.	Laura White and David Van Horn, 2008.	6Z – Found ineligible for NR, CR, or Local designation through survey evaluation.	Within a 1-mile radius
19-188275	Historic building	1 story Vernacular style single-family home	Laura White and David Van Horn, 2008.	6Z – Found ineligible for NR, CR, or Local designation through survey evaluation.	Within a 1-mile radius

6.2.4 Previous Cultural Reports and Studies

39 surveys and assessments (see Table 6) were previously conducted within a one-mile radius from the Project area. Cultural Reports and Studies that state NRHP, CRHR, or HCM criterion determinations are made by the author or investigators of the reports and studies and not determined by APRMI. Four surveys (LA-02323, LA-02476, LA-08425, LA-08427) found previously unrecorded prehistoric resources. These included lithic flakes and two manos. Eight surveys (LA-01948, LA-02323, LA-02476, LA-02494, LA-02634, LA-08168, LA-08425, LA-08427, LA-10596, and LA-11453) encountered previously unrecorded historic sites, largely trash deposits.

Table 6. Results of SCCIC Cultural Reports and Studies Identified

Report Number	Author(s)	Year	Title	Affiliation	Location	Artifacts Found
LA-00116	Bruce Love	1988	Archaeology Report for Amargosa Drainage North of Avenue M	Pyramid Archaeology	Within a 1-mile radius	None
LA-00162	Bruce Love	1988	Archaeology Report for Avenue M Right-of-Way and Amargosa Culvert Project	Pyramid Archaeology	Within a 1-mile radius	None
LA-1717	Leslie Mouriquand Blodgett	1988	Report of Archival Search and Field Inspection of Approximately 4.5 Linear Miles and Proposed Detention	Michael Brandman Associates	Within a 1-mile radius	None

			Basin Along Amargosa Creek in Palmdale, California			
LA-01831	Richard Norwood	1989	Cultural Resource Survey for Antelope Valley Business Park, 50 acre parcel, Palmdale, California	Pyramid Archaeology	Within a 1-mile radius	None
LA-01833	Gwendolyn Romani	1989	Cultural Resource Investigation: Hasibi Auto Dealership, City of Lancaster	Greenwood and Associates	Within a 1-mile radius	None
LA-01853	Brian Dillon	1986	An Archaeological Resource Survey and Impact Assessment of the Dean Parcel, Avenue N and Division Street, Palmdale, California	Scientific Resources Surveys	Within a 1-mile radius	None
LA-01948	Richard Norwood	Unknown	Cultural Resource Survey for 10 th Street West Office Plaza (GFBA Project No. 892240)	RT Factfinders	Within a 1-mile radius	Historic refuse
LA-02102	Bruce Love	1989	Cultural Resource Assessment, TT 44769, A.V. Business Park, 10 th West and Avenue M, Palmdale, Los Angeles County	Pyramid Archaeology	Within a 1-mile radius	None
LA-02137	Richard Norwood	1990	Cultural Resource Survey for Tract No. 47885; 18.01 Acres in Palmdale, California	Pyramid Archaeology	Within a 1-mile radius	None
LA-02323	R.W. Robinson	1990	A Cultural Resources Investigation of a Portion of the Amargosa Drainage System Within the City of Palmdale, Los Angeles County, California	City of Palmdale	Within a 1-mile radius	2 Lithic flakes
LA-02476	Christopher Drover	1991	An Archaeological Assessment of the Industry Trade Center Specific Plan Palmdale, California	None	Included the project site.	Historic site, prehistoric isolate mano (not within Project boundaries)
LA-02494	Russel Collett, Sue Wade	1991	Cultural Resource Survey of the Proposed Antelope Valley Business Park, City of Palmdale, California	RECON Regional Environmental Consultants	Within a 1-mile radius	Historic refuse
LA-02634	Kenneth Becker, Ronald Bissel	1992	Cultural Resources Reconnaissance of Antelope Valley Courts Facility, City of Lancaster, Los Angeles County, California	RMW Paleo Associates, Inc.	Within a 1-mile radius	Historic refuse
LA-04141	Steven Towers	1997	Cultural Resources Report Bakersfield-Rialto Fiberoptic Line Project Kern, Los Angeles, and San Bernadino Counties, California	CRM Tech	Within a 1-mile radius	None
LA-	Chester King	1998	Archaeological	Topangao	Within a 1-	None

04392			Reconnaissance for the 10 th Street West Transmission Main Lancaster, Los Angeles County, California	Anthropological Consultants	mile radius	
LA-05316	Bruce Love, Bai “Tom” Tang, Daniel Ballester, Mariam Dahdul	2000	Identification and Evaluation of Historic Properties Antelope Valley Transit Authority Transportation Facility	CRM Tech	Within a 1-mile radius	None
LA-05857	Knox Mellon	2001	RE: Nextel Communications Proposed Wireless Telecommunications Service – Southern California	State of California – Office of Historic Preservation	Within a 1-mile radius	None
LA-06075	Curt Drake	2002	Cultural Resource Assessment AT&T Wireless Services Facility No. D071C Los Angeles County, California	LSA Associates Inc.	Within a 1-mile radius	None
LA-07967	Scott Hudlow	2006	A Phase I Cultural Resource Survey for Property on Avenue M, APN 3128-013-015 and -016, City of Palmdale, California	Hudlow Cultural Resource Associates	Within a 1-mile radius	None
LA-07991	Bai “Tom” Tang, Michael Hogan	2006	Cultural Resources Technical Report City of Lancaster General Plan Update	CRM Tech	Within a 1-mile radius	None
LA-08043	Scott Hudlow	2005	A Phase I Cultural Resource Survey for Property on Avenue M, APN 3128-020-003 City of Palmdale, California	Hudlow Cultural Resource Associates	Within a 1-mile radius	None
LA-08168	Stacey Jordan	2007	Archaeological Survey Report for Southern California Edison Company Antelope-Bailey Reconductoring Project, Los Angeles County, California	Jones & Stokes	Within a 1-mile radius	Historic refuse
LA-08323	Michael Richards and Robin Turner	2005	A Phase I Cultural Resource Assessment of a 4 Acre Parcel in the City of Lancaster, Los Angeles County, California	ArchaeoPaleo Resource Management, Inc.	Within a 1-mile radius	None
LA-08325	Robert Wlodarski	2006	No title; is a Phase I Cultural Resource Assessment for the Bechtel Corporation Wireless Telecommunication Site LSANCAD071 (Highway 14 and Avenue N)	Cellular Archaeological Resource Evaluations	Within a 1-mile radius	None
LA-08330	Shannon Carmack and Paul Shattuck	2004	Cultural Resource Assessment Cingular Wireless Facility No. VY 558-01 City of Palmdale, Los Angeles County,	LSA Associates Inc.	Within a 1-mile radius	None

			California			
LA-08425	Theodore Cooley	2007	Archaeological Survey Report for Southern California Edison Company Acton Substation Loop-In Project Los Angeles County, California	Jones & Stokes	Within a 1-mile radius	2-3 Lithic Flakes, marine shell scatter, historic refuse
LA-08427	Theodore Cooley	2007	Archaeological Survey Report for Southern California Edison Company 66k Antelope Bus Split Project Los Angeles County, California	Jones & Stokes	Within a 1-mile radius	Bifacial mano, 2-3 Lithic Flakes, marine shell scatter, historic refuse
LA-09655	Robert White, Laura White, David Van Horn	2008	Phase I Cultural Resources Assessment of 1.94 Acres of Partially Developed Land Located at the Southwest Corner of Avenue N and 10 th Street West, City of Palmdale, Los Angeles County	Archaeologic al Associates	Within a 1-mile radius	None
LA-10578	Jane Fortier	2009	TEA21 Rural Roadside Inventory: Native American Consultation and Ethnographic Study Caltrans District 7, County of Los Angeles	Jones & Stokes	Within a 1-mile radius	None
LA-10596	Rebecca Orfila	2010	A Phase I Cultural Resources Assessment of City of Lancaster – Rule 20A Project Area (I/O 310334) 10 th Street West from Ave K-8 to Ave L-10, Lancaster, Los Angeles County, California	RSO Consulting	Within a 1-mile radius	Historic refuse
LA-11453	Rebecca Orfila	2011	RE: Archaeological Survey for the Southern California Edison Company: Nineteen Deteriorated Power Poles on the Petan 12kV, Forage 12kV, Hanger 12kV, Lupine 12kV, Assembly 12kV, Force 12kV, Moonglow 12kV, and Hughes Lake 12kV Circuits in Los Angeles County in California	RSO Consulting	Within a 1-mile radius	Historic refuse
LA-12093	Bai “Tom” Tang	2012	RE: Historical/Archaeological Resources Survey Rutan 2061 Project (Sunlight Partners), Section 4, T6N R12W, SBBM Near the City of Lancaster, Los Angeles County, California	CRM Tech	Within a 1-mile radius	None
LA-12745	Michael Way	2014	Cultural Resources Records Search and Site Visit Results for Verizon Wireless	EBI Consulting	Within a 1-mile radius	None

			Candidate Emtan (SCE Planning Office), 42060 10 th Street West, Lancaster, Los Angeles County, California.			
LA-12871	Sherri Gust, Kim Scott, and Courtney Richards	2014	Combined Paleontological Identification and Evaluation Report Without Survey For the High Desert Corridor Freeway, Los Angeles and San Bernadino Counties, California	Cogstone Resource Management Inc.	Within a 1-mile radius	None
LA-12873	Sherri Gust, Victoria Harvey, Kim Scott, Dustin Keeler, Tadhg Kirwan, Nancy Sikes, and David Earle	2014	Archaeological Survey Report for the High Desert Corridor, Los Angeles and San Bernadino Counties, California	Cogstone Resource Management Inc.	Within a 1-mile radius	None
LA-12875	Sherri Gust, Caprice “Kip” Harper	2015	Preliminary Historic Property Treatment Plan for the High Desert Corridor Project SR-14 to SR-18 Los Angeles and San Bernadino Counties, California	Cogstone Resource Management Inc.	Within a 1-mile radius	None
LA-12876	Nancy Sikes	2014	Historic Property Survey Report for the High Desert Corridor, Los Angeles & San Bernadino Corridor, Los Angeles & San Bernadino Counties, California	Cogstone Resource Management Inc.	Within a 1-mile radius	None
LA-12877	C. Lynn Furnis, Victoria Harvey, Tadhg Kirwan, Christina Peterson, and Sherri Gust	2014	Historical Resources Evaluation Report for The High Desert Corridor, Los Angeles & San Bernardino Counties, California	Cogstone Resource Management Inc.	Within a 1-mile radius	None
LA-13217	Jennifer Roland, Susan Hector	2016	Phase I Investigation for the Verizon Wireless Thirteen Tower Installation Project, Palmdale, Los Angeles County, California	NWB Environmental Services, LLC	Within a 1-mile radius	None

6.3 Archival Research

6.3.1 Ethnographic Research

As mentioned in Section 4.2 ethnographically, the inhabitants of the area were mostly Kitanemuk, Serrano, Vanyume, Tataviam, and Kawaiisu. The people were documented to have lived in large seasonal camps and villages within the Antelope Valley. Research conducted on the Antelope Valley Museum website stated that the inhabitants of the area built winter camps and/or migrated through the area when heading to the coast or for trading purposes. Due to confidentiality reasons maps showing where the villages were located are not available. Additionally, Chairwoman Donna Yocum of the San Fernando Band of Mission Indians contends that the entire Palmdale area contains countless Native American archaeological sites, many of which are considered sensitive and culturally unique. Moreover, it has been revealed through mitochondrial DNA that the inhabitants of some of the Tataviam/ Vanyume sites are direct ancestors of the SFMBI Tribal members, such as Chairwoman Donna Yocum. In conjunction with the information stated within this report, the Project has been determined to be potentially sensitive for archaeological and tribal resources. APRMI recommends archaeological resources monitoring to be conducted by a qualified archaeologist. This will reduce the damage to any potential archaeological or tribal resources discovered on the Project site itself to a less than significant impact level. Additionally, a local Native American monitor with direct descendants to the area should also be retained during ground disturbing activities, per the list of tribal contacts provided by the Native American Heritage Commission, or the City of Palmdale Consultation list.

6.3.2 Historic Topographic Maps and Aerial Photographs

A review of the available USGS Historical Topographic Map Collection did not identify any buildings or structures within the immediate Project property between 1930 to 1958 (Figure 6) and from 1958 to 2022 (Figure 7). In 1958, 10th Street West was established as an official road and some structures can be observed west of the road.

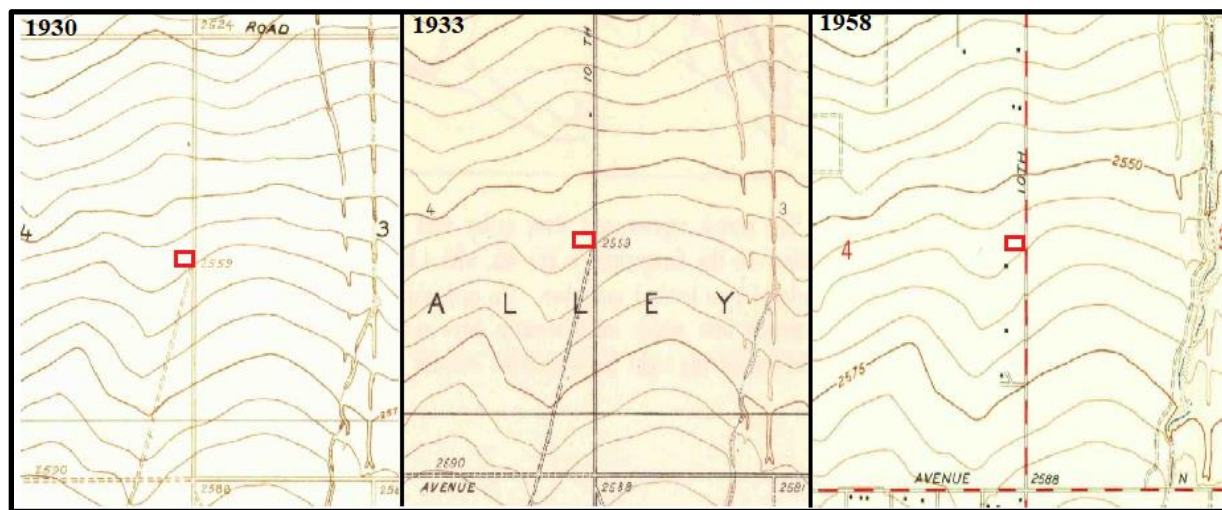


Figure 6. Historic maps from 1930-1958 (USGS, HTMC)

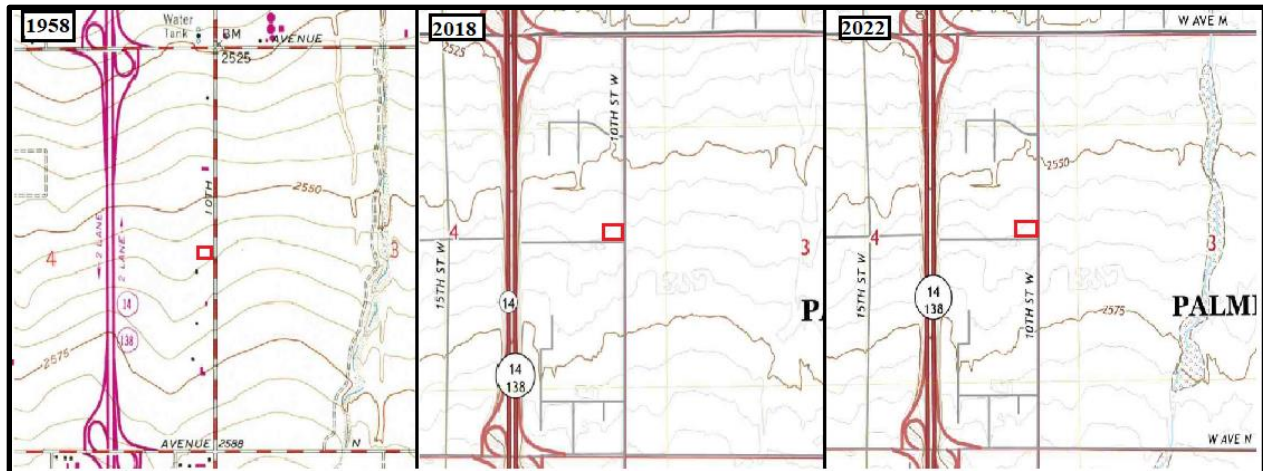


Figure 7. Maps from 1958-2022 (USGS, HTMC)

7.0 RESULTS OF FIELD RECONNAISSANCE

Results of the original field reconnaissance, as viewed in Figures 9-14, determined the area to be uneven hard pan desert terrain composed of alluvial sand, silt, sandstone, granite river cobbles, soapstone, and quartz. Ground visibility ranged from low to high depending on the density of brush, but overall, most of the topsoil was visible apart from the western Project boundary where the brush was extremely dense in certain spots. The project terrain flora included approximately 20 Joshua Trees, Sage Brush, Desert Cholla, Creosote, Turkey Mullein, Wire Lettuce, and various other desert grasses/wildflowers. Wildlife that was seen directly or indirectly through tracks/remains included rabbit, quail, ground squirrels, lizards, ravens, hummingbirds, and coyotes. A potential desert tortoise burrow (Figure 13) was observed 2 feet below surface grade in the west wall of the drainage ditch along the western border of the project. During the survey, a family of three stray Labrador dogs were seen running through the property, approaching the surveyors briefly before they wandered off. Although the parcel is undeveloped, potentially historic debris including bottles, jars, cans, tires, rusted metal objects, and other trash was observed throughout the area. Vehicle tracks were visible in areas with less vegetation.



Figure 8. View west of site from eastern Project boundary.



Figure 9. View west of survey marker at southwestern corner of site.



Figure 10. View north of the western Project boundary and drainage ditch.



Figure 11. Rusted can found on Project Site.



Figure 12. Potential desert tortoise burrow.



Figure 13. Rusty metal white box with fixture.

No paleontological resources were observed or identified on the surface of the Project property. Despite these negative results, a more in-depth analysis regarding the paleontological sensitivity of the Project area is discussed in further detail in the proceeding sections. Native American cultural resources were also not observed during the pedestrian survey; however, vegetation removal, grading, and excavation may expose cultural resources during Project grading activities. Historic trash was observed on the surface, indicating the potential for finding additional artifacts during Project grading.

8.0 NATIVE AMERICAN CONTACT

APRMI staff requested a Sacred Lands File Search and a Native American Contacts list for the Project from the Native American Heritage Commission (NAHC) on August 21st, 2023. The NAHC's search of the Sacred Lands Files, received on October 3rd, 2023, provided APRMI with a Native American Contacts list (see Appendix C). APRMI contacted the tribes, individuals, and organizations listed by phone first, to assure that the mailing information is correct and to let them know that an informational package regarding the Project, including a Project description, was

being sent to them by mail. The Project informational package along with an accompanying letter was sent to them by regular mail, on October 11th, 2023. Any written responses to APRMI's outreach can be viewed in Appendix C.

On October 11th, 2023, Chairwoman Donna Yocum for the San Fernando Band of Mission Indians (SFMBI), responded to APRMI through email and telephonic communication and stated the proposed Project falls within SFMBI Tataviam/Vanyume ancestral homelands and is considered an extremely culturally sensitive area. They request AB 52 consultation with the appropriate parties, specifically prior to any ground disturbing activities, and that a tribal monitor from NDNA Monitoring and Consulting LLC be on-site during any ground-disturbing activities.

On October 11th, Sarah Brunzell of the Fernando Tataviam Band of Mission Indians requested in a telephonic conversation to APRMI staff, that in addition to telephonic and written communication, APRMI was to complete the tribe's online information form. APRMI attempted to complete the form, but would have been charged \$75 to submit it, and so declined to do so.

On October 11th, Manfred Scott of the Quechan Tribe of the Fort Yuma Reservation responded telephonically and expressed interest in the Project. APRMI has not received a formal request for any action from the Quechan Tribe of the Fort Yuma Reservation either in written or telephonic form.

On November 2nd, 2023, Alexandra McCleary of the Yuhaaviatam of San Manuel Nation (YSMN) responded through email and stated that the Project area lies within Serrano Ancestral Territory and is of interest to the tribe. As the Project area is previously undeveloped and close to a water source, it may be sensitive for cultural resources. Consequently, the YSMN request AB 52 consultation.

A full list of communications from APRMI to Native American tribes can be seen in Table 7.

Table 7. APRMI Communications with Native Americans

Personal Contact	Tribal Affiliation	Communication from APRMI	Responses
Sarah Brunzell	Fernando Tataviam Band of Mission Indians	Physical letter, Telephone	Telephone – Requested completion of online form.
Robert Martin	Morongo Band of Mission Indians	Physical letter, Telephone	No response
Ann Brierty	Morongo Band of Mission Indians	Physical letter, Telephone	No response
Jill McCormick	Quechan Tribe of the Fort Yuma Reservation	Physical letter, Telephone	No response
Jordan Joaquin	Quechan Tribe of the Fort Yuma Reservation	Physical letter, Telephone	No response
Manfred Scott	Quechan Tribe of the Fort Yuma Reservation	Physical letter, Telephone	Telephone – Expressed Interest in Project
Alexandra McCleary	Yuhaaviatam of San	Physical letter,	Email – Requested AB

	Manuel Nation	Telephone	52 consultation
Mark Cochrane	Serrano Nation of Mission Indians	Physical letter, Telephone	No response
Wayne Walker	Serrano Nation of Mission Indians	Physical letter, Telephone	No response
Donna Yocum	San Fernando Band of Mission Indians	Physical letter, Telephone, Email	Telephone, Email – Requested AB 52 consultation and an on-site tribal monitor

9.0 ASSEMBLY BILL 52 NATIVE AMERICAN CONSULTATION

The City of Palmdale will conduct the Native American Consultation process with the individuals listed in the previous section, and on their AB52 list, as required by Assembly Bill 52. They will also prepare the documentation that takes place between the City of Palmdale and Native American interested parties. APRMI will help the City of Palmdale in the process if requested.

10.0 CONCLUSIONS

Field survey reconnaissance of the Project area yielded negative results for prehistoric and paleontological resources but did find potentially historic refuse. These pedestrian surveys only allow surface/existing grade observation. Since the Project area is located near a historical seasonal river, the area was likely flooded multiple times through thousands of years, therefore covering any prehistoric resources that may have been deposited on the surface. An analysis of the results of the cultural resources check requested from the SCCIC by APRMI determined that 18 historic and prehistoric sites and isolates have been found within a one-mile radius of Project boundaries. This indicates that there is a high potential for the discovery of prehistoric artifacts and the further discovery of historic ones during ground-disturbing activities.

Through cross referenced data of the 2008 geologic map of the USGS Lancaster & Alpine Butte quadrangles, the sediment observed on the Project site corresponds with known mapped sedimentary units of the site itself. The significance of these sediments is further elaborated in the results for the paleontological records check. Dr. Alyssa Bell, NHMLA Collections Manager has stated that no known vertebrate fossil localities lie within the direct boundaries of the Project, but four fossil localities have been found in similar sedimentary deposits that are also found on the Project site. Specifically, within the Harold Formation, Mastodon and horse family (Equidae) fossils have been recovered in Palmdale and adjacent areas. Other fossils recovered in Holocene and Pleistocene alluvial sediments near the area include camel, rabbits, lizards and other small mammals. Since most of these fossil remains were found at various depths, the entire Project site is considered potentially sensitive for paleontological resources since the sediment on site has been known to produce significant fossils as confirmed by the geologic background and paleontological records check results.

Archival research has determined the Project area is located within the ancestral homeland of the several Native American tribes. The Palmdale area was inhabited by the Kitanemuk, Serrano, Vanyume, Tataviam, and Kawaiisu. The NAHC records check of the SLF yielded negative results regarding prehistoric/ and or Native American presence for the area. However, the NAHC asserts that the absence of data in the SLF does not indicate the absence of cultural resources and that the appropriate tribes should be contacted for elaboration. APRMI contacted the tribes, individuals, and organizations provided from the Native American Contacts list. Letter and/or email correspondence was sent to the Native Americans on the list, with information regarding the Project. They were asked to respond and elaborate further regarding their ancestral homeland. One individual responded to the request. Chairwoman Donna Yocum of the San Fernando Band of Mission Indians responded by letter and telephonically with Ms. Robin Turner, stating that the area is considered highly culturally sensitive, especially since it has been determined through DNA testing, that many tribal members are direct descendants of the Tatavium and Vanyume people. She requested AB 52 consultation with the City of Palmdale prior to the beginning of construction, and the on-site presence of a Tribal Monitor from NDNA Monitoring and Consulting LLC during any ground-disturbing activities.

11.0 RECOMMENDATIONS

Due to the results in the record searches and the additional research in the Project area, the following mitigation measures are recommended to reduce impacts to the resources during Project development.

Prior to the onset of construction, a qualified paleontologist shall be retained for the Project. The Project paleontologist will provide construction personnel training classes and develop a procedure and protocol pamphlet, known as a Worker's Environmental Awareness Program (WEAP), which will be provided at each class. The training classes will include examples of paleontological resources (types of known fossils from the area) to be aware of what could be found on site and what protocols and procedures are required to follow if discoveries are made. The Contractor or Subcontractor(s) will ensure that all construction personnel are made available to attend the training and retain documentation demonstrating attendance.

Under the direction of the qualified Project paleontologist, paleontological monitoring will be required, as determined by the paleontologist at the time of construction-related activities within native soil in known fossil producing soil, to help ensure that if fossil remains are uncovered, each location will be mitigated to a less-than-significant effect. If paleontological resources are located during Project grading, all activity within 50 feet of the find will stop or be diverted to another area, and the qualified Project paleontologist will assess the significance of the find to determine the appropriate avoidance measures and mitigation. For any fossil remains found at the time of monitoring activities, laboratory preparation, analysis, cataloging, curation, and final acceptance to a legal repository will be required. Once paleontological resource construction monitoring is completed, and the resources found have been processed in the laboratory, a final Report of

Findings or Negative Findings Report document (if no resources are collected or observed) that summarizes the monitoring efforts, will be submitted to the City of Palmdale and the Natural History Museum of Los Angeles County or another legal repository.

Prior to the onset of construction, a qualified archaeologist will be retained for the Project. The Project archaeologist will provide construction personnel training classes and develop a procedure and protocol pamphlet, known as a Worker's Environmental Awareness Program (WEAP), which will be provided at each class. The training classes will include examples of cultural resources (i.e., prehistoric, Native American, and historical) as to be aware of what could be found on site and what protocols and procedures are required to follow if discoveries are made. The Contractor or Subcontractor(s) will ensure that all construction personnel are made available to attend the training and retain documentation demonstrating attendance.

Under the direction of the qualified Project archaeologist, archaeological monitoring will be required during construction-related earth-moving activities (excavation) to ensure that if any archaeological resources are uncovered, monitoring will help mitigate the adverse effects to a less-than-significant level. If archaeological resources (i.e., isolated artifacts, sites, or features) are located during Project construction, all activity within 50 feet of the find will stop or be diverted to another area, and the qualified Project archaeologist will assess the significance of the find to determine the appropriate avoidance measures and mitigation.

For any archaeological resources found at the time of monitoring, laboratory preparation, analysis, cataloging, curation, and final acceptance to a legal repository will be required. Once archaeological resources monitoring is completed, and the resources have been processed in the laboratory, a final Report of Findings or Negative Report of Findings document (if no resources are collected or observed) that summarizes the monitoring efforts, will be submitted to the City of Palmdale and the South Central Coastal Information Center.

As determined by the qualified Project archaeologist or the City of Palmdale, a qualified local Native American monitor should be retained during ground disturbing activities per the list of tribal contacts provided by the Native American Heritage Commission or the City of Palmdale's Consultation list, for any sensitive Tribal cultural resources that may be uncovered. Chairwoman Donna Yocum has requested that the Project employs a Tribal Monitor from NDNA Monitoring and Consulting. If Tribal cultural resources are found at the time of monitoring, all activity within 50 feet of the find would stop and the qualified Project archaeologist along with the Native American monitor will assess the significance of the find to determine the appropriate avoidance measures and mitigation. Upon completion of Tribal cultural resource construction monitoring, a compliance report that summarizes the monitoring efforts by the Native American monitor will be prepared.

A summarized list of recommended Mitigation Measures can be viewed in Table 8.

Table 8. Mitigation Monitoring Measures for the 10th Street West Warehouse Project

<i>Impact</i>	<i>Mitigation Measure</i>	<i>Impact after Mitigation Measure</i>
PAL-1 Development of the proposed project could potentially disturb undiscovered paleontological resources present on the project site.	<p>MM-PAL-1a Prior to the start of Project excavation, a qualified paleontologist shall be retained and create a Worker's Environmental Awareness Program (WEAP) pamphlet that will be provided as training to Project personnel as to understand the regulatory requirements for the protection of paleontological resources. This training shall include examples of paleontological resources to look for and protocols to follow if discoveries are made. The paleontologist shall develop the training and any supplemental materials necessary to execute said training.</p> <p>MM-PAL-1b Paleontological resources monitoring shall be conducted during Project excavation by a qualified paleontological resource monitor, per Society for Vertebrate Paleontology (2010) standards, under the supervision of a qualified Lead Paleontologist. Monitoring will entail the visual inspection of excavation and grading areas during excavation. The qualified paleontological resources monitor will periodically assess monitoring results in consultation with the Lead Paleontologist. If no (or few) fossils have been exposed, the Lead Paleontologist may determine that monitoring is no longer necessary, and/or periodic spot checks would be required. During construction monitoring, the monitor should process soil samples for micro-fauna per SVP guidelines.</p> <p>MM-PAL-1c In the event that paleontological resources are encountered when a monitor is not on site, all excavation shall cease within at least 50 feet of the discovery and the Principal Investigator and Lead Paleontologist must be notified immediately. If the monitor is present at the time of discovery, then the monitor will have the authority to temporarily divert the excavation equipment around the find and notify the Principal Investigator and Lead Paleontologist until it is assessed for scientific significance. Work cannot resume in the direct area of the discovery until the Principal Investigator and/or Lead Paleontologist indicates that excavation can resume.</p> <p>MM-PAL-1d If a paleontological discovery requires an excavation team or requires additional time to collect specimens, the area will be cordoned off and secured so that a paleontological resources excavation crew, led by the Principal Investigator and Lead Paleontologist, may retrieve the remains out of that localized area of in situ deposits while excavation, monitored by a paleontological resource monitor, can continue in other areas. Once the Principal Investigator and Lead Paleontologist has determined that the collection process is complete for a given area or locality, construction activity will resume in that localized area.</p>	Less than Significant

	<p>MM-PAL-1e All significant fossils collected will be prepared in a properly equipped paleontology laboratory to a point ready for curation. Preparation will include the careful removal of excess matrix from fossil materials and stabilizing and repairing specimens, as necessary. Any fossils encountered and recovered shall be identified to the lowest taxonomic level, photographed, catalogued, analyzed, and delivered to an accredited museum repository for permanent curation and storage. Any fossils collected shall be donated to a public, non-profit institution with a research interest in the materials within Los Angeles County or another local repository. Accompanying notes, maps, and photographs shall also be filed at the repository. The cost of curation is assessed by the repository and is the responsibility of the Project proponent.</p> <p>MM-PAL-1f At the conclusion of laboratory work and museum curation, a final report will be prepared describing the results of the paleontological mitigation monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the geology and paleontology in the project vicinity, a list of taxa recovered (if any), an analysis of fossils recovered (if any) and their scientific significance, and recommendations. If the monitoring efforts produced fossils, then a copy of the report will also be submitted to the designated museum repository.</p>	
CR-1 Construction associated with the proposed Project would result in the destruction or alteration of the character of known historically significant buildings and properties.	No known historically significant buildings and properties have been identified within, or adjacent to, the project site. Therefore, there would not be any impact to historic properties or buildings. No mitigation is required.	Less than Significant

<p>CR-2 Ground disturbing activities associated with the Project could uncover significant prehistoric or historic archaeological deposits that qualify as cultural resources as defined in Section 15064.5 of the CEQA Guidelines. Damage or destruction of such resources would be a potentially significant impact.</p>	<p>MM-CR-2a Prior to the start of Project excavation, a qualified archaeologist shall be retained and create a Worker's Environmental Awareness Program (WEAP) pamphlet that will be provided as training to Project personnel as to understand the regulatory requirements for the protection of cultural resources. This training shall include examples of archaeological cultural resources to look for and protocols to follow if discoveries are made. The archaeologist shall develop the training and any supplemental materials necessary to execute said training.</p> <p>MM-CR-2b Archaeological resources monitoring shall be conducted by an archaeological resource monitor during Project related earth-disturbing activities, per OHP standards, under the supervision of a qualified Lead Archaeologist. Monitoring will entail visual inspection of Project related earth-disturbing activities in native soil.</p> <p>MM-CR-2c Per the Native American contact responses, an approved Native American monitor, with documented ancestral ties to the area consistent with the standards of the Native American Heritage Commission (NAHC) shall be present for all ground disturbing activities that involve excavation of previously undisturbed soil until the archaeologist and Native American monitor deems that they are no longer in soil that may contain prehistoric and/or historic artifacts, sites, or features. Monitoring will entail visual inspection Project related earth-disturbing activities.</p> <p>MM-CR-2d If an archaeological resource is encountered during excavation when a monitor is not on site, all excavation shall cease within at least 50 feet of the discovery and the Principal Investigator and Lead Archaeologist must be notified. Work cannot resume in the direct area of the discovery until it is assessed by the Principal Investigator and/or Lead Archaeologist and indicates that excavation can resume.</p> <p>MM-CR-2e If an archaeological discovery cannot be preserved in situ and requires an excavation team or requires additional time to collect cultural resources, a Discovery and Treatment Plan (DTP) will be developed and the area will be cordoned off and secured so that an archaeological resources excavation team, led by the Principal Investigator and Lead Archaeologist, may recover the cultural resources out of that contained area. Once the Principal Investigator has determined that the collection process is complete for a given area or locality, construction activity will resume in that localized area.</p> <p>If any non-Native American human remains are encountered at any point during the Project, the coroner must be notified and all work on the site must cease until the coroner removes</p>	<p>Less than Significant</p>
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	<p>the remains and allows the Project to proceed as dictated by law.</p> <p>MM-CR-2f All significant cultural resources collected by the archaeologist will be prepared in a properly equipped laboratory to a point ready for curation. All significant artifacts collected will be prepared in a properly equipped archaeological laboratory to a point ready for curation. Artifacts will be identified, photographed, catalogued, analyzed, and delivered to an accredited museum repository for permanent curation and storage or to the appropriate Tribe. Accompanying notes, maps, and photographs shall also be filed at the repository. The cost of curation is assessed by the repository and is the responsibility of the Project proponent.</p> <p>MM-CR-2g At the conclusion of laboratory work but prior to museum curation, a final (negative or positive) report will be prepared describing the results of the cultural mitigation monitoring efforts associated with the project. The report will include a summary of the field and laboratory methods, an overview of the cultural background within the project vicinity, a list of cultural resources recovered (if any), an analysis of cultural resources recovered (if any) and their scientific significance, and recommendations. A copy of the report will be prepared for the City of Palmdale, the SCCIC, and be submitted to the designated museum repository (if applicable).</p>	
CR-3 Native American human remains may be inadvertently uncovered during project construction.	MM-CR-3a In the event that Native American human remains are inadvertently uncovered during the Project, the Project proponent will immediately cease activity on site and notify the coroner, and the local Native American most likely descendent (MLD), if not already on site, will be notified and the procedures dictated by law must be implemented.	Less than Significant

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10th St. Warehouse
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APPENDIX A

NHM Paleontological Resources Report



Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007
tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

September 3, 2023

ArchaeoPaleo Resource Management, Inc.
Attn: Robin Turner

re: Paleontological resources for the 10th St. Warehouse Project

Dear Robin:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the 10th St. Warehouse Project area as outlined on the portion of the Lancaster West USGS topographic quadrangle map that you sent to me via e-mail on August 29, 2023. We do not have any fossil localities that lie directly within the proposed project area, but we do have fossil localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth.

The following table shows the closest known localities in the collection of the Natural History Museum of Los Angeles County (NHMLA).

Locality Number	Location	Formation	Taxa	Depth
LACM VP 7884	East of the SE corner of the intersection of East 3rd Street & East Avenue H-13	Unknown formation (Pleistocene; fluvial brown clayey silt)	Camel (<i>Camelops hesternus</i>)	4 feet bgs
			Rabbit (<i>Sylvagus</i>), camel family (<i>Camelidae</i>), antelope squirrel (<i>Ammospermophilus</i>), kangaroo rat (<i>Dipodomys</i>), pocket mouse (<i>Perognathus</i>), pack rat (<i>Neotoma</i>), deer mouse (<i>Peromyscus</i>), vole family (<i>Microtinae</i>), iguana (<i>Dipsosaurus</i>), pocket gopher (<i>Thomomys</i>), spiny lizard (<i>Sceloporus</i>), side blotched lizard (<i>Uta</i>), colubrid snakes (<i>Trimorphodon</i> , <i>Masticophis</i> , <i>Phyllorhynchus</i>), night lizard (<i>Xantusia</i>), western alligator lizard (<i>Elgaria</i>), toothy skinks	
LACM VP 7853	Waste Management of North America Lancaster Landfill	Unknown formation (Pleistocene; sandy loess under a dune deposit strand, sandy siltstone, siltstone to clayey siltstone)		3-11 feet bgs

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			(<i>Plestiodon</i>), whiptail lizard (<i>Aspidocelis</i>), spiny lizards (<i>Phrynosomatidae</i>), smelt (<i>Osmeridae</i>)	
LACM VP CIT 451	Near intersection of E Barrel Springs Rd & 47th St E (Palmdale Quad)	Harold Formation	Mastodon (<i>Mammutidae</i>), horse family (<i>Equidae</i>)	Unknown
LACM VP 5942-5950	Along Avenue S from 90 th Street East in Palmdale to Lake Los Angeles	Unknown formation (Holocene)	Kingsnake (<i>Lampropeltis</i>), Lizard (<i>Lacertilia</i>), leopard lizard (<i>Gambelia</i>); snake (<i>Ophidia</i>), gopher snake (<i>Pituophis</i>); rabbit (<i>Lagomorpha</i>), rodent (<i>Rodentia</i>), Pocket gopher (<i>Thomomys</i>), pocket mouse (<i>Chaetodippus</i>), kangaroo rat (<i>Dipodomys</i>); birds (<i>Aves</i>)	0-9 feet bgs

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search covers only the records of the NHMLA. It is not intended as a paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,



Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice

APPENDIX B

SCCIC Cultural Resources Report



ArchaeoPaleo Resource Management, Inc.

A full-service Archaeology and Paleontology company
SBE/WBE/WOSB/DBE/UDBE/EBE/LBE/SLBE/CBE/VSBE/MicroBE Certified

August 21, 2023

South Central Coastal Information Center
California State University Fullerton
Department of Anthropology
800 North State College Blvd.
PO Box 6846
Fullerton, CA 92834-6846

I would like to request an archaeological records search for the 10th St. Warehouse (Project) listed below. The proposed Project will be located at Assessor Parcel No. 3111-012-083 / 3111-012-084. E. of SR-14, North West corner of W. Ave. M-8 and 10th St. W. within the City of Palmdale in the County of Los Angeles. This lot is located in Township 6 N, Range 12W, Section 04 within the Lancaster West, CA Quadrangle. This is currently a 187,647 SQ.FT. vacant lot and will be used to develop a 1-story, 21-foot high building, for warehouse and office use including trash area, parking area, and landscape. The owner is Takvoryan Investments LLC. Please let me know if you need additional information.

Thanks,

Robin Turner, President/CEO
ArchaeoPaleo Resource Management, Inc.
1531 Pontius Ave., Suite 200
Los Angeles, CA 90025

(424) 248-3316 ph.
(424) 248-3417 fax
rtturner@archaeopaleo.com

South Central Coastal Information Center
 California State University, Fullerton
 Department of Anthropology MH-426
 800 North State College Boulevard
 Fullerton, CA 92834-6846
 657.278.5395 / FAX 657.278.5542
sccic@fullerton.edu
California Historical Resources Information System
Orange, Los Angeles, and Ventura Counties

9/28/2023

Records Search File No.: 25410.11385

Robin Turner
 ArchaeoPaleo Resource Management
 1531 Pontius Avenue #200
 Los Angeles, CA 90025

Re: Record Search Results for the 10th St. Warehouse

The South Central Coastal Information Center received your records search request for the project area(s) referenced above, located on the Lancaster West and Ritter Ridge, CA USGS 7.5' quadrangle(s). The following reflects the results of the records search for the project area and a 1-mile radius:

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☒ custom GIS maps ☐ shape files ☐ hand-drawn maps

Resources within project area: 0	None
Resources within 1-mile radius: 8	SEE ATTACHED MAP or LIST
Reports within project area: 2	LA-02476, LA-08427
Reports within 1-mile radius: 37	SEE ATTACHED MAP or LIST

Resource Database Printout (list): ☐ enclosed ☒ not requested ☐ nothing listed
Resource Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed
Resource Digital Database (spreadsheet): ☐ enclosed ☒ not requested ☐ nothing listed
Report Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed
Report Database Printout (details): ☐ enclosed ☒ not requested ☐ nothing listed
Report Digital Database (spreadsheet): ☐ enclosed ☒ not requested ☐ nothing listed
Resource Record Copies: ☒ enclosed ☐ not requested ☐ nothing listed
Report Copies: ☒ enclosed ☐ not requested ☐ nothing listed
OHP Built Environment Resources Directory (BERD) 2022: ☒ available online; please go to
https://ohp.parks.ca.gov/?page_id=30338
Archaeo Determinations of Eligibility 2022: ☐ enclosed ☐ not requested ☒ nothing listed
Los Angeles Historic-Cultural Monuments ☐ enclosed ☐ not requested ☒ nothing listed
Historical Maps: ☒ enclosed ☐ not requested ☐ nothing listed
Ethnographic Information: ☒ not available at SCCIC
Historical Literature: ☒ not available at SCCIC

GLO and/or Rancho Plat Maps: ☒ not available at SCCIC
Caltrans Bridge Survey: ☒ not available at SCCIC; please go to
<http://www.dot.ca.gov/hq/structur/strmaint/historic.htm>
Shipwreck Inventory: ☒ not available at SCCIC; please go to
http://shipwrecks.slc.ca.gov/ShipwrecksDatabase/Shipwrecks_Database.asp
Soil Survey Maps: (see below) ☒ not available at SCCIC; please go to
<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System,

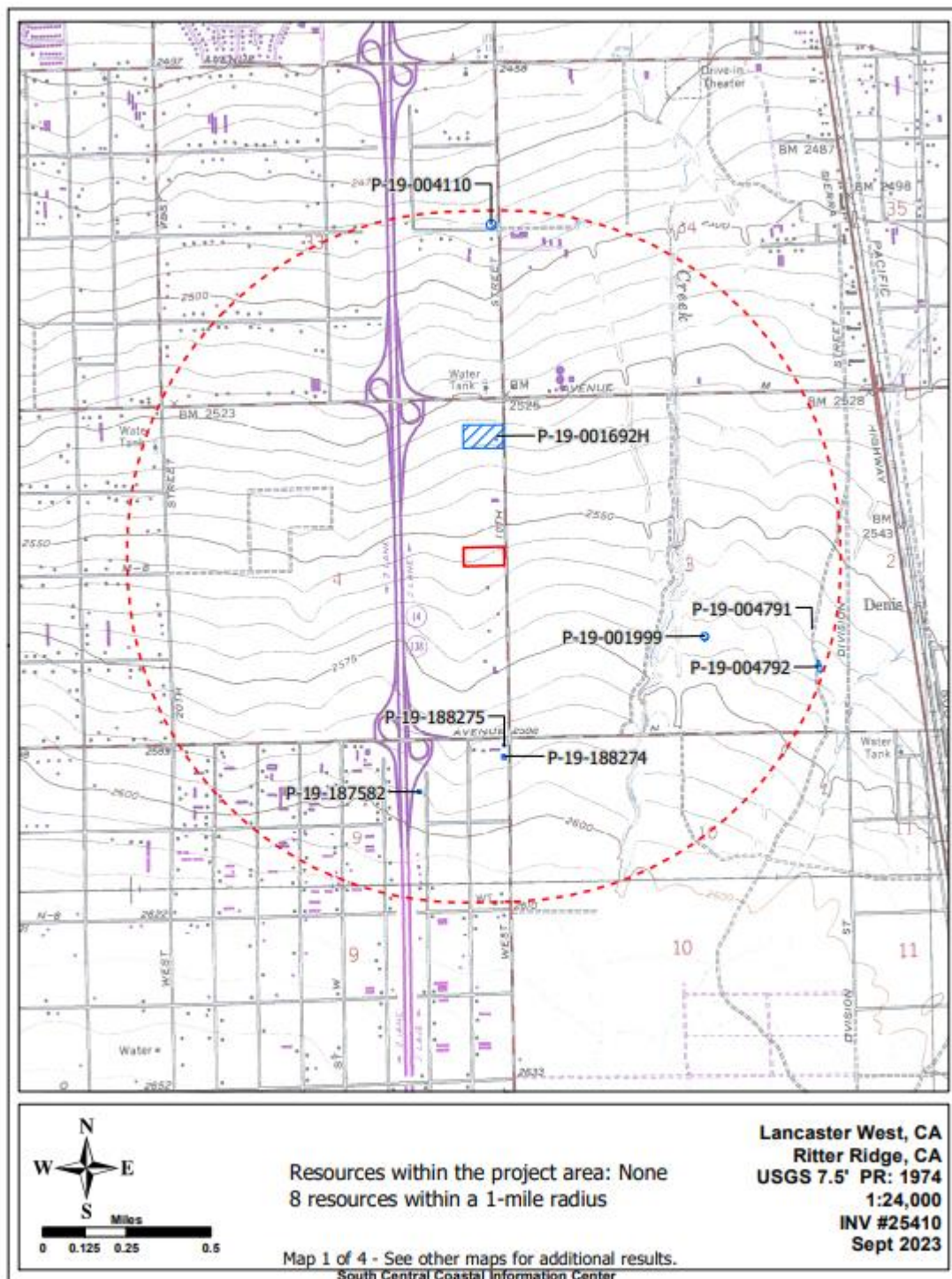
Isabela Kott

Digitally signed by Isabela Kott
Date: 2023.09.28 17:57:52 -07'00'

Isabela Kott
Assistant Coordinator, GIS Program Specialist

Enclosures:

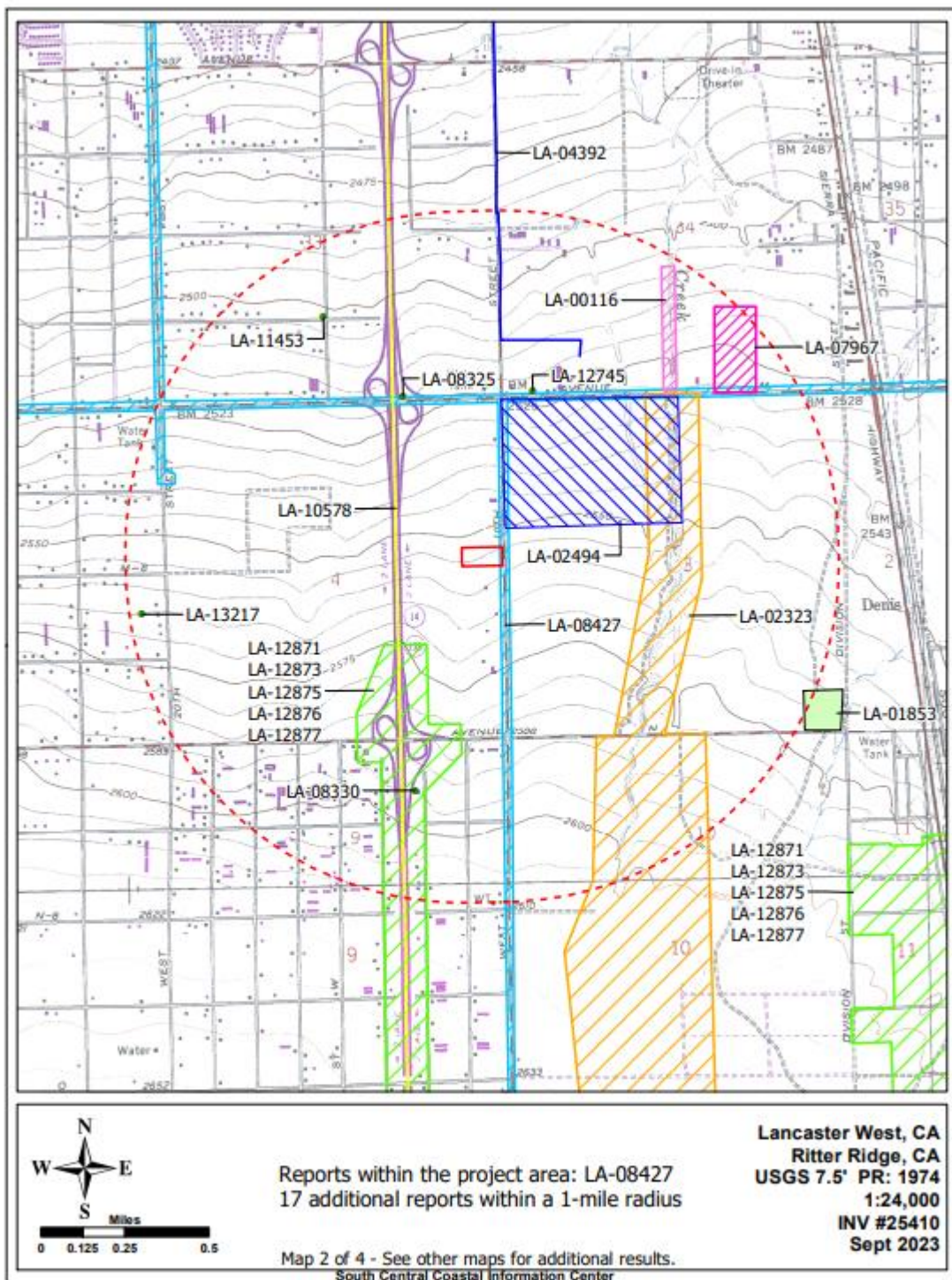
- (X) Custom Maps – 4 pages
- (X) Resource Database Printout (details) – 9 pages
- (X) Report Database Printout (list) – 5 pages
- (X) Resource Record Copies – (all) 30 pages
- (X) Report Copies – (list) 1460 pages
- (X) Historical Maps – 2 pages



May depict confidential cultural resource locations. Do not distribute.

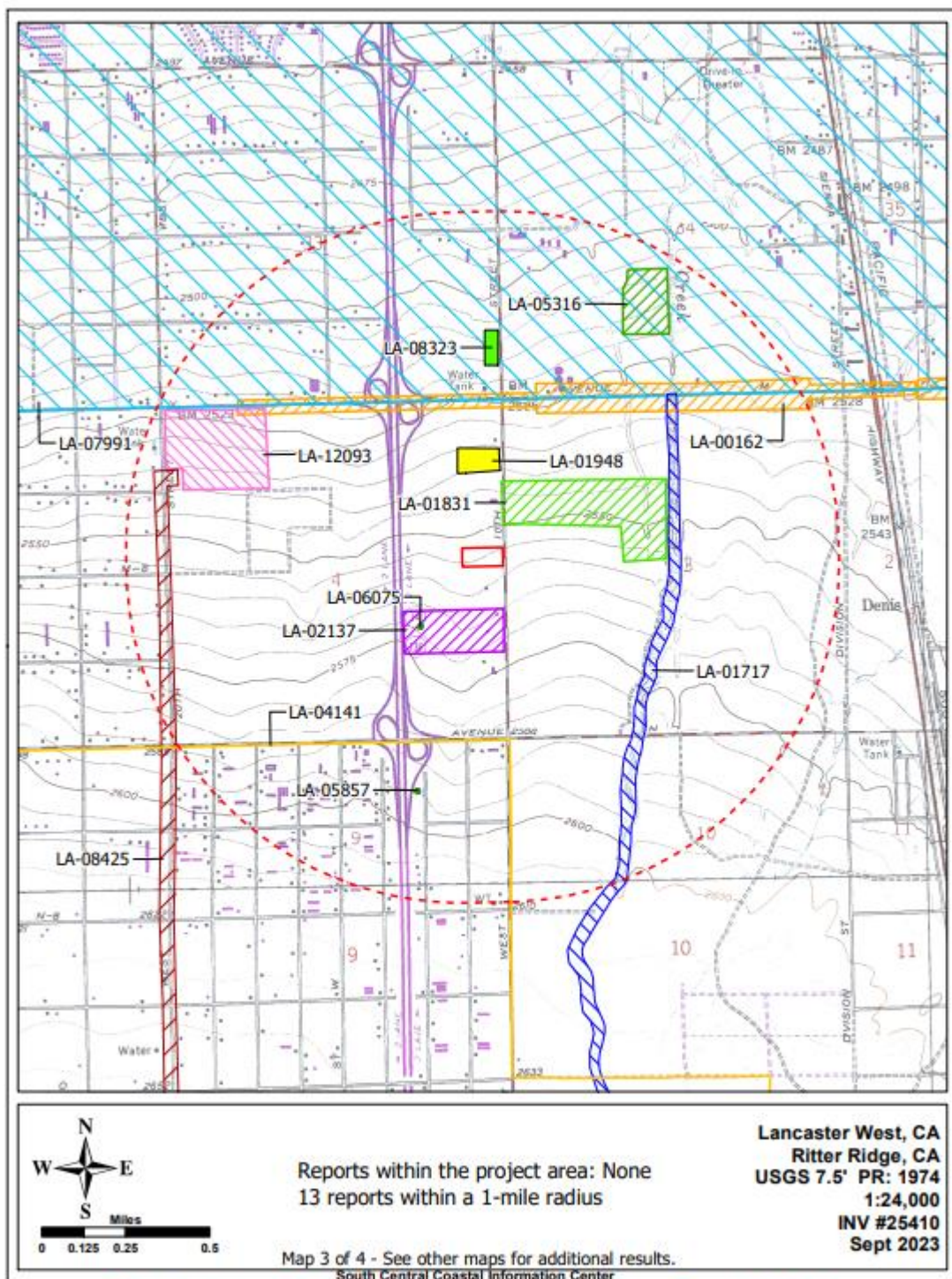
ArchaeoPaleo Resource Management, Inc.
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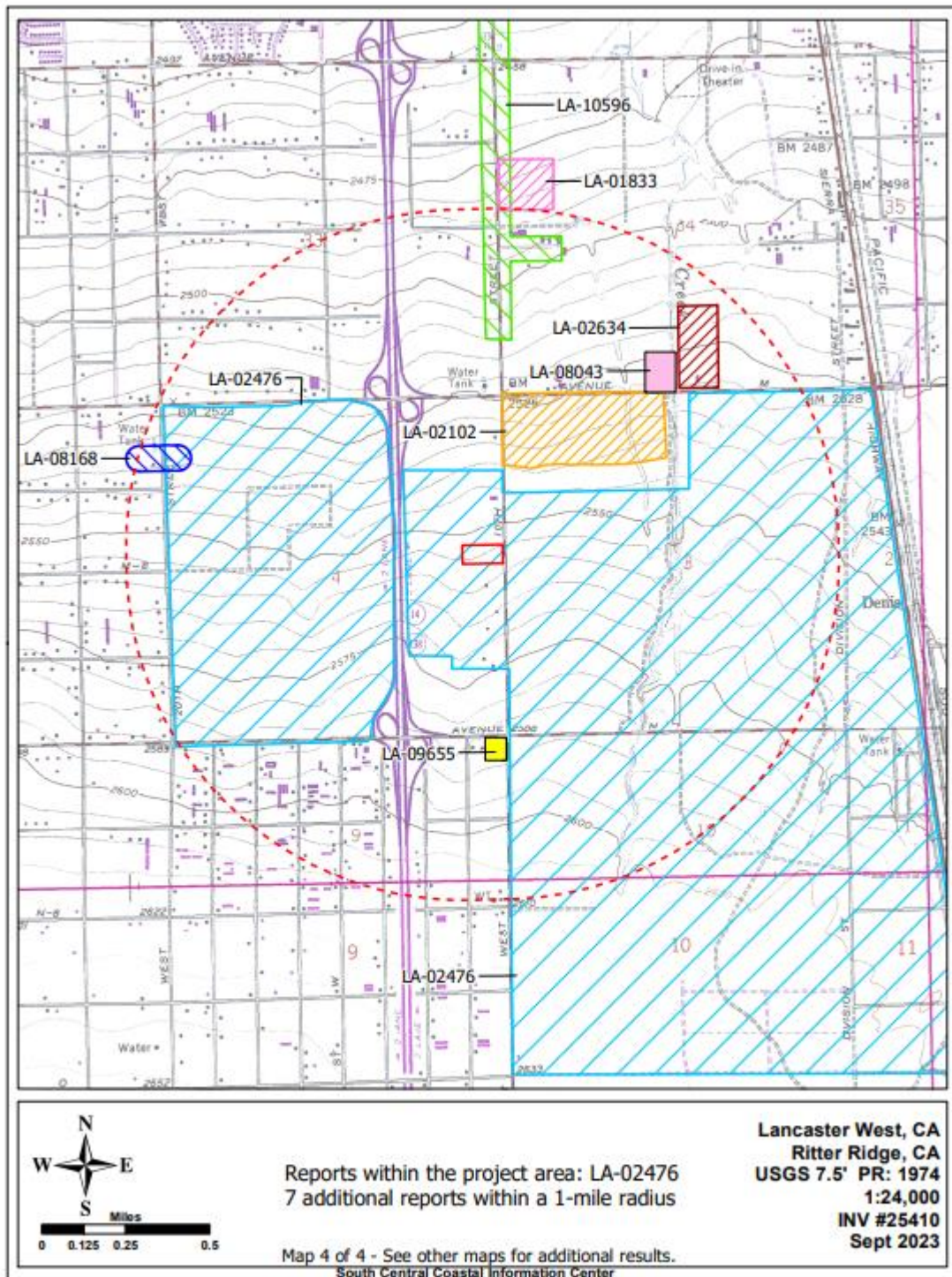


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May depict confidential cultural resource locations. Do not distribute.

APPENDIX C
NAHC Sacred Lands Search & Contact List
Responses by Native American Tribes

Native American Heritage Commission
Native American Contact List
Los Angeles County
10/03/2023

Fernandeno Tataviam Band of Mission Indians

Sarah Brunzell, CRM Manager
1019 Second Street, Suite 1 San Fernando, CA, 91340
Phone: (818) 837 - 0794
Fax: (818) 837-0796
jairo.avila@tataviam-nsn.us
Tataviam
Sent an email to response after call.

Morongo Band of Mission Indians

Ann Brierty, THPO
12700 Pumarra Road Banning, CA, 92220
Phone: (951) 755 - 5259
Fax: (951) 572-6004
abrierty@morongo-nsn.gov
Cahuilla
Serrano
Left a message.

Morongo Band of Mission Indians

Robert Martin, Chairperson
12700 Pumarra Road Banning, CA, 92220
Phone: (951) 755 - 5110
Fax: (951) 755-5177
abrierty@morongo-nsn.gov
Cahuilla
Serrano
Left a message.

Quechan Tribe of the Fort Yuma Reservation
Manfred Scott, Acting Chairman Kw'ts'an Cultural Committee

P.O. Box 1899 Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com
Quechan
Talked with him and he said he'll be looking out for our letter.

Quechan Tribe of the Fort Yuma Reservation

Jill McCormick, Historic Preservation Officer
P.O. Box 1899 Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com
Quechan
Left a message.

Quechan Tribe of the Fort Yuma Reservation

Jordan Joaquin, President, Quechan Tribal Council
P.O. Box 1899 Yuma, AZ, 85366
Phone: (760) 572 - 2423
executivesecretary@quechantribe.com
Quechan
Talked to them and they were responsive.

San Fernando Band of Mission Indians

Donna Yocum, Chairperson
P.O. Box 221838 Newhall, CA, 91322
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Fax: (503) 574-3308
ddyocum@comcast.net
Kitanemuk
Vanyume
Tataviam
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San Manuel Band of Mission Indians

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Left a message.

Serrano Nation of Mission Indians

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Serrano Nation of Mission Indians

Mark Cochrane, Co-Chairperson
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Call didn't go through.



CHAIRPERSON
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Chumash

VICE-CHAIRPERSON
Buffy McQuillen
Yakaya Pomo, Yuki,
Namlaki

SECRETARY
Sara Dutschke
Miwok

PARLIAMENTARIAN
Wayne Nelson
Luiseño

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Stanley Rodriguez
Kumeyaay

COMMISSIONER
Laurena Bolden
Serano

COMMISSIONER
Reid Milanovich
Cahuilla

COMMISSIONER
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STATE OF CALIFORNIA

Govin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION

October 3, 2023

Robin Turner
ArchaeoPaleo Resource Management

Via Email to: rturner@archaeopaleo.com

Re: 10th St. Warehouse, Palmdale, CA Project, Los Angeles County

Dear Ms. Turner:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green
Cultural Resources Analyst

Attachment

Page 1 of 1



Donna Yocum, Chairwoman
Vickie Solis, Secretary
Eleanor Marie Mia, Treasurer

Doris Martinez Smith, Elders Council
Jess Valenzuela, Elders Council
Donald Manriquez, Elders Council
Robert Martinez, Elders Council
Dennis Martinez, Elders Council

October 11, 2023

ArchaeoPaleo Resource Management
1531 Pontius Ave. Suite 200
Los Angeles, CA. 90025

Attention: Robin Turner
CEO/President/Principal Investigator

Dear Robin,

Thank you for the inquiry regarding the Cultural Resources / 10th Street Warehouse project in Palmdale CA. The proposed project falls within the Tribal/ Traditional Lands of the San Fernando Band of Mission Indians (SFBMI).

This location has a high probability of discovery of Cultural Resources due to the many sites in the near vicinity, therefore of concern to San Fernando Band of Mission Indians. As the MLD (Most Likely Descendant) representing the San Fernando Band of Mission Indians and recognized by the California Native American Heritage Commission, it is my responsibility to insure everything possible is put in place to secure the protection and preservation of SFBMI Cultural Resources from destruction or neglect and that all cultural resources are treated with the utmost respect and dignity as they so deserve in honor of our Ancestors. And, by enacting our rights by implementing those statutes which require interaction with agencies such as SB18, AB52 (CEQA) NAGPRA etc. when they apply.

The San Fernando Band of Mission Indians is in partnership with Steven Villa of NDNA Monitoring & Consulting, LLC and would like to provide one of our highly experienced Native American Monitors during ground disturbance.

I look forward to further dialogue on the matter.

Sincerely,

Donna Yocum, Chairwoman

P.O. Box 221838 Newhall, CA. 91322

ArchaeoPaleo Resource Management, Inc.
December 2023

10th St. Warehouse
Phase 1 Archaeological and
Paleontological Assessment

Dear Robin,

Thank you for reaching out to the Yuhaaviatam of San Manuel Nation (formerly known as the San Manuel Band of Mission Indians) concerning the proposed project area. YSMN appreciates the opportunity to review the project documentation received by the Cultural Resources Management Department on October 17, 2023. The proposed project is located within Serrano Ancestral Territory and is therefore of interest to the Tribe. However, based on our current knowledge, the proposed project area may be sensitive for cultural resources, as this location is close to a water source and on previously undeveloped land. As such, the Tribe will still wish to engage in government-to-government consultation pursuant to AB 52, should this project be subject to CEQA review.

Thank you again for your correspondence. If you have any additional questions or comments please reach out to me at your earliest convenience.

Regards,
Alexandra

Alexandra Mc Cleary

Sr Mgr Cultural Resource Management

Alexandra.McCleary@sanmanuel-nsn.gov

O:(909) 864-8933 Ext 50-2023

M:(909) 633-0054

26569 Community Center Dr Highland, California 92346

APPENDIX E

GEOTECHNICAL REPORT

for

**Proposed One-Story Warehouse
10th Street West,
Palmdale, CA 93551
APN: 3111-012-083, 3111-012-084**

Prepared For:

John Currado &
Michael Currado
Palmdale, CA 93551

Prepared By:

Engineering Services & Design of SoCal Inc.
19827 Reedview Drive
Rowland Heights, California 91748



Pablo C. Naranjo
Project Engineer
PE, GE 2961

2/26/2022
22-023-GO1

GEOTECHNICAL • STRUCTURAL • FOUNDATION • ARCHITECTURE

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- A Boring Logs**
- B Laboratory Test Results**
- C Seismic Design Values**

1. INTRODUCTION

As requested, and in accordance with our agreement dated 1/27/2022 with John Currado, ("Client"), Engineering Services & Design of SoCal Inc. (EDSOCAL INC.) has completed a Geotechnical Report for the One-Story Warehouse / Office ("Project") at the existing site. Recommendations provided herein are in accordance with the 2019 California Building Code (CBC).

The purpose of this geotechnical investigation report is to: summarize our understanding of the geotechnical aspects of the site, including existing site conditions, proposed development; summarize our subsurface investigation and findings; and to provide our geotechnical and foundation recommendations. The recommendations provided in this report are based on our understanding of existing site conditions, soil sampling, laboratory testing and geotechnical analysis.

2. SCOPE OF SERVICES

- Geologic hazard review.
- Reconnaissance of the property.
- Excavation, logging and sampling of two geotechnical borings to a maximum depth of 20 feet.
- Laboratory testing of soil samples to determine Sieve Analysis (ASTM D1140), Moisture Content and Density (ASTM D2216 & ASTM D2937) , Soluble Sulfate (CTM 417), Chloride Content (CTM 422), Resistivity and pH (CTM 643) and Collapsible (ASTM 4546).
- Geotechnical analysis of site conditions in relation to proposed development and formulation of foundation design recommendations.
- Preparation of this report.

This report summarizes our understanding of the geotechnical aspects of the site, including existing site conditions; summarizes our subsurface investigation and findings; and provides our geotechnical recommendations for the proposed (1) One-Story Building.

3. PROJECT DESCRIPTION

3.1 Site Location and Description

The subject site is located on a relatively flat property. The site is located on the east side of 10th Street West between West Avenue M and West Avenue N. The site is bordered by vacant land on the north, east and by commercial building structure on the south. All elevations and depths referenced will be in feet, with respect to the project specific vertical datum. The Site location is shown on Site Vicinity Map, Figure 1.

3.2 Proposed Development

Our understanding of the proposed development is based on the project plans architectural plans by SHL Engineering, Juan Carlos Herrera Architect, where an one-story warehouse / office building is proposed.

4. REVIEW OF AVAILABLE INFORMATION

4.1 Geologic Hazard Review

Our geologic hazard review was performed in general accordance with California Geological Survey (CGS) “Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California”, and the 2019 CBC. The following subsections present the results of our review as they pertain to the Site.

- Earthquake Fault Zones - According to the CGS, Earthquake Zones of Required Investigation, N/A Quadrangle, the Site is not located in a zone of required investigation for Alquist-Priolo Earthquake Fault Zone.
- Liquefaction - Liquefaction is a transformation of soil from a solid to a liquefied state during which saturated soil temporarily loses strength resulting from the buildup of excess pore water pressure, especially during earthquake-induced cyclic loading. Soil susceptible to liquefaction includes loose to medium dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits.

According to the CGS, Earthquake Zones of Required Investigation, SHZR_095 LANCASTER WEST Quadrangle dated 2005, the Site is not located in a zone of required investigation for liquefaction. The liquefaction location is shown on Liquefaction Location Map, Figure 2.

- Historic High Groundwater – According to the CGS SHZR_095 LANCASTER WEST, historically high groundwater depth is deeper than 50 feet. The historical groundwater location is shown on Historical Groundwater Map, Figure 3.
- Earthquake-Induced Landslides – According to the CGS, Earthquake Zones of Required Investigation, Quadrangle SHZR_095 LANCASTER WEST 2005, the Site is not located in a zone of required investigation for earthquake-induced landslides.

5. FIELD EXPLORATION

5.1 Drilling Auger and Sampling

EDSOCAL INC. performed two (2) boring to approximate depths of 20 feet using a CME truck mounted drill rig equipped with an 7” diameter hollow stem auger. The borings were drilled on the on within footprint of proposed foundations within floor plan of proposed Industrial Building.

Borings were logged and sampled using Modified California Ring (Ring) and Standard Penetration Test (SPT) samplers at selected depth intervals. Samplers were driven into the bottom of the boring with successive drops of a 140-pound weight falling 30 inches. The number of blows required to drive the last 12 inches of the 18-inch Ring and SPT samplers are shown on the boring logs in the “blows/foot” column (Appendix A). SPT was performed in the borings in general accordance with the American Standard Testing Method (ASTM) D1586 Standard Test Method. Representative bulk soil samples were also obtained from our borings

Standard Penetration Tests (SPT) with 2 inch O.D., and “Relative Undisturbed” samples with 3-inch O.D. were taken at approximately 5 foot intervals. California ring samples were taken at select locations using a 3 inch outer diameter split barrel California sampler lined with 2.42-inch-inner-diameter brass rings in

accordance with ASTM D3550. Soil samples were visually examined and classified in the field in accordance with the Unified Soil Classification System (USCS). Copies of the boring logs B-1 and B-2 are included in Appendix A.

The boring was advanced to the approximate location shown on Boring Location Plan, Figure 4.

DigAlert Underground Service Alert was contacted to mark out known utilities within the public right-of-way. The borings were drilled on 2/7/2022 under the full-time engineering observation of a field engineer from our office. Borings were backfilled with mechanically tamped soil cuttings upon completion.

6. LABORATORY ANALYSIS AND TEST RESULTS

Soil samples obtained from the borings were visually examined in the field, and classifications were confirmed by re-examination in our office. A geotechnical laboratory test program was performed on select soil samples and included the following tests:

Sieve Analysis (ASTM D1140), Moisture Content and Density (ASTM D2216 & ASTM D2937), Soluble Sulfate (CTM 417), Chloride Content (CTM 422), Resistivity and pH (CTM 643) and Collapsible (ASTM 4546).

The laboratory testing was performed by AP Engineering & Testing Inc. The laboratory test results are included in Appendix B. In-situ moisture content and dry density data are included on the geotechnical-boring logs (Appendix A).

7. SUBSURFACE AND SURFACE CONDITIONS

7.1 Subsurface Conditions

Details regarding the subsurface materials encountered are presented in the boring logs included in Appendix A. In general, the site subsurface conditions consist of near surface soils characterized as fill stratum underlain by Native Soils. Our interpretation of the subsurface conditions observed in the borings is summarized below.

Fill: Fill soils were observed in both borings B-1 and B-2. The fill stratum extends to depths up to 1 feet. These soils generally consist of silty Sand (SM), brown, moist, loose.

Native Material: Underlain the fill soils, Silty Sand (SM), brown, moist, medium dense to dense, were observed to the explored depths of 20 feet.

Groundwater: Groundwater was not encountered within the maximum 20 feet depth explored in the deepest boring drilled for this study. Historical high ground water level at the Site is approximately +50 feet below the ground surface (CGS, 2005).

Corrosion Consideration: The soluble sulfate content per the laboratory tests results is 19 ppm. Based on the sulfate contents of 19 ppm, and based on the American Concrete Institute (ACI), the soils have low corrosivity to concrete, and a minimum of $f'c = 2,500$ psi concrete mix is recommended. Additionally, per the sulfate contents of 19 ppm, the soils are slightly corrosive to metals.

8. GEOTECHNICAL EVALUATION AND DESIGN RECOMMENDATIONS

8.1 Seismic Design Parameters

We understand the project's seismic structural design will be in accordance with the 2019 California Building Code and ASCE 7-16. Based on the available subsurface information, and as shown in Appendix D, and in accordance with the seismic provisions of these codes, the following parameters are recommended for preliminary seismic design:

Site Class D

Type	Value	Description
F_a	1.2	Site amplification factor at 0.2 second
F_v	null - see section 11.4.8 (1) ⁽¹⁾	Site amplification factor at 1.0 second
S_s	1.713	MCE_R ground motion. (for 0.2 second period)
S_1	0.709	MCE_R ground motion. (for 1.0 second period)
S_{MS}	2.056	Site-modified spectral acceleration value
S_{M1}	null - see section 11.4.8 (1) ⁽¹⁾	Site-modified spectral acceleration value
S_{DS}	1.37	Numeric seismic design value at 0.2 Second SA
S_{D1}	null - see section 11.4.8 (1) ⁽¹⁾	Numeric seismic design value at 1.0 Second SA
SDC	null - See Section 11.4.8 ⁽¹⁾	Seismic design category
PGA_M	0.895	Site modified peak ground acceleration

Notes: (1) See Section 11.4.8 (ASCE 7-16).

8.2 Foundation Design

Based on the borings at the site to date, surficial subsurface material consists of loose-fill which is not suitable to support the proposed structures. Conventional spread and/or continuous footings can be supported on properly compacted engineered fill. We are providing recommendations for shallow foundation, over-excavation, and grading as follows.

8.2.1 Shallow Foundation

The proposed new structures can be supported on spread footings using an allowable bearing capacity of 2,000 psf, bearing on native soil encountered at 2 feet or properly compacted engineered fill. The allowable bearing capacity may be increased by one-third for transient loads, such as seismic and wind. Footings should be a minimum of 18-inches in width and embedded a minimum of 24-inches below the surrounding grade. Footing settlements of less than 1-inch over 40 feet, and differential settlements of less than 1-inch over 40 feet are anticipated with foundations bearing on appropriately prepared subgrade. An inch or less (over 40 feet) of seismically-induced settlement is anticipated under dry dynamic loading conditions, under the MCE_R level of ground shaking.

Footing excavation should be performed using a backhoe bucket fitted with a smooth steel plate welded across the bucket teeth to minimize disturbance during excavation and to provide a smooth bearing surface.

The foundation bearing level excavation subgrades should be firm and unyielding, inspected and approved by a qualified Geotechnical Engineer prior to steel placement and concrete placement.

Foundations should be constructed as soon as possible following subgrade approval. The contractor shall be responsible for maintaining the subgrade in its as approved condition (i.e. free of water, debris, etc.) until the footing is constructed.

- Lateral Resistance – Lateral resistance along the base of footings can be computed using a preliminary coefficient of 0.30. Soil resistance developed against lateral structural movement can be obtained from the passive pressure value of 250 pcf. If the sliding resistance calculated using the above coefficient of friction is deemed insufficient, shear keys can be provided in the bearing material to provide supplemental sliding resistance. Should additional lateral resistance be required, we should be notified so we can perform additional analyses and develop supplemental recommendations to resist the intended loads.

Adjacent Foundations – Surcharge loading from adjacent foundations should be considered where the adjacent foundations are supported on the soil above a 1H:1V theoretical influence line projecting upwards from the base of the lowest proposed foundation.

8.3 Collapsible Soils

According to the County of Los Angeles, Department of Public Works, Manual for Preparation of Geotechnical Reports dated July 1, 2019, soils subject to hydro-consolidation (collapsible soils) are typically soils deposited in a loose condition. These soils may be able to resist overburden pressures and additional loading at or near their in-place moisture content, but quickly consolidate when saturated or near full saturation. When subjected to increased loading and/or saturation these soils may experience consolidation or collapse greater than 2 percent.

Laboratory results indicated that a collapse test results at 5 feet shows collapsible results of 1.32% and 1.90% which is lower than the 2 %, therefore is not considered to have collapsible potential at 5 feet in depth.

The site should be designed to promote positive drainage away from the building footprints and landscaping should consist of mainly drought-tolerant native planting that requires limited irrigation. Confirmatory expansion index testing should be performed on the actual subgrade material during grading.

If the site experiences large seasonal changes in soil moisture, construction should be scheduled during or immediately after a prolonged rainy period where there is less potential volume change.

8.4 Retaining Wall

The retaining walls will be restrained and should be designed to resist soil and surcharge pressures as described below, and follow the subsurface drainage as shown Figure 5. EDSOCAL INC. should be notified in order to provide additional below-grade wall design parameters.

The existing retained soil greater than 6 feet in height can be designed using the following parameters:

- Soil Unit Weight – 120 pcf
- Internal Angle of Friction – 30 degrees
- Cohesion – 200 psf
- Coefficient of Sliding Friction – 0.30
- At-Rest Earth Pressure (restrained) – 60 psf/foot
- Passive Earth Pressure – 250 psf/foot (do not consider passive resistance for the top 1 foot of soil)
- A minimum surcharge pressure of 100 psf/foot should be used for street and walkway loading for the upper 15 feet. Lateral loads from adjacent structures, sidewalks, passageways, and other uniform surcharges, such as construction materials and equipment, on the wall backfill, may be considered to impart ½ of the surcharge for restrained walls.
- The seismic force increment may be considered to act as a triangular distribution pressure equal to 22 psf/foot. The seismic increment should be added to the active (unrestrained) lateral earth pressures when considered for retaining walls.

The above values assume backfill material behind the walls will consist of native on-site soils including clayey sands, and sandy clays. If conditions other than those discussed herein are anticipated, the lateral earth pressures should be provided on an individual basis by the Geotechnical Engineer/EDSOCAL INC.

8.5 Statement Section 111

In general, the proposed construction development will not adversely affect the geologic stability of adjacent properties. It is our opinion and according to geotechnical findings, including calculations, borings, and laboratory testing, the proposed development is safe from landside, settlement, or slippage.

8.6 Concrete Slabs on Grade and Miscellaneous Flatwork

Concrete slabs on grade for miscellaneous flatwork may be designed with a minimum thickness of 5.0 inches for normal loading conditions. However, if heavier loads are anticipated, a modulus of subgrade reaction of 75 pounds per cubic inch may be used when the slabs are supported by compacted fill.

All slabs and flatwork should be reinforced with a minimum of #4 bars, 18-inches on center, each direction, placed at the mid-height of the slab. The structural engineer may require heavier reinforcement. Control joints should be constructed to create squares or rectangles with a maximum spacing of 15 feet on large slab areas.

Damp proofing should be provided under all slabs on grade with moisture-sensitive floor coverings. The damp-proofing material should consist of a minimum 10 mil polyethylene liner. The liner should be placed

with 2 inches of sand below and 2 inches of sand above the polyethylene liner. The liner should be carefully fitted around service openings with joints lapped not less than 6 inches.

8.7 Corrosion Considerations

Chemical analyses performed on selected samples obtained from the borings for this study show soluble sulfate content of 19 ppm. Based on the sulfate contents, the onsite soil at this site is considered non-corrosive to concrete (ACI). A copy of the corrosion results is provided in Appendix C.

RECOMMENDATIONS FOR CONCRETE EXPOSED TO SULFATE-CONTAINING SOILS

Sulfate Exposure Severity	Classes	Water soluble sulfate (SO ₄) in soil (% by wgt)	Sulfate (SO ₄) in water (ppm)	Max Water to Cement Ratio by Weight	Minimum Compressive Strength (psi)	Cement Type	Calcium Chloride Admixture
Negligible	S0	0.00 - 0.10	0-150	---	2,500	---	No Restriction
Moderate	S1	0.10 - 0.20	150-1,500	0.50	4,000	II/V	No Restriction
Severe	S2	0.20 - 2.00	1,500-10,000	0.45	4,500	V	Not Permitted
Very Severe	S3	Over 2.00	Over 10,000	0.45	4,500	V Plus Pozzolan	Not Permitted

Corrosivity testing consisting of soils reactivity (pH) and resistivity (ohms-cm) were also tested on representative soils. The test results indicate that the soils have a soil reactivity PH of 7.7 and a resistivity of 11,227 ohms-cm. A neutral or non-corrosive soil has a reactivity value ranging from 5.5 to 8.4. Generally, soils that could be considered corrosive to metal have resistivities less than 3,000 ohms. Those soils with resistivity values of less than 1000 ohms-cm can be considered extremely corrosive.

Based on our test results, it is our opinion that the underlying soils at the site have moderate corrosion potential. Protection of buried pipes utilizing coatings on all underground pipes; clean backfills and a cathodic protection system can be effective in controlling corrosion. A qualified corrosion engineer should be consulted to further assess the corrosive properties of the soil.

8.8 Pavement Recommendations

Recommended pavement structural sections are based on the procedures outlined in "Design Procedures for Flexible Pavements" of the Highway Design Manual, California Transportation Department. This procedure uses the principal that the pavement structural section must be of adequate thickness to

distribute the load from the design traffic (TI) to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the strength of the soil (R-value).

Pavement sections were designed based on an R-Value of 30 and assumed Traffic Index of 4 for parking areas, 5 for driveway and 7 for truck access/fire lane. The recommend structural sections are as follows:

ASPHALT PAVEMENT STRUCTURAL SECTION

Pavement Area	Traffic Index	AC Thickness (in)	Base Thickness (in)
Parking Areas	4	4.0	6.0
Driveways	5	4.0	6.0
Truck Access/Fire Lane	7	5.5	10.0

Portland cement concrete (PCC) pavements for areas which are subject to traffic loads may be designed with a minimum thickness of 8 inches of Portland cement concrete on 12 inches of aggregate base.

Prior to paving, the subgrade soils should be scarified, adjusted to within 2% of optimum moisture and compacted to a minimum of 90% relative compaction. All aggregate base courses should be compacted to a minimum of 95% relative compaction.

8.9 Drainage and Irrigation

Finished grades should be designed and constructed so that no water ponds are in the vicinity of foundations. Drainage design in accordance with the 2019 California Building Code, Section 1804.3 is recommended or per local city/county requirements. Roof gutters should be provided and outflow directed away from the house in a non-erosive manner as specified by the project civil engineer or landscape architect. Proper interception and disposal of onsite surface discharge are presumed to be a matter of civil engineering or landscape architectural design.

The performance of the planned foundation and improvements is dependent upon maintaining adequate surface drainage both during and after construction. The ground surface around foundations and improvements should be graded so that surface water will not collect and pond. The impact of heavy irrigation can artificially create perched water conditions. This may result in seepage or shallow groundwater conditions where previously none existed.

Attention to surface drainage and controlled irrigation will significantly reduce the potential for future problems related to water infiltration. Irrigation should be well controlled and minimized. Seasonal adjustments should be made to prevent excessive watering.

Sources of uncontrolled water, such as leaky water pipes or drains, should be repaired if identified. The owner should be aware of the potential problems that could develop when drainage is altered through the construction of retaining walls, paved walkways, utility installations, or other various

improvements. Ponded water, incorrect drainage, leaky irrigation systems, overwatering, or other conditions that could lead to unwanted groundwater infiltration must be avoided.

Area drains should be installed in all planter and landscape areas. Planter surfaces should be sloped away from building areas in accordance with code requirements. Roof drainage should be tight-lined into the area drain system or carried to outlets at least 5 feet from building foundations. Planters and lawn areas should not be allowed adjacent to foundations unless they are lined with a bottom barrier installed with a minimum 5 percent gradient away from foundations and drained with a subdrain. Irrigation water should be controlled for the landscape areas in a way that maintains uniform moisture conditions around and below the building slab and footings. Changes in exterior moisture will promote heave and desiccation in the soil supporting foundations and must therefore be avoided. Installation of concrete patios and walkways adjacent to the building is recommended due to the potentially expansive on-site soil conditions. Any planters located adjacent to the building foundation must be lined in a manner that directs subsurface water at least 5 feet from the building before infiltration into the soil below. On-site surface soils have very low permeability. It is strongly recommended that surface water be collected and directed to a suitable off-site outlet rather than allowed to infiltrate into the soil. The bedrock may also act as a relatively impermeable barrier and will restrict vertical water passage.

9. CONSTRUCTION CONSIDERATIONS

9.1 Excavation and Grading

Prior to the commencement of excavation and grading, a meeting should be held at the Site with the owner, city inspector, excavation/grading contractor, civil engineer, and geotechnical consultant to discuss the work schedule and geotechnical aspects of grading.

All vegetation and deleterious materials should be removed from the areas to be graded prior to initiation of grading operations and disposed of off-site.

Any foundation remnants associated with former site structures encountered within excavations should be fully removed, and any void spaces that may be created should be backfilled with approved compacted structural fill.

Any environmentally unsuitable soils encountered during the excavation process should be properly disposed of off-site in accordance with all state and local regulations.

9.2 Site Overexcavation

Structural plans, grading plans, and foundation elevations were not available at the time of our investigation. Therefore, once formal plans are prepared and available for review, this office should review these plans from a geotechnical viewpoint, comment on any changes, and revise the recommendations of this report as necessary.

It is recommended that the existing soils within the field area be over excavated to a minimum depth of 5 feet below the existing grade. The required horizontal limits of the over excavated area shall be defined as the area extending from the edge of the perimeter proposed new field for a distance of 5 feet.

Prior to placement of compacted fills, all non-engineered fills and loose, porous, or compressible soils will need to be over-excavated down to the competent ground. Based on our exploratory borings, dense competent soils were encountered at a depth of 5 feet. throughout the site.

The exposed soils beneath all over-excavation and in cut areas not otherwise requiring over-excavation should be scarified to a minimum depth of 12 inches, moisture conditioned, and compacted to a minimum of 90% relative compaction.

The above recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. The over-excavation depths must be verified, and adjusted if necessary, at the time of grading. The over-excavated materials may be moisture conditioned and re-compacted as engineered fill.

9.3 Subgrade Preparation

Following excavation to the required subgrade depth, foundation subgrades should be level and proof-rolled using an approved compactor roller compactor, or equivalent. Any soft, loose, or unsuitable soils identified by the inspecting Geotechnical Engineer during proof-rolling should be removed and replaced with approved compacted fill.

The subgrade should be observed and approved by a qualified Geotechnical Engineer prior to steel or concrete placement.

9.4 Fill Material and Compaction Criteria

Fill material (imported or re-used) should be free of organic, and other deleterious materials and have a maximum particle size no greater than 3 inches. Imported fill should contain no more than 12 percent passing the no. 200 sieve by dry weight and have a plasticity index less than 7. Grain size distributions, Atterberg Limits, maximum dry density, and optimum water content determinations should be made on representative samples of the proposed fill material.

Structural backfill behind below-grade walls should be placed in uniform lifts (maximum 12-inches thick) and compacted to at least 90 percent of its maximum dry density at a moisture content within two (2) to three (3) percent of optimum moisture content, as determined by the Modified Compaction Test (ASTM D1557).

All fill placed below flatwork and any new fill beneath the building should be compacted to a minimum of 90 percent of its maximum dry density at a moisture content within two (2) to three (3) percent of optimum moisture content, as determined by the Modified Compaction Test (ASTM D1557). Fill placement should be subject to controlled full-time engineering observation and testing by the inspecting Geotechnical Engineer. Fill material should not be placed in areas where free water is standing or on surfaces that have not been approved by the inspecting Geotechnical Engineer.

9.5 Temporary Excavations

The subsurface soils below the ground surface can be classified as Cal/OSHA Type C soils types (California Code of Regulations, Title 8 Subchapter 4). Temporary excavations will be required to facilitate the proposed below-grade excavation and will need to be constructed in accordance with Cal/OSHA requirements. Temporary slopes may be excavated at a 2H:1V (horizontal to vertical). Steeper slopes with a maximum slope of 1.5H:1V (horizontal to vertical) may be excavated were acceptable by Cal/OSHA.

9.5.1 Excavations Maintenance - Erosion Control

The following recommendations should be considered a part of the excavation/erosion control plan for the subject site and are intended to supplement, but not supersede nor limit the erosion control plans produced by the Project Civil Engineer and/or Qualified SWPPP Developer. These recommendations should be implemented during periods required by the Building Code (typically between the months of October and April) or at any time of the year prior to a predicted rain event. Consideration should also be given to potential local sources of water/runoff such as existing drainage pipes or irrigation systems that remain in operation during construction activities.

9.5.2 Open Excavations:

All open excavations shall be protected from inclement weather, including areas above and at the toe of the excavation. This is required to keep the excavations from becoming saturated. Saturation of the excavation may result in a relaxation of the soils which may result in failures. Water/runoff should be diverted away from the excavation and not be allowed to flow over the excavation in a concentrated manner.

9.5.3 Open Trenches/Foundation Excavations:

No water should be allowed to pond adjacent to or flow into open trenches. All open trenches shall be covered with plastic sheeting that is anchored with sandbags. Areas around the trenches should be sloped away from the trenches to prevent water runoff from flowing into or ponding adjacent to the trenches.

After the inclement weather has ceased, the excavations shall be reviewed by the project geotechnical engineer and geologist for safety prior to recommencement of work. Foundation excavations that remain open during inclement weather shall be reviewed by the project geotechnical engineer and geologist prior to the placement of steel and concrete to ensure that proper embedment and contact with the bearing material have been maintained.

9.5.4 Grading In Progress:

During the inclement time of the year, or during periods prior to the onset of rain, all fill that has been spread and is awaiting compaction shall be compacted before stopping work for the day or before stopping work because of inclement weather. These fills, once compacted, shall have the surface sloped to drain to one area where water may be removed.

Additionally, it is suggested that all stock-piled fill materials be covered with plastic sheeting. This action will reduce the potential for the moisture content of the fill from becoming too high for compaction. If the fill stockpile is not covered during inclement weather, then aerating the fill to reduce the moisture

content would be required. This action is generally very time-consuming and may result in construction delays.

Work may recommence, after the rain event, once the site has been reviewed by the project geotechnical engineer.

9.6 Site Drainage

Proper drainage should be maintained at all times. Ponding or trapping of water in localized areas can cause differing moisture levels in the subsurface soil. Drainage should be directed away from the tops of excavations and existing foundations. Erosion protection and drainage control measures should be implemented during periods of inclement weather. During rainfall events, backfill operations may need to be restricted to allow for proper moisture control during fill placement.

Groundwater was not encountered during explorations performed for this study. Shallow perched water may be encountered at the Site depending on seasonal rainfall. The Site should be graded to ensure positive drainage away from the locations of the proposed development.

9.7 Utility Support

Utilities can be supported on grade, bearing on approved native soils or compacted fill. Utility subgrade should be confirmed to be free of standing water, firm, and unyielding prior to placement of utilities. Shading material should extend at least 12 inches over the top of the pipe unless otherwise required by the utility owner. The gradation of the proposed backfill material for use above pipe shading should be compared with the gradation of the native soils to determine if a separation fabric, such as Mirafi 140N or equivalent, is required between the two materials. Utility trench backfill should be compacted to 90 percent of the maximum dry density and moisture conditioned to within 3 percent of the optimum moisture content, as determined by ASTM Test Method D1557 (Modified Proctor compaction).

9.8 Hardscape Elements

Site pavers and walkways can be supported on compacted fill or native soils after excavating to the required subgrade level, then proof-rolled using an approved compactor such as a 5 ton (static drum weight) vibratory roller compactor, or equivalent. Any soft, loose, or unsuitable soils identified by the inspecting Geotechnical Engineer during proof-rolling should be removed and replaced with approved compacted fill.

10. PROTECTION OF NEIGHBORING STRUCTURES

All new construction work should be performed so as not to adversely impact or cause loss of support to neighboring/bordering structures. Special care will be required during construction activities to ensure excessive vibrations or movements are not induced in these structures, and Site activities do not result in their loss of support or instability.

We recommend a pre-construction conditions documentation be performed to document existing conditions of the Existing Parking Structure and existing structures surrounding the proposed development areas prior to initiating construction activities for the proposed structures at the Site. At a

minimum, the documentation should include video and photographic documentation of accessible and visible areas on the exterior facades of the buildings immediately bordering the Site.

Recommendations for an adjacent structure monitoring program will be developed for subsequent implementation and monitoring during construction. The structure monitoring program is anticipated to include vibration monitoring, elevation, and lateral monitoring points, crack monitors, and other instrumentation as deemed necessary.

11. CONSTRUCTION DOCUMENTS AND QUALITY CONTROL

During the final design, we should be retained to consult with the design team as geotechnical questions arise. Technical specifications and design drawings should incorporate Engineering Services & Design Inc.'s recommendations. When authorized, Engineering Services & Design Inc. will assist the design team in preparing specification sections related to geotechnical issues such as earthwork, shallow foundations, and backfill. Engineering Services & Design Inc. should also, when authorized, review foundation drawings prepared by the Structural Engineer and grading plans prepared by the Civil Engineer, as well as Contractor submittals relating to materials and construction procedures for geotechnical work. When site grading plan and foundation loads are available, Engineering Services & Design Inc. should review the design information to confirm if recommendations presented herein remain valid or if a geotechnical update report is needed.

Engineering Services & Design Inc. has investigated and interpreted subsurface conditions within the Site and developed the foundation design recommendations contained herein, and is, therefore, best suited to perform quality assurance observation and testing of geotechnical-related work during construction. This work requiring quality assurance confirmation includes, but is not limited to, earthwork, backfill, shallow foundations, ground improvement, and deep foundations. Recognizing that construction is essentially the completion of design, Engineering Services & Design Inc.'s quality assurance observation, and testing during construction is necessary to maintain our continuity of responsibility on this project.

12. OWNER AND CONTRACTOR OBLIGATIONS

The Contractor is responsible for construction quality control, which includes satisfactorily constructing the foundation system and any associated temporary works to achieve the design intent while not adversely impacting or causing loss of support to neighboring structures. Construction activities that can alter the existing ground conditions such as excavation, fill placement, foundation construction, ground improvement, etc. can also potentially induce stresses, vibrations, and movements in nearby structures and utilities, and disturb occupants of nearby structures. Contractors working at the Site must ensure that their activities will not adversely affect the performance of the structures and utilities, and will not disturb occupants of nearby structures. Contractors must also take all necessary measures to protect the existing structures during construction.

13. LIMITATIONS

The conclusions and recommendations provided in this report are based on available information from borings, and subsurface conditions inferred from a limited number of borings drilled for this study.

Recommendations provided are contingent upon one another and no recommendation should be followed independently of the others.

Any proposed changes in structures or their locations should be brought to Engineering Design & Services of SoCal Inc.'s attention as soon as possible so that we can determine whether such changes affect our recommendations. Information on subsurface strata shown on the logs represents conditions encountered only at the locations indicated and at the time of the investigation. If different conditions are encountered during construction, they should immediately be brought to Engineering Design & Services of SoCal Inc.'s attention for evaluation, as they may affect our recommendations.

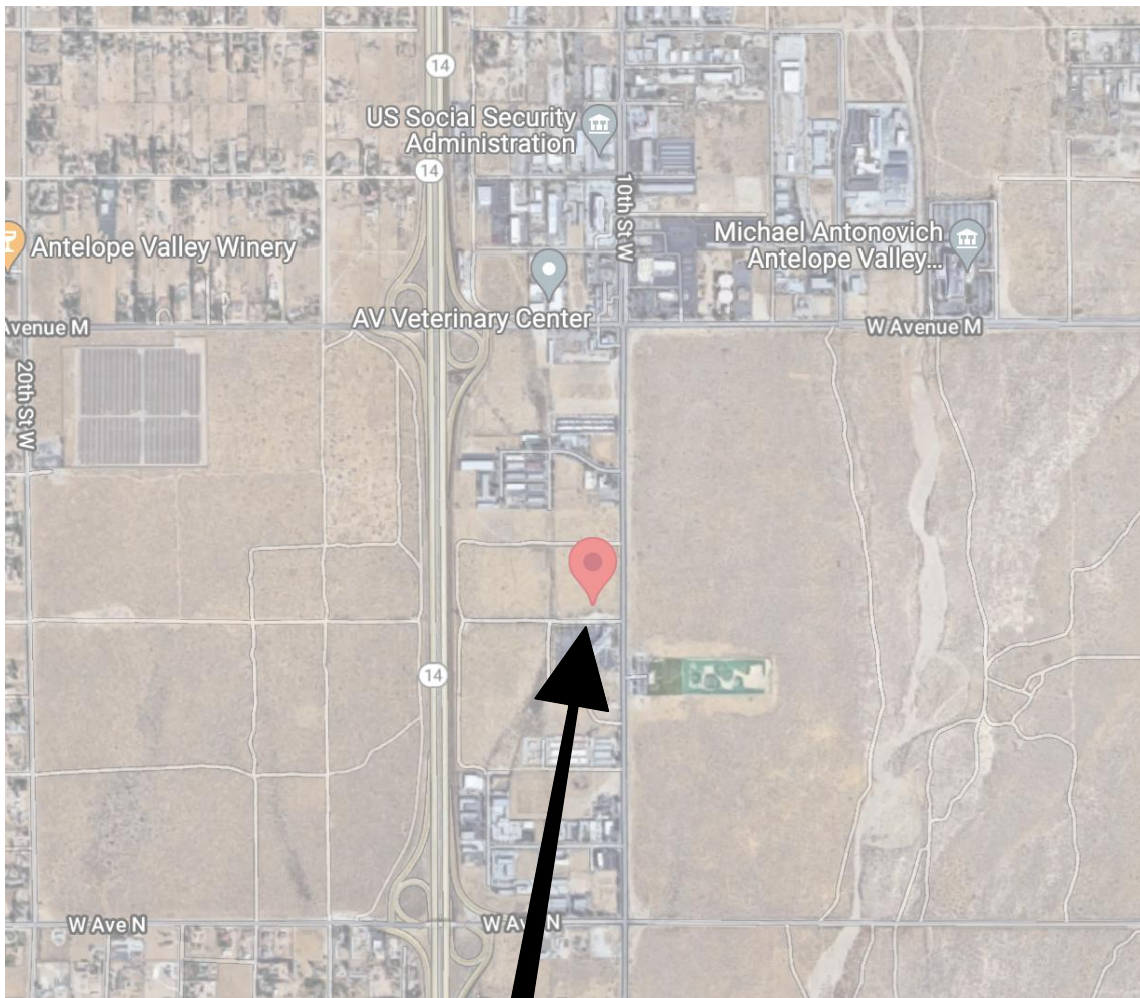
This report has been prepared to assist the Owner, Architect, Civil Engineer, and Structural Engineer in the design process and is only applicable to the design of the specific project identified. The information in this report cannot be utilized or depended on by engineers or contractors who are involved in evaluations or designs of facilities (including underpinning, grouting, stabilization, etc.) on adjacent properties which are beyond the limits of that which is the specific subject of this report.

Environmental issues (such as potentially contaminated soil and groundwater) are outside the scope of this study and should be addressed in a separate study.

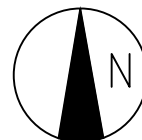
14. REFERENCES

- California Building Standards Commission, 2019 California Building Code, Title 24, Part 2. California Building Standards Commission, California Green Building Standards Code,
- California Code of Regulations, Title 24, Part 11, effective date January 1, 2011.
- California Division of Mines and Geology, 1997 and updated 2008, Guidelines for Evaluation and Mitigating Seismic Hazards in California, Special Publications 117 and 117A.
- California Division of Mines and Geology, 1999, Fault-Rupture Hazard Zones in California, Special Publication 42, Revised 1997, 1 and 2 added 1999.
- California Geological Survey, 2010, Fault Activity Map of California, California Geologic Data Map Series Map No. 6.

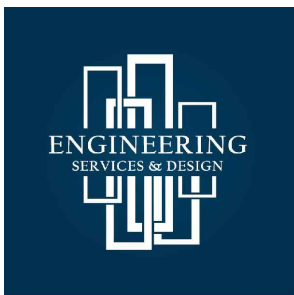
FIGURES



APPROXIMATE LOCATION



SOURCE: GOOGLE EARTH.



SITE VICINITY MAP

GEOTECHNICAL INVESTIGATION

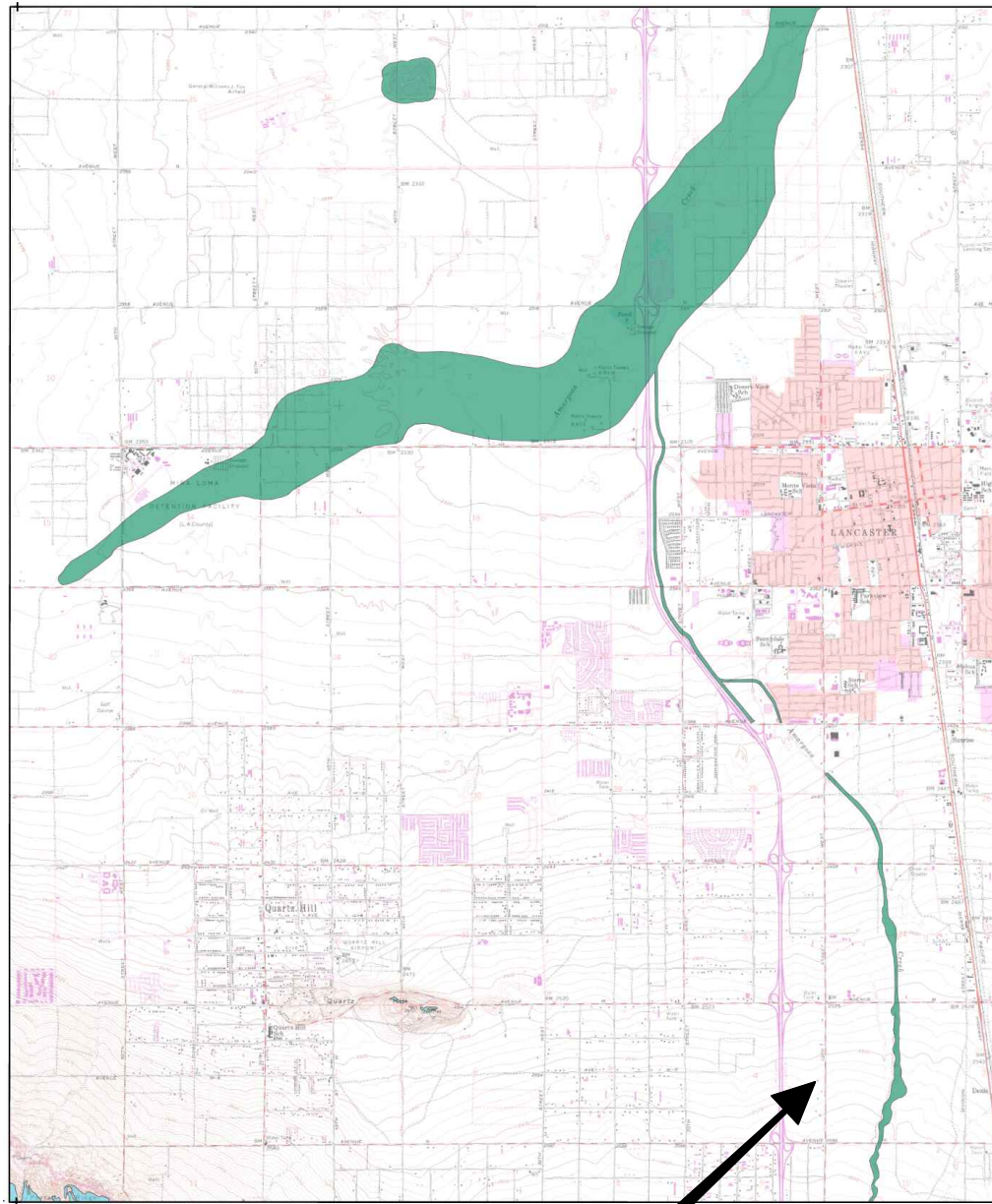
10th Street West, Palmdale, CA 93551

Project Number:
22-023-GO1

Scale: Not to Scale

Date February 17, 2022

Figure No: Page **1** of 38



APPROXIMATE LOCATION

SOURCE: CGS SHZR 095 LANCASTER WEST.



LIQUEFACTION LOCATION MAP

GEOTECHNICAL INVESTIGATION

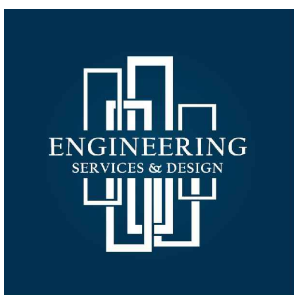
10th Street West, Palmdale, CA 93551

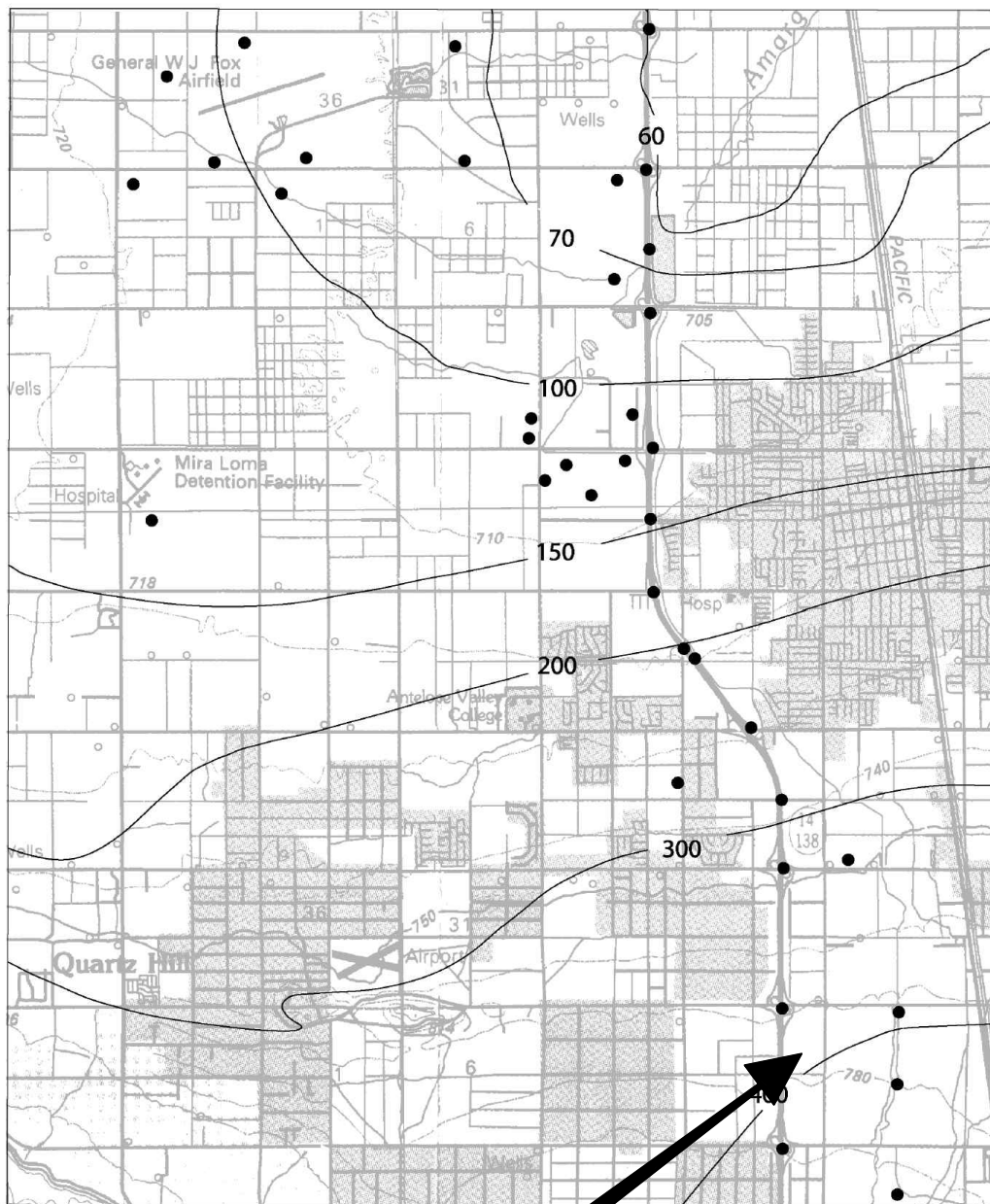
Project Number:
22-023-GO1

Scale: Not to Scale

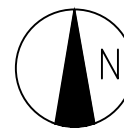
Date: February 17, 2022

Figure No: Page 2 of 38

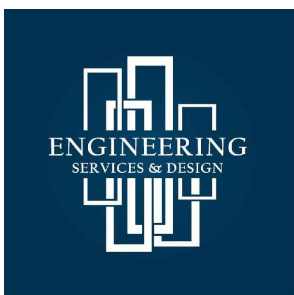




APPROXIMATE LOCATION



SOURCE: CGS SHZR 095 LANCASTER WEST.



HISTORICAL GROUNDWATER MAP

GEOTECHNICAL INVESTIGATION

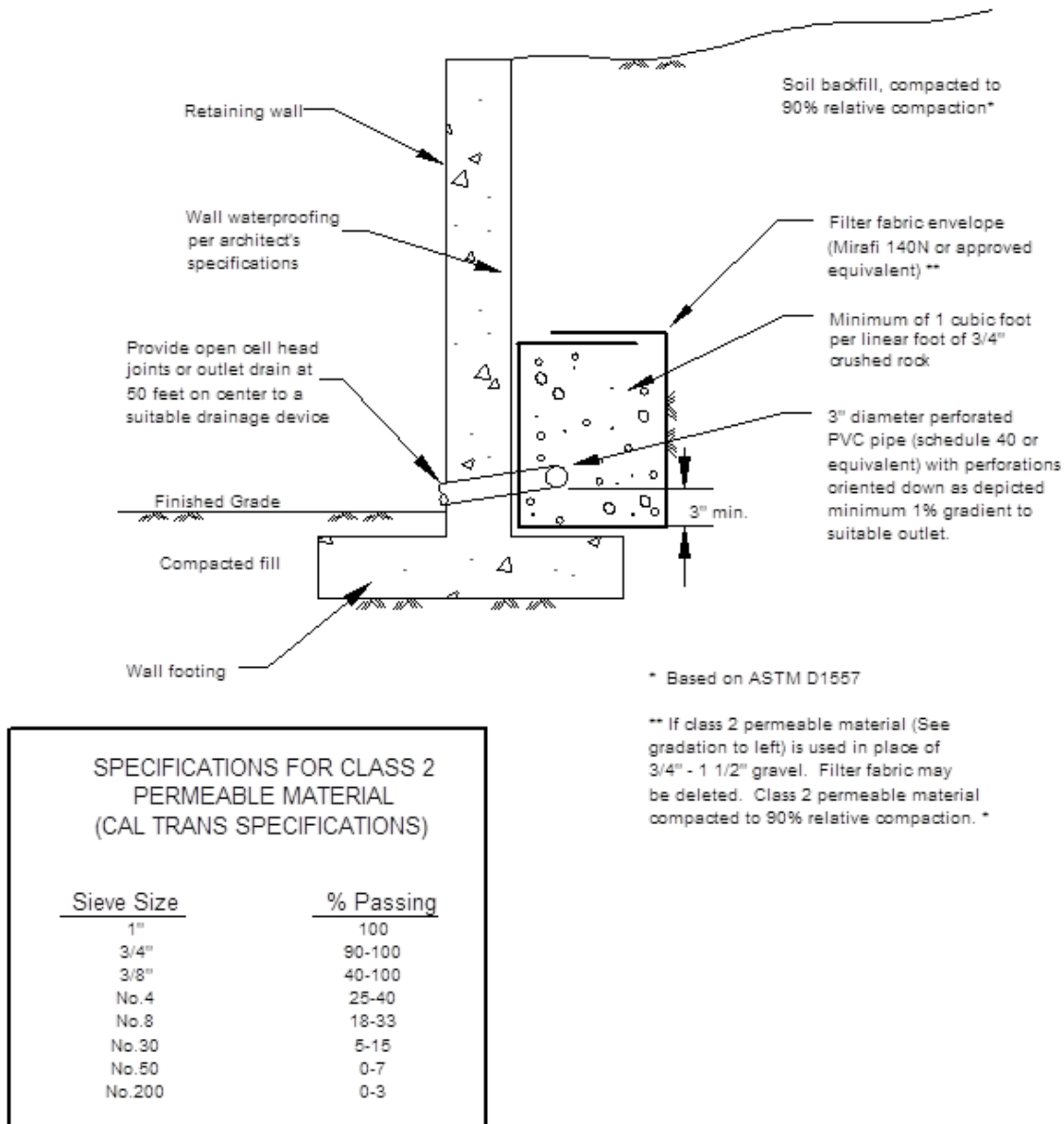
10th Street West, Palmdale, CA 93551

Project Number:
22-023-GO1

Scale: Not to Scale

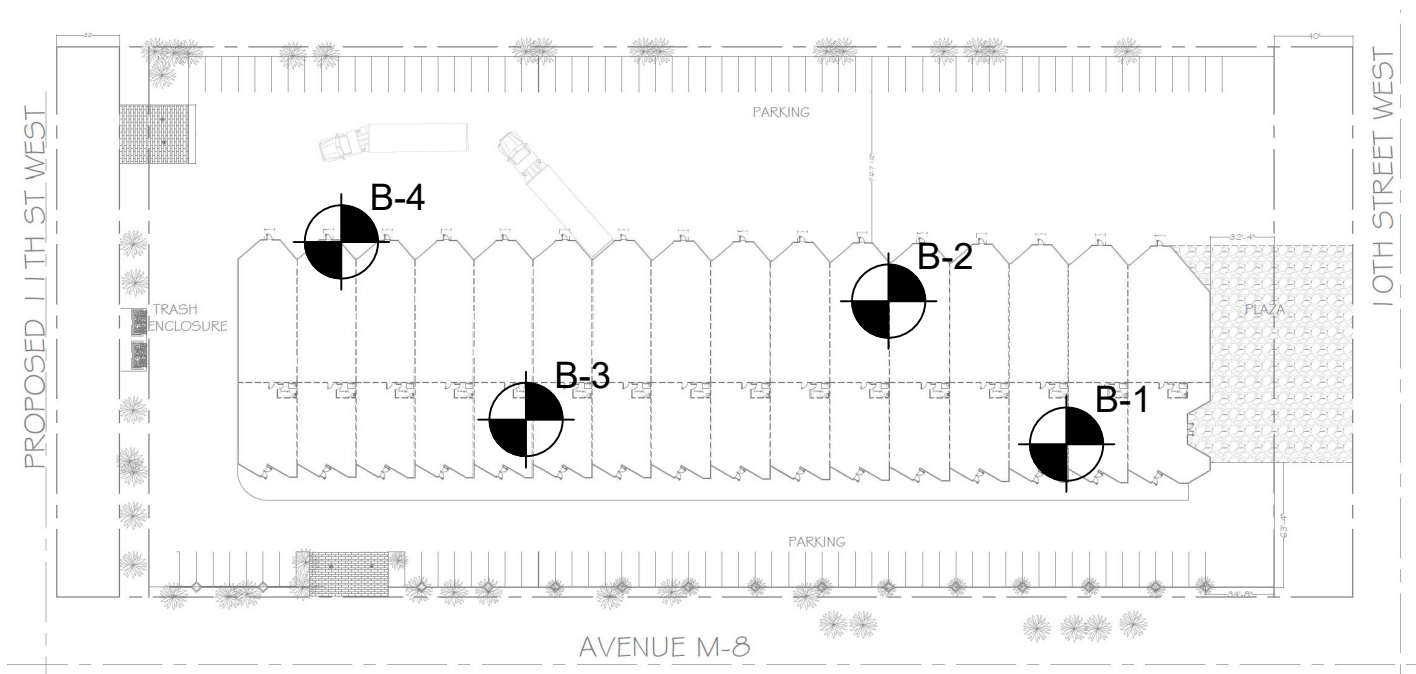
Date: February 17, 2022

Figure No: Page 16 of 38

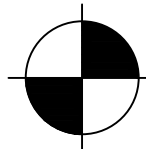


RETAINING WALL DRAINAGE DETAIL

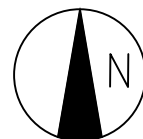
FIGURE 5



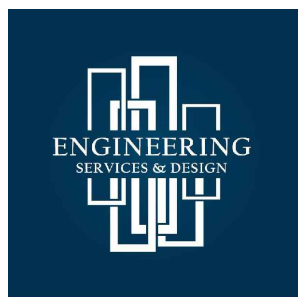
LEGEND:



B-1 BORING LOCATION



SOURCE: SHL ENGINEERING, 2021.



BORING LOCATION PLAN

GEOTECHNICAL INVESTIGATION

10th Street West, Palmdale, CA 93551

Project Number:
22-023-GO1

Scale: Not to Scale

Date: February 17, 2022

Figure No: Page 4 of 38

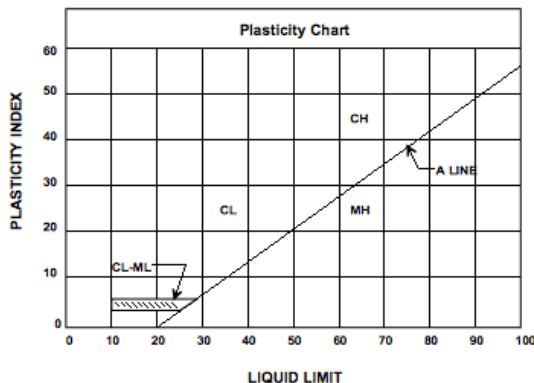
APPENDIX A

Boring Logs

LEGEND

Major Divisions				Group Symbol	Typical Names
Coarse-Grained Soils (Less than 50% passes No. 200 sieve)	Gravels (50% or less of coarse fraction passes No. 4 sieve)	Clean Gravels (Less than 5% passes No. 200 sieve)		GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
				GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		Gravels with Fines (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on Plasticity Chart.	GM	Silty gravels, gravel-sand-silt mixtures.
			Limits plots above "A" line & hatched zone on Plasticity Chart.	GC	Clayey gravels, gravel-sand-clay mixtures.
	Sands (More than 50% of coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% passes No. 200 sieve)		SW	Well graded sands, gravelly sands.
				SP	Poorly graded sands, gravelly sands.
		Sands with Fines (More than 12% passes No. 200 sieve)	Limits plots below "A" line & hatched zone on Plasticity Chart.	SM	Silty sands, sand-silt mixtures.
			Limits plots above "A" line & hatched zone on Plasticity Chart.	SC	Clayey sands, sand-clay mixtures.
Fine-Grained Soils (50% or more passes No. 200 sieve)	Silts-Plot below "A" line & hatched zone on Plasticity Chart	Silts of Low Plasticity (Liquid Limit Less Than 50)		ML	Inorganic silts, clayey silts with slight plasticity.
		Silts of High Plasticity (Liquid Limit More Than 50)		MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	Clays-Plot above "A" line & hatched zone on Plasticity Chart	Clays of Low Plasticity (Liquid Limit Less Than 50)		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		Clays of High Plasticity (Liquid Limit More Than 50)		CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

Note: Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the Plasticity Chart to have double symbol.



DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to 3/4 in.
Fine gravel	3/4 in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve

Project: Herrera_Warehouse Project Location: 10th Street West, Palmdale, CA, 93551 (APN: 3111-012-082) Project Number: 22-023-GO1	<h2 style="margin: 0;">KEY LOG</h2>
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Date(s) Drilled 02/07/22	Logged By: Pablo Naranjo	Checked By: P.N.
Drilling Method Tripode & Solid Auger	Drill Bit Size Type 6" Solid Auger	Total Depth of Borehole 16 feet
Drill Rig Type Portable Hydraulic Auger	Drilling Contractor Engineering Services & Design of SoCal Inc.	Approximate Surface Elevation N.A.
Groundwater Level and Date Measured Not Encountered	Sampling Method(s) California, SPT	
Borehole Backfill Soil Cuttings	Location As Shown on Figure 2, Boring Location Plan	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>COLUMN DESCRIPTIONS</p> <p>1 Elevation (feet): Elevation (MSL, feet).</p> <p>2 Depth (feet): Depth in feet below the ground surface.</p> <p>3 Sample Type: Type of soil sample collected at the depth interval shown.</p> <p>4 Sample Number: Sample identification number.</p> <p>5 Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.</p> <p>6 Material Type: Type of material encountered.</p> </div> <div style="width: 48%;"> <p>7 Graphic Log: Graphic depiction of the subsurface material encountered.</p> <p>8 MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.</p> <p>9 Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.</p> <p>10 Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.</p> <p>11 REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.</p> </div> </div>										
<p>FIELD AND LABORATORY TEST ABBREVIATIONS</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>CHEM: Chemical tests to assess corrosivity</p> <p>COMP: Compaction test</p> <p>CONS: One-dimensional consolidation test</p> <p>LL: Liquid Limit, percent</p> </div> <div style="width: 48%;"> <p>PI: Plasticity Index, percent</p> <p>SA: Sieve analysis (percent passing No. 200 Sieve)</p> <p>UC: Unconfined compressive strength test, Qu, in ksf</p> <p>WA: Wash sieve (percent passing No. 200 Sieve)</p> </div> </div>										
<p>MATERIAL GRAPHIC SYMBOLS</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p> Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)</p> <p> AF</p> </div> <div style="width: 48%;"> <p> Clayey SAND (SC)</p> <p> Silty SAND (SM)</p> <p> Poorly graded SAND (SP)</p> </div> </div>										
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>TYPICAL SAMPLER GRAPHIC SYMBOLS</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p> Auger sampler</p> <p> Bulk Sample</p> <p> 3-inch-OD California w/ brass rings</p> </div> <div style="width: 48%;"> <p> CME Sampler</p> <p> Grab Sample</p> <p> 2.5-inch-OD Modified California w/ brass liners</p> </div> </div> </div> <div style="width: 48%;"> <p>OTHER GRAPHIC SYMBOLS</p> <p> Water level (at time of drilling, ATD)</p> <p> Water level (after waiting)</p> <p> Minor change in material properties within a stratum</p> <p> Inferred/gradational contact between strata</p> <p> Queried contact between strata</p> </div> </div>										
<p>GENERAL NOTES</p> <p>1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.</p> <p>2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.</p>										





Project: Herrera_Warehouse	Log of Boring B-1
Project Location: 10th Street West, Palmdale, CA, 93551 (APN: 3111-012-082)	
Project Number: 22-023-GO1	

Date(s) Drilled	02/07/22	Logged By:	Pablo Naranjo	Checked By:	P.N.
Drilling Method	Hollow Stem Auger	Drill Bit Size Type	7" Hollow Stem Auger	Total Depth of Borehole	20 feet
Drill Rig Type	Truck Mounted Drill Rig	Drilling Contractor	Larry Hank's Drilling	Approximate Surface Elevation	N.A.
Groundwater Level and Date Measured	Not Encountered	Sampling Method(s)	California, SPT	Hammer Data	140 lbs - 30 in
Borehole Backfill	Soil Cuttings	Location	As Shown on Figure 2, Boring Location Plan		

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
0					Fill		Silty Sand (SM), brown, moist,			
			S- 1				Silty Sand (SM), brown, moist loose	4		Soluble Sulfate= 19 R-Value = 67
5			S- 2	15			trace gravel Medium Dense	2	109	Collapsible= 1.90%
10			S- 3	25			Medium Dense	11	115	
15			S- 4	34			with gravel Dense	3	94	
20			S- 5	43			Dense			
25							Stopped at 20 feet as Planned			

Project: Herrera_Warehouse	Log of Boring B-2
Project Location: 10th Street West, Palmdale, CA, 93551 (APN: 3111-012-082)	
Project Number: 22-023-GO1	

Date(s) Drilled: 02/07/22	Logged By: Pablo Naranjo	Checked By: P.N.
Drilling Method: Hollow Stem Auger	Drill Bit Size Type: 7" Hollow Stem Auger	Total Depth of Borehole: 20 feet
Drill Rig Type: Truck Mounted Drill Rig	Drilling Contractor: Larry Hank's Drilling	Approximate Surface Elevation: N.A.
Groundwater Level and Date Measured: Not Encountered	Sampling Method(s): California, SPT	Hammer Data: 140 lbs - 30 in
Borehole Backfill: Soil Cuttings	Location: As Shown on Figure 2, Boring Location Plan	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0				Fill		Silty Sand (SM), brown, moist,			
							Silty Sand (SM), brown, moist loose			
	5		S- 1	17			trace gravel Medium Dense	3	105	
	10		S- 2	23			Medium Dense	14	118	
	15		S- 3	32			with gravel Dense	3		
	20		S- 4	45			Dense			
	25						Stopped at 20 feet as Planned			

Project: Herrera_Warehouse	Log of Boring B-3
Project Location: 10th Street West, Palmdale, CA, 93551 (APN: 3111-012-082)	
Project Number: 22-023-GO1	

Date(s) Drilled: 02/07/22	Logged By: Pablo Naranjo	Checked By: P.N.
Drilling Method: Hollow Stem Auger	Drill Bit Size Type: 7" Hollow Stem Auger	Total Depth of Borehole: 20 feet
Drill Rig Type: Truck Mounted Drill Rig	Drilling Contractor: Larry Hank's Drilling	Approximate Surface Elevation: N.A.
Groundwater Level and Date Measured: Not Encountered	Sampling Method(s): California, SPT	Hammer Data: 140 lbs - 30 in
Borehole Backfill: Soil Cuttings	Location: As Shown on Figure 2, Boring Location Plan	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0				Fill		Silty Sand (SM), brown, moist,			
			S- 1				Silty Sand (SM), brown, moist loose	3		
	5		S- 2	19			trace gravel Medium Dense	2	108	Collapsible= 1.30%
	10		S- 3	26			Medium Dense	2	107	
	15		S- 4	35			with gravel Dense	2		
	20		S- 5	48			Dense			
							Stopped at 20 feet as Planned			
	25									

Project: Herrera_Warehouse	Log of Boring B-2
Project Location: 10th Street West, Palmdale, CA, 93551 (APN: 3111-012-082)	
Project Number: 22-023-GO1	

Date(s) Drilled: 02/07/22	Logged By: Pablo Naranjo	Checked By: P.N.
Drilling Method: Hollow Stem Auger	Drill Bit Size Type: 7" Hollow Stem Auger	Total Depth of Borehole: 20 feet
Drill Rig Type: Truck Mounted Drill Rig	Drilling Contractor: Larry Hank's Drilling	Approximate Surface Elevation: N.A.
Groundwater Level and Date Measured: Not Encountered	Sampling Method(s): California, SPT	Hammer Data: 140 lbs - 30 in
Borehole Backfill: Soil Cuttings	Location: As Shown on Figure 2, Boring Location Plan	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	Material Type	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	0				Fill		Silty Sand (SM), brown, moist,			
							Silty Sand (SM), brown, moist loose			
	5	✕	S- 1	18			trace gravel Medium Dense	2	105	
	10	✕	S- 2	25			Medium Dense	2		sample disturbed
	15	✕	S- 3	35			with gravel Dense			
	20	✕	S- 4	40			Dense			
	25						Stopped at 20 feet as Planned			

APPENDIX B

Laboratory Test Results

MOISTURE AND DENSITY TEST RESULTS

ASTM D2216 and ASTM D7263 (Method B)

Client: Engineering Services & Design Of SoCal Inc.

AP Lab No.: 22-0221

Project Name: Herrera Warehouse

Test Date: 02/10/22

Project No.: 22-023-G01

[illegible]

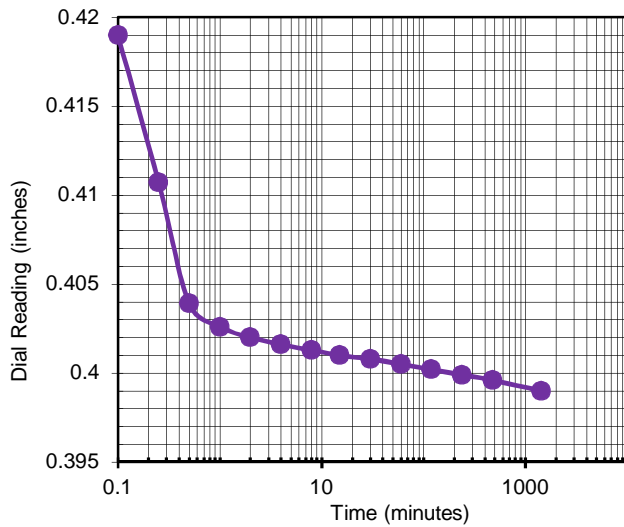
**AP Engineering and Testing, Inc.**

DBE|MBE|SBE

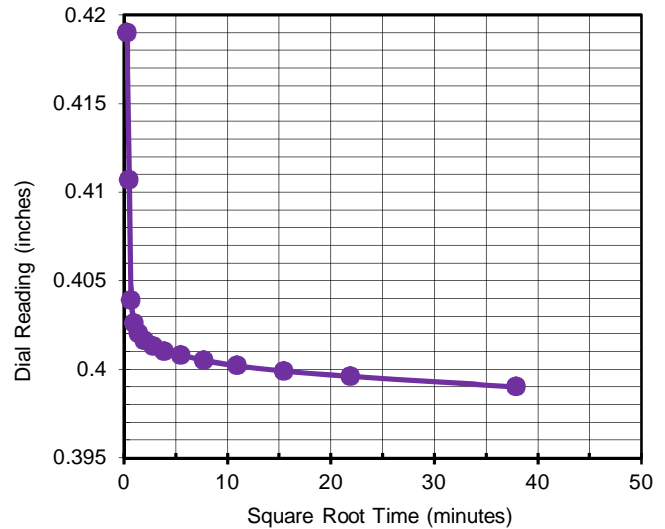
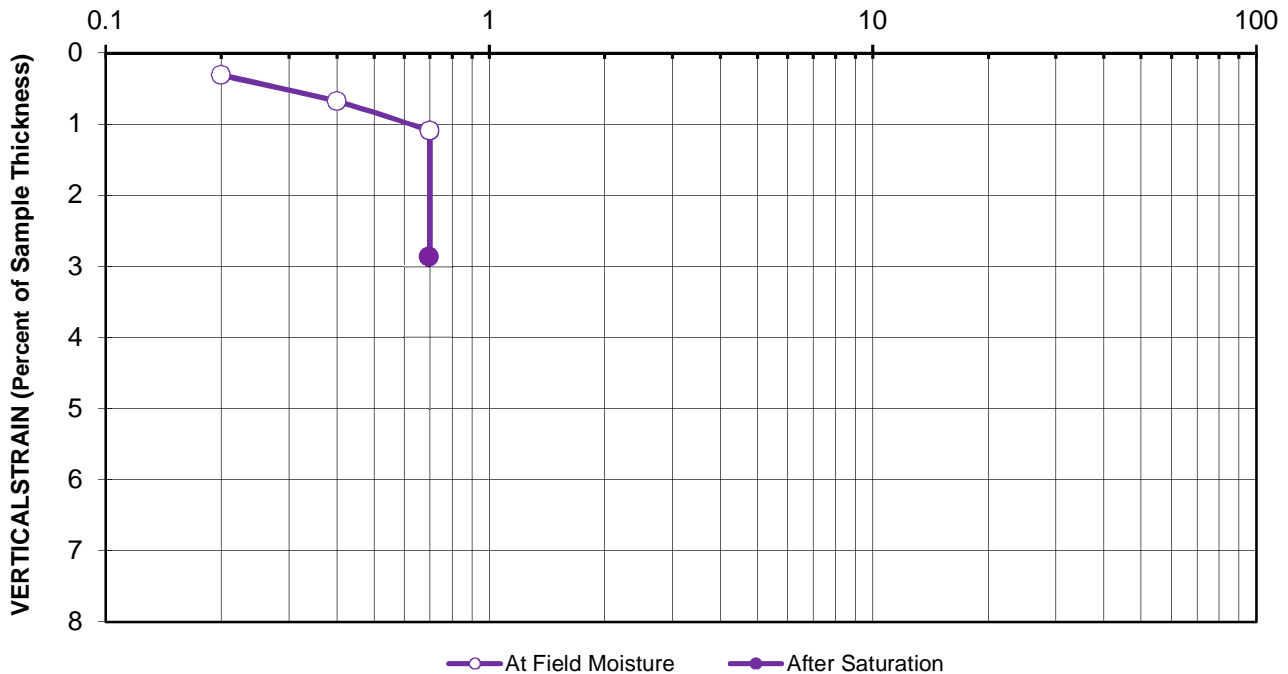
2607 Pomona Boulevard | Pomona, CA 91768

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Time Readings @ H2O ksf



Time Readings @ H2O ksf

**VERTICAL STRESS (ksf)**

—○— At Field Moisture

—●— After Saturation

Boring No. : B1
Sample No.: S2
Depth (feet): 5
Sample Type: Mod Cal
Soil Description: Sand w/silt & gravel
Remarks: Collapse = 1.90% upon inundation

Initial Dry Unit Weight (pcf): 108.3
Initial Moisture Content (%): 1.9
Final Moisture Content (%): 16.6
Initial Void Ratio: 0.56

**1-D SWELL/COLLAPSE
ASTM D 4546-14, Method B**

Project Name: Herrera Warehouse
Project No.: 22-023-GO1
Date: 2/11/22
AP No: 22-0221

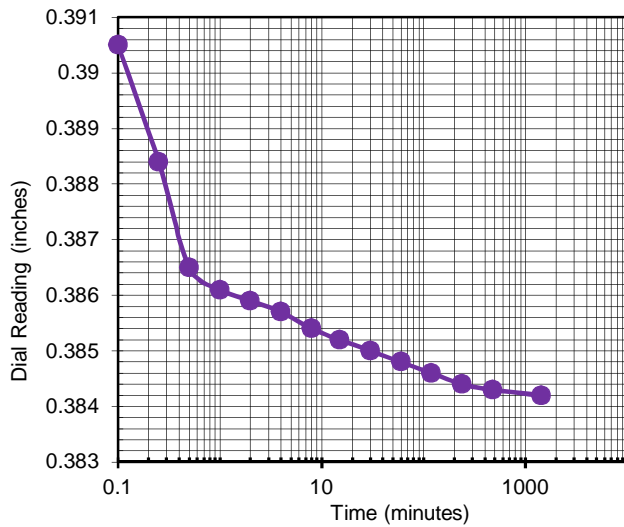
**AP Engineering and Testing, Inc.**

DBE|MBE|SBE

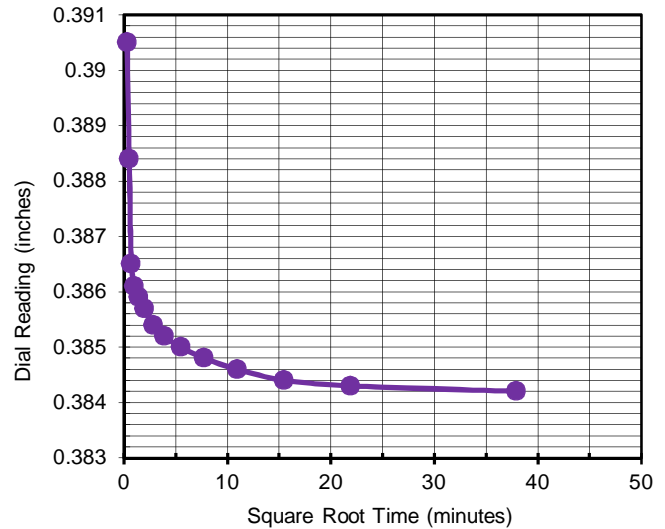
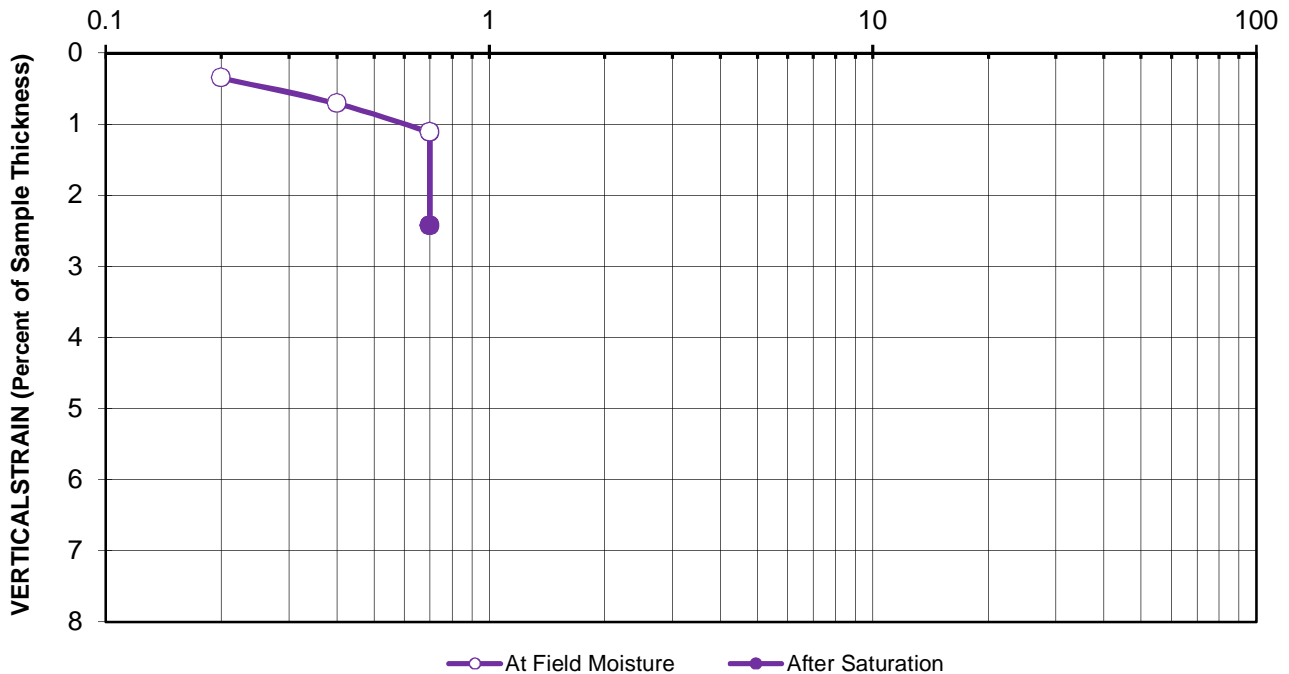
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Time Readings @ H2O ksf



Time Readings @ H2O ksf

**VERTICAL STRESS (ksf)**

At Field Moisture

After Saturation

Boring No. : B3
Sample No.: S2
Depth (feet): 5
Sample Type: Mod Cal
Soil Description: Sand w/silt
Remarks: Collapse = 1.32% upon inundation

Initial Dry Unit Weight (pcf): 106.9
Initial Moisture Content (%): 1.8
Final Moisture Content (%): 19.0
Initial Void Ratio: 0.58

**1-D SWELL/COLLAPSE
ASTM D 4546-14, Method B**

Project Name: Herrera Warehouse
Project No.: 22-023-GO1
Date: 2/11/22
AP No: 22-0221

**AP Engineering and Testing, Inc.**

DBE | MBE | SBE

2607 Pomona Boulevard | Pomona, CA 91768

t. 909.869.6316 | f. 909.869.6318 | www.aplaboratory.com**CORROSION TEST RESULTS**Client Name: Engineering Services & Design Of SoCal Inc.AP Job No.: 22-0221Project Name: Herrera WarehouseDate: 02/11/22Project No.: 22-023-GO1

Boring No.	Sample No.	Depth (feet)	Soil Description	Minimum Resistivity (ohm-cm)	pH	Sulfate Content (ppm)	Chloride Content (ppm)
B1	S1	0-3	Sand w/silt	11,227	7.7	19	20

NOTES: Resistivity Test and pH: California Test Method 643

Sulfate Content : California Test Method 417

Chloride Content : California Test Method 422

ND = Not Detectable

NA = Not Sufficient Sample

NR = Not Requested

**AP Engineering and Testing, Inc.**

DBE|MBE|SBE

2607 Pomona Boulevard | Pomona, CA 91768

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R-VALUE TEST DATA

ASTM D2844

Project Name: Herrera Warehouse
 Project Number: 22-023-GO1
 Boring No.: B1
 Sample No.: S1 Depth (ft.): 0-3
 Location: N/A
 Soil Description: Sand w/silt

Tested By: ST Date: 02/09/22
 Computed By: KM Date: 02/10/22
 Checked By: AP Date: 02/15/22

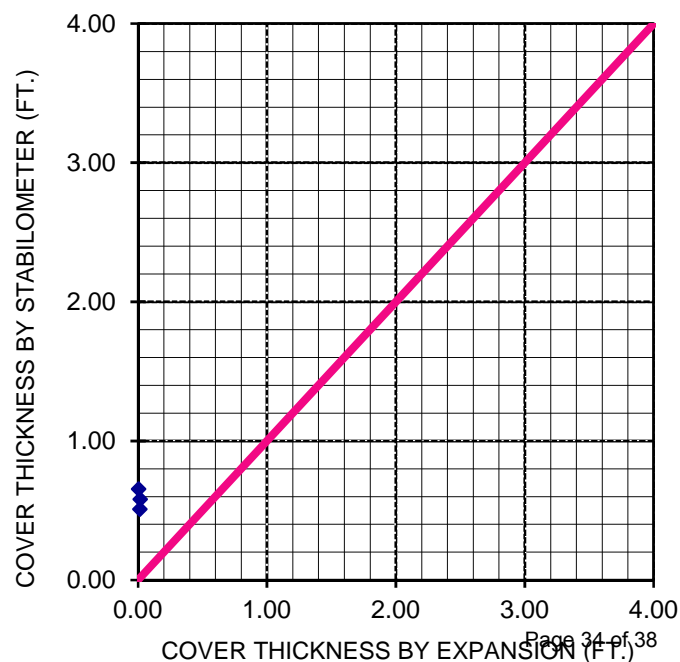
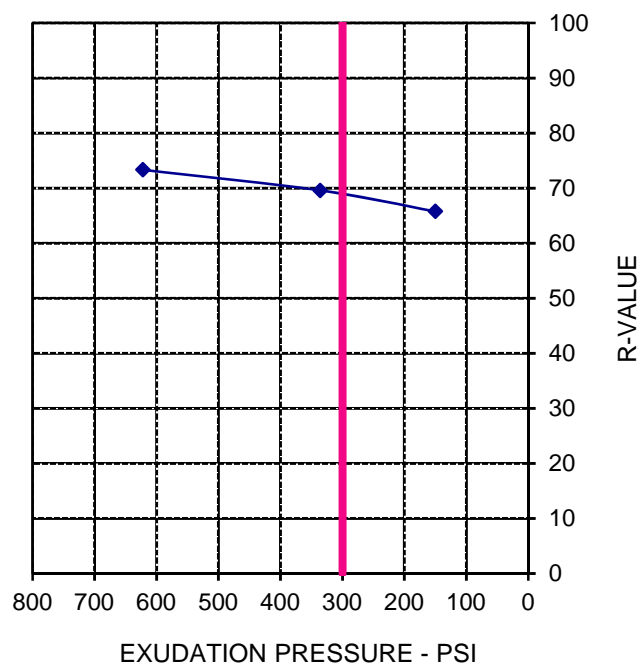
Mold Number	A	C	B	
Water Added, g	31	41	51	
Compact Moisture(%)	7.1	8.2	9.1	
Compaction Gage Pressure, psi	250	250	250	
Exudation Pressure, psi	622	336	150	
Sample Height, Inches	2.5	2.5	2.5	
Gross Weight Mold, g	3094	3099	3079	
Tare Weight Mold, g	1967	1968	1966	
Net Sample Weight, g	1128	1131	1113	
Expansion, inches $\times 10^{-4}$	4	5	1	
Stability 2,000 (160 psi)	13/24	15/26	18/31	
Turns Displacement	5.15	5.63	5.41	
R-Value Uncorrected	73	70	66	
R-Value Corrected	73	70	66	
Dry Density, pcf	127.6	126.7	123.7	
Traffic Index	8.0	8.0	8.0	
G.E. by Stability	0.51	0.58	0.65	
G.E. by Expansion	0.01	0.02	0.00	

R-VALUE

By Exudation:	69
By Expansion:	*N/A
At Equilibrium: (by Exudation)	69

Remarks

Gf = 1.34, and 0.0 %
 Retained on the $\frac{3}{4}$ "
 *Not Applicable



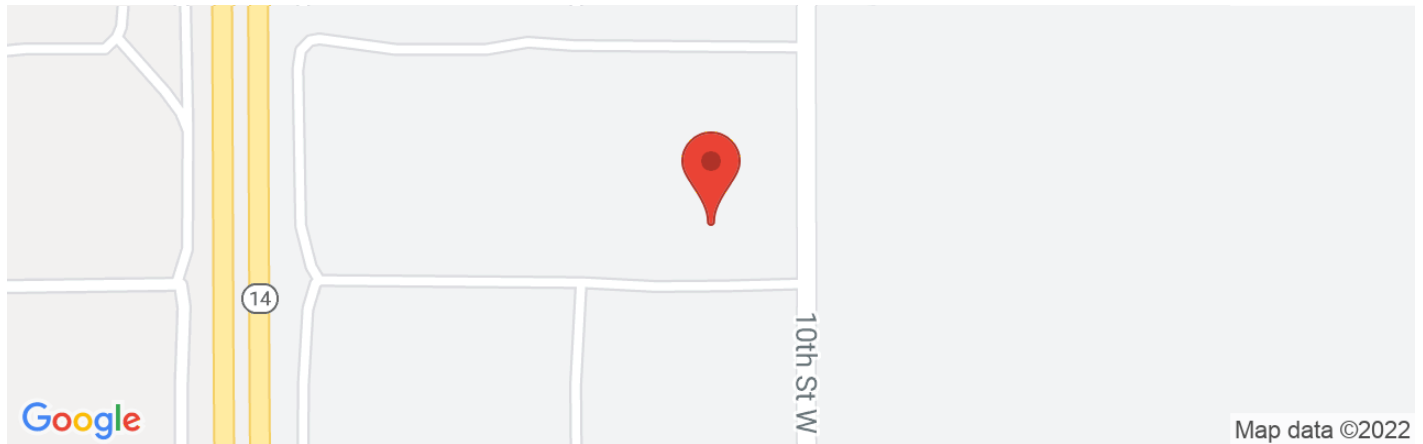
APPENDIX C

Seismic Design Values



22-023-GO1 WAREHOUSE

Latitude, Longitude: 34.638998, -118.148646



Date	2/17/2022, 2:00:03 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.713	MCE_R ground motion. (for 0.2 second period)
S_1	0.709	MCE_R ground motion. (for 1.0s period)
S_{MS}	2.056	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.37	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.746	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.895	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
S_{sRT}	2.082	Probabilistic risk-targeted ground motion. (0.2 second)
S_{sUH}	2.355	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
S_{sD}	1.713	Factored deterministic acceleration value. (0.2 second)
S_{1RT}	0.881	Probabilistic risk-targeted ground motion. (1.0 second)
S_{1UH}	1.014	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S_{1D}	0.709	Factored deterministic acceleration value. (1.0 second)
PGA_d	0.746	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.884	Mapped value of the risk coefficient at short periods

Type	Value	Description
C _{R1}	0.869	Mapped value of the risk coefficient at a period of 1 s

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May 30, 2022
Work Order No. 22.17

Jack Takvorian
c/o SHL Engineering
38414 Division Street
Palmdale, CA 93550

**RE: Preliminary Drainage Study for Proposed Multi-use Building at
10th Street West & Avenue M-8, Palmdale, CA 93551**

INTRODUCTION:

This provides our evaluation of the proposed site drainage improvements for the subject site. The site is located on 10th Street West in the City of Palmdale, California. The site is located in an industrial area. The existing site is undeveloped and the existing drainage pattern of the project area generally flows from southeast to northwest by sheet flow.

The proposed development will consist of a new 57,000 square foot mixed-use building and parking. Drainage will be controlled with site grading, integral flowline swales, drain inlets, storm drain pipes, and an underground stormwater retention system. The proposed improvements will generally maintain the existing drainage pattern.

HYDROLOGY:

Basis: County of Los Angeles Department of Public Works Hydrology Manual,
Drainage Map (Exhibit “A”) and specific hydrological charts, tables, etc. (Exhibit “B”).

This report addresses the proposed developed project area shown on the attached Drainage Map (Exhibit “A”). The design “flowpath” is very short, so a minimum time of concentration (t_c) of 5 minutes is used. The following parameters were selected from the County Hydrology Manual for use in the study:

Rainfall Zone: Lancaster West

Soil Type: 124

t_c : 5 minutes

Rainfall intensity from 50-Year 24- Hour Isohyet: $I_{50} = 3.3$ in

Reduction Factors:

Runoff Coefficient:

$I_{10} = 0.714 \times I_{50} = 2.36$	→ $C_u = 0.27$
$I_{25} = 0.878 \times I_{50} = 2.90$	→ $C_u = 0.35$
$I_{50} = 1.000 \times I_{50} = 3.30$	→ $C_u = 0.40$
$I_{100} = 1.122 \times I_{50} = 3.70$	→ $C_u = 0.45$

Equations:

$$I_{1440} = I_x / 24\text{-hours}$$

$$I_5 = (1440/t_c)^{0.47} \times I_{1440}$$

$$C_D = (0.9 \times \text{IMP}) + (1.0 - \text{IMP}) \times C_U$$

$$(C_D I)_5 = C_D \times I_5$$

$$Q = (C_D I)_5 A$$

Project Site Surface Area Breakdown:

Condition	Total Area (ac)	Pervious Area (ac)	% Pervious	Impervious Area (ac)	% Impervious
Existing	4.06	4.06	100	0.00	0
Proposed	4.06	0.61	15	3.45	85

Storm Flow Calculations:

					EXISTING			PROPOSED			
Frequency	Intensity	I_{1440} (in/hr)	I_5 (in/hr)	C_U	C_D	$(C_D I)_5$ (cfs/ac)	Q (cfs)	C_D	$(C_D I)_5$ (cfs/ac)	Q (cfs)	ΔQ (cfs)
I_{10}	2.36	0.10	1.41	0.27	0.27	0.38	1.54	0.81	1.13	4.60	3.06
I_{25}	2.90	0.12	1.73	0.35	0.35	0.61	2.46	0.82	1.41	5.74	3.28
I_{50}	3.30	0.14	1.97	0.40	0.40	0.79	3.20	0.82	1.62	6.59	3.40
I_{100}	3.70	0.15	2.21	0.45	0.45	0.99	4.04	0.83	1.84	7.47	3.43

HYDRAULICS:

A hydraulic analysis using Manning's Formula, for each of the proposed drainage conveyance system was performed using FlowMaster software (Haestad Methods, Inc.). Exhibit "C" shows the calculated flow capacities proposed drainage conveyance components. All drainage conveyance systems have been sized for a 50-year storm. It was determined that each component is capable of conveying the design flows. Our findings are presented below:

Drainage Area	Area (ac)	CI (cfs/ac)	Q (cfs)	Conduit Type	Minimum Slope	Capacity (cfs)	Comment
A	1.28	1.62	2.09	10" PVC	2%	3.66	OK
B	0.07	1.62	0.11	6" PVC	2%	0.94	OK
C	1.70	1.62	2.77	10" PVC	2%	3.66	OK
D	0.12	1.62	0.19	4' Gutter	0.5%	0.37	OK
E	0.01	1.62	0.01	4' Gutter	0.5%	0.37	OK
A+B	1.35	1.62	2.19	10" PVC	2%	3.66	OK
A+B+C	3.05	1.62	4.96	12" PVC	2%	5.95	OK

STORMWATER RETENTION REQUIREMENTS:

A preliminary on-site stormwater retention system has been sized to retain a 50-year storm event. The 50-year storm post-project runoff volume has been calculated using the Los Angeles County HydroCalc Calculator (version 1.0.3) shown in Exhibit D. These calculations resulted in a required stormwater retention volume of 37,622 cubic feet. The preliminary stormwater retention system has been sized using 102 inch diameter CMP pipe as shown below:

Pipe Diameter = 102 inches

Storage Volume = 56.7 cubic feet / foot

Liner feet of pipe = 665 feet

Total Storage Volume = 56.7 cf/ft x 665 ft = 37706 cf > 37,622 cf → OK

Conclusions:

On the basis of the above, where the before and after project conditions have been evaluated for the 10-year, 25-year, 50-year and 100-year peak flows, we find that the proposed development drainage facilities will adequately convey drainage flows from the required design storm frequencies. The preliminary stormwater retention system has been designed to store post-project 50-year storm runoff volume. The building pads have been elevated and sloped to accommodate the anticipated flows.

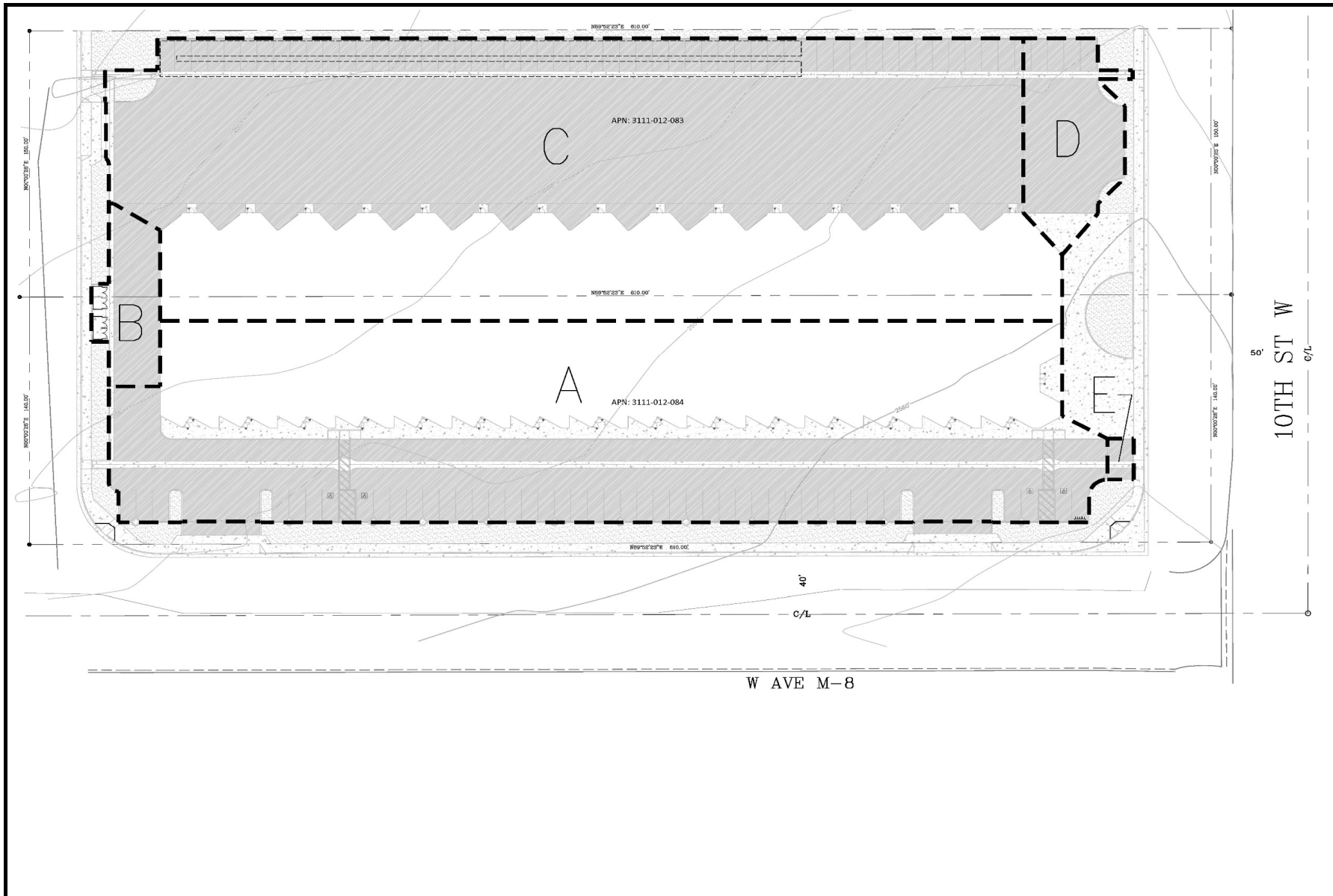
Respectfully Submitted,



Jacob G. Lukiewski, RCE
Principal



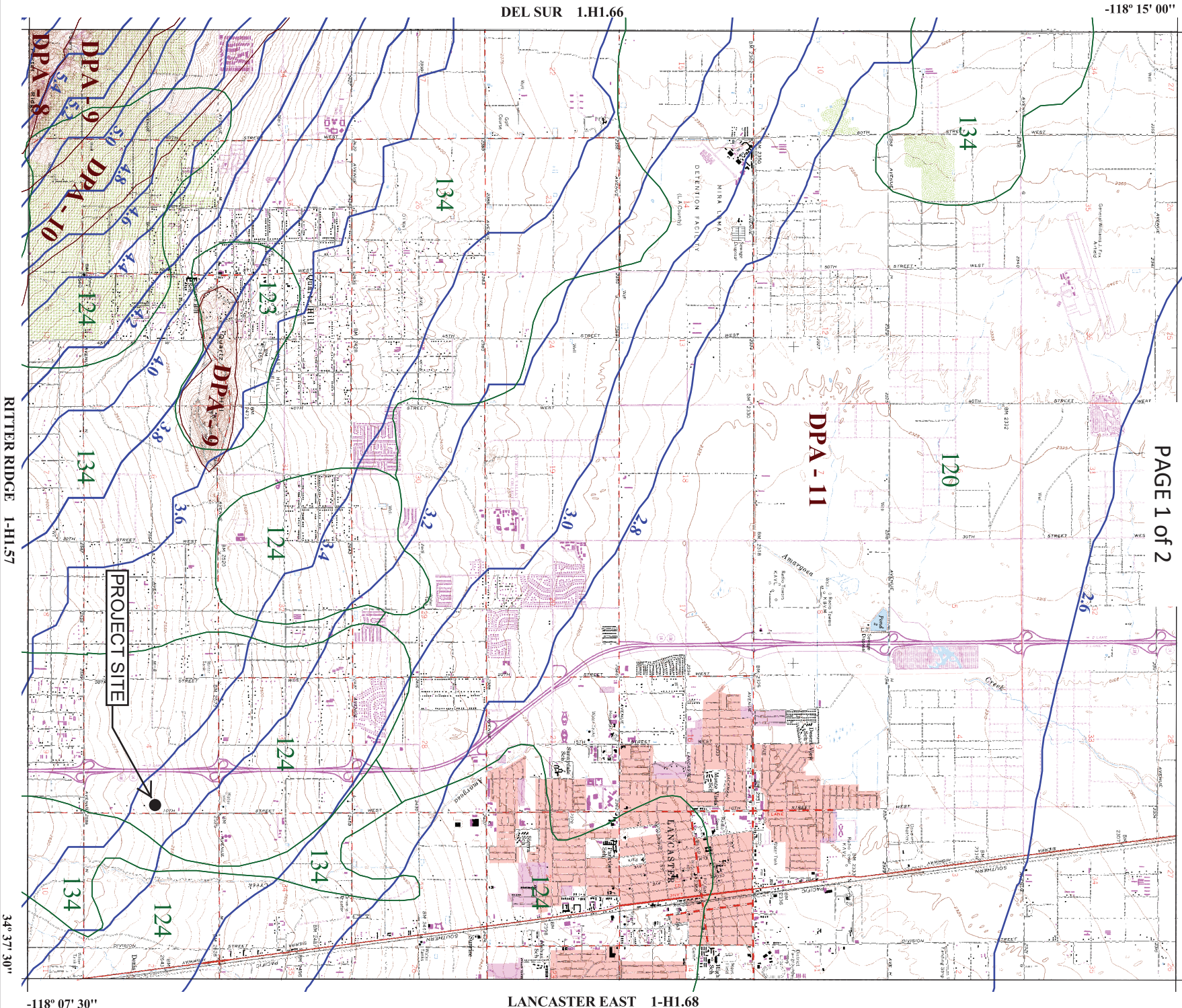
<i>Enclosures:</i>	<i>Exhibit A</i>	<i>Drainage Map</i>
	<i>Exhibit B</i>	<i>Hydrology Manual References</i>
	<i>Exhibit C</i>	<i>Flow Capacity Calculations</i>
	<i>Exhibit D</i>	<i>LA County HydroCalc Calculator</i>



34° 45' 00"

EXHIBIT "B"

PAGE 1 of 2



016

SOIL
CLASSIFICATION
AREA

7.2

INCHES OF
RAINFALL

DPA - 6

DEBRIS
POTENTIAL
AREA

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

LANCASTER WEST

50-YEAR 24-HOUR ISOHYET

1-HI.67

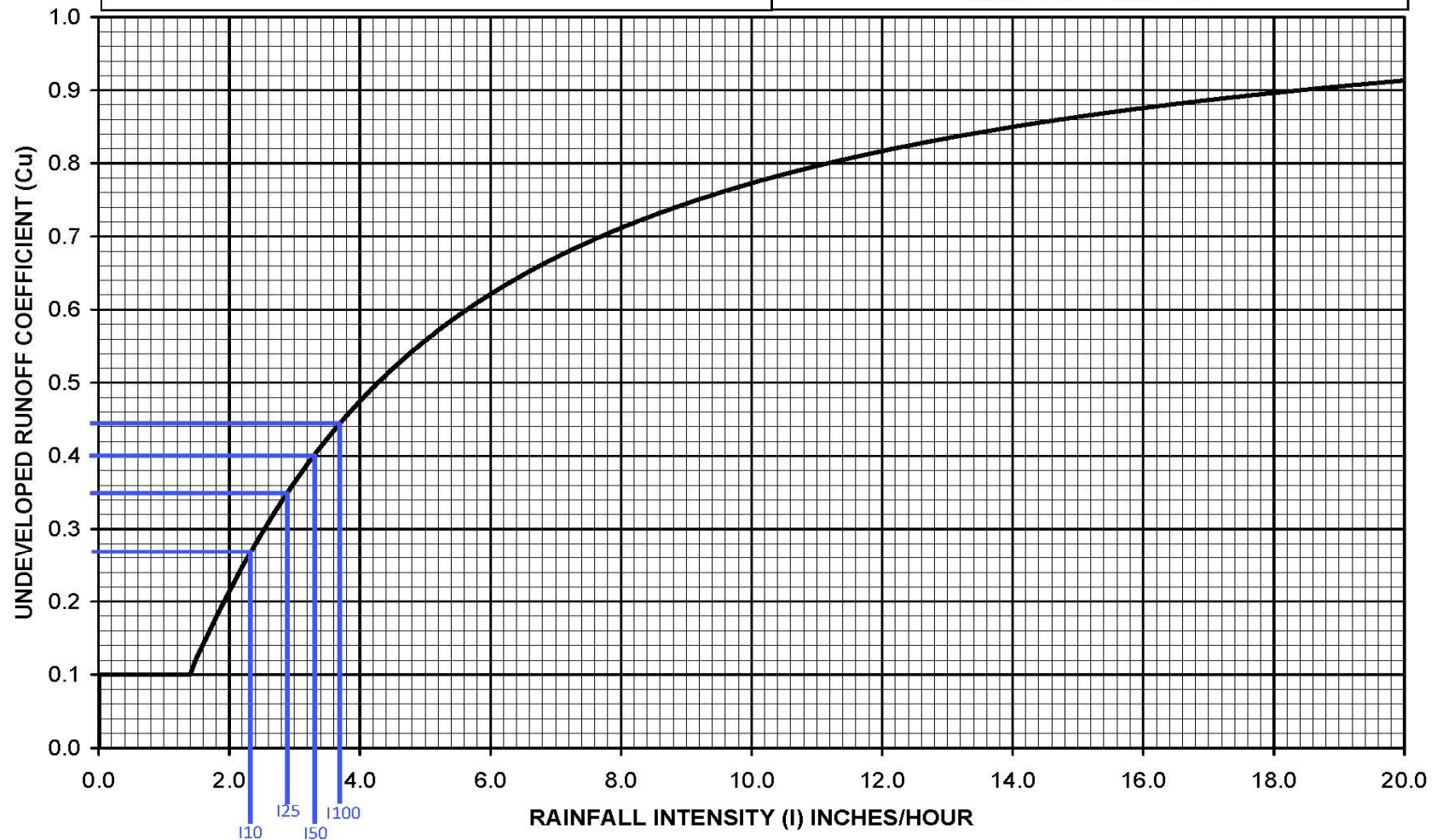


$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$
 Where: C_D = Developed Runoff Coefficient
 IMP = Proportion Impervious
 C_U = Undeveloped runoff coefficient



Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 124

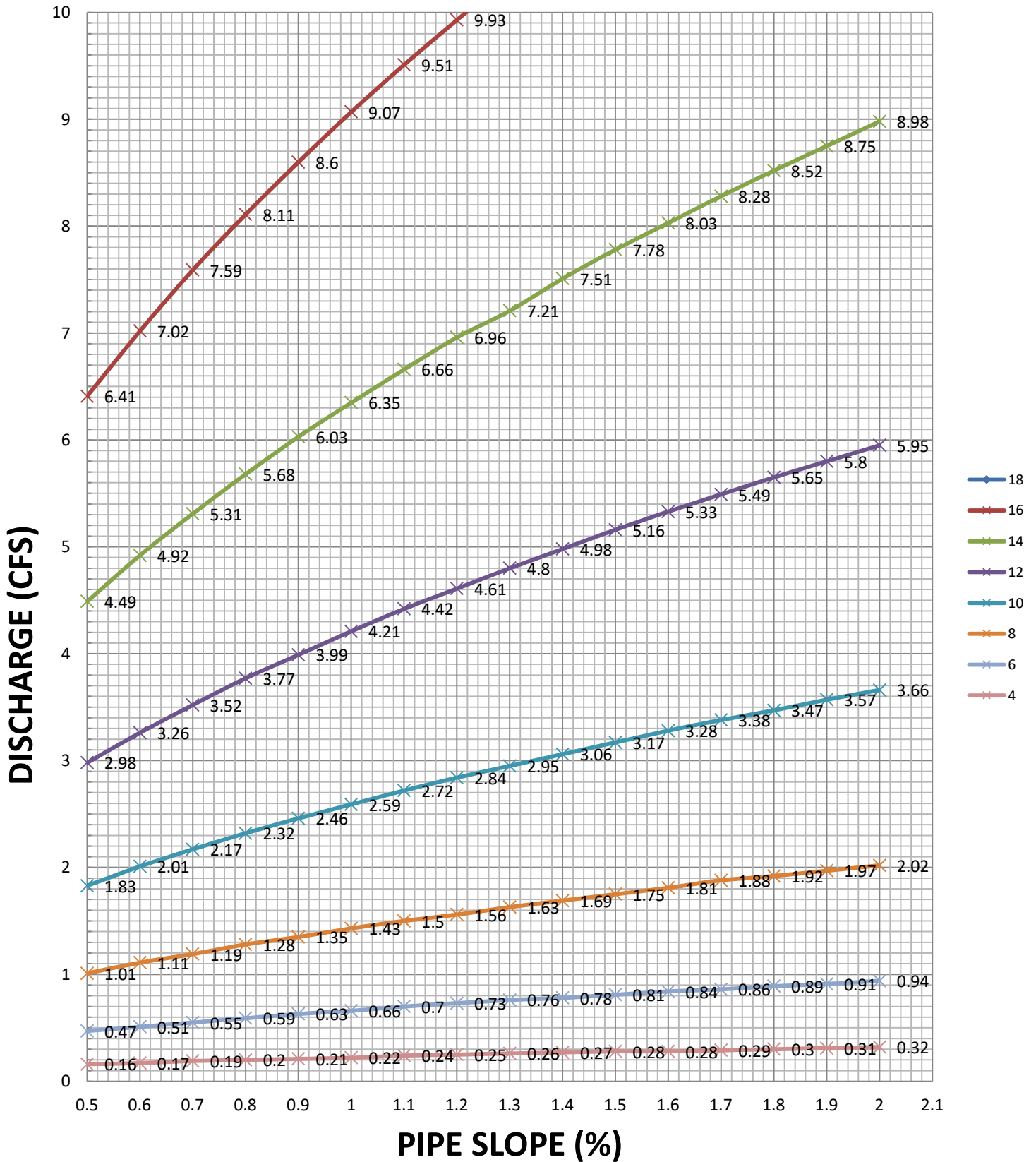


File: Soil Curve Data and Graphs 110-139 Tab: GN124

HYDROLOGY APPENDIX C

BJW: 06/14/2004

DISCHARGE (cfs) FOR PVC PIPE (n=0.011)



Manning Formula Uniform Trapezoidal Channel Flow at Given Slope and Depth

22.17 Takvorian

Gutter Capacity

Inputs			Results		
Bottom width	0	ft	Flow area	0.2600	ft^2
Side slope 1 (horiz./vert.)	15.384		Wetted perimeter	4.0083	ft
Side slope 2 (horiz./vert.)	15.384		Hydraulic radius	0.0649	ft
Manning roughness, n ?			Velocity, v	1.4135	ft/sec
○ Strickler ○ B/B (See notes)	.012		Flow, Q (See notes)	0.3675	cfs
Channel slope	0.5	% rise/run	Velocity head, h _v	0.0311	ft
Flow depth	0.13	ft	Top width, T	3.9998	ft
Bend Angle ? (for riprap sizing)	0		Froude number, F	0.98	
Rock specific gravity (2.65)			Average shear stress (tractive force), tau	0.0202	psf
Design rock size			n for design rock size per Strickler	0.0265	
○ Isbash ○ Maynard ○ Searcy			n for design rock size per Blodgett	0.1305	
* 1.25 (See notes)	0.1	ft	n for design rock size per Bathurst	0.0494	
			Blodgett vs. Bathurst	Bathurst	
			Required bottom angular rock size, D50 (Isbash & MC) ?	-0.0381	ft
			Required side slope 1 angular rock size, D50 (Isbash & MC) ?	-0.0382	ft
			Required side slope 2 angular rock size, D50 (Isbash & MC) ?	-0.0382	ft
			Required angular rock size, D50 (Maynard, Ruff, and Abt 1989)	NaN	ft
			Required angular rock size, D50 (Searcy 1967)	0.0134	ft



Peak Flow Hydrologic Analysis

File location: C:/Users/KyleFrost/Dropbox (M3 Civil)/M3 Civil Team Folder/M3 USERDATA/2022/22.17_Takvorian/02-Production/01-Reports/2022 05 30
Version: HydroCalc 1.0.3

Input Parameters

Project Name	22.17 Takvorian
Subarea ID	Post-project
Area (ac)	4.06
Flow Path Length (ft)	735.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	3.3
Percent Impervious	0.85
Soil Type	124
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	3.3
Peak Intensity (in/hr)	1.1397
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.78
Time of Concentration (min)	16.0
Clear Peak Flow Rate (cfs)	3.6093
Burned Peak Flow Rate (cfs)	3.6093
24-Hr Clear Runoff Volume (ac-ft)	0.8637
24-Hr Clear Runoff Volume (cu-ft)	37621.7057

