Tentative Tract Map 83359

Initial Study – Mitigated Negative Declaration

prepared by

Maison's Palmdale Boulevard 150, LLC
2007 Cedar Avenue
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prepared with the assistance of

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Initial Study

1. Project Title

Tentative Tract Map 83359

2. Lead Agency Name and Address

City of Palmdale
38300 Sierra Highway
Palmdale, California 93550

3. Contact Person and Phone Number

Brenda Mangaña, Planning Manager
(661) 267-5200
38250 Sierra Highway, Dev. Services Bldg.

4. Project Location

The Tentative Tract Map 83359 Project (hereafter referred to as "project" or "proposed project") is immediately adjacent to, and south of, East Palmdale Boulevard between 55th Street and 50th Street East in the City of Palmdale. The 20-acre project site is vacant and identified as Assessor Parcel Number (APN) 3023-002-184. The relatively flat site gently slopes northward and is dominated by Western Joshua trees and other vegetation (refer to the Biological Resources Assessment, Appendix B, for details), and disturbed throughout by off-highway-vehicle (OHV) use and trash dumping. The site is located 4.7 miles east of the intersection of Palmdale Boulevard and Sierra Highway. Figure 1 shows the location of the project site in the region and Figure 2 depicts the location of the site in its neighborhood context. Figure 3 depicts the extent of the tentative tract map study area.

5. Project Sponsor's Name and Address

Maison's Palmdale Boulevard 150, LLC
2007 Cedar Avenue
Manhattan Beach, California 90266
Contact: Kevin Harbison

6. General Plan Designation

The project site has a General Plan land use designation of Single Family Residential 3 (SFR 3). This designation allows for detached single-family subdivisions containing the City's standards 7,000 square foot minimum lot size. This designation allows a maximum density of three to six dwelling units per acre.

7. Zoning

The project site is zoned as Single Family Residential 3 (SFR 3). The SFR 3 Zone is established for the development of single-family detached dwellings at gross densities from zero to six dwelling units per acre and a minimum lot size of 7,000 square feet.

8. Description of Project

The proposed project would facilitate the development of up to 191-units of single story, single-family homes consisting of three-bedroom housing units, two-bedroom Accessory Dwelling Units and one-bedroom Junior Accessory Dwelling Units that would be offered for rent as a 100 percent affordable project to those qualifying at 30 to 80 percent Area Mean Income (AMI) for Los Angeles County. The project would also include a recreation center and community amenities on a total of 66 lots. The community would be an all-electric community and each residential unit would be constructed with rooftop solar, energy efficient appliances, and installation of all infrastructure improvements as conditioned by the City of Palmdale with approval of Tentative Tract Map (TTM) 83359. Within each lot, primary homes, accessory dwelling units (ADU), and junior ADUs would be separated by six-foot-tall vinyl fences and would be linked together by a network of walking paths and trails. The entire residential development would be enclosed by a six-foot-tall decorative perimeter block wall, except where existing and newly constructed streets would occur. Table 1, below, details a summary of the proposed project.

The entire community would comply with California Tax Credit Allocation Committee's requirement that a minimum of fifteen percent (15 percent) of the Low-Income Units be constructed with mobility features, as defined in California Building Code (CBC) 11B 809.2 through 11B 809.4, and a minimum of ten percent (10 percent) of the Low-Income Units be constructed with communications features, as defined in CBC 11B 809.5. These units shall, to the maximum extent feasible and subject to reasonable health and safety requirements, be distributed throughout the project consistent with 24 CFR Section 8.26.

Indoor community amenities include a community building with a tenant lounge, office spaces, and a fitness center. Outdoor amenities include a pool, spa, grill area, pocket community park, children's play area, and additional community open spaces. Additionally, a community trail network is planned to link the neighborhood and provide additional open spaces and parks for the community to utilize. Monumentation signage for the community would be installed along Palmdale Boulevard.

Streets that would be constructed within the project site and would link the community to East Palmdale Boulevard to the north as well as the existing residential projects to both the east and west of the project. All public rights-of-way would be constructed to the width shown on the TTM and would include road, sidewalks, and curbs and gutters. Americans with Disabilities Act (ADA) curb ramps, appropriate street signage, fire hydrants, and streetlights would also be installed for each street both inside and outside of the development.

Figure 1 Vicinity Map

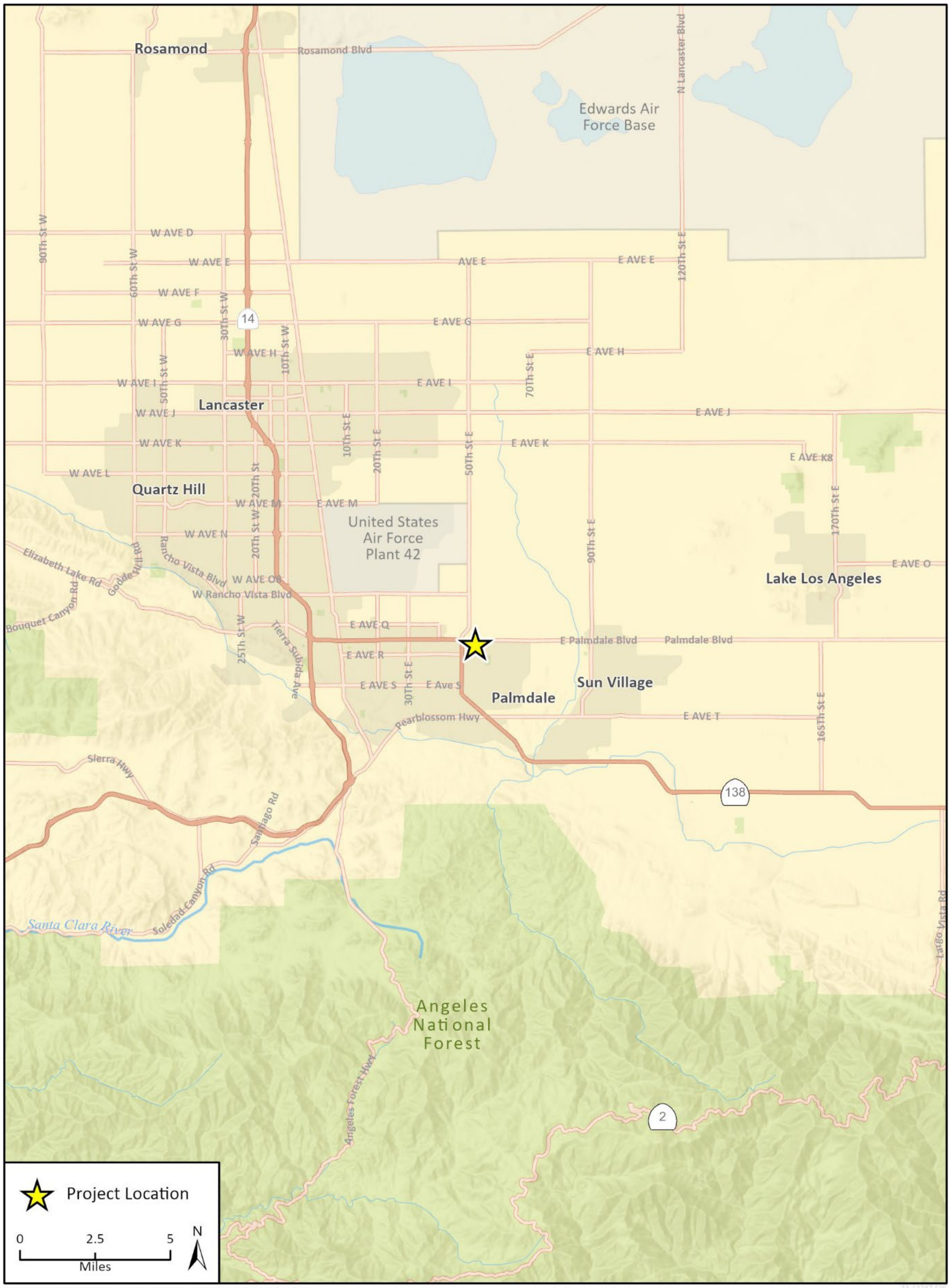

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Figure 2 Project Location

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Figure 3 Tentative Tract Map

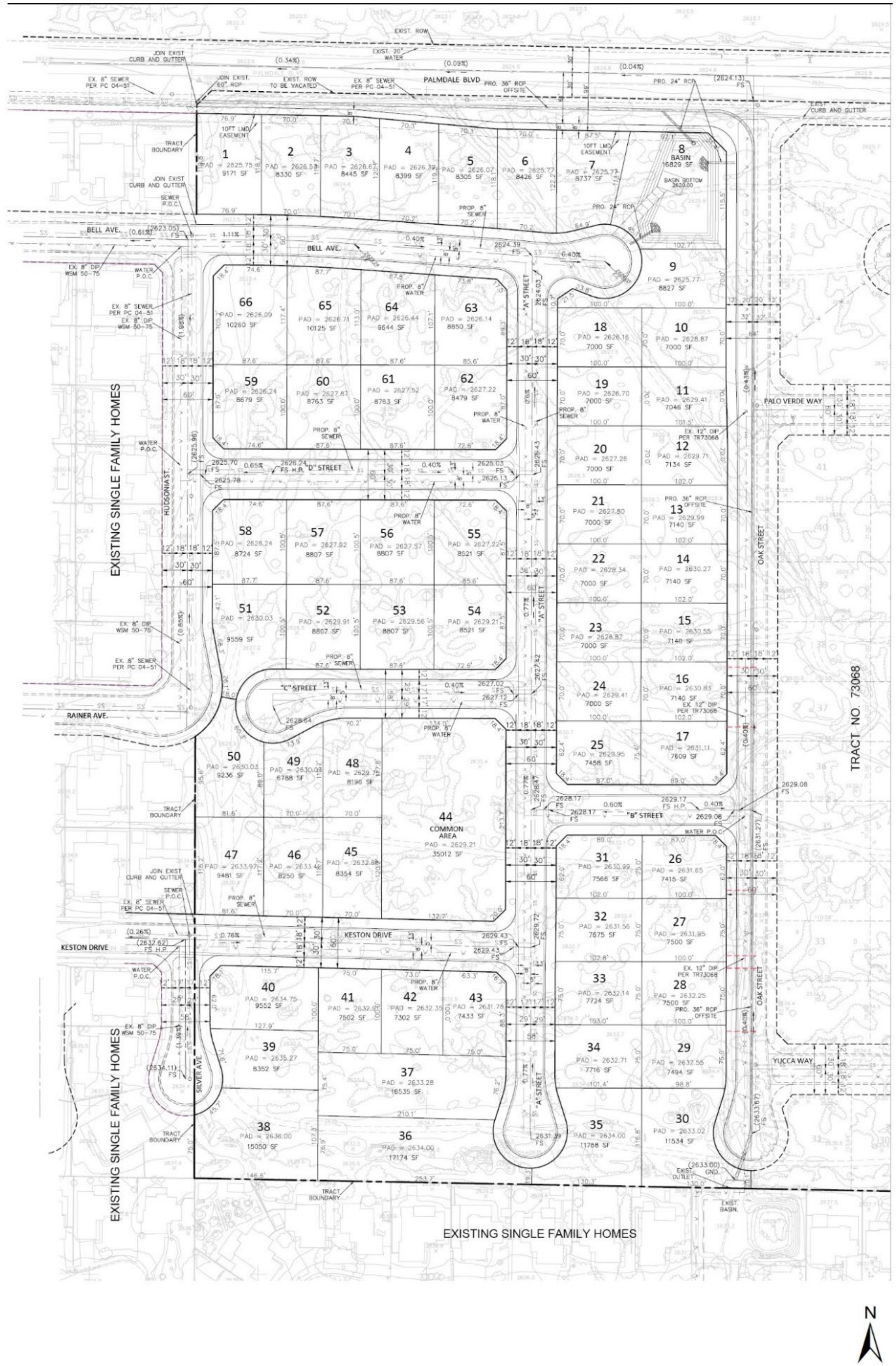

Table 1 Project Summary

Lot Size	
Lots 1-7, 9-43, 45-66 (Residential Units)	Range from 7,000 sf to 17,174 sf
Lot 8 (Drainage Basin)	16,829 sf
Lot 44 (Common Area)	35,012 sf
Lot Components	
Main Residential Unit	
Building Area (Net)	Range from 1,145 sf – to 1,226 sf
Garage Area (Net)	440 sf
sensiJunior ADU	496 sf
Front Patio	Range from 88 sf to 90 sf

Construction

Construction activities would include site preparation, grading, building construction, asphalt paving, and architectural coating. Construction of the proposed project is anticipated to occur over an approximately one and a half-year (18 month) period beginning in Summer of 2024 and construction will occur for approximately 14 to 15 months.

Construction would occur Monday through Saturday between the hours of 6:30 a.m. and 8:00 p.m. and must receive written permission from the City Engineer to perform such work as construction, repair, excavation, or earth moving work pursuant to the Palmdale Municipal Code (PMC) Chapter 8.28 (Building Construction Hours of Operation and Noise Control).

9. Surrounding Land Uses and Setting

The project site is in an urban area designated as SFR 3 and is surrounded by single-family residential neighborhoods off Palmdale Boulevard to the west and south. The parcel immediate to the east of the project site is currently vacant. To the north of the project site, there is vacant land designated as Residential Neighborhood 2 and 3.

10. Required Approvals

The proposed project would require approval of a Tentative Tract Map, Design Review approval, and approval of this Initial Study-Mitigated Negative Declaration (IS-MND) by the City of Palmdale. In addition to approvals from the City of Palmdale, an approval from the California Tax Credit Allocation Committee for State tax credits is required.

11. Have California Native American Tribes Traditionally and Culturally Affiliated with the Project Area Requested Consultation Pursuant to Public Resources Code Section 21080.3.1?

[The Tribal Consultation summary will be provided when the project application is submitted and the City begins the government-to-government consultation process under AB 52]

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Environmental Factors Potentially Affected

This project would potentially affect the environmental factors checked below, involving at least one impact that is "Potentially Significant" or "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

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

Determination

Based on this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

■ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "less than significant with mitigation incorporated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potential significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Brenda Mangaña	Planning Manager
Printed Name	Title

Environmental Checklist

1 Aesthetics

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

A scenic vista is defined as a public viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public. Public views are those that are experienced from a publicly accessible vantage point, such as a roadway or public park. The California Department of Transportation (Caltrans) manages the California State Scenic Highway Program, which designates State scenic highways. A scenic highway becomes officially designated when the local governing body applies to and is approved by Caltrans for scenic highway designation and adopts a Corridor Protection Program that preserves the scenic quality of the land that is visible from the highway right of way (Caltrans 2022).

The City of Palmdale Planning Area encompasses approximately 174 square miles within a transitional area between the foothills of the San Gabriel and Sierra Pelona Mountains and the Mojave Desert to the north and east (City of Palmdale 2022a). Across the Antelope Valley, elevations range from 500 to 900 feet. The high desert lies on the north side of the San Gabriel Mountains with elevations ranging between 2,500 and 3,000 feet. The project site is in a highly urbanized area that includes residential uses.

a. Would the project have a substantial adverse effect on a scenic vista?

A scenic vista is usually defined as a panoramic view from an elevated position or a long-range view from a public vantage point. While the City of Palmdale General Plan does not identify any specific scenic vistas in the city, General Plan Policy Land Use and Community Design (LUD) 5.7 aims for the protection and enhancement of the city's scenic vistas and limit development in areas with high scenic value (City of Palmdale 2022a). In addition, the proposed project does not occur along a view corridor identified in the City's General Plan. Long range views of hillsides surrounding Antelope Valley, such as those near Angeles National Forest, are visible from the project site. PMC Section 17.36.010 (Development Standards – Residential Zones) requires that buildings within an area zoned SFR 3 shall not exceed two stories or 35 feet in height, except when permitted by a conditional use permit. Given the distance between the surrounding hillsides and the project site, and that the proposed residences would not exceed two stories in height, the project would not result in impacts to the scenic quality of hillsides in the city. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

The nearest designated State scenic highway is State Route 2 (SR-2) located over 16 miles south of the project site (Caltrans 2019). The nearest eligible state scenic highway is State Route 58 (SR 58) located approximately 30 miles north of the project site. Therefore, no officially designated or eligible State scenic highways are near the project site, and the project site does not contain any trees, rock outcroppings, or historic buildings that would be impacted by the proposed project. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project, in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a 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?

The General Plan land use designation of the project site is Single Family Residential (SFR 3) consistent with the SFR 3 zone in the zoning code. Land uses surrounding the project site are similarly zoned as SFR 3. Residences surround the project site to the west, south, and east. Land to the north of the project site is designated as Other Jurisdiction. Thus, the proposed project would be consistent with the current zoning and land uses within the area.

Construction of the proposed project would replace the vacant parcel and utilize building materials that would complement the aesthetics of the existing residences surrounding the site to the west, south, and east. Additionally, the proposed project would comply with PMC Section 17.36.010 (Development Standards – Residential Zones) and Section 17.86.010 (Landscaping Requirements), which defines the requirements for building design and landscaping on the project site. Compliance with the applicable requirements would maximize the aesthetic quality of the proposed project.

While the proposed project would result in visual impacts during construction due to the presence of equipment, vehicles, construction fencing, signage, and lighting, these impacts would be temporary and limited to the construction phase only. Once fully built, the proposed project would result in the permanent impact to the visual character of the project area with the presence of single-story, single-family homes. As discussed above, the height of the proposed development would be within the height restrictions defined by the PMC Section 17.36.010 (Development Standards – Residential Zones). In addition, the proposed project would include construction best management practices (BMPs) including but not limited to proper storage of equipment, project site maintenance, dust control measures, and limiting hours of construction within the hours mandated by PMC Section 8.28.030 (Construction Noise Prohibited in Residential Zones). Permanent impacts would include the presence of new development on a currently vacant site. The proposed project is located in an urbanized area and the surroundings are fully developed with residential buildings.

In addition, the Land Use and Community Design Element of the City General Plan includes policies regarding the maintenance of community design and character. Some of those policies include, but are not limited to, the following (City of Palmdale 2022a):

Goal LUD-4: High-quality architecture and site design in the renovation and construction of all buildings.

Policy LUD-4.5: Use visual and physical design cues within the design of a building and within building entries to emphasize the building entrance and connections to public spaces and public pathways/networks.

Policy LUD-4.7: Allow iconic and memorable building designs, particularly on larger nonresidential properties.

Policy LUD-4.8: Design sites and buildings adjacent to natural areas with transparent design elements. Employ bird-safe design near habitat areas or migratory routes.

Goal LUD-6: Pedestrian-oriented, human-scale and well-landscaped streets and civic spaces.

Policy LUD-6.3: For construction of new small-scale housing and minor subdivision projects, design site plans that provide amenities and integrated networks for walking and bicycling.

Policy LUD-6.4: Improve existing parks and public spaces throughout the city to provide beautiful, comfortable, and inviting gathering spaces.

The proposed project complies with Policy LUD-6.3 by ensuring that the streets constructed within the project site would link the community to East Palmdale Boulevard to the north as well as the existing residential projects to both the east and west of the project. In addition, the project would maintain the community’s aesthetic by following the design standards outlined in PMC Section 17.36.010 (Development Standards – Residential Zones). The project would contain single-family residences, similar to areas surrounding the project site. Thus, the proposed project would be compatible with the surrounding neighborhoods and consistent with land uses in the area. In addition, the proposed project would be consistent with the General Plan and building heights would be compatible with heights allowed in the surrounding area. Therefore, implementation of the proposed project would result in a less-than-significant impact associated with visual character and scenic quality.

LESS THAN SIGNIFICANT IMPACT

d. Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?

The proposed project would add temporary and permanent lighting to the project area. During construction, the project would include temporary construction lighting for areas requiring additional lighting. The project would limit construction hours within the PMC Section 8.28.030 (Construction Noise Prohibited in Residential Zones) requirement where construction activities are prohibited between 8:00 p.m. to 6:30 a.m. Other additional lighting sources would come from vehicles and other large operating equipment. Once operational, permanent lighting sources would primarily be from outdoor lighting necessary to ensure safety and additional vehicle lights.

Lighting associated with the proposed project would be required to comply with PMC Section 17.86.030 (Outdoor Lighting), which requires consistent illumination levels with the character and use surrounding of the surrounding development; excessive illumination is prohibited. Additionally, exterior lighting would be required to be located and designed to minimize glare beyond the proposed project site. Glare onto the adjacent properties would be minimized using down casting, cut-off type fixtures, as necessary, that are shielded and would direct lights towards the specific areas needing illumination. For areas that are located near residents, the lowest allowable lighting levels would be used.

Compliance with the PMC would help to mitigate the effects of permanent light and glare induced by the proposed project. Therefore, implementation of the proposed project would result in a less than significant impact.

LESS THAN SIGNIFICANT IMPACT

2 Agriculture and Forestry Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	□	□	■	□
b. Conflict with existing zoning for agricultural use or a Williamson Act contract?	□	□	□	■
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)); timberland (as defined by Public Resources Code Section 4526); or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	□	□	□	■
d. Result in the loss of forest land or conversion of forest land to non-forest use?	□	□	□	■
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	□	□	□	■

a. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The California Department of Conservation (DOC), Division of Land Resource Protection, Farmland Mapping and Monitoring Program (FMMP), tracks and categorizes land with respect to agricultural resources. Land is designated as one of the following and each has a specific definition: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Grazing Land, Urban Built-Up Land, and Other Land.

According to the DOC California Important Farmland Finder, the project site is classified as Other Land (DOC 2016). Other Land is defined as land not included in any other mapping territory. Often times, this area can include rural residential land, vacant or disturbed land, semi-agricultural, and rural commercial land (DOC 2019). For the proposed project, the project site would be considered vacant and disturbed land. Areas to the west, south, and east are all classified as Urban and Built-Up Land. Thus, the proposed project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

c. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)); timberland (as defined by Public Resources Code Section 4526); or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

e. Would the project 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?

The current zoning of SFR 3. This designation would be consistent with the SFR (Single Family Residential) General Plan Land Use designations. The project site is not associated with a Williamson Act contract. No agricultural use is present on the project site or within the vicinity of the project. The proposed project would not impact any agricultural uses. In addition, there are no forests or timberlands located within the City of Palmdale. Therefore, the proposed project would not cause the loss of forest land or conversion of forest to non-forest land. Therefore, no impact would occur.

NO IMPACT

3 Air Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	■	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	■	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	■	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	■	☐

The project site is within the Mojave Desert Air Basin (MDAB), an inland region in southern California that includes the desert portions of northwestern Los Angeles County, eastern Kern County, northeastern Riverside County, and San Bernardino County. The region is closed off from southern coast of California and central California by mountain ranges with the Sierra Nevada Mountains to the north, the Tehachapi Mountains to the northwest, and the San Gabriel and San Bernardino Mountains to the south. The Sonoran Desert borders the eastern and southern portions of the MDAB. The regional climate in the MDAB is dry-host desert climate characterized by little cloud formation, daytime solar heating, and infrequent precipitation. The air quality within the MDAB is primarily influenced by meteorology, topography, and a wide range of emission sources, such as dense population centers, substantial vehicular traffic, and industry. The Antelope Valley Air Quality Management District (AVAQMD) monitors and regulates local air quality in the eastern portion of the MDAB, which includes the cities of Lancaster and Palmdale (AVAQMD 2022a).

Air Quality Regulations

Federal Air Quality Regulations

Ambient Air Quality Standards represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The federal Clean Air Act (CAA) was enacted in 1970 and amended in 1977 and 1990 [42 United States Code (USC) 7401] for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity.

The U.S. Environmental Protection Agency (USEPA) has set primary and secondary National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with a diameter of up to ten microns (PM_{10}) and up to 2.5 microns ($PM_{2.5}$), and lead (Pb). Primary standards are those levels of air quality deemed necessary, with an adequate margin of safety, to protect public health. Table 2 lists the current federal and State standards for regulated pollutants.

Table 2 Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	–	0.09 ppm
	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.00 ppm	9.00 ppm
	1-Hour	35.00 ppm	20.00 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.100 ppm	0.180 ppm
Sulfur Dioxide	Annual	0.030 ppm	–
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	0.075 ppm	0.25 ppm
PM_{10}	Annual	–	20 µg/m^3
	24-Hour	150 µg/m^3	50 µg/m^3
PM_{25}	Annual	12 µg/m^3	12 µg/m^3
	24-Hour	35 µg/m^3	–
Lead	30-Day Average	–	1.5 µg/m^3
	3-Month Average	0.15 µg/m^3	–

ppm = parts per million; µg/m^3 = micrograms per cubic meter
Source: CARB 2016

State Air Quality Regulations

CALIFORNIA AMBIENT AIR QUALITY STANDARDS

The California Clean Air Act (CCAA) was enacted in 1988 (California Health & Safety Code Section 39000 et seq.). While USEPA is the federal agency designated to administer air quality regulation, the California Air Resources Board (CARB) is the State equivalent in the California Environmental Protection Agency (CalEPA). Under the CCAA the State has developed the California Ambient Air Quality Standards (CAAQS), which are generally more stringent than the NAAQS. Table 2 lists the current State standards for regulated pollutants. In addition to the federal criteria pollutants, the CAAQS also specify standards for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. Like the federal CAA, the CCAA classifies specific geographic areas as either "attainment" or "nonattainment" areas for each pollutant, based on the comparison of measured data within the CAAQS.

California is divided geographically into 15 air basins for managing the air resources of the State on a regional basis. Areas within each air basin are considered to share the same air masses and, therefore, are expected to have similar ambient air quality. If an air basin is not in either federal or State attainment for a criteria pollutant, the basin is classified as a nonattainment area for that pollutant. Under the CAA, once a nonattainment area has achieved the air quality standards for a criteria pollutant, it may be re-designated to an attainment area for that pollutant. To be re-designated, the area must meet air quality standards and have a 10-year plan for continuing to meet and maintain air quality standards, as well as satisfy other requirements of the federal CAA. Areas that have been re-designated to attainment are called maintenance areas.

The MDAB is designated a nonattainment area for the federal and State eight-hour ozone standards, State one-hour ozone standards, and for State PM_{10} standards. The AVAQMD portion of the MDAB is designated unclassifiable or in attainment for all other federal and State standards (AVAQMD 2022b).

TOXIC AIR CONTAMINANTS

A toxic air contaminant (TAC) is an air pollutant that may cause or contribute to an increase in mortality or serious illness, or which may pose a present or potential hazard to human health. TACs may result in long-term health effects such as cancer, birth defects, neurological damage, asthma, or genetic damage, or short-term acute effects such as eye watering, respiratory irritation, runny nose, throat pain, and headaches. TACs are considered either carcinogenic or non-carcinogenic based on the nature of the health effects associated with exposure. For carcinogenic TACs, potential health impacts are evaluated in terms of overall relative risk expressed as excess cancer cases per one million exposed individuals. Non-carcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

TACs include both organic and inorganic chemical substances. One of the main sources of TACs in California is diesel engines that emit exhaust containing solid material known as diesel particulate matter (DPM); however, TACs may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. TACs commonly associated with gasoline dispensing stations include the organic compounds of benzene, toluene, and xylene. Benzene is a known human carcinogen and can result in short-term acute and long-term chronic health impacts (USEPA n.d.).

In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (Assembly Bill [AB] 1807: Health and Safety Code Sections 39650–39674). The Legislature established a two-step process to address the potential health effects from TACs. The first step is the risk assessment (or identification) phase. The second step is the risk management (or control) phase of the process.

The California Air Toxics Program establishes the process for the identification and control of TACs and includes provisions to make the public aware of significant toxic exposures and for reducing risk. Additionally, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly Bill) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, identify facilities having localized impacts, ascertain health risks, notify nearby residents of significant risks, and reduce those significant risks to acceptable levels. The Children's Environmental Health Protection Act, California Senate Bill (SB) 25 (Chapter 731, Escutia, Statutes of 1999), focuses on children's exposure to air pollutants. The act requires CARB to review its air quality standards from a children's health perspective, evaluate the statewide air quality monitoring network, and develop any additional air toxic control measures needed to protect children's health.

STATE IMPLEMENTATION PLAN

The federal CAA Amendments mandate that states submit and implement a State Implementation Plan (SIP) for areas not meeting air quality standards. The SIP includes pollution control measures to demonstrate how the standards will be met through those measures. The SIP is established by incorporating measures established during the preparation of air quality attainment plans and adopted rules and regulations by each local air district, which are submitted for approval to CARB and the USEPA. The goal of an air quality attainment plan is to reduce pollutant concentrations below the NAAQS through the implementation of air pollutant emissions controls. Local air districts and other agencies, such as the Department of Pesticide Regulation and the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the USEPA for approval and publication in the Federal Register. All of the items included in the California SIP are listed in the Code of Federal Regulations (CFR) at 40 CFR 52.220.

As the regional air quality management district, the AVAQMD is responsible for preparing and implementing the portion of the SIP applicable to the portion of the MDAB within its jurisdiction. The air pollution control district for each county adopts rules, regulations, and programs to attain federal and state air quality standards and appropriates money (including permit fees) to achieve these objectives.

Local Air Quality Regulations

AVAQMD OZONE ATTAINMENT PLAN

Under State law, air districts are required to prepare a plan for air quality improvement for pollutants for which the district is in non-compliance. The AVAQMD adopted the Federal 75 parts per billion (ppb) Ozone Attainment Plan for the Western Mojave Desert Nonattainment Area in March 2017 to reach attainment for federal and State standards. The Ozone Attainment Plan incorporates new scientific data and notable regulatory actions that have occurred since adoption of the 2010 Ozone Attainment Plan including the approval of the new federal 8-hour ozone standard of 0.070 parts per million (ppm) that was finalized in 2015. The Final 2017 Ozone Attainment Plan addresses several State and federal planning requirements and incorporates new scientific information, primarily in the form of updated emissions inventories, ambient measurements, and meteorological air quality models. The Southern California Association of Governments' (SCAG) projections for socio-economic data (e.g., population, housing, employment by industry) and transportation activities from the 2016 Regional Transportation Plan/Sustainable Communities Strategy (2016 RTP/SCS) are integrated into the 2017 Ozone Attainment Plan. To minimize potential impacts from project emissions, the AVAQMD implements rules and regulations for emissions that may be generated by various uses and activities. Rules and regulations relevant to the proposed project include Rule 403 (Fugitive Dust), Rule 402 (Nuisance), and Rule 1113 (Architectural Coatings).

2020-2045 REGIONAL TRANSPORTATION PLAN/SUSTAINABLE COMMUNITIES STRATEGY

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties. On September 3, 2020, SCAG's Regional Council formally adopted the 2020-2045 RTP/SCS (titled Connect SoCal). The 2020-2045 RTP/SCS builds upon the progress made through implementation of the 2016-2040 RTP/SCS and includes 10 goals focused on promoting economic prosperity, improving mobility, protecting the environment, and supporting healthy/complete communities. The SCS implementation strategies include focusing growth near destinations and mobility options, promoting diverse housing choices, leveraging technology innovations, and supporting implementation of sustainability policies. The SCS establishes a land use vision of center-focused placemaking, concentrating growth in and near Priority Growth Areas, transferring of development rights, urban greening, creating greenbelts and community separators, and implementing regional advance mitigation (SCAG 2020). The RTP/SCS pertains to air quality because the strategies set forth in the plan would reduce air pollutant emissions from mobile sources.

City of Palmdale General Plan

The City of Palmdale General Plan (2022) contains goals, policies, and strategies for enhancing community character and quality of life, expanding economic development opportunities, managing growth, addressing impacts of climate change, and improving outcomes for public health and sustainability. The General Plan includes numerous goals and policies in the Air Quality Element through which air quality would be improved and project impacts reduced, as follows:

Goal AQ-2: Minimize particulates less than 10 microns in size (PM_{10}) and minimize activities that generate dust.

Policy AQ 2-4: Erosion and Dust Control Measures**.** Require erosion and dust control measures for new construction, including covering soil with straw mats or use of chemical soil and dust binders during site grading, followed by hydroseeding and watering disturbed construction areas as soon as possible after grading to prevent fugitive dust.

Goal AQ-3: Reduction and/or elimination of unnecessary sources of air pollution.

Policy AQ 3-4: Reduce Reactive Organic Gas**.** Reduce reactive organic gas (ROG) and particulate emissions from building materials and construction methods, by promoting the use of nonsolvent-based, high-solid, or water-based coatings, and requiring compliance with all pertinent AVAQMD rules.

Goal AQ-4: Reduce air pollution caused by energy consumption.

Policy AQ 4-2: Energy Conservation. Encourage energy conservation from all sectors of the community by promoting and/or requiring the use of energy efficient appliances, processes, and equipment, and promoting energy audits and retrofits of existing structures.

Policy AQ 4-3: Recycling. Require local government, Palmdale citizens, and local businesses and industries to recycle, as mandated by state law, and to otherwise recycle to the maximum extent possible in accordance with the requirements of the Palmdale Municipal Code.

Policy AQ 4-4: Solar Energy**.** Require new developments to minimize obstruction of direct sunlight for solar energy systems on adjacent properties.

Criteria Pollutants

Ozone

Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases[1] (ROG). NO_X are formed during the combustion of fuels, while ROG are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it usually occurs in substantial concentrations between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide

CO is a local pollutant produced by the incomplete combustion of carbon-containing fuels, such as gasoline, natural gas, oil, coal, and wood. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic. Therefore, elevated concentrations are usually found near areas of high traffic volumes. The health effects from CO are related to its affinity for hemoglobin in the blood. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulty in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Sulfur Dioxide

SO_2 is a combustion product, with the primary source being power plants and heavy industries that use coal or oil as fuel. SO_2 is also a product of diesel engine combustion. The health effects of SO_2 include lung disease and breathing problems for people with asthma. SO_2 in the atmosphere contributes to the formation of acid rain.

Nitrogen Dioxide

NO_2 is a byproduct of fuel combustion, with the primary sources being motor vehicles and industrial boilers and furnaces. The principal form of NO_2 produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. NO_2 absorbs blue light, gives a reddish-brown cast to the atmosphere, and reduces visibility. It can also contribute to the formation of ozone/smog and acid rain.

Particulate Matter

Suspended atmospheric PM_{10} and $PM_{2.5}$ are comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. The characteristics, sources, and potential health effects associated with PM_{10} and $PM_{2.5}$ can be different. Major man-made sources of PM_{10} are agricultural operations, industrial processes, combustion of fossil fuels, construction, demolition operations, and entrainment of road dust into the atmosphere. Natural sources include windblown dust, wildfire

[1] Organic compound precursors of ozone are routinely described by several variations of three terms: hydrocarbons (HC), organic gases (OG), and organic compounds (OC). These terms are often modified by adjectives such as total, reactive, or volatile, and result in various acronyms, such as TOG (total organic gases), ROG (reactive organic gases), ROC (reactive organic compounds), and VOC (volatile organic compounds). While most of these differ in some significant way from a chemical perspective, two groups are important from an air quality perspective: non-photochemically reactive in the lower atmosphere, or photochemically reactive in the lower atmosphere (ROG and VOC).

smoke, and sea spray salt. The finer $PM_{2.5}$ particulates are generally associated with combustion processes as well as formation in the atmosphere as a secondary pollutant through chemical reactions. $PM_{2.5}$ is more likely to penetrate deeply into the lungs and poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the $PM_{2.5}$ that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Current Air Quality

CARB operates a network of air quality monitoring stations throughout the MDAB. The purpose of the monitoring stations is to measure ambient concentrations of pollutants and determine whether ambient air quality meets the California and federal standards. The monitoring station located closest to the project site is the Lancaster – 43301 Division Street station located approximately eight miles northwest of the project site. This monitoring station measures ozone, NO_2, PM_{10}, and $PM_{2.5}$.

Table 3 reports ambient air quality measurements and indicates the number of days that each standard has been exceeded at the Lancaster – 43301 Division Street station. The ambient air quality in the area exceeded the State and Federal 8-hour ozone standard and the Federal PM_{10} standard in 2020, 2021, and 2022. The area also exceeded the State 1-hour ozone standard in 2020 and 2022 and the Federal PM_{10} and $PM_{2.5}$ standards in 2020 and 2021. The area did not exceed other air quality standards in 2020, 2021, or 2022.

Table 3 Ambient Air Quality at the Monitoring Station

Pollutant	2020	2021	2022
8 Hour Ozone (ppm), 8-Hour Average	0.083	0.079	0.082
Number of days above State and Federal standards (>0.070 ppm)	8	3	33
Ozone (ppm), Worst Hour	0.099	0.086	0.098
Number of days above State standard (>0.09 ppm)	4	0	3
Number of days above Federal standard (>0.112 ppm)	0	0	0
Nitrogen Dioxide (ppm) - Worst Hour (Federal Measurements)	0.052	0.046	0.044
Number of days above State standard (>0.18 ppm)	0	0	0
Number of days above Federal standard (0.10 ppm)	0	0	0
Particulate Matter 10 microns, $\mu g/m^3$, Worst 24 Hours	192.3	411.2	76.2
Number of days above Federal standard (>150 $\mu g/m^3$)	1	1	0
Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours	74.7	35.7	15.1
Number of days above Federal standard (>35 $\mu g/m^3$)	9	1	0

Source: CARB 2023

Sensitive Receptors

The term "sensitive receptor" refers to a person in the population who is more susceptible to health effects due to exposure to an air contaminant than the population at large or to a land use that may reasonably be associated with such a person. Examples include residences, schools, playgrounds, childcare centers, churches, athletic facilities, retirement homes, and long-term health care facilities. Sensitive receptors that may be affected by air quality impacts associated with construction and operation of the proposed project include the residents of the single-family developments located adjacent to the western, southern, and eastern project boundaries. There are no other sensitive receptor groups within 1,000 feet of the project site.

Methodology

Criteria pollutant emissions for project construction and operation were calculated using the California Emissions Estimator Model (CalEEMod), Version 2022.1. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide (CAPCOA 2022). The input data and subsequent construction and operation emission estimates for the proposed project are discussed below. CalEEMod output files for the project are included in the Air Quality Greenhouse Gas Emissions Study (Appendix A).

Construction Emissions

Construction input data for CalEEMod include, but are not limited to: (1) the anticipated start and finish dates of construction activity; (2) inventories of construction equipment to be used; and (3) areas to be excavated and graded. The analysis assessed maximum daily emissions from individual construction activities, including site preparation, grading, building construction, paving, and architectural coating. Construction would require heavy equipment during demolition, site preparation, grading, building construction, and paving. Construction equipment estimates are based on surveys of construction projects within California conducted by members of CAPCOA. Note that there would be no demolition phase since the existing site is vacant.

Construction emissions were modeled in CalEEMod to occur over 18 months, starting in January 2024 with completion anticipated in July 2025. Although construction would likely begin in summer of 2024, this analysis conservatively assumes an earlier start date, as emissions factors for construction equipment are lower in later years. Construction emissions associated with development of the proposed project were quantified using the types and quantities of equipment for each construction phase as provided by the applicant. CalEEMod also estimates off-site emissions from worker, vendor, and hauling truck trips. The number of worker and vendor trips are based on CalEEMod defaults. Cut material would be used for construction of the proposed drainage basin; therefore, the project would not require material export or import.

Operational Emissions

In CalEEMod, operational sources of criteria pollutant emissions include area, energy, and mobile sources. The project's single-family, ADU, and junior ADU uses were combined and attributed to the "Single Family Housing" land use subtype, while the proposed community amenities were modeled as a 2,630-square foot "Racquet Club." Uncovered parking spaces and internal roadways were modeled as "Parking Lot." The modeling analyzed 191 total dwelling units.

The proposed project would not include natural gas connections, and such emissions are therefore excluded from this analysis. Emissions associated with area sources, including consumer products, landscape maintenance, and architectural coating were calculated in CalEEMod, and standard emission rates were utilized from CARB, USEPA, and emission factor values provided by the local air district (CAPCOA 2022). Mobile emissions are estimated by multiplying the project trip rate, average trip length, and the vehicle emission factors. The traffic consultant, General Technologies and Solutions (GTS), provided project-specific trip generations based on the Institute of Transportation Engineers (ITE) rates for "Single-Family Detached Housing" and "Multifamily Housing (Low-Rise)." The trip rate was estimated to be 1,460 total trips. The project-specific trip generation rates provided are included in the CalEEMod outputs in the Air Quality Greenhouse Gas Emissions Study (Appendix A).

Significance Thresholds

To determine whether a project would result in a significant impact to air quality, Appendix G of the CEQA Guidelines requires consideration of whether a project would:

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

The AVAQMD has adopted numerical significant emissions thresholds to determine whether an air pollution source could contribute individually or cumulatively to the worsening local or regional air quality. These thresholds, which would apply to temporary construction and long-term operational emission, are shown in Table 4.

Table 4 Antelope Valley Air Quality Management District Significance Thresholds

Pollutant	Annual Threshold (tons/year)	Daily Threshold (lbs/day)
CO	100	548
NO_X	25	137
VOC	25	137
SO_X	25	137
PM_{10}	15	82
$PM_{2.5}$	12	65

Source: AVAQMD 2016

AVAQMD guidance states that a project would have a significant impact related to TACs if the project would expose sensitive receptors to pollutant concentrations resulting in a cancer risk greater than or equal to 10 in one million and/or a non-cancerous Hazard Index (HI) greater than or equal to one.

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

The AVAQMD is required, pursuant to the federal Clean Air Act, to reduce emissions of criteria pollutants for which the AVAQMD portion of the MDAB is in nonattainment. Strategies to achieve these emissions reductions are developed in the 2023 Federal 70 ppb Ozone Attainment Plan (2023 Ozone Plan), prepared by AVAQMD for the region. Forecasts used in the 2023 Ozone Plan are developed by SCAG, which are based on local general plans and other related documents that are used to develop population, employment, and traffic projections. Consistency with the 2023 Ozone Plan is determined by analyzing a project with the assumptions in the Plan. As such, projects that propose development that is consistent with the growth anticipated by the local land use plan would be consistent with the SCAG growth projections and the 2023 Ozone Plan emissions estimates.

The project involves the construction of 191 residential units that would result in an increase in the city's population. Based on an average household size of 3.4 persons per dwelling unit in the city, the project would house approximately 649 residents (California Department of Finance 2023). The population growth projections used in the 2023 Ozone Plan forecast show that the population of Palmdale will reach 207,000 residents by 2045, an increase of 48,400 from 2016 projections (SCAG 2020). The project's buildout would not exceed the 2023 Ozone Plan population growth forecast for Palmdale. The project's population growth represents approximately 1.3 percent of the total population growth expected in Palmdale between 2016 and 2045. Therefore, the proposed project would be consistent with AQMP growth assumptions and accommodated within and consistent with the 2023 Ozone Plan, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project 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?

Table 5 and Table 6 summarize maximum daily and annual emissions of pollutants throughout the construction period of the project, respectively. Detailed modeling results are provided in Appendix A. Emissions would not exceed AVAQMD significance thresholds during project construction. Therefore, project construction would not result in a cumulatively considerable net increase of a criteria pollutant, and impacts would be less than significant.

Table 5 Daily Construction Criteria Pollutant Emissions

	Maximum Emissions (lbs/day)					
	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Year 2024	5	38	52	<1	7	4
Construction Year 2025	70	24	51	<1	5	2
Maximum Emissions	70	38	52	<1	7	4
AVAQMD Significance Thresholds	137	137	548	137	82	65
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Table 2.2 "Construction Emissions by Year, Unmitigated" emissions. Highest of summer and winter emissions results are shown for maximum daily emissions. See CalEEMod worksheets in Appendix A.

Table 6 Annual Construction Criteria Pollutant Emissions

	Maximum Emissions (tons/year)					
	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Year 2024	1	3	5	<1	1	<1
Construction Year 2025	1	2	3	<1	<1	<1
Maximum Emissions	1	3	5	<1	1	<1
AVAQMD Significance Thresholds	25	25	100	25	15	12
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Table 2.2 "Construction Emissions by Year, Unmitigated" emissions. See CalEEMod worksheets in Appendix A.

Operational

Table 7 summarizes emissions associated with operation of the project. The majority of operational emissions generated would be due to mobile emissions from vehicle trips to and from the project site. As shown in Table 7 and Table 8, emissions generated during the operation of project would not exceed AVAQMD significance thresholds. Therefore, the project would not result in a cumulatively considerable net increase of a criteria pollutant, and impacts would be less than significant.

Table 7 Daily Operational Criteria Pollutant Emissions

	Maximum Daily Emissions (lbs/day)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Area	8	<1	27	<1	<1	<1
Energy	0	0	0	0	0	0
Mobile	8	6	59	<1	10	2
Project Emissions	16	6	86	<1	10	2
AVAQMD Thresholds	137	137	548	137	82	65
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Project emissions may not sum exactly due to rounding

Source: Table 2.5 "Operations Emissions by Sector, Unmitigated" emissions. Highest summer and winter emissions results are shown for maximum daily emissions. See CalEEMod worksheets in Appendix A.

Table 8 Annual Operational Criteria Pollutant Emissions

	Maximum Annual Emissions (tons/year)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Area	<1	<1	2	<1	<1	<1
Energy	0	0	0	0	0	0
Mobile	1	1	9	<1	2	<1
Project Emissions	2	1	12	<1	2	<1
AVAQMD Thresholds	25	25	100	25	15	12
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Project emissions may not sum exactly due to rounding

Source: Table 2.5 "Operations Emissions by Sector, Unmitigated" emissions. See CalEEMod worksheets in Appendix A.

LESS THAN SIGNIFICANT IMPACT

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Toxic Air Contaminants

CONSTRUCTION

Construction-related activities would result in short-term, project-generated emissions of DPM exhaust emissions from off-road, heavy-duty diesel equipment for site preparation grading, building construction, and other construction activities. DPM was identified as a TAC by CARB in 1998. The potential cancer risk from the inhalation of DPM (discussed in the following paragraphs) outweighs the potential non-cancer health impacts (CARB 2021b).

Generation of DPM from construction projects typically occurs in a single area for a short period. Construction of the proposed project would occur over approximately 18 months. The dose to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that a person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the Maximally Exposed Individual. The risks estimated for a Maximally Exposed Individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period (assumed to be the approximate time that a person spends in a household). OEHHA recommends this risk be bracketed with 9-year and 70-year exposure periods. Health risk assessments should be limited to the period/duration of activities associated with the project.

The maximum $PM_{2.5}$ emissions, which is used to represent DPM emissions for this analysis, would occur during site preparation and grading activities. While site preparation and grading emissions represent the worst-case condition, such activities would occur for three months, less than 3 percent for a 9-year health risk calculation period and less than one percent for a 30-year and 70-year health risk calculation period. $PM_{2.5}$ emissions would decrease for the remaining construction period because construction activities such as building construction, architectural coating, and paving would require less construction equipment. Therefore, DPM generated by project construction is not expected to create conditions where the probability that the Maximally Exposed Individual would contract cancer is greater than 10 in one million. This impact would be less than significant.

OPERATION

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) provides recommendations regarding the siting of new sensitive land uses near potential sources of air toxic emissions (e.g., freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing facilities). CARB guidelines provide the recommended siting distances both for the development of sensitive land uses in proximity to TAC sources and for the addition of new TAC sources in proximity to existing sensitive land uses. Residential land uses do not generate substantial TAC emissions based on the air toxic sources listed in CARB's guidelines. Therefore, the expected hazardous TACs generated on site (e.g., cleaning solvents, paints, landscape pesticides, etc.) for the proposed land uses would be below thresholds warranting further study under the California Accidental Release Program. The project would not expose off-site sensitive receptors to significant amounts of carcinogenic or TACs. Therefore, operational impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Sensitive receptors in the project vicinity include single-family residences at the project boundaries to the east, south and west. Construction activities would be temporary and transitory and associated odors would cease upon construction completion. Such odors disperse rapidly with distance. Accordingly, the proposed project would not create objectionable odors affecting a substantial number of people during construction, and short-term impacts would be less than significant.

The project does not include land uses typically associated with odor complaints such as sewage treatment plants, landfills, recycling facilities, and agricultural uses. Vehicles approaching, idling, and leaving the site may release odorous exhaust emissions. Odors of this nature disperse rapidly with distance and do not typically result in odor impacts. Additionally, the project site is located adjacent to Palmdale Boulevard, an arterial road, so vehicle exhaust is already prevalent in the project area. For these reasons, operational odor impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

4 Biological Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	□	■	□	□
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?	□	■	□	□
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	□	■	□	□
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	□	□	■	□
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	□	■	□	□
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	□	□	□	■

A field reconnaissance survey of the biological study area (BSA) was conducted on September 21, 2022, to document the existing site conditions and evaluate the potential for presence of sensitive biological resources. The Biological Resources Assessment is included as Appendix B. In addition, western Joshua trees were documented on the project site during a western Joshua tree assessment conducted on July 21, 2021. One vegetation community, *Yucca brevifolia* Woodland Alliance (Joshua tree woodland), was identified in the BSA. This community generally occurs in alluvial fans, ridges, and gentle to moderate slopes. Canopy, shrub layer, and herbaceous layer is open to intermittent with perennial grasses and seasonal annuals.

One shallow, ephemeral drainage intersects the project site and adjacent parcel which may generally convey stormwater runoff from the residential development to the south and from Palmdale Avenue to the north during significant rain events. This drainage feature is not identified in the National Hydrogeography Dataset or National Wetlands Institute; however, it is identified as a dashed "blue-line stream" in U.S. Geological Survey topographic maps. Due to the presence of a defined bed and bank, indicated by the break in slope, the California Department of Fish and Wildlife (CDFW) may assert jurisdiction over this drainage. As of December 2022, the portion of the drainage in APN 3023-002-016 is under construction and will be filled in pursuant to Streambed Alteration Agreement EPIMS-LAN-23730-R5 and a new temporary nine-foot dirt swale will be constructed to divert flow from the portion of the drainage on APN 3023-002-184 to a stormwater basin south of the project. Grading associated with the proposed project would eliminate the entirety of the remainder of the drainage, as well as the new temporary swale, approximately 0.75 acre, and replace it with underground storm drains which would outlet into an on-site basin. The drainage does not provide surface flows to adjacent waters of the State or waters of the U.S.

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

The literature search identified 19 special status plant species and 31 special status wildlife species within the nine-quad search area. Of the 19 special status plants and 31 special status wildlife species identified, the BSA contains suitable habitat for western Joshua tree and short-joint beavertail cactus as well as California glossy snake, coast horned lizard, burrowing owl, loggerhead shrike, LeConte's thrasher, and nesting birds. Direct and potentially indirect impacts to these species may occur as a result of construction activities.

Western Joshua Trees and Short-Joint Beavertail Cacti

Western Joshua tree (State Candidate) has been documented across the project site and short-joint beavertail cactus (California Rare Plant Ranks 1B.2) has a moderate potential to occur. Because short-joint beavertail cactus is identifiable at any season but was not observed during the reconnaissance survey, its abundance on the site is expected to be low, if any. Construction of the project would impact these species directly on-site by permanent removal of 181 western Joshua tree individuals and habitat, and potentially indirectly in the native habitat to the north through construction dust and other human disturbances that may prevent photosynthesis or degrade habitat. The extensive areas of natural habitat to the north would remain suitable for short-joint beavertail cactus and large enough to support robust populations of this species, and proposed activity at the project site would not substantially affect those regional populations. Absent mitigation, impacts to western Joshua trees would be potentially significant and impacts to short-joint beavertail cacti would be less than significant. Implementation of Mitigation Measures BIO-1 and BIO-2 would reduce impacts to western Joshua trees to less than significant and further reduce impacts to short-joint beavertail cacti.

Burrowing Owls

Burrowing owl are a ground-dwelling species that rely on small mammals and large insects for prey. If owls are present, construction of the project could impact individuals directly by construction-related injury or mortality and permanent removal of habitat, and potentially indirectly in the native habitat to the north due to construction noise, dust, and other human disturbances that may cause a nest to fail. The relatively small project footprint of the site, compared to the amount of available suitable habitat for these species, suggests that site development is unlikely to result in population-level impacts. The presence of extensive areas of natural habitat to the north would remain suitable and large enough to support robust populations of these species, and proposed activity at the project site would not substantially affect those regional populations; therefore, impacts would not be significant. However, implementation of Mitigation Measures BIO-1, BIO-3, and BIO-4 would ensure compliance with federal and State law by avoiding the take of burrowing owls or destruction of their nests.

Special Status Reptiles

California glossy snake and coast horned lizard (CDFW Species of Special Concern [SSCs])) both have a moderate potential to occur on the project site. If the animals are present, construction of the project would impact these species directly by permanent removal of habitat, and potentially indirectly due to construction noise, dust, and other human disturbances in the native habitat to the north. The relatively small project footprint of the site, compared to the amount of available suitable habitat for these species, suggests that site development is unlikely to result in population-level impacts. The extensive areas of natural habitat to the north would remain suitable and large enough to support robust populations of these species, and proposed activity at the project site would not substantially affect those regional populations. Therefore, potential impacts to special status reptiles would be less than significant.

Special Status and Nesting Birds

Loggerhead shrike and LeConte’s thrasher (CDFW SSCs) as well as migratory or other common nesting birds are protected by the California Fish and Game Code (CFGC) Sections 3503 and 3503.5, and the federal Migratory Bird Treaty Act (MBTA) and may nest in ornamental trees, grass, bare ground, burrows/cavities, man-made structures and shrubs on or adjacent to the project site. Construction of the project thus has the potential to directly (by destroying a nest) or potentially indirectly (construction noise, dust, and other human disturbances that may cause a nest to fail) impact nesting birds protected under the CFGC and MBTA. Absent mitigation, impacts to special status birds would be potentially significant. Implementation of Mitigation Measures BIO-1, and BIO-4 would reduce impacts to these species to less than significant and would also ensure compliance with federal and State law by avoiding take of all nesting birds.

Desert Kit Fox

While the desert kit fox is not a special-status species, take of this species is prohibited by CDFW regulations (14 CCR 760) and must be avoided. Desert kit fox has moderate potential to occur on the project site due to the presence of suitable habitat, and individuals could be killed or injured by construction equipment if present on the site during construction. Because it is a common species, impacts to the desert kit fox would not rise to the level of significance under CEQA. However, the survey and avoidance measures described in recommended Mitigation Measure BIO-5 would ensure compliance with CDFW regulations.

BIO-1 Environmental Worker Education Training Program

Before any ground disturbing work (including vegetation clearing and grading) occurs in the construction footprint, a qualified biologist shall conduct a mandatory biological resources awareness training for all construction personnel. Topics to discuss include sensitive species that may be encountered in the project area, photographs to aid in identification of sensitive species that may be encountered, the laws and codes that regulate these species, and the protection measures that must be followed to avoid and minimize impacts. The training shall also include good housekeeping measures and best management practices. If new construction personnel are added to the project, the contractor shall ensure that the new personnel receive the mandatory training before starting work. The subsequent training of personnel may include video of the initial training and/or the use of written materials rather than in-person training by a biologist.

BIO-2 Western Joshua Tree Avoidance and Compensatory Mitigation

- A Desert Vegetation Preservation Plan shall be developed and submitted to the City of Palmdale. The plan shall include:
  - A report and site plan prepared by a desert native plant specialist which depicts the location of each Joshua tree, discusses their age and health, identifies and locates all trees and shrubs which can be saved in place or relocated.
  - A site landscaping plan showing the proposed location of those Joshua trees or, and any other native desert vegetation that will remain on-site.
  - A long-term maintenance program for any desert vegetation preserved on the site. The minimum term of any maintenance program shall be two growing seasons, unless a shorter length of time is determined by the City's Landscape Architect, or in cases where the trees retained on the site are of such health and vigor after one growing season that their survival is assured.
- A desert vegetation removal permit shall be obtained from the City's Landscape Architect, prior to the removal of any native desert vegetation as defined in this chapter.
- A Western Joshua Tree Conservation Act Permit shall be obtained prior to the removal of any Joshua trees.
- Prior to receiving take authorization from the participating agency, the project proponent shall pay mitigation fees to the participating agency for deposit into the Western Joshua Tree Conservation Fund.

BIO-3 Burrowing Owl Pre-construction Clearance Survey

A qualified wildlife biologist shall conduct a pre-construction survey of proposed impact areas to confirm presence/absence of burrowing owl individuals no more than 14 days prior to construction. The survey methodology shall be consistent with the methods outlined in the CDFW *Staff Report on Burrowing Owl Mitigation* (2012). If no active breeding or wintering owls are identified, no further mitigation is required.

If burrowing owl is detected on-site, the following mitigation measures shall be implemented in accordance with the *CDFW Staff Report on Burrowing Owl Mitigation* (2012):

- The project proponent shall hire a qualified wildlife biologist that should be on-site during initial ground-disturbing activities in potential burrowing owl habitat identified throughout the habitat assessment.
- No ground-disturbing activities shall be permitted within a buffer no less than 200 meters (656 feet) from an active burrow, depending on the level of disturbance, unless the qualified biologist determines a reduced buffer would not adversely affect the burrowing owl(s).
- Occupied burrows shall not be disturbed during the nesting season (February 1 to August 31).
- During the nonbreeding (winter) season (September 1 to January 31), ground-disturbing work can proceed near active burrows as long as the work occurs no closer than 50 meters (165 feet) from the burrow, depending on whether the level of disturbance is low, and if the active burrow is not directly affected by the project activity. A smaller/larger buffer may be established by the qualified biologist following monitoring and assessments of the project's effects on the burrowing owls. If active winter burrows are found that would be directly affected by ground-disturbing activities, owls can be excluded from winter burrows according to recommendations made in the *Staff Report on Burrowing Owl Mitigation* (2012). Additionally, if burrowing owls are found on-site, a qualified biologist shall prepare and submit a passive relocation program in accordance with Appendix E (i.e., Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans) of the *CDFW Staff Report on Burrowing Owl Mitigation* (2012) for CDFW review and approval prior to the commencement of disturbance activities on-site.
- Burrowing owls shall not be excluded from burrows until a Burrowing Owl Exclusion Plan is developed based on the recommendations made in Appendix E (i.e., Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans) of the CDFW St*aff Report on Burrowing Owl Mitigation* (2012). The Burrowing Owl Exclusion Plan shall be submitted to CDFW for review and approval prior to the commencement of disturbance activities on-site.
- Prior to passive relocation, the project proponent shall be responsible for acquiring compensatory mitigation at a ratio of 1:1 for lost breeding and/or wintering habitat. Mitigation shall be implemented on- or off-site including permanent conservation and management of burrowing owl habitat through the recordation of a conservation easement, funding of a non-wasting endowment, and implementation of a Mitigation Land Management Plan based on the CDFW *Staff Report on Burrowing Owl Mitigation* (2012) and CDFW guidance. Mitigation lands shall be identified through coordination with CDFW and on, adjacent, or proximate to the impact site where possible and where habitat is suitable to support burrowing owl. If required, compensatory mitigation shall be completed prior to passive relocation of owls and completion of construction.
- When a qualified biologist determines that burrowing owls are no longer occupying the project site and passive relocation is complete, construction activities may begin. A final letter shall be prepared by the qualified biologist documenting the results of the passive relocation. The letter shall be submitted to CDFW.

BIO-4 Pre-construction Nesting Bird Surveys

The following measure is required to maintain compliance with the CFGC Sections 3503 and 3503.5 and the MBTA with respect to nesting birds:

- If construction activities take place during the bird nesting season (generally February 1 through August 31, but variable based on seasonal and annual climatic conditions), nesting bird surveys shall be performed by a qualified biologist within three days prior to project activities to determine the presence/absence, location, and status of any active nests on site and within 100 feet of the site.
- If nesting birds are found on site, a construction buffer of appropriate size (as determined by the qualified biologist) shall be implemented around the active nests and demarcated with fencing or flagging. If ground/burrow nesting birds are identified, demarcation materials that do not provide perching habitat for predatory bird species shall be used. Nests shall be monitored at a minimum of once per week by the qualified biologist until it has been determined that the nest is no longer being used by either the young or adults. No ground disturbance shall occur within this buffer until the qualified biologist confirms that the breeding/nesting is complete, and all the young have fledged and are capable of surviving independently of the nest. If project activities must occur within the buffer, they shall be conducted at a distance that will prevent project-related disturbances, as determined by the qualified biologist.

If no nesting birds are observed during pre-construction surveys, no further actions are necessary.

BIO-5 Desert Kit Fox

A qualified biologist shall conduct a preconstruction survey for desert kit fox no more than 30 days prior to initiation of construction activities. Inactive dens directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse. Potentially active dens directly impacted by construction activities shall be monitored for three consecutive nights using a tracking medium such as diatomaceous medium or fire clay and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand. If tracks are observed, dens shall be fitted with the one-way trap doors to encourage animals to move off-site. After 48 hours post installation, the den shall be excavated by hand and collapsed. If an active natal den is detected, construction buffer of appropriate size (as determined by the qualified biologist) shall be implemented around the natal den and demarcated with fencing or flagging.

Significance After Mitigation

Mitigation Measures BIO-1 through BIO-5 require pre-construction survey and biological monitoring be conducted prior to and during ground disturbing activities at the project site. If unanticipated special status species or nesting birds are encountered during ground disturbance, work in the immediate area of the find would stop and a qualified biologist would be contacted immediately. Implementation of Mitigation Measures BIO-1 through BIO-5 would avoid or reduce the project's potentially significant impacts to any sensitive species and nesting birds that may be encountered during ground disturbing activities.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. *Would the project 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?*

The proposed project would directly impact 20 gross acres of Joshua tree woodland, as the entire project is subject to clearing and grading. In addition, the proposed project would also indirectly impact the parcel to the north through excessive dust potentially limiting photosynthesis. Implementation of Mitigation Measures BIO-1 and BIO-2 would reduce impacts to sensitive natural communities to less than significant.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. *Would the project 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?*

The on-site drainage is potentially subject to CDFW jurisdiction. The drainage contains a distinct bed and bank that generally conveys surface water flow from stormwater runoff away from the residential development to the south. Grading associated with project construction would eliminate the entirety of the drainage, approximately 0.75 acre, and replace it with underground storm drains that would outlet into an on-site basin. These impacts to jurisdictional areas would be considered significant but mitigable. Of the 0.75 acres to be impacted, the project proponent has already mitigated 0.49 acres as part of the adjacent project (EPIMS-LAN-23730-R5). As such, the remaining 0.26 acres still need to be mitigated as part of the proposed project.

Obtaining a permit from CDFW and potentially providing compensatory mitigation, as required by Mitigation Measure BIO-6, would reduce potential direct and indirect impacts to this feature to a less than significant level.

BIO-6 Jurisdictional Waters and Wetlands

Prior to ground disturbance activities, the project proponent shall consult with CDFW. Based on such consultation, if permits are required for the project, appropriate permits shall be obtained prior to disturbance of jurisdictional resources. In addition, compensatory mitigation for impacts to jurisdictional features shall be identified prior to disturbance of the features. A 1:1 mitigation ratio shall be used, unless a higher ratio is required by CDFW. Mitigation may take the form of permittee-responsible on-site or off-site mitigation, or purchasing credits from an approved mitigation bank. The project proponent shall comply with the compensatory mitigation required and proof of compliance, along with copies of permits obtained from CDFW shall be provided to the City.

Significance After Mitigation

Mitigation Measure BIO-6 requires compensatory mitigation of jurisdictional resources on a 1:1 or greater ratio. Implementation of Mitigation Measure BIO-6 would reduce the project's potentially significant impacts to jurisdictional resources on the project site.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

d. Would the project 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?

Wildlife corridors are generally defined as connections between habitat areas that allow for physical and genetic exchange between otherwise isolated animal populations. Such linkages may serve a local purpose, such as between foraging and denning areas, or they may be regional in nature, allowing movement across the landscape. Some habitat linkages may serve as migration corridors, wherein animals periodically move away from an area and then subsequently return. Examples of barriers or impediments to movement include housing and other urban development, roads, fencing, or open areas with little vegetative cover.

As discussed above, project site is surrounded by residential developments on the west, south, and east sides; and the site is bounded to the north by Palmdale Boulevard, a heavily traveled road. The project site is disturbed by dumping, and recreational use by pedestrians and OHVs. Potential wildlife movement on the project site could only occur between the natural habitat block to the north and the surrounding residential developments, which does not significantly contribute to a wildlife movement corridor. Therefore, the proposed project would not interfere with the movement of any native wildlife species. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

PMC Chapter 14.04 (Joshua Tree and Native Vegetation Preservation)regulates the implementation of the proposed project would result in permanent direct impacts to all western Joshua trees onsite, as the entire project site is subject to clearing and grading. In addition, the proposed project would indirectly impact the parcel to the north through excessive dust potentially limiting photosynthesis. As part of compliance with the PMC, implementation of Mitigation Measures BIO-1 and BIO-2 would reduce potential impacts to western Joshua trees and native desert vegetation to less than significant. No other tree species would be affected by the project. Potential impacts would be less than significant.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project site is not located within or near an area subject to an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other approved habitat conservation plan at the local, regional, or State levels. Therefore, no impact would occur.

NO IMPACT

5 Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	□	□	■	□
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	□	■	□	□
c. Disturb any human remains, including those interred outside of formal cemeteries?	□	□	■	□

CEQA requires a lead agency to determine whether a project may have a significant effect on historical resources (Public Resources Code Section 21084.1) and Tribal cultural resources (Public Resources Code Section 21074 [a][1][A]-[B]). Tribal cultural resources are discussed in Section 18, *Tribal Cultural Resources* of this IS-MND.

A historical resource is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR); a resource included in a local register of historical resources; or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (CEQA Guidelines, Section 15064.5[a][1-3]).

A resource shall be considered historically significant if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, if it can be demonstrated that a project would cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that resources cannot be left undisturbed, mitigation measures are required (Public Resources Code Section 21083.2[a], [b]).

Public Resources Code Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it:

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

A Cultural Resources Study was conducted by BFSA Environmental Services (BFSA), a Perennial Company, on November 11, 2022, to locate and record any cultural resources present within the project site and subsequently evaluate any resources as part of the City of Palmdale's environmental review process. The BFSA Cultural Resources Study is included as Appendix C1.

As a part of the Cultural Resources Study an archaeological records search for a one-mile radius was conducted by BFSA through the South Central Coastal Information Center (SCCIC) at CSU Fullerton on October 20, 2022. The SCCIC records search results identified eight previously recorded resources, all historic, located within one mile of the project, none of which are located within the project's boundaries. The records search also identified 29 previous studies conducted within one mile of the project, two of which include the subject property (Norwood 1989; ERCE 1991). Both previous reports include the study of approximately 2,500 acres conducted in support of the City of Palmdale's Eastside General Plan Amendment (GPA90-15). Norwood (1989) initially noted three trash scatters within the current project; however, the scatters were not formally recorded, and only superficial information was collected. Based upon Norwood's assessment, these trash scatters were associated with period between the late 1940s and 1960s.

A field survey was conducted on October 25, 2022, by BFSA. During the survey, a 50- by 50-foot historic trash scatter was identified within the northern third of the project area. It is not clear if this finding corresponds with any of the three trash scatters previously noted within the property by Norwood (1989). However, based upon a review of the identified surface scatter, the finding represents a single episode of transient refuse disposal which occurred between the late 1930s and 1950s. Based upon the results of the current study, the finding is not considered eligible for the California Register of Historical Resources (CRHR) as the scatter does not retain any additional research value given the observable lack of a subsurface component and the limited information the historic artifacts can provide. Further, the integrity of the site has been impacted by recent disturbances to the property.

A Sacred Lands File (SLF) search was also requested from the Native American Heritage Commission (NAHC), which was returned with negative results. The Cultural Resources Study concluded that the property has potential to yield additional archaeological resources that may have been obscured or buried by the previous impacts to the property. As a result, it is recommended that an archaeological monitor be present during future ground disturbances associated with the project to observe grading and identify any historic or prehistoric resources that may be exposed by earthwork.

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

CEQA Guidelines Section 15064.5 defines "substantial adverse change" as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource is materially impaired. CEQA Guidelines, Section 15064.5, subdivision (b)(2), defines "materially impaired" for purposes of the definition of "substantial adverse change" as follows:

The significance of an historical resource is materially impaired when a project:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

As described above and in the Cultural Resources Report provided by BFSA dated November 11, 2022, no eligible historical resources are documented within the project site. In addition, review of historic registers and inventories indicate that no recorded historical landmarks or points of interest are present within the project area. However, the field survey, conducted on October 25, 2022, revealed a 50- by 50-foot scatter of approximately 100 vent hole/hole-in-top and sanitary cans, glass, and ceramic fragments. A close inspection of the artifact scatter and the surrounding soils indicates that the site has no depth. The types of cans identified at the site were utilized most commonly after the 1920s and 1930s, the Cultural Resources Study suggests the finding likely dates to between the late 1930s and 1950s, but it is not considered eligible for the CRHR as the scatter does not retain any additional research value given the observable lack of a subsurface component. Therefore, the project would have a less than significant impact on the significance of a historical resource as defined in Section 15064.5(b) of the CEQA Guidelines.

LESS THAN SIGNIFICANT IMPACT

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

As documented above, the BFSA Cultural Resources Study found no eligible historical or archaeological resources on the project site. However, the study concludes that the project site has the potential to yield archaeological resources that may have been obscured by the previous impacts to the property. As a result, it is recommended that an archaeological monitor be present during future ground disturbances associated with the project to observe grading and identify any historic or prehistoric resources that may be exposed by earthwork. The monitoring program should include Native American observers only in the event that prehistoric deposits are discovered, as described below in Mitigation Measure CR-1. The project would have a less than significant impact with mitigation.

Mitigation Measure

CR-1 Archaeological Monitoring Program

The applicant shall retain a qualified archaeological to spot-check and/or monitor all project-related ground disturbing activities. Archaeological monitoring shall be performed under the direction of an archaeologist meeting the Secretary of the Interior's Professional Qualification Standards for archeology (National Park Service 2020). Monitors will have the authority to halt and redirect work should any archaeological resources be identified during monitoring. If archaeological resources are encountered during ground-disturbing activities, work in the immediate area must halt and the find evaluated for listing in the California Register of Historical Resources (CRHR) and National Register of Historical Place (NRHP). Archaeological monitoring may be reduced or halted at the discretion of the project archaeologist, in consultation with the lead agency, as warranted by conditions such as encountering bedrock, sediments being excavated are fill, or negative findings during the first 50 percent of ground-disturbance. If monitoring is reduced to spot-checking, spot-checking shall occur when ground-disturbance moves to a new location within the project site and when ground disturbance extends to depths not previously reached (unless those depths are within bedrock). In the event that archaeological resources are unexpectedly encountered during ground-disturbing activities, work in the immediate area should be halted within 50 feet of the find and a qualified archaeologist should be contacted immediately to evaluate the find. If the find is prehistoric, then a Native American representative should also be contacted to participate in the evaluation of the find. If necessary, the evaluation may require preparation of a treatment plan and archaeological testing for CRHR eligibility. If the discovery proves to be eligible for the CRHR and cannot be avoided by the proposed project, additional work, such as data recovery excavation, may be warranted to mitigate any significant impacts to historical resources. The monitors shall submit a report to the City to document compliance within 30 days of completion of ground disturbing activities.

Significance After Mitigation

Mitigation Measure CR-1 requires archaeological monitoring be conducted during ground disturbing activities at the project site. If unanticipated archaeological resources are encountered during ground disturbance, work in the immediate area of the find would stop and a qualified archaeologist would be contacted immediately. Implementation of Mitigation Measure CR-1 would avoid or reduce the project's potentially significant impacts to any archaeological resources that may be found during ground disturbing activities.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

The project site is not part of a formal cemetery and is not known to have been used for disposal of historic or prehistoric human remains. There are no known human remains on the site. Therefore, human remains are not expected to be encountered during construction of the proposed project. In the unlikely event that human remains are encountered during project construction, State Health and Safety Code Section 7050.5 requires ground disturbance in the area of the find to halt until the County Coroner has made the necessary findings as to the origin and disposition of the remains pursuant to Public Resources Code Section 5097.98. Compliance with these regulations would ensure the proposed project would not result in significant impacts due to disturbing human remains, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

6 Energy

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

The proposed project would consume energy during the construction and operation of the single-family residential units and community amenities. The proposed project would install a photovoltaic (PV) system to create electricity that would power the residential units and the community amenities to heat and cool the buildings. In addition, construction activities consume gasoline and diesel fuels by on-road construction equipment, including worker and vendors trucks mobile emissions to and from the project site. Southern California Edison (SCE) would provide electricity to the project site. The proposed project would not include natural gas connections, as such, natural gas energy consumption excluded from this analysis.

Most of California's electricity is generated in-State with approximately 30 percent imported from the northwestern and southwestern states in 2021 (California Energy Commission [CEC] 2022a). In addition, 33.6 percent of California's electricity supply in 2021 came from renewable energy sources, such as wind, solar photovoltaic, geothermal, and biomass (CEC 2022a). On September 16, 2022, SB 1020 created clean electricity targets for eligible renewable energy resources and zero-carbon resources to supply 90 percent of retail sale electricity by 2035, 95 percent by 2040, 100 percent by 2045, and 100 percent of electricity procured to serve all State agencies by 2035. Table 9 summarizes the electricity consumption for Los Angeles County and SCE, as compared to statewide consumption.

Table 9 2021 Electricity and Natural Gas Consumption

Energy Type	Los Angeles County	SCE	California	Proportion of SCE Consumption	Proportion of Statewide Consumption[1]
Electricity (GWh)	65,375	81,129[2]	277,764	29%	24%

GWh = gigawatt-hours; SCE = Southern California Edison.

[1] For reference, the population of Los Angeles County (9,861,224 persons) is approximately 25.2 percent of the population of California (39,185,605 persons) (California Department of Finance 2022).

Source: CEC 2022a and 2022b

Petroleum-based fuels are used for approximately 83 percent of the State's transportation activity (United States Energy Information Administration [EIA] 2022). Gasoline, which is used by light-duty cars, pickup trucks, and sport utility vehicles, is the most used transportation fuel in California with 13.8 billion gallons sold in 2021 (CEC 2022c). Diesel, which is used primarily by heavy duty-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm equipment, and heavy-duty construction and military vehicles, is the second most used fuel in California with 1.9 billion gallons sold in 2021 (CEC 2022c). Table 10 summarizes the petroleum fuel consumption for Los Angeles County, as compared to statewide consumption.

Table 10 2021 Annual Gasoline and Diesel Consumption

Fuel Type	Los Angeles County (million gallons)	California (million gallons)	Proportion of Statewide Consumption[1]
Gasoline	3,061	13,818	7%
Diesel	224	1,883	9%

[1] For reference, the population of Los Angeles County (9,861,224 persons) is approximately 25.2 percent of the population of California (39,185,605 persons) (California Department of Finance 2022).
Source: CEC 2022c

Methodology

Fuel consumption associated with project construction and operation was estimated based on the CalEEMod outputs in the Air Quality Greenhouse Gas Emissions Study (Appendix A). The project assumptions for CalEEMod are described under Section 3, *Air Quality.* The project's fuel consumption during construction activities was estimated based on the applicant-provided construction schedule and the number of construction equipment. Default CalEEMod assumptions for construction vehicle trips (e.g., worker and vendor trips) were used. See Appendix A for construction equipment and vehicle fuel consumption calculations.

Operational fuel consumption was based on the project's anticipated average daily vehicle trips, and the project's residential consumptions of electricity. Default CalEEMod assumption for vehicle miles traveled (VMT) per trip were used. Annual VMT is calculated and found in the CalEEMod outputs. Operational fuel consumption is estimated by multiplying the annual VMT by the default CalEEMod fleet mix and the average fuel economy. See Appendix D for the operational fuel consumption calculations of the project.

a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The proposed project would use nonrenewable and renewable resources for construction and operation of the project. The anticipated use of these resources is detailed in the following subsections. As supported by the discussion below, the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources that would result in a significant environmental impact.

Construction Energy Demand

The project would require site preparation and grading, building construction, architectural coating, and landscaping and hardscaping. During construction, energy would be consumed in the form of petroleum-based fuels used to power off-road construction vehicles and equipment on the project site, construction worker travel to and from the project site, and vehicles used to deliver materials to the site. The consumption of electricity and natural gas to power the project's off-road construction vehicles and equipment would be negligible based on standard construction vehicle fleet mix fuel consumption. As shown in Table 11, project construction would require approximately 55,563 gallons of gasoline and approximately 117,207 gallons of diesel fuel. These construction energy estimates are conservative because they assume that the construction equipment used in each phase of construction is operating every day of construction.

Table 11 Estimated Fuel Consumption during Construction (gallons)

Source	Gasoline	Diesel
Construction Equipment & Hauling Trips	–	117,207
Construction Worker Vehicle Trips	55,563	–

See Appendix D for energy calculation sheets

Energy use during construction would be temporary in nature, and construction equipment used would be typical of similar-sized construction projects in the region. In addition, construction contractors would be required to comply with the provisions of California Code of Regulations (CCR) Title 13 Sections 2449 and 2485, which prohibit diesel-fueled commercial motor vehicles and off-road diesel vehicles from idling for more than five minutes and would minimize unnecessary fuel consumption. Construction equipment would be subject to the USEPA Construction Equipment Fuel Efficiency Standard, which would also minimize inefficient, wasteful, or unnecessary fuel consumption. Furthermore, per applicable regulatory requirements such as California's Green Building Standards Code (CALGreen; CCR, Title 24, Part 11), the project would comply with construction waste management practices to divert a minimum of 65 percent of construction and demolition debris. These practices would result in efficient use of energy necessary to construct the project. In the interest of cost-efficiency, construction contractors also would not utilize fuel in a manner that is wasteful or unnecessary. Therefore, the project would not involve the inefficient, wasteful and unnecessary use of energy during construction, and the construction-phase impact related to energy consumption would be less than significant.

Operational Energy Demand

Operation of the proposed project would increase area energy demand from greater electricity consumption compared to current conditions on the undeveloped site. Electricity would be used for heating and cooling systems, lighting, appliances, water use, and the overall operation of the project buildings. Gasoline and diesel fuel consumption would be used for motor vehicle travel to and from the project site.

Table 12 summarizes estimated operational energy consumption for the proposed project. As shown therein, project operation would require approximately 210,455 gallons of gasoline and 47,371 gallons of diesel for transportation fuels. The project would require 1.44 GWh of electricity per year from a PV system, therefore, electricity consumption is anticipated to have a net zero draw from the grid. Residential vehicle trips would represent the greatest operational use of energy associated with the proposed project.

Table 12 Estimated Project Annual Operational Energy Consumption

Source	Energy Consumption[1]	MMBtu Conversion (MMBtu)
Transportation Fuels[2]		
Gasoline	210,455 gallons	23,105
Diesel	47,371 gallons	6,038
Building Operations		
Electricity	1.44 GWh	4,916
Total Energy Consumption		**34,059**

MMBtu = million metric British thermal units; GWh = Gigawatt hours

[1] Energy consumption is converted to MMBtu for each source

[2] The estimated number of average daily trips associated with the project is used to determine the energy consumption associated with fuel use from operation of the project. According to CalEEMod calculations (see Appendix A), the project would result in approximately 3,788,152 annual VMT.

Source: Appendices A and D

The project would be required to comply with the standards established in the CCR Title 24, which would minimize the wasteful, inefficient, or unnecessary consumption of energy resources during operation. CALGreen (CCR, Title 24, Part 11) requires implementation of energy efficient light fixtures and building materials into the design of new construction projects. Furthermore, the 2022 Building Energy Efficiency Standards (Title 24, Part 6) requires newly constructed buildings to meet energy performance standards set by the CEC. These standards are specifically crafted for new buildings to result in energy efficient performance. Therefore, the proposed project would not lead to wasteful, inefficient, or unnecessary consumption of energy resources. Potential impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

New development on the project site would increase energy consumption through electricity to power facilities and heating and cooking. In addition, petroleum is used in motor vehicles used by residents. In 2011, the city adopted an Energy Action Plan to achieve energy independence and energy efficiency and conservation 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. Since then, the City of Palmdale released its 2045 General Plan in October 2022, establishing a series of goals and policies to reduce GHG emissions and increase sustainability. The Plan's Sustainability, Climate, and Resilience chapter serve as the Climate Action Plan (CAP) for the City of Palmdale. Goals and policies from the 2045 General Plan are described in Section 8, *Greenhouse Gas Emissions.* In addition, the following goals, policies, and actions related to Energy Action Plan include (City of Palmdale 2011):

Goal 1: Reduce Energy Demand Through Energy Conservation and Efficiency

Measure 1.3: Energy Efficiency in New Development.

Measure 1.6: Residential Energy Efficiency.

Goal 3: Promote Renewable Energy Generation and Use.

> **Measure 3.3**: Residential Renewable Energy. Encourage the residential sector to meet energy needs through on-site renewable energy sources.

The project would also be subject to State requirements for energy efficiency, including the mandatory measures for residential development contained in the 2022 CALGreen and Title 24 Building Energy Efficiency Standards. The proposed project would comply with Title 24 Building Energy Efficiency Standards by including renewable energy on-site using a solar PV system to provide power to the single-family residences and community amenities. Additionally, the project would include water-efficient appliances and fixtures in every residential unit, as well as drought tolerant landscaping and water efficient irrigation systems in accordance with the CALGreen standards, which would reduce the project's water use and energy needed to provide water to the project. These sustainability features align with the energy efficiency goals established in the City's Energy Action Plan and 2045 General Plan. Therefore, the project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency, and there would be a less than significant impact.

LESS THAN SIGNIFICANT IMPACT

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7 Geology and Soils

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1. 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?	☐	☐	■	☐
2. Strong seismic ground shaking?	☐	☐	■	☐
3. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
4. Landslides?	☐	☐	■	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	■	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	■	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	■
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	■	☐	☐

A Geologic and Geotechnical Engineering Investigation was prepared by GeoSoils Consultants Inc. on October 27, 2021, to study the soil conditions of the project site. It was concluded that the project site was considered feasible from a geologic and geotechnical engineering standpoint. The report included recommendations to be followed during grading. The report has been included as Appendix E and attached to this report.

a.1. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving 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?

a.2. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

The project site is in a seismically active area of southern California, and therefore, could experience strong ground shaking from local and regional faults. A fault that has ruptured in at least the last 11,700 years is considered to have a higher potential of future seismicity and is considered an active fault by the Alquist-Priolo Earthquake Fault Zoning Act. Faults with evidence of longer earthquake frequency events are considered to have a lower potential of future seismicity. According to California Geological Survey (CGS), the project site is not located in an Alquist-Priolo Fault Zone (CGS 2022). However, the site is situated in a region subject to strong earthquakes occurring along active faults such as the San Andreas, Nadeau, Cemetery, Little Rock, and Leona Avenue. The closest known active fault to the site is the San Andreas fault which is located at a distance of approximately 3.2 miles southwest of the site. The possibility of ground acceleration, or shaking at the project site, may be considered as approximately similar to the southern California region as a whole.

To reduce geologic and seismic impacts, the City regulates development through the requirements of the CBC. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The earthquake design requirements of the CBC consider the occupancy category of the structure, site class, soil classifications, and various seismic coefficients. The CBC provides standards for various aspects of construction, including but not limited to excavation, grading, earthwork, construction, preparation of the site prior to fill placement, specification of fill materials, fill compaction and field testing, retaining wall design and construction, foundation design and construction, and seismic requirements. It includes provisions to address issues such as, but not limited to, ground shaking. In accordance with California law, project design and construction would be required to comply with provisions of the CBC. Because the project would comply with the CBC and because the project would not exacerbate existing ground shaking hazards, impacts related to seismically induced ground shaking and fault rupture would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.3. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

a.4. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

Liquefaction is a process whereby soil is temporarily transformed to fluid form during intense and prolonged ground shaking or because of a sudden shock or strain. Typically, liquefaction occurs in areas where there are loose soils and the depth to groundwater is less than 50 feet from the surface. The project site is not located within a mapped liquefaction or landslide area identified by the California Geological Survey (CGS 2022). In addition, according to the Geotechnical Engineering Investigation, the site is underlain by dense alluvium and groundwater levels are below at least 50 feet (Appendix E). As a result, the site is not subject to liquefaction. Due to the relatively flat topography of the site and surrounding areas, the project site is not at risk of landslides.

Furthermore, design and construction of the project would conform to the current seismic design provisions of the CBC, which incorporates the latest seismic design standards for structural loads and materials, as well as provisions from the National Earthquake Hazards Reduction Program, to mitigate losses from an earthquake, including liquefaction, and provide for the latest in earthquake safety. While the project would be susceptible to seismic activity given its location within a seismically active area, the project site is not susceptible to liquefaction or landslides and would be required to minimize this risk, to the extent feasible, through the incorporation of applicable CBC standards. Therefore, the project would not result in substantial adverse impacts related to liquefaction or landslides, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project result in substantial soil erosion or the loss of topsoil?

The proposed project involves the construction of a new single-family residential community on a project site that is currently vacant. Construction activities have the potential to result in soil erosion, particularly during grading and excavation activities. Fugitive dust caused by strong wind and/or earth-moving operations during construction would be minimized through compliance with SCAQMD Rule 403, which prohibits visible particulate matter from crossing property lines. Standard practices to control fugitive dust emissions include watering of active grading sites, covering soil stockpiles with plastic sheeting, and covering soils in haul trucks with secured tarps. In addition, the potential for project construction activities to result in increased erosion and sediment transport by stormwater to surface waters would be minimized because the project would be required to comply with a Construction General Permit, which is issued by the State Water Resources Control Board (SWRCB). The Construction General Permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP), which outlines BMPs to reduce erosion and topsoil loss from stormwater runoff (also refer to the discussion in Section 10, *Hydrology and Water Quality*). Compliance with the Construction General Permit would ensure that BMPs are implemented during construction and minimize substantial soil erosion or the loss of topsoil. Upon completion of construction, the project site would be stabilized with landscaping and paving, and operational activities would not result in soil erosion. Therefore, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. *Would the project 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?*

Lateral spreading is the horizontal movement or spreading of soil toward an open face. Lateral spreading may occur when soils liquefy during an earthquake event, and the liquefied soils with overlying soils move laterally to unconfined spaces. Subsidence is the sudden sinking or gradual downward settling of the earth's surface with little or no horizontal movement. Subsidence is caused by a variety of activities that include, but are not limited to, withdrawal of groundwater, pumping of oil and gas from underground, the collapse of underground mines, liquefaction, and hydrocompaction. Collapse potential refers to the potential settlement of a soil under existing stresses upon being wetted.

As discussed under *Impacts 7.a.1* through *7.a.4*, although the proposed project is in a seismically active area, the project site is not located on unstable soils or a geologic unit at risk for liquefaction or landslides. The project site consists of relatively flat land that is surrounded by developed land with no significant slopes that would present a landslide hazard. Furthermore, construction and operation of the project would not involve activities known to cause or trigger subsidence and is not anticipated to adversely affect soil stability or increase the potential for local or regional landslides, subsidence, liquefaction, or collapse. The project would comply with CBC requirements. Because the project would not create or exacerbate conditions related to unstable soils, impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. *Would the project 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?*

Expansive soils are highly compressible, clay-based soils that tend to expand as they absorb water and shrink as water is drawn away. According to the USDA online Web Soil Survey map the soil on the project site is made up of loamy sand and loamy fine sand with a 0 to 2 precent slope (USDA 2022). The Geotechnical Engineering Investigation concluded that alluvium underlies the project site and consists of sand and gravelly sand, with variable amounts of silt (Appendix E). The alluvium is slightly moist and dense. Sandy and gravelly soils do not typically contain significant levels of clay that could adversely affect building footings.

Furthermore, the proposed project would be required to comply with the most recent CBC requirements, which have been developed to property safeguard structures and occupants from land stability hazards, such as expansive soils. Therefore, impacts related to expansive soils would be less than significant.

LESS THAN SIGNIFICANT IMPACT

e. *Would the project 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?*

The project would be served by the City's existing sewer system and no septic tanks are proposed for the project. Therefore, there is no potential for adverse effects due to soil incompatibility with septic tanks. No impact would occur.

NO IMPACT

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., trackways, imprints, burrows, etc.). Paleontological resources are not found in “soil” but are contained within the geologic deposits or bedrock that underlies the soil layer. Typically, fossils are greater than 5,000 years old (i.e., older than middle Holocene in age) and are typically preserved in sedimentary rocks (Society of Vertebrate Paleontology [SVP] 2010). Fossils occur in a non-continuous and often unpredictable distribution within some sedimentary units, and the potential for fossils to occur within sedimentary units depends on several factors. It is possible to evaluate the potential for geologic units to contain scientifically important paleontological resources, and therefore evaluate the potential for impacts to those resources and provide mitigation for paleontological resources if they are discovered during construction of a development project.

A paleontological resource assessment was conducted by BFSA on October 25, 2022 (Appendix C2), the full assessment is included as Appendix E. The paleontological assessment of the project included a review of paleontological literature and fossil locality records for a previous project in the area; a review of the underlying geology; and recommendations to mitigate impacts to potential paleontological resources.

The paleontological resources assessment confirmed the potential for paleontological resources to exist on the project site due to the presence of thin, Holocene alluvial deposits mapped at the surface of the project. Construction activities may result in the destruction, damage, or loss of undiscovered paleontological resources. Therefore, impacts to paleontological resources would be potentially significant. Mitigation Measure GEO-1 requires a mitigation program that establishes monitoring and a recovery protocol in the event that prehistoric deposits are discovered.

Mitigation Measure

GEO-1 Paleontological Resource Impact Mitigation Program

Prior to the issuance and approval of grading permits for the project the applicant shall submit a Paleontological Resource Impact Mitigation Program (PRIMP). The PRIMP shall include the following:

1. Prior to initiation of any grading, drilling, and/or excavation activities, a preconstruction meeting shall be held and attended by the paleontologist of record, representatives of the grading contractor and subcontractors, the project owner or developer, and a representative of the lead agency. The nature of potential paleontological resources shall be discussed, as well as the protocol that is to be implemented following the discovery of any fossiliferous materials.
2. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be performed by a qualified/project paleontologist or paleontological monitor. Monitoring shall be performed starting at the surface on a full-time basis; Holocene alluvial deposits should be monitored parttime at the discretion of the project paleontologist. The timing and duration of the monitoring of excavation activities within the alluvial fan deposits shall be at the discussion of the project paleontologist based on the geological conditions observed by the paleontological monitor and/or the project paleontologist.

3. Paleontological monitors shall be equipped to salvage fossils as they are unearthed to avoid construction delays. The monitor shall be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or, if present, are determined upon exposure and examination by qualified paleontological personnel to have low potential to contain fossil resources. The monitor shall notify the project paleontologist, who will then notify the concerned parties of the discovery.
4. Paleontological salvage during trenching and boring activities is typically from the generated spoils and does not delay the trenching or drilling activities. Fossils will be collected and placed in cardboard flats or plastic buckets and identified by field number, collector, and date collected. Notes shall be taken on the map location and stratigraphy of the site, which is photographed before it is vacated, and the fossils are removed to a safe place. On mass grading projects, discovered fossil sites shall be protected by flagging to prevent them from being overrun by earthmovers (scrapers) before salvage begins. Fossils will be collected in a similar manner, with notes and photographs being taken before removing the fossils. Precise location of the site is determined with the use of handheld GPS units. If the site involves remains from a large terrestrial vertebrate, such as large bone(s) or a mammoth tusk, that is/are too large to be easily removed by a single monitor, a fossil recovery crew shall excavate around the find, encase the find within a plaster and burlap jacket, and remove it after the plaster is set. For large fossils, use of the contractor's construction equipment may be solicited to help remove the jacket to a safe location.
5. Isolated fossils shall be collected by hand, wrapped in paper, and placed in temporary collecting flats or five-gallon buckets. Notes will be taken on the map location and stratigraphy of the site, which is photographed before it is vacated, and the fossils are removed to a safe place.
6. Particularly small invertebrate fossils typically represent multiple specimens of a limited number of organisms, and a scientifically suitable sample can be obtained from one to several five-gallon buckets of fossiliferous sediment. If it is possible to dry screen the sediment in the field, a concentrated sample may consist of one or two buckets of material. For vertebrate fossils, the test is usually the observed presence of small pieces of bones within the sediments. If present, multiple five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment.
7. In accordance with the "Microfossil Salvage" section of the SVP guidelines (2010:7), bulk sampling and screening of fine-grained sedimentary deposits (including carbonate-rich paleosols) must be performed if the deposits are identified to possess indications of producing fossil microvertebrates to test the feasibility of the deposit to yield fossil bones and teeth.
8. In the laboratory, individual fossils shall be cleaned of extraneous matrix, any breaks will be repaired, and the specimen, if needed, will be stabilized by soaking in an archivally approved acrylic hardener (*e.g.,* a solution of acetone and Paraloid B-72).
9. Recovered specimens will be prepared to a point of identification and permanent preservation (not display), including screen-washing sediments to recover small invertebrates and vertebrates. Preparation of individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.
10. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.,* the LACM) shall be conducted. The paleontological program should include a written repository

agreement prior to the initiation of mitigation activities. Prior to curation, the City of Palmdale shall be consulted on the repository/museum to receive the fossil material.

11. A final monitoring and mitigation report of findings and significance shall be prepared, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location(s). The report, when submitted to, and accepted by, the appropriate lead agency, shall signify satisfactory completion of the project program to mitigate impacts to any potential nonrenewable paleontological resources (*i.e.,* fossils) that might have been lost or otherwise adversely affected without such a program in place.

Significance after Mitigation

Implementation of Mitigation Measure GEO-1 during project construction would reduce potential impacts related to paleontological resources to a less than significant level by providing for the recovery, identification, and curation of previously unrecovered fossils. Impacts would be less than significant with mitigation.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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8 Greenhouse Gas Emissions

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	■	☐	☐
b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	■	☐	☐

Overview of Greenhouse Gases

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. The term "climate change" is often used interchangeably with the term "global warming," but climate change is preferred because it conveys that other changes are happening in addition to rising temperatures. The baseline against which these changes are measured originates in historical records that identify temperature changes that occurred in the past, such as during previous ice ages. The global climate is changing continuously, as evidenced in the geologic record which indicates repeated episodes of substantial warming and cooling. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming over the past 150 years. The United Nations Intergovernmental Panel on Climate Change (IPCC) expressed that the rise and continued growth of atmospheric CO_2 concentrations is unequivocally due to human activities in the IPCC's Sixth Assessment Report (2021). Human influence has warmed the atmosphere, ocean, and land, which has led the climate to warm at an unprecedented rate in the last 2,000 years. It is estimated that between the period of 1850 through 2019, that a total of 2,390 gigatonnes of anthropogenic CO_2 was emitted. It is likely that anthropogenic activities have increased the global surface temperature by approximately 1.07 degrees Celsius between the years 2010 through 2019 (IPCC 2021). Furthermore, since the late 1700s, estimated concentrations of CO_2, methane, and nitrous oxide in the atmosphere have increased by over 43 percent, 156 percent, and 17 percent, respectively, primarily due to human activity (USEPA 2021a). Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature.

Gases that absorb and re-emit infrared radiation in the atmosphere are called GHGs. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons and perfluorocarbons and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere, and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are usually by-products of fossil fuel combustion, and CH_4 results from off-gassing associated with agricultural practices and landfills. Human-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (USEPA 2021a).

Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" (CO_2e), which is the amount of GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 30, meaning its global warming effect is 30 times greater than CO_2 on a molecule per molecule basis (IPCC 2021).[2]

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat-trapping effect of GHGs, the earth's surface would be about 33 degrees Celsius (°C) cooler (World Meteorological Organization 2022). However, since 1750, estimated concentrations of CO_2, CH_4, and N_2O in the atmosphere have increased by 47 percent, 156 percent, and 23 percent, respectively, primarily due to human activity (IPCC 2021). GHG emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, are believed to have elevated the concentration of these gases in the atmosphere beyond the level of concentrations that occur naturally.

Greenhouse Gas Emissions Inventory

Global

In 2015, worldwide anthropogenic total 47,000 million MT of CO_2e, which is a 43 percent increase from 1990 GHG levels (USEPA 2021b). Specifically, 34,522 million metric tons (MMT) of CO_2e of CO_2, 8,241 MMT of CO_2e of CH_4, 2,997 MMT of CO_2e of N_2O, and 1,001 MMT of CO_2e of fluorinated gases were emitted in 2015. The largest source of GHG emissions were energy production and use (includes fuels used by vehicles and buildings), which accounted for 75 percent of the global GHG emissions. Agriculture uses and industrial processes contributed 12 percent and six percent, respectively. Waste sources contributed for three percent and two percent was due to international transportation sources. These sources account for approximately 98 percent because there was a net sink of two percent from land-use change and forestry (USEPA 2021b).

Federal

United States GHG emissions were 6,347.7 MMT of CO_2e in 2021 or 5,593.5 MMT CO_2e after accounting for sequestration. Emissions increased by 6.8 percent from 2020 to 2021. The increase from 2020 to 2021 was driven by an increase in CO_2 emissions from fossil fuel combustion which increased seven percent relative to previous years and is primarily due to the economic rebounding after the COVID-19 Pandemic. In 2020, the energy sector (including transportation) accounted for

[2] The Intergovernmental Panel on Climate Change's (2021) *Sixth Assessment Report* determined that methane has a GWP of 30. However, the 2017 Climate Change Scoping Plan published by the California Air Resources Board uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change's (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes a GWP of 25.

81 percent of nationwide GHG emissions while agriculture, industrial and waste accounted for approximately 10 percent, six percent, and three percent respectively (USEPA 2023).

California

Based on a review of CARB's California Greenhouse Gas Inventory for the years between 2000-2020, California produced 369.2 MMT of CO_2e in 2020, which is 35.3 MMT of CO_2e lower than 2019 levels. The 2019 to 2020 decrease in emissions is likely due in large part to the impacts of the COVID-19 pandemic. The major source of GHG emissions in California is the transportation sector, which comprises 37 percent of the State's total GHG emissions. The industrial sector is the second largest source, comprising 20 percent of the State's GHG emissions while electric power accounts for approximately 16 percent. The magnitude of California's total GHG emissions is due in part to its large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions as compared to other states is its relatively mild climate. In 2016, California achieved its 2020 GHG emission reduction target of reducing emissions to 1990 levels as emissions fell below 431 MMT of CO_2e (CARB 2022). The annual 2030 statewide target emissions level is 260 MMT of CO_2e (CARB 2017).

Regional

The City of Palmdale' CAP includes GHG inventories for the city (City of Palmdale 2022a). In 2017, total community GHG emissions were estimated at 1,042,284 MT CO_2e. Out of the total 2017 GHG emissions inventory, on-road transportation (i.e., gasoline and diesel consumption from motor vehicles on local roads and highways) accounted for 59 percent of the emissions, residential energy consumption accounted for 19 percent, and nonresidential energy consumption accounted for 16 percent. The remaining six percent of GHG emissions was due to solid waste, off-road equipment, water and wastewater, and industrial sources.

Greenhouse Gas Emissions Regulations

Federal Regulations

The U.S. Supreme Court in *Massachusetts et al. v. Environmental Protection Agency et al*. ([2007] 549 U.S. 05-1120) held that the USEPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act. The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines and requires annual reporting of emissions. In 2012, the USEPA issued a Final Rule that establishes the GHG permitting thresholds that determine when CAA permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

In 2014, the U.S. Supreme Court in *Utility Air Regulatory Group v. EPA* (134 S. Ct. 2427 [2014]) held that USEPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT).

State Regulations

ASSEMBLY BILL 1493 – CALIFORNIA ADVANCED CLEAN CARS PROGRAM

AB 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, USEPA granted the waiver of CAA preemption to California for its GHG emission standards for motor vehicles beginning with the 2009 model year. Pavley I regulates model years from 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs, and should provide major reductions in GHG emissions. By 2025, when the rules will be fully implemented, new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB 2011).

CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006 (ASSEMBLY BILL 32, AND SENATE BILL 32)

The "California Global Warming Solutions Act of 2006," (AB 32), outlines California's major legislative initiative for reducing GHG emissions. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 target of 431 MMT CO2e, which was achieved in 2016. CARB approved the Scoping Plan on December 11, 2008, which included GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among others (CARB 2008). Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since the Scoping Plan's approval.

The CARB approved the 2013 Scoping Plan update in May 2014 (CARB 2014). The update defined the CARB's climate change priorities for the next five years, set the groundwork to reach post-2020 statewide goals, and highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the state's longer term GHG reduction strategies with other state policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014).

On September 8, 2016, the governor signed Senate Bill (SB) 32 into law, extending the California Global Warming Solutions Act of 2006 by requiring the state to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, the CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, and implementation of recently adopted policies and legislation, such as SB 1383 and SB 100 (discussed later). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of six MT CO_2e by 2030 and two MT CO_2e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, sub-regional, or regional level), but not for specific individual projects because they include all emissions sectors in the state (CARB 2017).

Assembly Bill 1279

AB 1279, the California Climate Crisis Act, was passed on September 16, 2022, and declares the State would achieve net zero GHG emissions as soon as possible, but no later than 2045, and to achieve and maintain net negative GHG emissions thereafter. In addition, the bill states that the State would reduce GHG emissions by 85 percent below 1990 levels no later than 2045.

In response to the passage of AB 1279 and the identification of the 2045 GHG reduction target, CARB published the Final 2022 Climate Change Scoping Plan in November 2022 (CARB 2022b). The 2022 Update builds upon the framework established by the 2008 Climate Change Scoping Plan and previous updates while identifying new, technologically feasible, cost-effective, and equity-focused path to achieve California's climate target. The 2022 Update includes policies to achieve a significant reduction in fossil fuel combustion, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands (NWL) to reduce emissions and sequester carbon, and the capture and storage of carbon.

The 2022 Update assesses the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan, addresses recent legislation and direction from Governor Gavin Newsom, extends and expands upon these earlier plans, and implements a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045, as well as taking an additional step of adding carbon neutrality as a science-based guide for California's climate work. As stated in the 2022 Update, "The plan outlines how carbon neutrality can be achieved by taking bold steps to reduce GHGs to meet the anthropogenic emissions target and by expanding actions to capture and store carbon through the state's NWL and using a variety of mechanical approaches" (CARB 2022b). Specifically, the 2022 Update:

- Identifies a path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030.
- Identifies a technologically feasible, cost-effective path to achieve carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels.
- Focuses on strategies for reducing California's dependency on petroleum to provide consumers with clean energy options that address climate change, improve air quality, and support economic growth and clean sector jobs.
- Integrates equity and protecting California's most impacted communities as driving principles throughout the document.
- Incorporates the contribution of NWL to the State's GHG emissions, as well as their role in achieving carbon neutrality.
- Relies on the most up-to-date science, including the need to deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration, as well as direct air capture.
- Evaluates the substantial health and economic benefits of taking action.
- Identifies key implementation actions to ensure success.

In addition to reducing emissions from transportation, energy, and industrial sectors, the 2022 Update includes emissions and carbon sequestration in NWL and explores how NWL contributes to long-term climate goals. Under the Scoping Plan Scenario, California's 2030 emissions are anticipated to be 48 percent below 1990 levels, representing an acceleration of the current SB 32 target. Cap-and-Trade regulation continues to play a large factor in the reduction of near-term emissions for meeting the accelerated 2030 reduction target. Every sector of the economy will need to begin to transition in this decade to meet our GHG emissions reduction goals and achieve carbon neutrality no later than 2045. The 2022 Update approaches decarbonization from two perspectives, managing a phasedown of existing energy sources and technologies, as well as increasing, developing, and deploying alternative clean energy sources and technology.

SENATE BILL 97 – CEQA: GREENHOUSE GAS EMISSIONS

SB 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in CEQA documents. In March 2010, the California Natural Resources Agency (Resources Agency) adopted amendments to the CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

SENATE BILL 375 – 2008 SUSTAINABLE COMMUNITIES AND CLIMATE PROTECTION ACT

SB 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPOs) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. SCAG was assigned targets of an 8 percent reduction in GHGs from transportation sources by 2020 and a 19 percent reduction in GHGs from transportation sources by 2035. In the SCAG region, SB 375 also provides the option for the coordinated development of sub regional plans by the sub regional councils of governments and the county transportation commissions to meet SB 375 requirements.

SENATE BILL 1383 – SHORT-LIVED CLIMATE POLLUTANTS

Adopted in September 2016, SB 1383 requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. The bill requires the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with CARB, to adopt regulations that achieve:

- 50-percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020; and
- 75-percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2025.

The bill also mandates various state and local agencies develop further strategies to reduce emissions generated by specific industries such as agriculture. The stated goal is to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SENATE BILL 100 – CALIFORNIA RENEWABLES PORTFOLIO STANDARD PROGRAM

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's Renewables Portfolio Standard Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

EXECUTIVE ORDER B-55-18 TO ACHIEVE CARBON NEUTRALITY

On September 10, 2018, Governor Brown issued Executive Order B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

ASSEMBLY BILL 341 – CALIFORNIA INTEGRATED WASTE MANAGEMENT ACT

The California Integrated Waste Management Act of 1989, as modified by AB 341, requires each jurisdiction's source reduction and recycling element to include an implementation schedule that shows: (1) diversion of 25 percent of all solid waste by January 1, 1995, through source reduction, recycling, and composting activities; (2) diversion of 50 percent of all solid waste on and after January 1, 2000; and (3) diversion of 75 percent of all solid waste by 2020, and annually thereafter. CalRecycle is required to develop strategies to implement AB 341, including source reduction.

CLEAN ENERGY, JOBS, AND AFFORDABILITY ACT OF 2022 (SENATE BILL 1020)

Adopted on September 16, 2022, SB 1020 creates clean electricity targets for eligible renewable energy resources and zero-carbon resources to supply 90 percent of retail sale electricity by 2035, 95 percent by 2040, 100 percent by 2045, and 100 percent of electricity procured to serve all state agencies by 2035. This bill shall not increase carbon emissions elsewhere in the western grid and shall not allow resource shuffling.

California Building Standards Code

The California Code of Regulations (CCR) Title 24 is referred to as the California Building Standards Code. It consists of a compilation of several distinct standards and codes related to building construction including plumbing, electrical, interior acoustics, energy efficiency, and handicap accessibility for persons with physical and sensory disabilities. The current iteration is the 2022 Title 24 standards. The California Building Standards Code's energy-efficiency and green building standards are outlined below.

PART 6 – BUILDING ENERGY EFFICIENCY STANDARDS/ENERGY CODE

CCR Title 24, Part 6 is the Building Energy Efficiency Standards or California Energy Code. This code, originally enacted in 1978, establishes energy-efficiency standards for residential and non-residential buildings in order to reduce California's energy demand. New construction and major renovations must demonstrate their compliance with the current Energy Code through submittal and approval of a Title 24 Compliance Report to the local building permit review authority and the California Energy Commission (CEC). The 2022 Title 24 standards are the applicable building energy efficiency standards for the proposed project because they became effective on January 1, 2023.

PART 11 – CALIFORNIA GREEN BUILDING STANDARDS

The California Green Building Standards Code, referred to as CALGreen, was added to Title 24 as Part 11, first in 2009 as a voluntary code, which then became mandatory effective January 1, 2011 (as part of the 2010 California Building Standards Code). The 2022 CALGreen includes mandatory minimum environmental performance standards for all ground-up new construction of residential and non-residential structures. It also includes voluntary tiers with stricter environmental performance standards for these same categories of residential and non-residential buildings. Local jurisdictions must enforce the minimum mandatory CALGreen standards and may adopt additional amendments for stricter requirements.

Regional and Local Regulations

2020 – 2045 SCAG REGIONAL TRANSPORTATION PLAN

On September 3, 2020, the SCAG's Regional Council formally adopted the 2020-2045 RTP/SCS entitled Connect SoCal. The 2020-2045 RTP/SCS builds upon the progress made through implementation of the 2016-2040 RTP/SCS and includes 10 goals focused on promoting economic prosperity, improving mobility, protecting the environment, and supporting healthy/complete communities. The SCS implementation strategies include focusing growth near destinations and mobility options, promoting diverse housing choices, leveraging technology innovations, and supporting implementation of sustainability policies. The SCS establishes a land use vision of center-focused placemaking, concentrating growth in and near Priority Growth Areas, transferring of development rights, urban greening, creating greenbelts and community separators, and implementing regional advance mitigation (SCAG 2020).

CITY OF PALMDALE GENERAL PLAN 2045

The City of Palmdale has established a series of goals and policies in the 2045 City of Palmdale General Plan to reduce GHG emissions and increase sustainability. The Sustainability, Climate, and Resilience chapter of the Plan serves as the Climate Action Plan (CAP) for the City of Palmdale. The City of Palmdale developed the CAP to reduce emissions and make Palmdale a more sustainable, healthier, and resilient community. Pursuant with CEQA Guidelines Section 15183.5, the CAP would meet the requirements of a qualified CAP and future residential projects developed under the Plan would be able to tier from the CAP for analysis purposes (City of Palmdale 2022a). The CAP includes the following goals and policies that would be applicable to the project:

Clean Energy

- Goal SCR-2: Utilize a fossil fuel free energy system (SB 100).
  - **SCR-2.1 Carbon Free Energy.** Direct EPIC to provide 75 percent carbon-free or renewable electricity to residents and businesses by 2030, achieving 100 percent carbon-free electricity by 2045.
  - **SCR-2.2 Community Solar.** Explore the development of community solar projects and microgrids.

Buildings

- Goal SCR-3: Green and decarbonized buildings for new construction and major renovations.
  - **SCR-3.1 Energy Efficient New Construction.** Integrate CALGreen Tier 1 and Tier 2 green building and energy efficiency standards into new construction and major remodels.
  - **SCR-3.2 All-Electric Reach Code.** Consider adopting a local reach code to encourage new buildings to be all-electric.
  - **SCR-3.3 Solar + Storage.** Require installation of photovoltaic panels and battery storage on all residential new construction and nonresidential new construction over 5,000 sq. ft.

Transportation

- Goal SCR-4: Reduced greenhouse gas emissions from transportation (SB 379, EO N-79-20).
  - **SCR-4.1 Bike Facilities.** Promote bicycle use with new private development projects through requirements for bicycle parking, lockers and showers, bike share facilities, and when feasible, connections to City bike lanes.
  - **SCR-4.2 Public Transit.** Expand the public transit system, increase frequency of service, and provide shade at transit stops.
  - **SCR-4.4 EV Reach Code.** Adopt EV requirements beyond CALGreen in both number of chargers and charger capacity.
  - **SCR-4.7 Pedestrian and Cyclist Safety.** Improve bicycle and pedestrian modes of travel by improving pedestrian and cyclist safety. Example techniques include increasing the number of sidewalks, pending connected and protected bike lanes, and redesigning high incidence intersections.

Solid Waste

- Goal SCR-5: Increased resource capture and reduced waste sent to landfills (SB 1383).
  - **SCR-5.1 Zero Waste Plan.** Create a zero-waste plan that institutes cost-effective diversion programs for municipal operations and the community.
  - **SCR-5.2 Organic Waste Diversion.** Establish programs to comply with State-established requirements for organics and food waste diversion.

Water and Wastewater

- Goal SCR-6: Safe and secure water supply.
  - **SCR-6.1 Recycled Water.** Increase availability of local recycled water.
  - **SCR-6.4 Rainwater Capture.** Encourage rainwater capture and use of cisterns for outdoor watering purposes.

Methodology

GHG emissions were calculated using the same input data as described in Section 3, *Air Quality*, in addition to the following:

- **Construction Emission Amortization:** Consistent with the industry standard, total construction GHG emissions resulting from a project were amortized over 30 years and added to operational GHG emissions to account for their contribution to GHG emissions over the lifetime of the project.

- **Electricity:** Electricity emissions only apply to GHG emissions (as the energy is generated off-site and therefore may not be relevant for local and regional air quality conditions) and are calculated by multiplying the energy use times the carbon intensity of the utility district per kilowatt hour (CAPCOA 2022). The default electricity consumption values in CalEEMod include the CEC-sponsored California Commercial End Use Survey and Residential Appliance Saturation Survey studies.
- **Waste Generation:** Operational emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CAPCOA 2022). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by CalRecycle.
- **Water and Wastewater:** Operational emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for northern and southern California.

Significance Thresholds

Based on Appendix G of the CEQA Guidelines, impacts related to GHG emissions from the project would be significant if the project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions.

The majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15064[h][1]).

Section 15064.4 of the CEQA Guidelines recommends that lead agencies quantify GHG emissions of projects and consider several other factors that may be used in the determination of significance of GHG emissions from a project, including the extent to which the project may increase or reduce GHG emissions; whether a project exceeds an applicable significance threshold; and the extent to which the project complies with regulations or requirements adopted to implement a plan for the reduction or mitigation of GHG emissions. The City of Palmdale has prepared a qualified CAP pursuant to CEQA Guidelines Section 15183.5(b). The CAP serves as a "qualified plan for the reduction of greenhouse gases" and provides a mechanism for tiering and streamlining of GHG emissions analysis for projects that are consistent with such a plan.

As part of the CAP, the City of Palmdale has established GHG reduction targets consistent with the statewide goal of reducing GHG emissions to 40 percent below 1990 levels by 2030 (478,418 MT CO_2e). Additionally, the CAP provides additional reductions beyond what is needed to achieve the 2017 Scoping Plan 2030 goal and advances the City's progress toward the goal of carbon neutrality by 2045 contained in the 2022 Scoping Plan. To achieve these reductions, the City's CAP has established per-service population emissions targets that are used for this analysis, which are: 2 MT CO_2e per service population by 2030; 1.3 MT CO_2e per service population by 2035; and 1.2 MT CO_2e per service population by 2045. Per-service population emissions are calculated by dividing total community emissions by the residents plus employees.

a. *Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?*

The City of Palmdale CAP is a qualified GHG reduction plan consistent with the requirements of CEQA Guidelines Section 15183.5. In accordance with the CAP, project GHG emissions would be less than significant if it can be demonstrated that the project would be consistent with the CAP and generate less than 2 MT CO_2e per service population per year.

Project construction would generate temporary short-term GHG emissions through travel to and from the worksite and from the operation of construction equipment such as graders, backhoes, and generators. Construction of the project would generate approximately 1,546 MT CO_2e over the entire construction period. As shown in Table 13, the proposed project's amortized construction-related emissions would be 52 MT CO_2e.

Operation of the proposed project would generate GHG emissions associated with area sources (e.g., landscape maintenance), energy and water usage, vehicle trips, and wastewater and solid waste generation. Table 13 combines the estimated construction and operational GHG emissions associated with development of the project. As shown therein, the project would generate approximately 2,206 MT of CO_2e per year during operation. Total emissions (amortized construction emissions plus annual operation emissions) would be 3.5 MT of CO_2e per year per SP (conservatively rounded up to the nearest tenth). These emissions would exceed the 2.0 MT of CO_2e per year per service person goal of the City CAP, and impacts would be potentially significant. Implementation of Mitigation Measure GHG-1 below would be required to reduce impacts to a less than significant level.

Table 13 Combined Annual Greenhouse Gas Emissions

Emission Source	Annual Emissions (MT CO_2e per year)
Construction	
2024	1,047
2025	499
Construction Total	**1,546**
Amortized over 30 years	**52**
Operational	
Area	8
Energy	325
Mobile	1,779
Solid Waste	59
Water	35
Refrigerant	<1
Operational Total	**2,206**
Total Emissions	**2,258**

Emission Source	Annual Emissions (MT CO_2e per year)
Service Population (Residents)	**657**
Emissions per Service Person[2]	**3.5**
Threshold	**2.0**
Threshold Exceeded?	**Yes**

MT = metric tons; CO_2e = carbon dioxide equivalents

[2] Emissions per SP rounded up to the nearest tenth.

Notes: Emissions modeling was completed using CalEEMod. See Appendix A for modeling results.

Mitigation Measure

GHG-1 Greenhouse Gas Reduction Plan

The project applicant shall prepare and implement a GHG Reduction Plan (GHGRP) that demonstrates emissions reductions from project operation by approximately 1,004 MT of CO_2e per year to 1,254 MT of CO_2e per year for the lifetime of the project, or by an amount determined through further analysis of project GHG emissions at the time of GHGRP preparation. Potential GHG reduction measures included in the GHGRP may include, but would not be limited to, the following on-site measures:

- Construction of buildings that achieve energy and water efficiencies beyond those specified in the California Code of Regulations, Title 24 requirements
- Implementation of green building practices and/or cool roofs
- Installation of energy-efficient equipment and appliances exceeding California Green Building Code standards
- Installation of outdoor water conservation and recycling features, such as smart irrigation controllers and reclaimed water usage
- Installation of low-flow bathroom and kitchen fixtures and fittings
- Installation of light emitting diode (LED) lights
- Implementation of waste reduction programs that may include waste minimization, waste diversion, composting, and material reuse/recycling
- Provision of incentives and outreach that promote alternative transportation and transit use to future employees and patrons
- Promotion of alternative fuel vehicles, including through the installation of electric vehicle charging infrastructure beyond those required

If GHG emissions cannot be feasibly reduced through implementation of on-site measures, the following off-site measures may be implemented:

- Directly undertake or fund activities that reduce or sequester GHG emissions ("Direct Reduction Activities") and retire the associated "GHG Mitigation Reduction Credits." A "GHG Mitigation Reduction Credit" shall mean an instrument issued by an Approved Registry and shall represent the estimated reduction or sequestration of 1 MT of CO_2e that shall be achieved by a Direct Reduction Activity that is not otherwise required (CEQA Guidelines Section 15126.4[c][3]). A "GHG Mitigation Reduction Credit" must achieve GHG emission reductions that are real, permanent, quantifiable, verifiable, enforceable, and in addition to any GHG emission reduction required by law or regulation or any other GHG emission reduction that otherwise would occur in accordance with the criteria set forth in the California Air Resources Board's most recent Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation (2013). An "Approved Registry" is an accredited carbon registry that follows approved California Air Resources Board Compliance Offset Protocols. At this time, Approved Registries include American Carbon Registry, Climate Action Reserve, and Verra (California Air Resources Board 2018). Credits from other sources will not be allowed unless they are shown to be validated by protocols and methods equivalent to or more stringent than the California Air Resources Board standards. In the event that a project or program providing GHG Mitigation Reduction Credits to the project applicant loses its accreditation, the project applicant shall comply with the rules and procedures of retiring GHG Mitigation Reduction Credits specific to the registry involved and shall undertake additional direct investments to recoup the loss.

- Obtain and retire "Carbon Offsets." "Carbon Offset" shall mean an instrument issued by an Approved Registry and shall represent the past reduction or sequestration of 1 MT of CO2e achieved by a Direct Reduction Activity or any other GHG emission reduction project or activity that is not otherwise required (CEQA Guidelines Section 15126.4[c][3]). A "Carbon Offset" must achieve GHG emission reductions that are real, permanent, quantifiable, verifiable, enforceable, and in addition to any GHG emission reduction required by law or regulation or any other GHG emission reduction that otherwise would occur in accordance with the criteria set forth in the California Air Resources Board's most recent *Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation* (2013). If the project applicant chooses to meet some of the GHG reduction requirements by purchasing offsets on an annual and permanent basis, the offsets shall be purchased according to the City's preference, which is, in order of the City's preference: (1) within Palmdale; (2) within the air basin; (3) within the State of California; then (4) elsewhere in the United States. In the event that a project or program providing offsets to the project applicant loses its accreditation, the project applicant shall comply with the rules and procedures of retiring offsets specific to the registry involved and shall purchase an equivalent number of credits to recoup the loss.

The GHGRP shall be submitted by the project developer and reviewed and approved by the City of Palmdale as being in compliance with this measure prior to grading or building permit issuance. Applicable elements of the approved GHGRP shall be reflected on project site plans prior to certificate of occupancy. Condition compliance shall include monitoring and verifying implementation of measures included in the GHGRP.

Significance After Mitigation

To implement Mitigation Measure GHG-1, the project applicant may choose to apply a wide variety of GHG emission reduction measures, including carbon offsets, to reduce project-related emissions to 1,254 MT of CO_2e per year. Therefore, implementation of Mitigation Measure GHG-1 would reduce project-related emissions below the threshold of significance of 1,254 MT of CO_2e per year or 2 MT of CO_2e per service population per year. Impacts would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

b. *Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*

2022 Scoping Plan

The principal State plans and policies for reducing GHG emissions are AB 32, SB 32, and AB 1279. The quantitative goal of AB 32 is to reduce GHG emissions to 1990 levels by 2020; the goal of SB 32 is to reduce GHG emissions to 40 percent below 1990 levels by 2030; and the goal of AB 1279 is to achieve net zero GHG emissions no later than 2045 and reduce GHG emissions by 85 percent below 1990 levels no later than 2045. The 2022 Scoping Plan expands upon earlier plans to include the AB 1279 targets. The 2022 Scoping Plan's strategies that are applicable to the proposed project include reducing fossil fuel use and vehicle miles traveled (VMT), decarbonizing the electricity sector, maximizing recycling and diversion from landfills, and increasing water conservation. The project would be consistent with these goals through project design, which includes 100 percent electric project design, complying with the latest Title 24 Green Building Code and Building Efficiency Energy Standards, and complying with the AB 341 waste diversion goal of 75 percent. In addition, the project would receive electricity from Southern California Edison (SCE), which is required to reduce GHG emissions by increasing procurement from eligible renewable energy by set target years as required by SB 100. Therefore, the project would not conflict with the 2022 Scoping Plan.

Connect SoCal: 2020-2045 SCAG RTP/SCS

According to the 2020-2045 RTP/SCS, the updated targets for the SCAG region are eight percent below 2005 per capita emission levels by 2020 (this value is unchanged from the previous 2020 CARB target) and 19 percent below 2005 per capita emissions levels by 2035. The revised 2035 target is higher than the previous CARB target of 13 percent for the SCAG region. The 2020-2045 RTP/SCS includes implementation strategies for focusing growth near destinations and mobility options, promoting diverse housing choices, leveraging technology innovations, supporting implementation of sustainability policies, and promoting a green region. Furthermore, specific actions to reduce GHG emissions under the 2020-2045 RTP/SCS include designing transportation options that reduce the reliance on solo car trips, promoting low emission technologies such as electric vehicles and ride sharing, supporting statewide GHG emissions legislation, and pursuing funding opportunities to support local sustainable development projects that reduce GHG emissions.

Table 14 Project Consistency with the South Coast Association of Governments 2020-2045 RTP/SCS

Goals	Consistency
Goal 2: Improve mobility, accessibility, reliability, and travel safety for people and goods	**Consistent.** The proposed project would include interior roadways, sidewalks, and trails to provide vehicle, bicycle, and pedestrian access to residences. This expanded pedestrian network would provide pedestrian access to local schools and parks, including Domenic Massari Park and Knight High School to the southeast, as well as commercial uses to the west. Therefore, the project would have accessible and reliable travel options and be designed to reduce reliance on solo vehicle trips.
Goal 5: Reduce greenhouse gas emissions and improve air quality	**Consistent.** The proposed project would include several sustainable design features, including those required by Title 24 and CALGreen standards. The project would include photovoltaic systems and battery storage installed on each residential building. All proposed residential units would be equipped with energy-efficient appliances and lighting, water-efficient fixtures, and water-efficient irrigation systems. The project would meet the requirements of the 2022 California Energy Code.
Goal 6: Support healthy and equitable communities	**Consistent.** The proposed project would provide housing near city parks, commercial areas, and schools. Furthermore, the project would include design features such as sidewalks and multiple access points to the project site. These features would promote active transportation and foster efficient development patterns within the project site vicinity.
Goal 9: Encourage development of diverse housing types in areas that are supported by multiple transportation options	**Consistent.** The proposed project would include interior roadways, sidewalks, and trails to provide vehicle, bicycle, and pedestrian access to residences. This expanded pedestrian network would provide pedestrian access to local schools and parks, including Domenic Massari Park and Knight High School to the southeast. The project would be near a commercial downtown area along 47th Street and East Avenue R. The project would include improvement of pedestrian and bicycle facilities, and site access would be provided along several access points. Proposed on-site facilities would establish residences on an underutilized lot adjacent to existing development. Therefore, the project would provide connectivity with planned neighboring residential developments.

Source: SCAG 2020

City of Palmdale Climate Action Plan

The project's consistency with the City of Palmdale General and CAP policies aimed at reducing GHG emissions are shown in Table 15. Although the project would be consistent with applicable policies from the City of Palmdale General Plan and CAP, it would exceed the CAP's per service population thresholds as shown in Table 13, above. Therefore, the project would be inconsistent with the CAP and impacts would be potentially significant.

Table 15 Project Consistency with the Palmdale General Plan

Policy	Consistency
Goal SCR-4: Reduced greenhouse gas emissions from transportation. **Policy SCR-4.1 Bike Facilities:** Promote bicycle use with new private development projects through requirements for bicycle parking, lockers and showers, bike share facilities, and when feasible, connections to City bike lanes.	**Consistent.** The proposed project would create sidewalks and pathways within the project site to accommodate pedestrians and cyclists, which would connect to existing and planned off-site pedestrian and bicycle facilities.
Goal SCR-3: Green and decarbonized buildings for new construction and major renovations. **Policy SCR3.2: All-Electric Reach Code.** Consider adopting a local reach code to encourage new buildings to be all-electric. **Policy SCR-3.3: Solar + Storage.** Require installation of photovoltaic panels and battery storage on all residential new construction and nonresidential new construction over 5,000 sq. ft.	**Consistent.** The project would comply with all standards set forth in the CBC Title 24, which would minimize the wasteful, inefficient, or unnecessary consumption of energy resources during operation. Furthermore, in accordance with the 2022 California Green Building Standards for residential developments, low-rise residences (three stories or less) are required to install on-site photovoltaic arrays. The project would include solar rooftop photovoltaic systems, in addition to battery storage. All proposed residences would be equipped with energy-efficient appliances and lighting, water-efficient fixtures, and water-efficient irrigation systems. As mentioned above under the 2022 Scoping Plan, the project would be consistent with the State's climate goals by increasing renewable energy and providing energy efficiency in the buildings.

Source: City of Palmdale 2022a

In summary, the plan consistency analysis provided above demonstrates that the project complies with or exceeds the plans, policies, regulations and GHG reduction actions/strategies outlined in SCAG's 2020-2045 RTP/SCS and the 2022 Scoping Plan. However, the project would exceed the per service population threshold established by the City and would therefore be inconsistent with the City's 2045 General Plan and CAP. Therefore, the project would conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing emissions of GHG emissions. Implementation of Mitigation Measure GHG-1 below would reduce project related emissions to a less than significant level.

Mitigation Measure

Refer to Mitigation Measure GHG-1, above.

Significance After Mitigation

Implementation of Mitigation Measure GHG-1 would require the developer to implement a GHG Reduction Plan. Such mitigation would reduce project emissions to below the established threshold and ensure that the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions. Impacts would be less than significant with mitigation incorporated.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

9 Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	□	□	■	□
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	□	□	■	□
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	□	□	■	□
d. Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	□	□	□	■
e. For a project located in an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	□	□	□	■
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	□	□	■	□
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	□	□	□	■

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Project construction would involve the use of potentially hazardous materials such as vehicle fuels and fluids that could be released should an accidental leak or spill occur. However, standard construction BMPs for the use and handling of such materials, such as the use of secondary containment, would be implemented to avoid or reduce the potential for such conditions to occur. Furthermore, any use of potentially hazardous materials utilized during construction of the proposed project would be subject to all local, State, and federal regulations regarding the handling of potentially hazardous materials. The transport, use, and storage of hazardous materials during construction of the project would be subject to all applicable State and federal laws, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, California Hazardous Material Management Act, and hazardous waste management and cleanup under CCR Title 22. Therefore, project construction would not create a significant hazard to the public and environment through the routine transport, use, or disposal of hazardous materials.

Operation of the proposed project would likely involve the use of common materials in the regular maintenance of homes and landscaping, such as cleaning and degreasing solvents, fertilizers, and pesticides. However, these maintenance activities would only require minor quantities of such products and would not involve the use of extremely hazardous substances. Use of these materials would be subject to compliance with existing regulations, standards, and guidelines established by the federal, State, and local agencies related to storage, use, and disposal of hazardous materials. The transport, use, and storage of hazardous materials during operation of the project would be subject to all applicable State and federal laws, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, California Hazardous Material Management Act, and hazardous waste management and cleanup under CCR Title 22. Other than small quantities of materials used in the maintenance of the residential community, operation of the proposed project would not involve the use or storage of substantial quantities of hazardous materials, nor would the project generate large quantities of hazardous waste. Therefore, operation of the proposed project would not create a significant hazard to the public or the environmental through the routine transport, use, or disposal of hazardous materials and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project 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?

As described above, construction of the project would involve the use of potentially hazardous materials such as vehicle fuels and fluids that could be released should an accidental leak or spill occur. However, as further discussed in Section 10, *Hydrology and Water Quality*, the SWPPP for the proposed project would include standard construction BMPs for the use and handling of such materials to avoid or reduce the potential for such conditions to occur. Typical construction BMPs include secondary containment and special storage for hazardous materials used on-site, the use of drip pans under vehicles and equipment, and provisioning of spill kits and cleanup plans in the event of an accidental spill. The transport, use, and storage of hazardous materials during construction of the project would be conducted in accordance with all applicable State and federal laws, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, California Hazardous Material Management Act, and hazardous waste management and cleanup under CCR Title 22. Therefore, project construction would not create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Operation of the residential homes would not involve the use or storage of significant quantities of hazardous materials. Therefore, project operation is not anticipated to create a significant hazard to the public or environment through the accidental release of hazardous materials. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?

The nearest school facilities to the project site are Chaparral Prep Academy approximately one mile south of the project site, Mesquite Elementary School 1.2 mile southwest of the project site, and Buena Vista Elementary School 1.6 miles south of the project site.

During construction of the proposed project, hazardous and potentially hazardous materials would be utilized for the transport and operation of vehicles and machinery. As discussed above, the transport, use, and storage of hazardous materials during the construction of the project would be conducted in accordance with all applicable State and federal laws, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, California Hazardous Material Management Act, and hazardous waste management and cleanup under CCR Title 22. Compliance with these regulations would reduce the potential of accidental spills or hazardous emissions during construction. Furthermore, operation and maintenance of the proposed project would only involve the use of common cleaning and landscape maintenance materials comparable to those materials already in use in the project site vicinity.

Although the project site is in proximity to several schools, none are within 0.25 mile of the site, and the project would not regularly store or use significant quantities of hazardous materials, nor would it generate large quantities of hazardous waste. Therefore, the project would not emit hazardous emissions or handle hazardous or acutely hazardous materials that could result in significant impacts to nearby schools. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Government Code Section 65962.5 requires the CalEPA to develop an updated Cortese List. The California Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. The analysis for this section included a review of the following resources to provide hazardous material release information:

- SWRCB GeoTracker database
- DTSC EnviroStor database
- DTSC Hazardous Waste and Substances Site List (Cortese)

A search of the EnviroStor database and Cortese List did not identify Resource Conservation and Recovery Act (RCRA) sites within 0.25-mile of project site (DTSC 2023a; DTSC 2023b). In addition, according to GeoTracker, there are no LUST or other clean-up sites within 0.25 mile of the project site (SWRCB 2023). Therefore, the project is not located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and would not create a significant hazard to the public or the environment. Thus, no impact would occur.

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?

The project site is not located within two miles of a public airport or within an airport land use plan. The airport nearest to the project site is the Palmdale Regional Airport located approximately four miles to the northwest. Furthermore, there are no private airstrips in the vicinity of the project site. Therefore, the project would not result in safety hazards related to airports for people residing or working at the project site and its vicinity. No impact would occur.

NO IMPACT

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The proposed project would involve the construction of 191 single-family housing units. During construction, temporary and occasional lane closures on East Palmdale Boulevard may be required, but two-way traffic would be maintained on these roadways and at construction entry points. Pursuant to Chapter 14.40 of the PMC, as part of the City's requirements for obtaining an excavation and traffic control permit, the contractor is required to submit to the City a construction work site traffic control plan for any street/lane closures for review and approval prior to the commencement of construction activities. The submittal and approval of the construction traffic control plan would ensure that construction would not interfere with local traffic or emergency response and evacuation procedures.

Vehicles, including emergency response vehicles, would be able to access the project site via the main entrance off East Palmdale Boulevard. The proposed project would not modify East Palmdale Boulevard, other than by adding the entrances to the project site. In addition, the project would not result in inadequate emergency access because it would be subject to Fire Department review of site plans, site construction, and the actual structures prior to occupancy to ensure that required fire protection safety features, including building sprinklers and emergency access, are implemented. Therefore, the proposed project would not impair implementation of or physically interfere with an adopted emergency response or evacuation plan. Potential impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

Undeveloped wildland areas that are susceptible to wildfires are not located in proximity to the project site. As further discussed in Section 20, *Wildfire,* the project site is not located in a Fire Hazard Severity Zone (FHSZ) or Very High Hazard Severity Zone (VHFHSZ) for wildland fires (California Department of Forestry and Fire Protection [CALFIRE] 2022). The nearest VHFHSZ is located approximately 5.2 miles south of the project site located in a State Responsibility Area near Mt. Emma Road (CALFIRE 2022). The nearest VHFHSZ within a Local Responsibility Area is located

8.7 miles west of the project site (CALFIRE 2022). Therefore, the project would not expose people or structures to a significant risk of loss injury or death involving wildland fires. No impact would occur.

NO IMPACT

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10 Hydrology and Water Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	□	□	■	□
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	□	□	■	□
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
(i) Result in substantial erosion or siltation on- or off-site;	□	□	■	□
(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	□	□	■	□
(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?	□	□	■	□
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	□	□	■	□
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	□	□	■	□

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Construction of the proposed project could result in soil erosion due to earth-moving activities such as excavation, grading, soil stockpiling, and the generation of water pollutants including trash, construction materials, and equipment fluids. Prior to initiation of construction, the project would be required to obtain coverage under a Construction General Permit to comply with Clean Water Act National Pollution Discharge Elimination System (NPDES) requirements, administered by the Los Angeles Regional Water Quality Control Board (LARWQCB). In addition, the project would be required to comply with the LARWQCB's Water Quality Control Plan. Under the conditions of the Construction General Permit and the Water Quality Control Plan, the developer would be required to eliminate or reduce non-storm water discharges, develop and implement a SWPPP for the project construction activities, and perform inspections of the storm water pollution prevention measures and control practices to ensure conformance with the site SWPPP. The Construction General Permit prohibits the discharge of materials other than storm water discharges and prohibits all discharges that contain a hazardous substance in excess of reportable quantities established by 40 CFR 117.3 or 40 CFR 302.4. The General Permit also specifies that construction activities must meet all applicable provisions of Sections 30 and 402 of the Clean Water Act. Compliance with the permit would require the development and implementation of a SWPPP and associated BMPs during project construction. Conformance with Section 402 of the Clean Water Act would ensure that construction of the proposed project would not violate any water quality standards or waste discharge requirements. In addition, Chapter 14.05 Section 14.05.080 of the PMC requires project applicants to complete a soil management report in order to reduce runoff.

The requirements of the applicable City and State ordinances are intended to protect water quality and support attainment of water quality standards in downstream receiving water bodies. Therefore, operation of the project would not violate any water quality standards or waste discharge requirements, nor would it otherwise substantially degrade water quality. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

The project site lies above the Antelope Valley Groundwater Basin. Though the project would increase the amount of impervious surface on the site compared to existing conditions, the incorporation of the biofiltration system and underground vault would ensure stormwater is captured and treated on the project site, from which it would be infiltrated into the ground.

The project site lies within the service boundaries of the Palmdale Water District (PWD). PWD primarily sources its water supply from California Aqueduct, Littlerock Dam, the Antelope Valley Groundwater Basin, and the Leslie O. Carter Water Treatment Plant (LOCWTP). As discussed in Section 18, *Utilities and Service Systems,* the proposed project's water demand would not substantially affect the PWD's supplies. According to its 2020 Urban Water Management Plan, PWD would be able to provide reliable water supplies for an average year (PWD 2021). However, PWD anticipates that during single-dry year conditions, demands would exceed existing supplies starting in 2030 and that during multiple dry year conditions, demands would exceed existing supplies starting in 2045 (PWD 2020). PWD is currently in the process of developing the Palmdale Regional Water Augmentation Project, which is anticipated to provide 5,325 AFY for surface water augmentation or groundwater injection. In addition, PWD has identified numerous short and long-term transfer and exchange opportunities, as described in Section 4.3.3.2, which would provide additional supplies to help overcome supply shortages (PWD 2020). PWD has identified various demand reduction responses for their clients in order to offset interrupted or reduced water supplies. Such measures include use of the PWD Water Use Rebate Program, repairing water leaks, prohibiting outside car washing, restricted landscape watering, shut off of all fountains or outdoor aesthetic water features, and prohibiting the watering of hardscapes. Therefore, it is anticipated that existing supplies in combination with identified future and potential water supply opportunities and demand reduction responses would enable PWD to meet all future water demands under all hydrologic conditions through the end of the planning period.

Therefore, operational water use associated with the proposed project would not significantly deplete groundwater supplies or impede sustainable groundwater management of the Antelope Valley Groundwater Basins. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c.(i) Would the project 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 result in substantial erosion or siltation on- or off-site?

c.(ii) Would the project 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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

c.(iii) Would the project 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 that would 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?

c.(iv) Would the project 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 impede or redirect flood flows?

The project would not alter the course of a stream or river since the project site and surrounding area do not contain water bodies. However, the project would alter internal site drainage through the addition of impervious surfaces, which could increase stormwater runoff volume and flow. Drainage improvements for the development would consist of catch basins connected to underground storm drain which outlets into a detention basin located at lot 8 of the TTM. This basin would accept flows from the community and detain from flowing offsite while also infiltrating water back into the groundwater basin. Should a large storm event occur, the basin has been designed with an overflow pump to pump water so that all standing water is removed from the basin within 72-hours. As shown in Figure 3, new drainage features would be constructed on-site to minimize potential flooding and offsite stormwater flows, in accordance with the requirements of the PMC Section 08.04.200 (Adoption of Administrative Provisions for the Palmdale Building Code, Plumbing Code, Mechanical Code, Electrical Code, Residential Code and Green Building Code). The applicable provisions of the PMC are intended to protect water quality and support attainment of water quality standards in downstream receiving water bodies. Compliance with the PMC requires preparation of a Stormwater Management Plan (SWMP) that illustrates the capabilities of on-site BMPs to capture and treat flows from a ten-year storm event. Furthermore, the SWMP includes an assessment of whether drainage alterations would create a Hydrologic Condition of Concern due to hydromodification, such as changes in watershed hydrologic processes and runoff that result in increased streamflow and sediment transport. As part of the project's final design review, the project would be required to submit a SWMP demonstrating adequate stormwater retention using BMPs.

The project would implement BMPs to capture and retain stormwater on-site, for compliance with the PMC and MS4 Permit requirements. Implementation of BMPs would slow the velocity of water and allow sediment and debris to settle out of the water column, as well as capture stormwater on the site, thereby minimizing the potential for downstream flooding, erosion/siltation, pollution, or exceedances of stormwater drainage system capacity. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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

The project site is designated Zone X on the most recent Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, indicating it is within an area of minimal flood hazard (FEMA 2008). The project site is approximately 48 miles from the Pacific Ocean and not subject to tsunami. The nearest inland water body subject to seiche is the Harold Reservoir, located 4.75 miles southwest of the project site. The project site is not located in the inundation zone for the Harold Reservoir (California Department of Water Resources 2015). Furthermore, the project does not involve storage or processing of pollutants, other than minor quantities of typical household hazardous wastes, such as cleaning agents and landscaping maintenance materials, that would be released due to inundation should such an event occur. Therefore, the project would result in a less-than-significant impact related to the release of pollutants due to project inundation.

LESS THAN SIGNIFICANT IMPACT

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

As discussed under *Threshold 10a* above, project construction and operational activities would be required to comply with the LARWQCB's Water Quality Control Plan, NPDES Construction General Permit, and MS4 Permit by preparing and adhering to a SWPPP and SWMP. With implementation of the required SWPPP and SWMP, the proposed project would adequately treat, detain, and control stormwater flows on the project site and would not conflict with or obstruct the LARWQCB Water Quality Control Plan. As discussed under *Threshold 10b*, the project would receive water from the Antelope Valley Basin through service provided by Palmdale Water Company. These basins are adjudicated, and water demand generated by the proposed project would not conflict with or obstruct the sustainable management of these basins. The project site lies above the Antelope Valley Basin, which was adjudicated in 2015 and is controlled by a court-mandated water management plan to ensure its long-term sustainability. The proposed residential uses on the project site would not be point source generators of water pollutants that could affect the Antelope Valley Basin, and the project does not propose ground water extraction. Therefore, project construction and operation would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

11 Land Use and Planning

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	☐	☐	☐	■
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	■	☐

a. Would the project physically divide an established community?

The project site is currently vacant. The proposed project involves the construction of 191 single-family residential homes. Primary vehicular access to the site would connect to East Palmdale Boulevard. Pedestrians would be able to access the project site via the sidewalks along East Palmdale Boulevard. Streets that would be constructed within the project would link the community to East Palmdale Boulevard to the north as well as the existing residential projects to both the east and west of the project. No impact would occur.

NO IMPACT

b. Would the project 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?

The proposed project involves the construction of a residential community on a site with a General Plan land use designation of SFR-3 (Single Family Residential) and a zoning designation of SFR-3 (Single Family Residential), which permits densities of 0 to 6 dwelling units per acre. The proposed project would be consistent with the intent of the General Plan to meet the Regional Housing Needs Assessment housing needs by creating a single-family housing development on a vacant site, thereby adding to the housing stock in the city.

The proposed development would comply with all applicable policies contained in the General Plan and the development standards for the SFR-3 zone. Accordingly, the proposed project would not conflict with the City's General Plan or zoning standards. In addition, as described in Section 3, *Air Quality*, and Section 8, *Greenhouse Gas Emissions*, the proposed project would be consistent with the goals and policies of the AQMP and SCAG's 2020-2045 RTP/SCS upon implementation of Mitigation Measure GHG-1. There are no environmental impacts that would result as a specific consequence of the proposed changes to the site's General Plan land use designation, beyond what is already evaluated and disclosed by this IS-MND. Therefore, the proposed project would not conflict with land use plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect, and impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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12 Mineral Resources

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

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

b. Would the project 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?

The California Surface Mining and Reclamation Act of 1975 (SMARA) was enacted to promote conservation and protection of significant mineral deposits. According to the California Department of Conservation Mineral Land Classification Maps, the project site is in an area classified as Mineral Resource Zone (MRZ)-2, which indicates that the project area contains identified mineral resources (DOC 1984). Additionally, the City's General Plan states that the city is located in a MRZ-2 area. Though the project site is in an area with identified mineral resources, the project site has not historically been used for mineral resource recovery and is surrounded by urbanized area primarily developed with residential. The project site and its vicinity are therefore not used for or compatible with mineral deposit recovery. In addition, according to the California Geologic Energy Management Division (CalGEM), there are no active oil extraction-sites in the vicinity of the project (CalGEM 2022). Furthermore, the project site is not within the City's Mineral Resource Extraction land use designation or zone. Given the existing conditions of the project site and its surroundings, the proposed project would not result in the loss of availability of a known mineral resource, and there would be no impact.

NO IMPACT

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13 Noise

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	□	□	■	□
b. Generation of excessive groundborne vibration or groundborne noise levels?	□	□	■	□
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	□	□	□	■

Noise Setting

Overview of Noise

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (Caltrans 2020a).

HUMAN PERCEPTION OF SOUND

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response. Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; dividing the energy in half would result in a 3 dB decrease (Caltrans 2020a).

Human perception of noise has no simple correlation with sound energy: the perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease (i.e., twice the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (half) as loud (10.5 times the sound energy) (Caltrans 2020a).

SOUND PROPAGATION AND SHIELDING

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in the noise level as the distance from the source increases. The manner by which noise reduces with distance depends on factors such as the type of sources (e.g., point or line), the path the sound will travel, site conditions, and obstructions.

Sound levels are described as either a "sound power level" or a "sound pressure level," which are two distinct characteristics of sound. Both share the same unit of measurement, dB. However, sound power (expressed as L_{pw}) is the energy converted into sound by the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers, such as an eardrum or microphone, which is the sound pressure level. Sound measurement instruments only measure sound pressure, and noise level limits are typically expressed as sound pressure levels.

Noise levels from a point source (e.g., construction, industrial machinery, air conditioning units) typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance. Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2020a). Noise levels may also be reduced by intervening structures; the amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels. Natural terrain features, such as hills and dense woods, and man-made features, such as buildings and walls, can significantly alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5-dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2011). Structures can substantially reduce exposure to noise as well. The FHWA's guidance indicates that modern building construction generally provides an exterior-to-interior noise level reduction of 10 dBA with open windows and an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows (FHWA 2011).

DESCRIPTORS

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important factors of project noise impact. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. The noise descriptors used for this study are the equivalent noise level (L_{eq}), Day-Night Average Level (DNL; may also be symbolized as L_{dn}), and the community noise equivalent level (CNEL; may also be symbolized as L_{den}).

L_{eq} is one of the most frequently used noise metrics; it considers both duration and sound power level. The L_{eq} is defined as the single steady-state A-weighted sound level equal to the average sound energy over a time period. When no time period is specified, a 1-hour period is assumed. The L_{max} is the highest noise level within the sampling period, and the L_{min} is the lowest noise level within the measuring period. Normal conversational levels are in the 60 to 65-dBA L_{eq} range; ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (Federal Transit Administration [FTA] 2018).

Noise that occurs at night tends to be more disturbing than that occurring during the day. Community noise is usually measured using Day-Night Average Level (L_{dn}), which is the 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime hours (10:00 p.m. to 7:00 a.m.). Community noise can also be measured using Community Noise Equivalent Level (CNEL or L_{DEN}), which is the 24-hour average noise level with a +5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a +10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. (Caltrans 2020a).[3] The relationship between the peak-hour L_{eq} value and the L_{dn}/CNEL depends on the distribution of noise during the day, evening, and night; however noise levels described by L_{dn} and CNEL usually differ by 1 dBA or less. Quiet suburban areas typically have CNEL noise levels in the range of 40 to 50 CNEL, while areas near arterial streets are in the 50 to 60+ CNEL range (FTA 2018).

Groundborne Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of Hz. The frequency of a vibrating object describes how rapidly it oscillates. The normal frequency range of most groundborne vibration that can be felt by the human body starts from a low frequency of less than 1 Hz and goes to a high of about 200 Hz (Crocker 2007).

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings, such as from nearby construction activities, may cause windows, items on shelves, and pictures on walls to rattle. Vibration of building components can also take the form of an audible low-frequency rumbling noise, referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the vibration source (FTA 2018). Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and annoying to building occupants and vibration-sensitive land uses.

Vibration amplitudes are usually expressed in peak particle velocity (PPV), which is normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration and other construction activities because it is related to the stresses that are experienced by buildings (Caltrans 2020).

Project Area Noise Setting

The most common source of noise in the project site vicinity is vehicular traffic from East Palmdale Boulevard and 47th Street East. To characterize ambient sound levels at and near the project site, three 15-minute sound level measurements and one 24-hour sound level measurement were conducted on Wednesday, September 21, 2022. Short-Term Noise Measurement 1 (ST-1) was taken at the northern edge of the project site to capture noise levels from East Palmdale Boulevard. ST-2 was taken at the southwestern edge of the project site near the adjacent single-family residences. ST-3 was conducted at the center of the project site. Table 16 and Table 17 summarize the results of the noise measurements and Table 18 shows the recorded traffic volumes. Noise measurement locations are shown in Figure 4. Detailed sound level measurement data are included in Appendix F.

[3] Because DNL and CNEL are typically used to assess human exposure to noise, the use of A-weighted sound pressure level (dBA) is implicit. Therefore, when expressing noise levels in terms of DNL or CNEL, the dBA unit is not included.

Table 16 Project Site Vicinity Sound Level Monitoring Results- Short-Term

Measurement Location		Sample Times	Approximate Distance to Primary Noise Source	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)
ST-1	Northern Boundary of Project Site	10:13 – 10:28 a.m.	50 feet to centerline of East Palmdale Boulevard	66.2	47.6	79.0
ST-2	Southwestern Boundary of Project Site	9:49 – 10:04 a.m.	1,200 feet to centerline of East Palmdale Boulevard	42.0	36.9	55.9
ST-3	Center of Project Site	9:26 – 9:41 a.m.	650 feet to centerline of East Palmdale Boulevard	44.3	38.9	52.7

L_{eq} = average noise level equivalent; dBA = A-weighted decibel; L_{min} = minimum instantaneous noise level; L_{max} = maximum instantaneous noise level

Detailed sound level measurement data are included in Appendix F.

Table 17 Project Site Vicinity Noise Monitoring Results – Long Term

Sample Time	dBA L_{eq}	Sample Time	dBA L_{eq}
24-hour Measurement – Center of Project Site, 500 Feet from Palmdale Boulevard – September 21-22, 2022			
10:59 a.m.	49.7	10:59 p.m.	42.1
11:59 a.m.	48.1	11:59 p.m.	48.3
12:59 p.m.	48.4	12:59 a.m.	40.3
1:59 p.m.	50.6	1:59 a.m.	39.0
2:59 p.m.	49.3	2:59 a.m.	41.6
3:59 p.m.	51.5	3:59 a.m.	45.0
4:59 p.m.	47.8	4:59 a.m.	55.1
5:59 p.m.	49.9	5:59 a.m.	50.4
6:59 p.m.	53.3	6:59 a.m.	51.5
7:59 p.m.	49.5	7:59 a.m.	50.9
8:59 p.m.	46.5	8:59 a.m.	50.1
9:59 p.m.	48.9	9:59 a.m.	41.2
24-hour Noise Level (CNEL)			**56.0**

L_{eq} = average noise level equivalent; dBA = A-weighted decibel; CNEL = Community Noise Equivalent Level

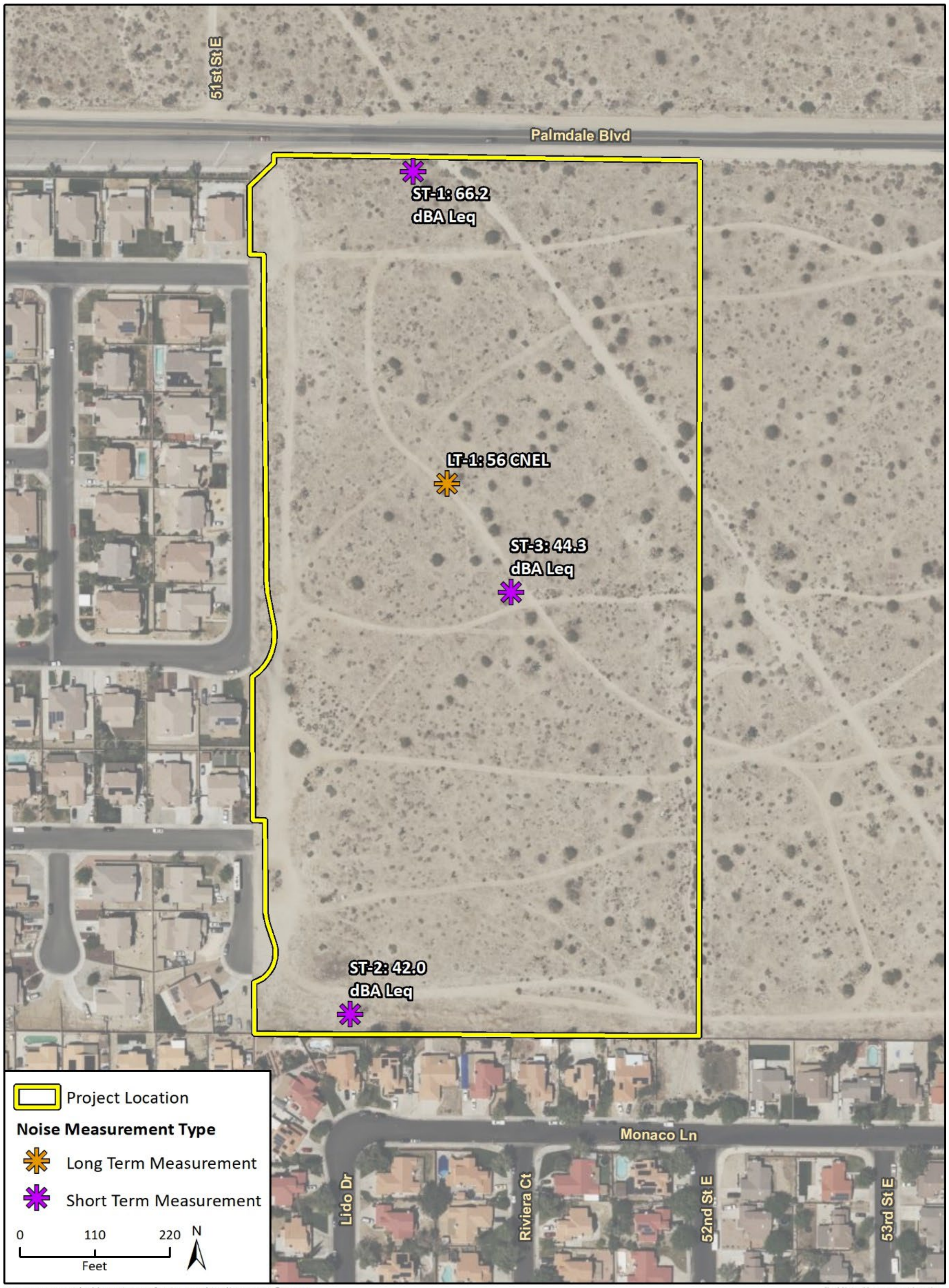
Detailed sound level measurement data are included in Appendix F.

Table 18 Sound Level Monitoring Traffic Counts

Measurement	Roadway	Traffic	Autos	Medium Trucks	Heavy Trucks
ST-1	East Palmdale Boulevard	15-minute count	202	3	3
		One-hour Equivalent	808	12	12
Percent			**97%**	**1.5%**	**1.5%**

Detailed sound level measurement data are included in Appendix F.

Figure 4 Noise Measurement Locations



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SENSITIVE RECEIVERS

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. In the City of Palmdale, noise sensitive land uses (also referred to as "sensitive receivers") include residences, schools, libraries, hospitals/medical facilities, and assisted living facilities (City of Palmdale 2022a).

Vibration-sensitive receivers, which are similar to noise-sensitive receivers, include residences and institutional uses, such as schools, churches, hospitals and libraries. Vibration-sensitive receivers also include buildings where vibrations may interfere with vibration-sensitive equipment that is affected by vibration levels that may be well below those associated with human annoyance (e.g., recording studies or medical facilities with sensitive equipment). As shown in Figure 2, the nearest sensitive receivers to the project site are the single-family homes adjacent to the project site to the south and west.

Regulatory Setting

Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual

There are no federal regulations directly applicable to the proposed project. However, the FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction in their Transit Noise and Vibration Impact Assessment Manual (FTA 2018). For residential uses, the daytime noise threshold is 80 dBA Leq for an 8-hour period. In addition, the FTA recommends a vibration limit of 0.2 inches per second (in/sec) peak particle velocity (PPV) for potential building architectural damage at residential buildings and 0.3 in/sec PPV at commercial buildings.

Sections 5 and 6 of manual addresses the federal guidelines used to evaluate a project for potential vibration impacts. The vibration impact analysis is a multi-step process used for determining vibration analysis level, determining vibration impact criteria, and evaluating vibration impact. FTA guidelines state that the threshold of perception for humans is approximately 65 vibration decibels (VdB). A vibration level of 85 VdB can result in strong annoyance, and a vibration level of 100 VdB is the threshold of potential damage (FTA 2018). Construction activity can result in varying degrees of ground vibration depending on the equipment and methods employed, and older and more fragile buildings must receive special consideration. These guidelines are advisory and should be used to assess the impacts of ground borne vibrations created from transit and construction sources.

California Building Code

California Code of Regulations Title 24, Building Standards Administrative Code, Part 2, and the California Building Code codify the state noise insulation standards. These noise standards apply to new construction in California to control interior noise levels as they are affected by exterior noise sources. The regulations specify that interior noise levels for residential and school land uses should not exceed 45 CNEL.

City of Palmdale General Plan

The State of California requires each city and county to adopt a Noise Element as part of its General Plan. Such Noise Elements must contain a Land Use/ Noise Compatibility Matrix. The objective of noise compatibility guidelines is to provide the community with a means of judging the noise environment that it deems to be generally acceptable. A recommended (but not mandatory) matrix is presented in the "Guidelines for the Preparation and Content of Noise Elements of the General Plan" (Governor's Office of Planning and Research [OPR] 2003). The City of Palmdale Land Use/Noise Compatibility Matrix in the 2022 General Plan Noise Element is based on, and is similar to the California Land Use/Noise Compatibility Matrix. The matrix is used to determine whether a proposed new use would be compatible with the ambient noise environment in which it is proposed as well as whether or not the proposed new use would create noise compatibility conflicts with established uses. The compatibility table, shown in Figure 5, illustrates the ranges of community noise exposure in terms of what is "normally acceptable," "conditionally acceptable," "normally unacceptable," and "clearly unacceptable."

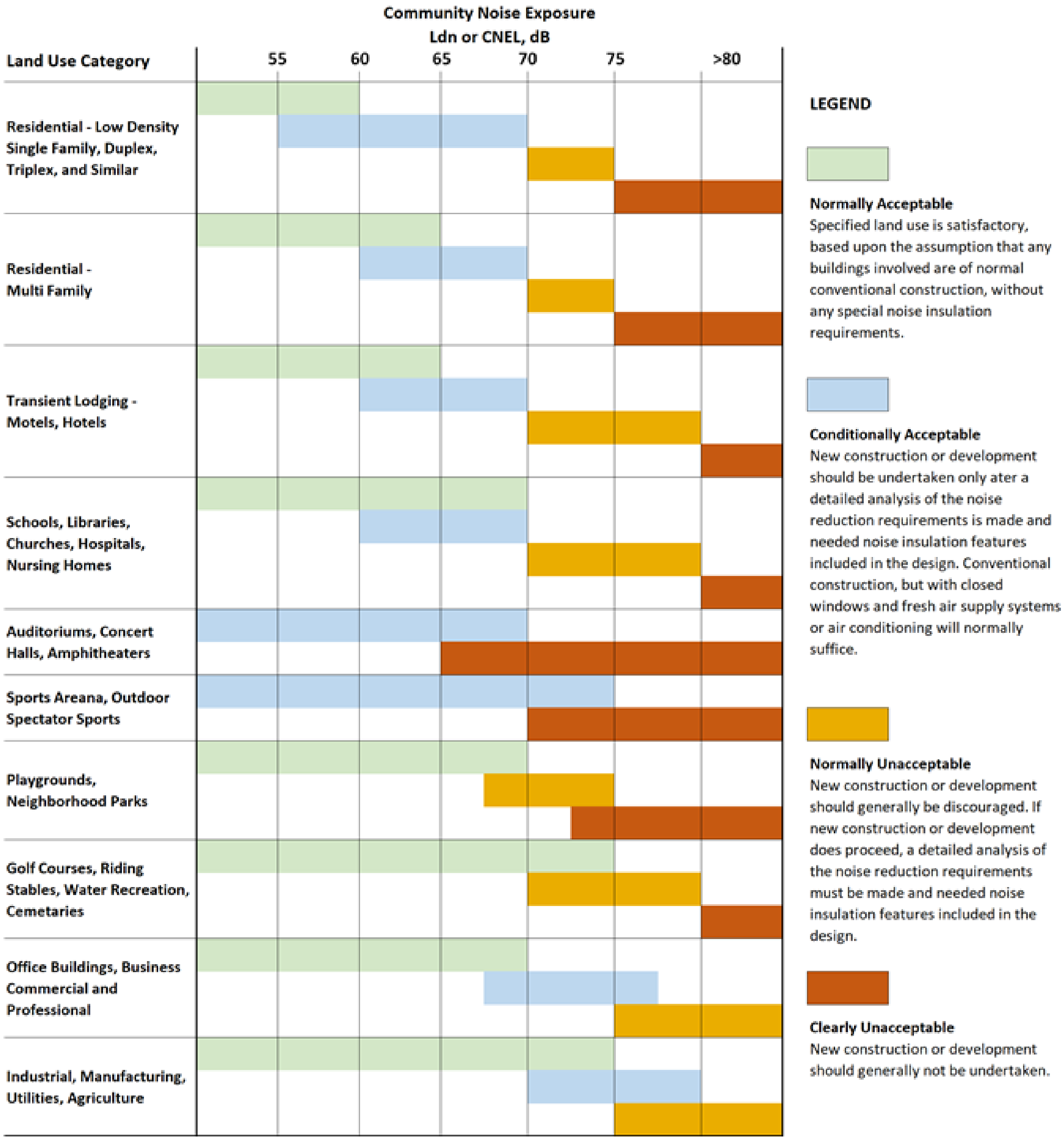
Denotation of a land use as "normally acceptable" implies that the highest noise level in that exposure level is the maximum desirable for existing or conventional construction that does not incorporate any special acoustical treatment. In general, evaluation of land use that falls into the "normally acceptable," "conditionally acceptable," or "normally unacceptable" noise environments should analyze other potential factors that would affect the noise environment. These include consideration of the types of noise source, the sensitivity of the noise receiver, the noise reduction likely to be provided by structures, and the degree to which the noise source may interfere with speech, sleep, or to other activities characteristic of the land use. Generally, the City's Land Use/Noise Compatibility Matrix is used as a guide to define where placement of certain land uses is considered acceptable. The Noise Element of the City's current General Plan also contains policies to maintain an acceptable noise environment in the city. Goals and policies from the proposed Plan relating to noise are listed in the impact analysis discussions in Section 4, *Impact Analysis*.

Palmdale Municipal Code

The City also implements and enforces noise control through the PMC Chapter 9.18 (Disturbing, Excessive, Loud, or Offensive Noise), which sets both daytime and nighttime sound level limits for residential and commercial zones; prohibits any person or property owner in the city from creating 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.

PMC Chapter 8.28 (Building Construction Hours of Operation and Noise Control), prohibits any person or property owner in the City to 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.

Figure 5 Palmdale General Plan Noise Level Guidance



Source: City of Palmdale 2022a

a. *Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

The following discussions address the potential noise level increases associated with construction and operation of the project.

Construction Noise

Pursuant to Chapter 8.28 (Building Construction Hours of Operation and Noise Control) of the PMC, noise generated by construction activities is not prohibited if it occurs on Monday through Saturday, between the hours of 6:30 a.m. to 8:00 p.m. In addition, the FTA-recommended criterion of 80 dBA L_{eq} for residential daytime receivers is used as a significance threshold for nearby residences. Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (FHWA 2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, construction noise levels were estimated at noise sensitive receivers near the project site. RCNM provides reference noise levels for standard construction equipment, with an attenuation rate of 6 dBA per doubling of distance for stationary equipment.

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FTA 2018). Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some have high-impact noise levels.

Construction activity would result in temporary noise in the project site vicinity, exposing surrounding nearby receivers to increased noise levels. Construction noise would typically be higher during the heavier periods of initial construction (i.e., site preparation and grading) and would be lower during the later construction phases (i.e., building construction and paving). Typical heavy construction equipment during project grading could include dozers, loaders, graders, and dump trucks. It is assumed that diesel engines would power all construction equipment. Construction equipment would not all operate at the same time or location. In addition, construction equipment would not be in constant use during the 8-hour operating day.

Project construction would occur nearest to the single-family residences within the southern and western portion of the project site. Over the course of a typical construction day, construction equipment would be located as close as 15 feet to the properties but would typically be located at an average distance farther away due to the nature of construction and the lot size of the project. For example, during a typical construction day when performing construction near these residences, the equipment may operate across a horizontal distance (15 to several hundred feet) from a nearby noise receiver. Therefore, it is assumed that over the course of a typical construction day the construction equipment would operate at an average distance of 100 feet from the single-family residences to the west and south.

Construction noise is typically loudest during activities that involve excavation and soil movement, such as site preparation and grading. Project construction would occur nearest to the single-family residences located west and south of the project site. It is conservatively assumed that over the course of a typical construction day the construction equipment would operate 100 feet from the nearest sensitive receiver. At a distance of 100 feet, a loader, front end loader and dump truck would generate a noise level of 74.4 dBA L_{eq} (RCNM calculations are included in Appendix F). Therefore, construction noise levels would not exceed the FTA's daytime residential threshold of 80 dBA L_{eq}, and impacts would be less than significant.

Operation Noise

The City of Palmdale has not established operational noise standards. Therefore, operational noise standards based upon USEPA are provided for this analysis. Based upon available sleep criteria data, an interior nighttime level of 35 dBA is considered acceptable (USEPA 1974). Assuming a 15 dBA reduction with windows open, an exterior noise level of 50 dBA L_{eq} would be required to maintain an acceptable interior noise environment of 35 dBA. Off-site project noise (i.e., roadway noise) would result in a significant impact if the project would increase traffic noise levels by 3 dBA, which would be a perceptible increase in traffic noise.

HVAC Units

The main noise source associated with a residential development are heating, ventilation, and air conditioning (HVAC) units). The unit used in this analysis is a Carrier 38HDR060 split-system, which is a typical HVAC unit used on single-family residential sites and has a sound power level of 72 dBA (see Appendix F for manufacturer's specifications). HVAC equipment for single-family residences are typically located at ground-level, on the side or backyard portions of a house. It is assumed that 191 ground-level HVAC units distributed across the project site would be needed, based on 191 dwelling units. The closest future residential lots to nearby receivers would occur on the southern edge of the project site.

Each residence would have at least one ground-level HVAC equipment. Given estimated setbacks, HVAC equipment could be within 20 feet of existing residences. At a distance of 20 feet, an HVAC unit would generate noise levels of 48 dBA, which would not exceed an exterior noise level of 50 dBA L_{eq} at nearby residences that would result in an exceedance of an acceptable interior noise environment of 35 dBA. In addition, future fencing between properties may provide additional noise attenuation. Therefore, operational noise impacts associated with HVAC equipment would be less than significant.

Additional on-site noise sources such as landscape maintenance, low-speed traffic on internal roadways, conversations, open space activities, and trash hauling also would be typical of noise generated by neighboring land uses and would not substantially contribute to overall ambient noise levels. Therefore, on-site operations would have a less than significant impact on noise-sensitive receivers.

Off-site Traffic Noise

The overall increase in traffic noise from the project was estimated using ADT "future with project conditions" data from the Traffic Signal Warrant Study prepared by General Technologies and Solutions, included as Appendix G. These daily ADT scenarios are shown in Table 19. The roadway segment that is expected to experience the greatest increase in trips is Palmdale Boulevard during PM peak hours. Therefore, it is anticipated that traffic at this roadway segment is expected to create the greatest off-site traffic noise impacts when compared to other intersections near the project site. As shown in Table 19, PM peak hour trips would increase by approximately nine percent over existing conditions under the project. A nine percent increase in traffic on a roadway would equate to an increase of 0.4 dBA. Therefore, the project would not double the existing mobile noise source and would not increase noise levels by 3 dBA, which is considered a barely perceptible noise increase. Therefore, off-site traffic noise impacts would be less than significant.

Table 19 Daily Vehicle Trip Summary

Palmdale Boulevard	Residential Trips
Existing Conditions	16,745[1]
Existing Plus Project Conditions	18,205
Change in Trips	**+1,460**
Percent Change in Vehicle Trips (%)	**9%**

[1] Existing condition traffic counts are observed traffic counts on Palmdale Avenue as presented in the Traffic Signal Warrant Study (General Technologies and Solutions 2023). For the noise analysis, all project trips were conservatively added to this observed value.

LESS THAN SIGNIFICANT IMPACT

b. *Would the project result in generation of excessive groundborne vibration or groundborne noise levels?*

The project would result in the generation of excessive groundborne vibration or groundborne noise levels if vibration levels exceed 0.2 in/sec PPV at residential structures or 0.3 in/sec PPV at commercial structures.

The project does not include any substantial vibration sources associated with operation. Thus, construction activities have the greatest potential to generate ground-borne vibration affecting nearby receivers, especially during grading and excavation of the project site. Table 20 shows vibration levels of anticipated grading and excavation equipment used during construction. The greatest vibratory source during construction in the project vicinity would be a large bulldozer. Neither blasting nor pile driving would be required for construction of the project.

Table 20 Vibration Levels Measured during Construction Activities

Equipment	PPV at 25 ft. (in/sec)
Large Bulldozer	0.089
Loaded Trucks	0.076
Small Bulldozer	0.003

Source: FTA 2018

Construction activities known to generate excessive ground-borne vibration, such as pile driving, would not be conducted to construct the project. Based on FTA recommendations, limiting vibration levels to below 0.2 in/sec PPV at residential structures would prevent architectural damage regardless of building construction type. The greatest anticipated source of vibration during project construction activities would be from a dozer, which may be used within 15 feet of the nearest off-site sensitive receivers to the to the west and south. A dozer would create approximately 0.089 in/sec PPV at a distance of 25 feet (FTA 2018). This would equal a vibration level of approximately 0.16 in/sec PPV at a distance of 15 feet.[4] This would be lower than the 0.2 in/sec PPV threshold. Therefore, temporary vibration impacts associated with the dozer (and other potential equipment) would be less than significant.

[4] PPVEquipment = PPVRef $(25/D)^n$ (in/sec), PPVRef = reference PPV at 25 feet, D = distance ,and n = 1.1

Operation of the project would not include any substantial vibration sources. Therefore, operational vibration impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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 airport nearest to the project site, Palmdale Regional Airport, is located approximately 3.8 miles to the northwest. The project would not be located within the 65 CNEL noise contour of the Palmdale Regional Airport (City of Palmdale 2022a). Therefore, no substantial noise exposure from airport noise would occur to construction workers, users, or employees of the project, and no impacts would occur.

NO IMPACT

14 Population and Housing

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project:				
a. Induce substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	□	□	■	□
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	□	□	□	■

a. *Would the project 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)?*

According to the California Department of Finance (DOF), the City of Palmdale has an estimated population of 165,917 with an average household size of 3.4 persons (DOF 2023). SCAG estimates that the city's population will increase to 207,000 by 2045, which is an increase of approximately 25 percent or 41,083 persons (SCAG 2020). The proposed project involves the construction of 191 units of new single-family housing lots in Palmdale. Construction of the proposed project would increase the existing population by up to approximately 649 residents[5] (a 0.4 percent increase from the existing population) to 166,566, which would be within SCAG's 2045 population forecast. In addition, according to DOF estimates, the city has an existing housing stock of 43,800 units, which SCAG forecasts will increase by 18,000 units (an approximate 41 percent increase) to 61,800 units by 2045 (DOF 2021; SCAG 2020). The project would generate 191 housing units, which would represent approximately 0.3 percent of the projected increase in housing units. Given that the proposed project would not exceed SCAG's 2045 population or housing forecast, the project would not cause a substantial increase in population or induce unplanned population growth. Therefore, impacts associated with population growth would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. *Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*

The project site is vacant; therefore, the project would not displace existing housing or people and would not require construction of replacement housing elsewhere. No impact would occur.

NO IMPACT

[5] 191 units x 3.4 persons per unit

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15 Public Services

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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:				
1 Fire protection?	□	□	■	□
2 Police protection?	□	□	■	□
3 Schools?	□	□	■	□
4 Parks?	□	□	■	□
5 Other public facilities?	□	□	■	□

a.1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, or the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

The City of Palmdale works with the Los Angeles County Fire Department (LACoFD) to provide fire protection and paramedic emergency services to residents and businesses within the city. The nearest fire station is Fire Station No. 93, which is located at 5624 E Avenue R, approximately 0.9 mile southeast of the project site. On October 14, 2022, staff contacted Fire Station No. 93 and spoke with Fireman Sean Strinkle who stated there are a total number of six people on duty at all times including one captain, one engineer, one firefighter, and three paramedics (LACoFD 2022). There is also one fire engine and one paramedic squad engine. The fire station responds to approximately 4,500 incidents per year. The LACoFD has a goal of 4-6 minutes for on scene arrival (City of Palmdale 2022a). Furthermore, Fire station staff indicated that there is capacity to sustain additional residents; therefore, the proposed project would not require new or physically altered fire protection facilities. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered police protection facilities, or the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

The City of Palmdale contracts with the Los Angeles County for most emergency services, including police protection services. The Los Angeles County Sheriff's Department provides police protection to services to residents and businesses within the city, across 770 square miles (Los Angeles County Sheriff's Department 2020). The Sheriff's Department is located at 750 East Avenue Q, which is approximately five miles west of the project site. The current average response time for emergency calls within the city is under six minutes for on scene arrival (City of Palmdale 2022a).

The City also requires the payment of development impact fees to meet the demand for public facilities, including police protection services created by the development (City of Palmdale). Therefore, the project would not result in the need for new or physically altered police protection facilities that could have environmental impact. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.3. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered schools, or the need for new or physically altered schools, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

The project site is served by the Palmdale Unified School District (PUSD) which had an enrollment of 17,805 students in the 2021-2022 academic year (PUSD 2022), and the Antelope Valley Union High School District, which had an enrollment of 23,000 students (AVUHSD 2022). The project site would be served by Golden Poppy Elementary School (Kindergarten-Grade 5), Cactus Middle School (Grade 6 – Grade 8), and Palmdale High School (Grade 9-Grade 12).

The need for new school facilities is typically associated with a population increase that generates an increase in enrollment large enough to cause new schools to be constructed. The proposed project involves construction of a 191-unit residential development. On average, 47.6 percent of families in Palmdale have school-age children (City of Palmdale 2022a). Based on this estimate, 91 of the residential units would have school-aged children. According to Section 14, *Population and Housing*, the average persons per household in Palmdale is 3.4, so conservatively assuming two school-aged children per household, the project would generate approximately 182 students. Compared to the 17,805 students enrolled in PUSD schools for the 2021-2022 school year, the project would incrementally increase existing student enrollment by approximately one percent. In addition, according to the Palmdale School District Student Centric Facilities Master Plan, the district anticipates a drop in student total enrollment from the 2016 base line level in the 2023-2024 school year. The Palmdale School District anticipates a drop in enrollment of Transitionary Kindergarten (TK) to eighth grade from 19,024 to 18,791.6 from the 2016-2017 to 2023-2024 school years (PUSD 2017).

Furthermore, the project applicant would be required to pay the state-mandated school impact fees that would contribute to the funds available for development of new school facilities. Pursuant to Section 65995 (3)(h) of the California Government Code (Senate Bill 50, chaptered August 27, 1998), the payment of statutory fees "...is deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization." Therefore, the project would not substantially increase the number of students at local public school or lead to the need for new or physically altered school facilities. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered parks, or the need for new or physically altered parks, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives?

According to the General Plan, the City owns and operates 19 parks that consist of 351 acres of parkland. The General Plan establishes a park standard of providing five acres of park per 1,000 residents (City of Palmdale 2022a). According to the DOF, the city has an estimated population of 167,398, (DOF 2022). Therefore, the city's existing population and parkland ratio is 2.09 acres per 1,000 residents, which results in approximately 41 percent of the current target for public parks. The city would need an additional 496 acres of parkland to meet the current parkland to resident ratio target. The proposed project could result in the addition of approximately 588 new residents in the city, which would bring the city's population to 167,986, indicating that the city would need additional parkland to meet the current parkland to resident ratio.

The nearest park to the project is Domenic Massari Park, located approximately 3,500 feet south of the project site, which is a 40-acre park that includes a playground area, two picnic pavilions, walking and jogging paths, five soccer fields, and other amenities. Residents under the proposed project may use the existing recreational facilities, which could result in deterioration or need for additional recreational space. The project would provide a pocket community park, a children's play area, and additional community open spaces. Additionally, a community trail network is planned to link the neighborhood and provide additional open spaces and parks for the community to utilize. Furthermore, the project would be required to pay the City's development impact fees or in-lieu fees from development projects to mitigate the impacts associated with the development on the City's existing park system (City of Palmdale 2022a). The proposed project would not create the need for new or expanded park facilities. Impact would be less than significant.

LESS THAN SIGNIFICANT IMPACT

a.5. Would the project result in substantial adverse physical impacts associated with the provision of other new or physically altered public facilities, or the need for other new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives?

The project site is in an urban area already served by public services and facilities, such as utilities and public libraries. Development of the project would result in incremental impacts to the City's public services and facilities such as storm drain usage, solid-waste disposal, water usage, and wastewater disposal. These impacts are analyzed in Section 10, *Hydrology and Water Quality*, and Section 19, *Utilities and Service Systems*. The project's contribution to storm drain usage, solid-waste disposal, water usage, and wastewater disposal would be offset through project-specific features described in the individual resource section analyses indicated above.

The City of Palmdale is served by the Palmdale City Library located approximately 4.5 miles east of the project site at 700 East Palmdale Boulevard. As discussed in Section 14, *Population and Housing*, the proposed project could potentially increase the city's population by up to 588 residents, which would be an increase of approximately 0.35 percent of the city's population. Increased population generated by the proposed project would incrementally increase demand on local public libraries in the vicinity, such as the Palmdale City Library. However, the project would be subject to Palmdale's development impact fees for library facilities. As a result, the proposed project would contribute to the financing of library services through impact fees and property taxes, which would mitigate the need for new or physically altered government facilities that support library use. Therefore, the project would not substantially affect existing governmental facilities or require the need for new or altered governmental facilities. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

16 Recreation

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	□	□	■	□
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	□	□	■	□

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

According to the General Plan, the City owns and operates 19 public parks with a totaling 370 acres of land for public use and 351 acres of existing parkland (City of Palmdale 2022a). According to the DOF, the city has an estimated population of 167,398 (DOF 2022). Therefore, the City's existing population and parkland ratio is 2.09 acres per 1,000 residents, which results in approximately 41 percent of the current target for public parks. According to the general plan, the city would need an additional 496 acres of parkland to meet the current parkland to resident ratio target (City of Palmdale 2022a). The project site is within 3,500 feet south of Domenic Massari Park, and the project would include a pocket community park and amenities such as a pool, fitness center, and recreation space which would help serve the recreational needs of future residents. Additional residents may use the existing recreational facilities, which may result in deterioration or need for additional recreational space. The City currently collects park development impact fees or in-lieu fees from development projects to mitigate the impacts associated with the development on the City's existing park system. Therefore, potential impacts related to recreational facilities would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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17 Transportation

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

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Regional access to the project site is provided by SR-138, which is approximately one mile north of the project site, and SR-14, which is approximately 5.4 miles west of the project site. Local access to the site is provided by East Palmdale Blvd and East Avenue R. In addition, regional mass transit service is provided by Antelope Valley Transit Authority (AVTA). The site is currently served by AVTA bus routes 3 and 98 along East 47th Street. The nearest bus stop for AVTA bus routes 3 and 98 is approximately 2,000 feet west of the project site at the intersection of East 47th Street and East Ave R. Sidewalks are provided along all roadways around the project site for pedestrian access.

The City adopted the Los Angeles County Public Works *Transportation Impact Analysis (TIA) Guidelines* (July 2020) to assess VMT. In addition to the County's Transportation Impact Analysis Guidelines, City of Palmdale General Plan Circulation Element; Land Use and Community Design Element; and the Palmdale Transit Area Specific Plan, contain the City's goals addressing the circulation system. The project's consistency with the applicable goals, objectives, and policies contained in the Palmdale General Plan is discussed in Table 21, below.

Table 21 Project Consistency with Palmdale Circulation System Plans

Goal	Project Consistency
General Plan Circulation Element	
Goal C1: Establish, maintain, and enhance a system of streets and highways which will provide for the safe and efficient movement of people and goods throughout the Planning Area, while minimizing adverse impacts on the community.	**Consistent.** The proposed project is within the vicinity of SR-138, which is approximately one mile north of the project site, and SR-14, which is approximately 5.4 miles west of the project site. Local access to the site is provided by East Palmdale Boulevard and East Avenue R, providing accessibility to the site and effective movement of people and goods. The proposed project is within the vicinity of AVTA bus routes 3 and 98 along East 47th Street, enhancing access to alternative mobility options. Therefore, the project would be consistent with Goal C1.
Goal C2: Reduce the number of trips and vehicle miles traveled by individuals within the Planning Area, to meet regional transportation and air quality goals.	**Consistent**. The project would allow future project residents to easily access public transportation (approximately 2,000 feet from the project site) and retail uses. Therefore, future residents would be within walking and bicycling distance to public transportation and commercial/retail amenities, which would reduce the number of trips and VMT. In conclusion, the project would be consistent with Goal C2.
General Plan Land Use and Community Design Element	
Goal L1: Create a vision for long-term growth and development in the City of Palmdale which provides for orderly, functional patterns of land uses within urban areas, a unified and coherent urban form, and a high quality of life for its residents. **Policy L1.1.1**: Through adoption of the Land Use Map, direct future growth to areas which can accommodate development based upon topography, environmental factors, availability of infrastructure, and/or comprehensive planning. These areas include the following: 1. Vacant land within urbanized areas (infill lots), where backbone infrastructure is available or planned for; 2. Areas governed by adopted Specific Plans; 3. Areas in which infrastructure master planning has occurred.	**Consistent.** The proposed project involves the construction of a 191 units of new single-family housing lots in an infill site in a residential area with nearby access to retail, services, and public transit providing for a variety of mobility options for residents. The project would include recreational amenities for residents including shared open space and a recreation center. Therefore, the proposed project would provide a high-quality living environment with convenient access and mobility options and would be consistent with Goal L1 and Policy L1.1.1.

Source: City of Palmdale General Plan

As illustrated above, the proposed project would not conflict with the goals, objectives, and policies contained in the Palmdale General Plan. The project would continue to be served by and would not interfere with existing and planned roadway, pedestrian, bicycle, and public transit facilities. The proposed project would not alter AVTA's existing transit system or introduce features that would preclude the addition of bike lanes as planned in the Transit Area Specific Plan, nor would the project alter operation of the existing ATVA bus stops in the vicinity of the project site. Therefore, the proposed project would not conflict with a program, plan, ordinance, or policy addressing the circulation system. Potential impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

In December 2018, the California Natural Resources Agency certified and adopted the updated CEQA Guidelines package. The amended CEQA Guidelines, specifically Section 15064.3, generally require the use of VMT as the primary metric for the evaluation of transportation impacts associated with land use and transportation projects. In general terms, VMT quantifies the amount and distance of automobile travel attributable to a project or region. All agencies and projects state-wide are required to utilize the updated CEQA Guidelines for evaluating transportation impacts as of July 1, 2020.

The updated CEQA Guidelines allow for the lead agency to have discretion in establishing methodologies and thresholds, provided there is substantial evidence to demonstrate that the established procedures promote the intended goals of the legislation. Where quantitative models or methods are unavailable, CEQA Guidelines Section 15064.3 allows agencies to assess VMT qualitatively using factors such as availability of transit and proximity to other destinations. The Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA* provides technical considerations regarding methodologies and thresholds with a focus on office, residential, and retail developments as these projects tend to have the greatest influence on VMT.

The VMT Analysis conducted by General Technologies and Solutions (GTS) used the Los Angeles County Public Works Transportation Impact Analysis (TIA) Guidelines, dated July 23, 2020, as a guide in the VMT analysis of this project. Pursuant to the Los Angeles County Public Works TIA Guidelines, certain residential projects that further the State’s affordable housing goals are presumed to have a less-than-significant impact on VMT if 100 percent of the units, excluding manager’s units, are set aside for lower income households. Based on the screening criteria above, the project is a 100 percent affordable project and therefore VMT impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?

The project would be accessible via a proposed access road on East Palmdale Boulevard. Other than the construction of the proposed access road the project would not alter East Palmdale Boulevard (e.g., no roadway widening required). Project site plans indicate the provision of on-site drive aisles to accommodate vehicular access to and circulation throughout the project site. Traffic calming features would include internal roadway speed limits and speed bumps, would be included to ensure safe circulation within the site. Furthermore, development of the proposed residential project would be compatible with the existing land uses surrounding the project site, which also primarily includes single-family residential neighborhoods. Therefore, implementation of the project would not result in substantial hazards due to geometric design features or incompatible uses. Potential impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project result in inadequate emergency access?

During construction, temporary and occasional lane closures may be required on East Palmdale Boulevard. However, two-way traffic would still be maintained at construction entry points and along East Palmdale Boulevard as required by the City of Palmdale’s Encroachment, Grading, and

Landscaping Permit (City of Palmdale 2019). Therefore, project construction would not result in inadequate emergency access to the project site or surroundings, and potential impacts would be less than significant.

Prior to construction, site circulation plans would be reviewed by the LACoFD during the project application process to ensure adequate on-site lane widths and configurations for emergency vehicle ingress and egress. Furthermore, the proposed project would not modify existing roadways in the vicinity, other than by adding new site access points, and therefore, would not affect emergency vehicle use of roadways that surround the project site. The project would be subject to LACoFD review of site plans prior to occupancy to ensure that required fire protection safety features, including building sprinklers and emergency access, are implemented. During project operation, emergency response vehicles would be able to access the project site via the main entrance along East Palmdale Boulevard. Therefore, potential impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

18 Tribal Cultural Resources

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in a Public Resources Code Section 21074 as either a site, feature, place, or 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:				
a. 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)?	☐	☐	☐	☐
b. 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 Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☐

[Placeholder for summary of City's AB 52 consultation process]

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074 that is 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)?

b. Would the project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074 that is 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 Section 5024.1?

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19 Utilities and Service Systems

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	□	□	■	□
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	□	□	■	□
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	□	□	■	□
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	□	□	■	□
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	□	□	■	□

a. Would the project 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?

c. Would the project 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?

The project site is in an urbanized area and served by existing utilities infrastructure. The City of Palmdale is within the service boundaries of the Palmdale Water District. As discussed below under the analysis for *Threshold 19.b*, PWD would have adequate water supplies available for the proposed project during the normal years. However, PWD anticipates that during a single-dry year conditions, demand will exceed existing supply starting in 2045. PWD anticipates demand exceeding supplies in 2021 and 2023 during a consecutive five-year drought. Additional supplies or a reduction in demand are needed to meet demand; therefore, PWD has identified short-term and long-term transfer and exchange opportunities to provide additional supplies to overcome shortages. In addition, PWD is developing the Palmdale Regional Water Augmentation Project to provide surface water augmentation or groundwater injection. The Water Shortage Contingency Plan also identifies potential demand reduction actions to reduce shortages (PWD 2021). Therefore, potential impacts related to water facilities would be less than significant.

Wastewater

The project site is within the service boundaries of the Palmdale Water Reclamation Plant (PWRP), which is owned and operated by the Los Angeles County Sanitation District No. 20 (LACSD 2022). The PWRP, north of Palmdale provides primary, secondary, and tertiary treatment of 12 million gallons of wastewater per day (City of Palmdale 2022a). According to CalEEMod outputs in the Air Quality Greenhouse Gas Emissions Study (Appendix A), the project is anticipated to require approximately 16 million gallons of water per year. Assuming that total water demand is equivalent to approximately 120 percent of wastewater generation, the project would generate approximately 13 gallons of wastewater per year, or approximately 35,616 gallons per day, which would account for approximately 0.2 percent of the current daily capacity of 12 million gallons per day (LACSD 2022). Therefore, the PWRP would have adequate capacity to provide wastewater treatment for the proposed project and the proposed project would not require the construction of new or expanded wastewater conveyance or treatment facilities. Potential impacts would be less than significant.

Stormwater

The project site would continue to connect to the existing storm drain system operated and maintained by the City. The proposed project would increase impervious surfaces over the project site due to the construction of 191 residential units. As discussed in Section 10, *Hydrology and Water Quality*, prior to the initiation of construction, the project would be required to obtain coverage under a Construction General Permit to comply with the NPDES requirement. In addition, the project would be required to comply with the LARWQCB's Water Quality Control Plan. Under the conditions of the Construction General Permit and the Water Quality Control Plan, the developer would be required to eliminate or reduce non-storm water discharges, develop, and implement a SWPPP for the project construction activities, and perform inspections of the storm water pollution prevention measures and control practices to ensure conformance with the site SWPPP and associated BMPs. Therefore, stormwater facilities would be less than significant.

Electric Power, Natural Gas, and Telecommunications

The proposed project would not cause substantial unplanned population growth (see Section 14 *Population and Housing*) and would not result in wasteful or inefficient use of energy (see Section 6, *Energy*). Project operation would result in an increase in electricity consumption on the project site by 1.5 GWh per year; however, electricity consumption is anticipated to have a net zero draw from the electricity grid since electricity would be generated by a PV system. Therefore, the project would not require the extension or expansion of electrical facilities.

According to CalEEMod outputs in the Air Quality Greenhouse Gas Emissions Study (Appendix A), there would be no estimated natural gas consumption for the project. Therefore, the project would not require additional natural gas storage/transmission facilities. Likewise, the project site is an infill project served by existing telecommunications facilities within the city and would not require the expansion or construction of new telecommunications infrastructure. Telecommunications including cell phone towers, microwave towers, and other telecommunication equipment are located throughout the city. According to the City of Palmdale General Plan, cell phone, fiber optic, and microwave towers are owned by AT&T, CenturyLink, DirectTV, Dish Network, Exede Satellite Internet, Frontier Communications, HughesNet, Sprint, Time Warner, Verizon, and Viasat Satellite. Television/radio towers are in the foothills of the San Gabriel Mountains.

LESS THAN SIGNIFICANT IMPACT

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

The project site receives its water service from the PWD with water supplies that include imported water, local and regional supplies, groundwater, and recycled water. PWD purchases imported water from the Department of Water Resources. The groundwater used by PWD is pumped from the Antelope Valley Groundwater Basin and has accounted for 35 percent of PWD's supplies since 2016. PWD jointly owns and operates the Littlerock Dam Reservoir, which constitutes PWD's surface water supply source and is located in the hills southwest of the PWD service area. PWD is actively working with the Sanitation Districts of Los Angeles County (LACSD) to develop recycled water supplies for its service area customers and future groundwater recharge projects (PWD 2021).

According to the 2020 Urban Water Management Plan, the PWD would have an adequate supply of water over the next twenty-five years (Table 27). PWD anticipates having adequate supplies to meet demands during normal years. However, PWD anticipates that during single-dry year conditions, demands will exceed supplies starting in 2030 and during multiple-dry year conditions, demands will exceed supplies starting in 2045. Additionally, in a consecutive five-year drought, PWD anticipates demands exceeding supplies in 2021 and 2023. Therefore, additional supplies are assumed to be needed to meet demands under those conditions (PWD 2021).

Table 22 Normal Year Water Supply and Demand Comparison (acre-feet per year [AFY])

	2025	2030	2035	2040	2045
Estimated Service Area Population	126,998	132,003	138,554	145,962	153,766
Water Supply Totals	36,725	35,315	35,345	35,375	35,375
Water Demand Totals	20,220	21,310	22,980	24,780	26,250

Source: 2020 PWD Urban Water Management Plan

Table 23 Single and Multiple Dry Year Water Supply and Demand Comparison (AFY)

	2025	2030	2035	2040	2045
Estimated Service Area Population	126,998	132,003	138,554	145,962	153,766
Single Dry Year					
Water Supply Totals	21,235	20,600	21,410	22,225	22,225
Water Demand Totals	20,220	21,310	22,980	24,780	26,250
Multiple - First Dry Year					
Water Supply Totals	28,125	26,390	26,105	25,665	25,665
Water Demand Totals	20,220	21,310	22, 980	24,780	26,250
Multiple - Second Dry Year					
Water Supply Totals	28,125	26,390	26,105	26,665	26,665
Water Demand Totals	20,220	21,310	22,980	24,780	26,250
Multiple - Third Dry Year					
Water Supply Totals	28,125	26,390	26,105	25,665	25,665
Water Demand Totals	20,220	21,310	22,980	24,780	26,250
Multiple - Fourth Dry Year					
Water Supply Totals	28, 125	26,390	26,105	26,665	25,665
Water Demand Totals	20,220	21,310	22,980	24,780	26,250
Multiple - Fifth Dry Year					
Water Supply Totals	28,125	26,390	26,105	26,665	26,665
Water Demand Totals	20,220	21,310	22,980	24,780	26,250

Source: 2020 PWD Urban Water Management Plan

The project would be constructed in accordance with all applicable CBC standards, including those that mandate water-efficient fixtures and features and would also be mandated to adhere to the applicable water conservation measures for landscaping. Potential impacts may be less than significant. According to CalEEMod results in the Air Quality Greenhouse Gas Emissions Study (see Appendix A), the project would demand approximately 44, 265 gallons of water per day, or approximately 49.58 AFY. PWD anticipates water demand to increase by 6,030 AFY between 2025 and 2045. The project's water demand would account for approximately 0.8 percent of PWC's anticipated water demand and therefore would be accommodated by the water supply available for the city during the normal, single dry year, and multiple dry year conditions through the year 2045. Potential impacts related to water supply would be less than significant.

LESS THAN SIGNIFICANT IMPACT

d. Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

e. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

AB 341 set a statewide goal for a 75 percent reduction in waste disposal by the year 2020 and established mandatory recycling for commercial businesses. The City is required to comply with this law and report their progress towards achieving the 75 percent reduction goal to CalRecycle. The

City of Palmdale contracts with Antelope Valley Recycling & Disposal Facility, located at 1200 W City Ranch Road. The Antelope Valley Recycling and Disposal Facility has a maximum permitted throughput of 5,548 tons of solid waste per day. The anticipated life for the landfill and its currently permitted capacity is April 2044. The last reported remaining capacity at the landfill was approximately 17,911,225 cubic yards (CalRecycle 2019).

Construction of the proposed project would generate solid waste, including construction debris. This construction debris would include materials such as scrap wood, concrete, and plaster materials. Construction debris would be removed and disposed of in a timely manner and in accordance with all applicable laws and regulations. The handling of all debris and waste generated during construction of the project would be subject to CALGreen requirements and the California Integrated Waste Management Act of 1989 (AB 939) requirements for salvaging, recycling, and reuse of materials from construction activity on the project site. In accordance with CALGreen requirements, the project would be required to achieve a minimum of 65 percent diversion rate for construction waste. Construction and demolition waste would be hauled to the Antelope Valley Recycling and Disposal Facility, located approximately 6.5 miles west of the project site. The removal of construction debris would only occur during the construction period and construction of the proposed project would not contribute to an exceedance of the permitted capacity of any local landfill.

According to the CalEEMod results in the Air Quality Greenhouse Gas Emissions Study (see Appendix A), operation of the proposed project would generate approximately 272.06 tons of solid waste per year or approximately 0.7 ton per day. The project's anticipated daily solid waste generation would account for less than 0.01 percent of the Antelope Valley Recycling and Disposal Facility permitted throughput. Given the existing surplus capacity at the Antelope Valley Recycling and Disposal Facility the solid waste generated by operation of the project would be adequately accommodated by existing landfills. In addition, the proposed project would comply with federal, State, and local statues and regulations related to solid waste, such as AB 939 and the City's recycling programs for residences. Therefore, potential impacts related to solid waste would be less than significant.

LESS THAN SIGNIFICANT IMPACT

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20 Wildfire

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	■	☐
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	■
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	■
d. Expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	■

a. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

A Fire Hazard Severity Zone (FHSZ) is a mapped area that designates zones (based on factors such as fuel, slope, and fire weather) with varying degrees of fire hazard (i.e., moderate, high, and very high). While FHSZs do not predict when or where a wildfire will occur, they do identify areas where wildfire hazards could be more severe and therefore are of greater concern. FHSZs are meant to help limit wildfire damage to structures through planning, prevention, and mitigation activities/requirements that reduce risk. The FHSZs serve several purposes: they are used to designate areas where California's wildland urban interface building codes apply to new buildings, they can be a factor in real estate disclosure, and they can help local governments consider fire hazard severity in the safety elements of their general plans.

The project site is in an urban area of Palmdale surrounded by roads and structures, including residential and commercial buildings. Undeveloped wildland areas are not located near the project site. According to the California FHSZ Viewer, the project site is not located in a FHSZ or VHFHSZ for wildland fires (CALFIRE 2022). The nearest VHFHSZ is located 10.6 miles northwest of the project site on the west side of SR 14. Additionally, as shown in Figure 13.4 of the Safety Element, the project area is not associated with a wildfire hazard zone area (City of Palmdale 2022a). Therefore, the project site would not be subject to substantial risk of wildfire.

The project involves the construction and operation of a 191 single-single family housing development, which would incrementally increase demand for fire protection services. As discussed in Section 15, *Public Services*, the project site is in an urbanized area already served by the LACoFD and would not have a significant impact on fire response times nor create a substantially greater need for additional fire protection services above current capacity. The nearest fire station to the project site is Fire Station No. 93, which is located at 5624 E Avenue R, approximately one mile southeast of the project site, and would provide emergency and evacuation services in the event of a fire. Furthermore, all buildings would be constructed to meet the current building code fire safety requirements. During construction, temporary and occasional lane closures may be required on East Palmdale Boulevard. However, two-way traffic and emergency access to the site would still be maintained at construction entry points and along East Palmdale Boulevard as required by the City of Palmdale's Encroachment, Grading, and Landscaping Permit (City of Palmdale 2019). Therefore, project construction would not result in inadequate emergency access to the project site or surroundings. Impacts would be less than significant.

LESS THAN SIGNIFICANT IMPACT

b. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project, 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?

As discussed under the response to *Threshold a*, the project site is not located in a FHSZ or VHFHSZ for wildland fires. There are no streams or rivers located on or adjacent to the project site, and the project site and surrounding areas are relatively flat and not at high risk of downslope or downstream flooding or landslides. The project does not involve uses that could exacerbate wildfire risks and risks to project occupants would be mitigated through conformance with the 2022 California Fire Code, 2022 CBC, and California Health and Safety Code, which establish provisions for fire safety related to construction, maintenance and design of buildings and land uses. Therefore, the project would not exacerbate wildfire risks or expose people or structures to risk due to runoff, post-fire slope instability, or drainage changes. Likewise, residents of the project site would not be exposed to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. No impact would occur.

NO IMPACT

c. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project 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?

The project site is not within or near a VHFHSZ or state responsibility area. The project site is located 10.6 miles east of the nearest mapped VHFHSZ (CALFIRE 2022). The project site is undeveloped but is within an urbanized area served by existing infrastructure, including roads and utilities. The project would be served by the existing utilities in the project area and would not require the installation or maintenance of associated infrastructure within the FHSZs that may exacerbate fire risk. Therefore, no impact would occur.

NO IMPACT

d. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslopes or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?*

As discussed under the response to *Threshold a,* the project site is not located in a FHSZ or VHFHSZ for wildland fires. There are no streams or rivers located on or adjacent to the project site, and the project site and surrounding areas are relatively flat and not at high risk of downslope or downstream flooding or landslides. The project does not involve uses that could exacerbate wildfire risks and risks to project occupants would be mitigated through conformance with the 2022 California Fire Code, 2022 CBC, and California Health and Safety Code, which establish provisions for fire safety related to construction, maintenance and design of buildings and land uses. Therefore, the project would not exacerbate wildfire risks or expose people or structures to risk due to runoff, post-fire slope instability, or drainage changes. Likewise, residents of the project site would not be exposed to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. No impact would occur.

NO IMPACT

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21 Mandatory Findings of Significance

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

a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

As discussed in Section 4, *Biological Resources*, the project site contains suitable habitat for western Joshua tree and short-joint beavertail cactus as well as California glossy snake, coast horned lizard, burrowing owl, loggerhead shrike, LeConte’s thrasher, and nesting birds. Implementation of Mitigation Measures BIO-1 through BIO-6 would address potential impacts to special-status species and natural habitats occurring in the project site. Mitigation Measures BIO-1 and BIO-2 would reduce impacts to western Joshua trees to less than significant and further reduce impacts to short-joint beavertail cacti. The relatively small project footprint of the site, compared to the amount of available suitable habitat for burrowing owls, suggests that site development is unlikely to result in population-level impacts. However, implementation of Mitigation Measures BIO-1, BIO-3, and BIO-4 would ensure compliance with federal and State law by avoiding the take of burrowing owls or destruction of their nests. Loggerhead shrike and LeConte's thrasher (CDFW SSCs), as well as migratory or other common nesting birds, may rest in ornamental trees, grass, bare ground, burrows/cavities, man-made structures and shrubs on or adjacent to the project site. Construction of the project thus has the potential to directly by destroying a nest or potentially indirectly impact nesting birds protected under the CFGC and MBTA due to construction noise, dust, and other human disturbances that may cause a nest to fail. Implementation of Mitigation Measures BIO-1, and BIO-5 would reduce impacts to these species to a less than significant level, and would also require compliance with federal and State law by avoiding take of nesting birds. The site is a suitable habitat for the Desert kit fox, thus Mitigation Measure BIO-5 requires compliance with CDFW regulations.

As discussed in Section 5, *Cultural Resources,* the Cultural Resources Study reported that no eligible historical or archeological resources are located on the project site. However, the project site has the potential to yield unknown archeological resources. As a result, it is recommended than an archeological monitor be present during future ground disturbances associated with the project to observe grading and identify any historic or prehistoric resources that may be discovered during the construction period. Implementation of Mitigation Measure CR-1 would avoid or reduce the project's potentially significant impacts to any archaeological resources that may be found during ground disturbing activities.

Impacts would be less than significant with the mitigation incorporated; therefore, the project would not substantially degrade the quality of the environment due to impacts associated with biological and cultural resources.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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)?

There are no projects identified in the City of Palmdale Project Postings located within one-mile of the project site (City of Palmdale 2022b). Therefore, as concluded in sections 1 through 20, the project would have no impact, less than significant impact, or less than a significant impact with mitigation incorporated, with respect to all environmental issues considered in the document. Cumulative impacts related to several other resource areas have been addressed in the individual resource sections of this IS-MND, including air quality, GHG emissions, noise, and transportation (see CEQA Guidelines Section 15064(h)(3)).

As discussed in Section 3, *Air Quality*, and Section 8, *Greenhouse Gas Emissions*, the proposed project would generate temporary short-term GHG emissions through travel to and from the worksite and from the operation of construction equipment such as graders, backhoes, and generators. During operation the proposed project would generate GHG emissions associated with area sources (e.g., landscape maintenance), energy and water usage, vehicle trips, and wastewater and solid waste generation. Total emissions (amortized construction emissions plus annual operation emissions) would be 3.3 MT of CO_2e per year per SP (conservatively rounded up to the nearest tenth). These emissions would exceed the 2.0 MT of CO_2e per year per service person goal of the City CAP, and impacts would be potentially significant. Implementation of Mitigation Measure

GHG-1 would be required to reduce impacts to a less than significant level. The impact analyses in these sections use AVAQMD thresholds that already account for cumulative (regional) impacts. Therefore, air quality and GHG emissions associated with operation and construction would be less than significant and would not be cumulatively considerable.

As discussed in Section 13, *Noise,* the proposed project would comply with the construction hours established by the PMC and would remain below the FTA daytime threshold at the nearest noise sensitive receivers in the vicinity of the project site. Therefore, the proposed project would not be anticipated to create a cumulatively considerable noise impact.

As discussed in Section 17, *Transportation*, the project would not conflict with any City policies addressing the circulation network and would not generate substantial VMT. Therefore, the project would not contribute to any cumulatively considerable adverse transportation effects.

This IS-MND determined that, for some of the other resource areas (e.g., agriculture and mineral resources), the proposed project would have no impact in comparison to existing conditions. Therefore, the project would not contribute to cumulative impacts related to these issues. Other issues (e.g., biological resources, cultural resources, geology, hazards, hazardous materials, and tribal cultural resources) are by their nature project specific and impacts at one location do not add to impacts at other locations or create additive impacts. As such, cumulative impacts would be less than significant (not cumulatively considerable).

LESS THAN SIGNIFICANT IMPACT

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

In general, impacts to human beings are associated with air quality, GHG emissions and climate change, hazards and hazardous materials, and noise impacts. As detailed in analyses for air quality, hazards and hazardous materials, and noise, the proposed project would not result, either directly or indirectly, in adverse effects related to these issue areas. In the case of GHG emissions, operations of the proposed project would generate GHG emissions that would exceed the 2.0 MT of CO_2e per year per service person goal of the City CAP, and impacts would be potentially significant. As discussed in Section 8 *Greenhouse Gas Emissions,* implementation of Mitigation Measure GHG-1 would require the project applicant to prepare and implement a GHG Reduction Plan (GHGRP) that demonstrates emissions reductions from project operation by approximately 730 MT of CO_2e per year to 1,198 MT of CO_2e per year for the lifetime of the project, or by an amount determined through further analysis of project GHG emissions at the time of GHGRP preparation in order to reduce impacts to a less than significant level. Compliance with applicable rules and regulations included in this IS-MND would reduce potential impacts on human beings to a less than significant level.

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED

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References

Bibliography

Antelope Valley Air Quality Management District (AVAQMD). 2016. Antelope Valley AQMD CEQA and Federal Conformity Guidelines. https://avaqmd.ca.gov/files/e5b34d385/AV%20CEQA%20Guides%202016.pdf (accessed September 2023).

_____. 2022a. District Boundaries. https://avaqmd.ca.gov/district-boundaries (accessed September 2023).

_____. 2022b. Antelope Valley AQMD Attainment Status. https://avaqmd.ca.gov/files/e0986ab83/AVAQMD+2017+Attainment+Status+Table.pdf (accessed September 2023).

_____. 2023. AVAQMD Federal 70 ppb Ozone Attainment Plan. https://avaqmd.ca.gov/files/1e287138b/70+ppb+Ozone+Plan+Final+Draft+AV+01.04.2023.pdf (accessed September 2023).

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model User's Guide Version 2022.1. April. https://caleemod.com/documents/user-guide/01_User%20Guide.pdf (accessed September 2023).

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. April. https://www.arb.ca.gov/ch/handbook.pdf (accessed September 2023).

_____. 2011. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the "LEV III" Amendments to the California Greenhouse Gas and Criteria Pollutant Exhaust and Evaporative Emission Standards and Test Procedures and to the On-Board Diagnostic System Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and to the Evaporative Emission Requirements for Heavy-Duty Vehicles. December. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2012/leviiighg2012/levisor.pdf (accessed September 2023).

_____. 2014. First Update to the Climate Change Scoping Plan. May. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf (accessed September 2023).

_____. 2016. Ambient Air Quality Standards. Last modified: May 4, 2016. https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf (accessed September 2023).

_____. 2017. California's 2017 Climate Change Scoping Plan. December 14, 2017. https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf

_____. 2021b. Overview: Diesel Exhaust & Health. n.d. https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health (accessed September 2023).

_____. 2021c. California Greenhouse Gas Emissions for 2000 to 2019 Trends of Emissions and Other Indicators. July. https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2019/ghg_inventory_trends_00-19.pdf (accessed September 2023).

_____. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. November 16. Available at: https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp.pdf (accessed September 2023).

_____. 2023. *Top 4 Summary: Select Pollutant, Years, & Area*, iADAM: Air Quality Data Statistics. [database]. N.d. https://www.arb.ca.gov/adam/topfour/topfour1.php (accessed September 2023).

California Climate Action Registry (CCAR) General Reporting Protocol. 2009. Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1. http://sfenvironment.org/sites/default/files/fliers/files/ccar_grp_3-1_january2009_sfe-web.pdf (accessed September 2023).

California Climate Change Center. 2006. Climate Scenarios for California. March. https://research.fit.edu/media/site-specific/researchfitedu/coast-climate-adaptation-library/united-states/west-coast-amp-hawaix27i/california---statewide/CCCC.--2006.--Climate-Scenarios-for-California.pdf (accessed September 2023).

California Department of Conservation (DOC). 2016. California Important Farmland Finder. https://maps.conservation.ca.gov/DLRP/CIFF/ (accessed September 2022).

_____. 2019. FMMP - Rural Land Mapping Project. https://www.conservation.ca.gov/dlrp/fmmp/Pages/rural_land_mapping.aspx (accessed September 2022).

_____. 1984. Special Report 143: Mineral Land Classification of the Greater Los Angeles Area, Part V.

California Department of Finance (DOF). 2023. E-City/County Population and Housing Estimates, 1/1/2023. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fdof.ca.gov%2Fwp-content%2Fuploads%2Fsites%2F352%2FForecasting%2FDemographics%2FDocuments%2FE-5_2023_InternetVersion.xlsx&wdOrigin=BROWSELINK (accessed June 2023).

California Department of Fish and Wildlife (CDFW). 2012. Staff Report on Burrowing Owl Mitigation.

California Department of Food and Agriculture. 2020. California Agricultural Statistics Review. August. https://www.cdfa.ca.gov/Statistics/PDFs/2020_Ag_Stats_Review.pdf (accessed September 2023).

California Department of Forestry and Fire Protection (CALFIRE). 2022. Fire Hazard Severity Zone Viewer. https://egis.fire.ca.gov/FHSZ/ (accessed December 2022).

California Department of Transportation (Caltrans). 2019. State Scenic Highway Map. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways (accessed September 2022).

_____. 2020a. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. (CT-HWANP-RT-13-069.25.2) September. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/traffic-noise-protocol-april-2020-a11y.pdf

_____. 2020b. *Transportation and Construction Vibration Guidance Manual*. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

_____. 2022. Frequently Asked Questions. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways/lap-liv-i-scenic-highways-faq2 (accessed November 2022).

California Department of Water Resources. 2013. Managing an Uncertain Future: Climate Change Adaption Strategies for California's Water, volume 4 reference guide. https://cawaterlibrary.net/wp-content/uploads/2017/05/Climate_Adaptation_Strategies.pdf (accessed September 2023).

_____. 2015. Dam Breach Inundation Map Web Publisher. October 8, 2015. https://fmds.water.ca.gov/maps/damim/ (accessed October 2022).

California Energy Commission (CEC). 2018a. 2019 Building Energy Efficiency Standards." March 2018. https://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Building_Standards_FAQ_ada.pdf (accessed November 2022).

_____. 2018b. News Release: Energy Commission Adopts Standards Requiring Solar Systems for New Homes, First in Nation. Immediate Release May 9, 2018. https://www.energy.ca.gov/news/2018-05/energy-commission-adopts-standards-requiring-solar-systems-new-homes-first#:~:targetText=Energy%20Commission%20Adopts%20Standards%20Requiring%20Solar,New%20Homes%2C%20First%20in%20Nation&targetText=SACRAMENTO%20%2D%20Moving%20to%20cut%20energy,photovoltaic%20systems%20starting%20in%202020 (accessed November 2022).

_____. 2022a. Total System Electric Generation. https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2019-total-system-electric-generation (accessed December2022).

_____. 2022b. "California Energy Consumption Database." https://ecdms.energy.ca.gov/ (accessed December 2022).

_____. 2022c. "California Retail Fuel Outlet Annual Reporting (CEC-A15) Results." https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-retail-fuel-outlet-annual-reporting (accessed December 2022).

California Geologic Energy Management Division (CalGEM). 2022. Well Finder. https://maps.conservation.ca.gov/doggr/wellfinder/#/-118.03406/34.57540/16 (accessed October 2022).

California Geological Survey. 2022. Earthquake Zones of Required Investigation. https://maps.conservation.ca.gov/cgs/EQZApp/app/ (accessed October 2022).

California Natural Resources Agency. 2009. 2009 California Climate Adaptation Strategy. March 2009. https://resources.ca.gov/CNRALegacyFiles/docs/climate/Statewide_Adaptation_Strategy.pdf (accessed September 2023).

Crocker, Malcom J. (Editor). 2007. Handbook of Noise and Vibration Control Book, ISBN: 978-0-471-39599-7, Wiley-VCH, October.

Department of Toxic Substances (DTSC). 2023a. EnviroStor. https://www.envirostor.dtsc.ca.gov/public/ (accessed September 2023).

_____. 2023b. Hazardous Waste and Substances List (Cortese). https://www.envirostor.dtsc.ca.gov/public/search.asp?PAGE=5&CMD=search&ocieerp=&business_name=&main_street_number=&main_street_name=&city=&zip=&county=&branch=&status=ACT%2CBKLG%2CCOM&site_type=CSITES%2CFUDS&cleanup_type=&npl=&funding=&reporttype=CORTESE&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29&federal_superfund=&state_response=&voluntary_cleanup=&school_cleanup=&operating=&post_closure=&non_operating=&corrective_action=&tiered_permit=&evaluation=&spec_prog=&national_priority_list=&senate=&congress=&assembly=&critical_pol=&business_type=&case_type=&display_results=&school_district=&pub=&hwmp=False&permitted=&pc_permitted=&inspections=&inspectionsother=&complaints=&censustract=&cesdecile=&ORDERBY=city&next=Next+50 (accessed September 2023).

Federal Emergency Management Agency (FEMA). 2008. National Flood Hazard Layer FIRMette. September 26, 2008. https://msc.fema.gov/arcgis/rest/directories/arcgisjobs/nfhl_print/mscprintb_gpserver/ja7b9a3bc364b4c288f626e350c471861/scratch/FIRMETTE_5ec53071-6b9a-407d-89b7-247b3c480a5a.pdf (accessed October 2022).

Federal Highway Administration (FHWA). 2006. *FHWA Highway Construction Noise Handbook*. (FHWAHEP-06-015; DOT-VNTSC-FHWA-06-02). Available at: http://www.fhwa.dot.gov/environment/construction_noise/handbook. (accessed November 2018).

_____. 2011. Highway Traffic Noise: Analysis and Abatement Guidance (FHWA-HEP-10-025). https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment*. November. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

General Technologies and Solutions. 2023. Traffic Signal Warrant Study for the intersection of E Palmdale Blvd and the proposed access road for the Palmdale Two residential development. July 6.

Governor's Office of Planning and Research (OPR). 2003. State of California General Plan Guidelines. https://www.ca-ilg.org/sites/main/files/file-attachments/resources__General_Plan_Guidelines_2003.pdf?1350954879 (accessed December 2022).

Institute of Transportation Engineers (ITE). 2021. Trip Generation Manual, 11th Edition. Volume 1: Desk Reference.

Intergovernmental Panel on Climate Change (IPCC). 2007. Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-spm-1.pdf (accessed September 2023).

_____. 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)] Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf (accessed September 2023).

Los Angeles County Fire Department (LACoFD). 2022. Conversation with Fireman Sean Strinkle (accessed October 14, 2022)

National Park Service. 2020. Professional Qualification Standards. https://www.nps.gov/articles/sec-standards-prof-quals.htm (accessed December 2022).

Office of Environmental Health Hazard Assessment. 2015. Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf (accessed September 2023).

Palmdale, City of. 1994. Community Design Element. December 24, 1994. https://www.cityofpalmdale.org/DocumentCenter/View/568/Community-Design-Element-PDF (accessed September 2022).

_____. 2011. Energy Action Plan. Adopted August 3, 2011. https://cityofpalmdale.org/DocumentCenter/View/195/Palmdale-Energy-Action-Plan-PEAP-PDF

_____. 2022a. Palmdale 2045 General Plan. https://www.palmdale2045.org/general-plan. (accessed September 2023).

_____. 2022b. Planning Projects. https://cityofpalmdale.org/176/Planning (accessed November 2022).

Palmdale Water District. 2021. 2020 Urban Water Management Plan. https://www.palmdalewater.org/wp-content/uploads/2021/10/PWD_Final_2020_UWMP.pdf (accessed December 2022).

Palmdale Unified School District (PUSD). 2022. By the Numbers. https://www.palmdalesd.org/ (accessed October, 2022).

State Water Resources Control Board (SWRCB). 2023. GeoTracker. https://geotracker.waterboards.ca.gov/ (accessed September 2023).

Southern California Association of Governments (SCAG) 2020. Connect SoCal: The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments. Adopted May 7, 2020. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176. (accessed November 2022).

U.S. Department of Agriculture (USDA). 2022. Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx (accessed October 2022).

United States Energy Information Administration (EIA). 2022. Table F16: Total Petroleum Consumption Estimates, 2020. https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_use_pa.html&sid=US&sid=CA (accessed December 2022).

United States Environmental Protection Agency (USEPA). 1974. Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety. Report No. 550/9-74-004 March 1974. Available at: https://www.rosemonteis.us/documents/usepa-1974. (accessed September 2022).

_____. 2021a. Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases. Last updated April 2021. https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases (accessed September 2023).

_____. 2021b. Climate Change Indicators: Global Greenhouse Gas Emissions. Last updated April 2021. https://www.epa.gov/climate-indicators/climate-change-indicators-global-greenhouse-gas-emissions (accessed September 2023).

_____. 2021c. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019. April 2021. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019 (accessed September 2023).

_____. N.d. Benzene. https://www.epa.gov/sites/production/files/2016-09/documents/benzene.pdf (accessed September 2023).

World Meteorological Organization (WMO). 2013. A summary of current and climate change findings and figures: a WMO information note. March 2013. https://library.wmo.int/opac/index.php?lvl=notice_display&id=15892#.Wt9-Z8gvzIU (accessed September 2023).

_____. 2022. Greenhouse Gases. https://public.wmo.int/en/our-mandate/focus-areas/environment/greenhouse-gases (accessed December 2022).

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Appendix A

Air Quality and Greenhouse Gas Emissions Study

Tentative Tract Map 83359 Project

Air Quality and Greenhouse Gas Emissions Study

prepared for

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Kevin Harbison
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September 2023

This report prepared on 50% recycled paper with 50% post-consumer content.

Table of Contents

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Appendices

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1 Project Description and Impact Summary

1.1 Introduction

This report details the analysis of potential air quality and greenhouse gas (GHG) impacts associated with the construction and operation of the proposed Tentative Tract Map (TTM) 83359 Project (herein referred to as "proposed project" or "project") in Palmdale, California. Rincon Consultants, Inc. (Rincon) prepared this study under contract to Maison's Palmdale Boulevard 150, LLC for use by the City of Palmdale in support of environmental documentation being prepared for the project pursuant to the California Environmental Quality Act (CEQA).

1.2 Project Summary

Project Location

The project site is in the City of Palmdale in northern Los Angeles County in southern California. The regional location of the project site is shown in Figure 1. The 20-acre project site (Assessor's Parcel Number 3023-002-184) is located immediately adjacent to, and south of, East Palmdale Boulevard between 55th Street and 50th Street East. The project location is depicted in Figure 2. Surrounding land uses include single family residential uses to the south, east, and west. The vacant parcel of property immediately to the north of the project site across Palmdale Boulevard has an existing land use designation of Business Park and is zoned as Planned Industrial (M-4).

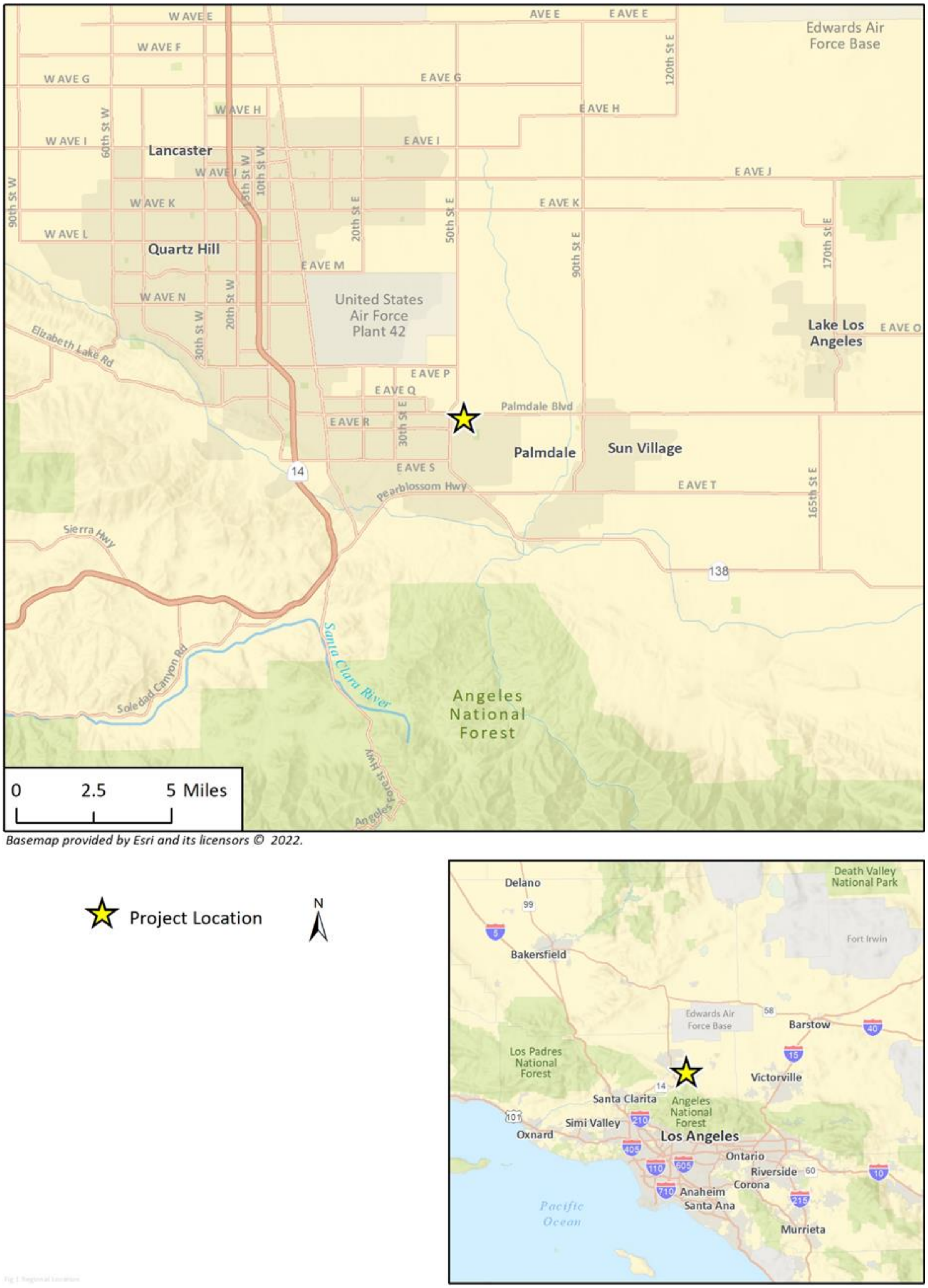
Project Description

The proposed project would facilitate the development of up to 191 units of single story, single-family homes consisting of three-bedroom housing units, two-bedroom Accessory Dwelling Units and one-bedroom Junior Accessory Dwelling Units that would be offered for rent as a 100% affordable project to those qualifying at 30% to 80% Area Mean Income (AMI) for Los Angeles County. The project would also include a recreation center and community amenities on a total of 66 lots. The community would be all-electric and each residential unit would be constructed with rooftop solar, energy efficient appliances, and installation of all infrastructure improvements as conditioned by the City of Palmdale with approval of Tentative Tract Map (TTM) 83359. Within each lot, primary homes, accessory dwelling units (ADU), and junior ADUs would be linked together by a network of walking paths and trails.

Indoor community amenities include a community building with a tenant lounge, office spaces, and a fitness center. Outdoor amenities include a pool, spa, grill area, pocket community park, children's play area, and additional community open spaces. Additionally, a community trail network is planned to link the neighborhood and provide for additional open spaces and parks for the community to utilize.

Streets that would be constructed within the project site and would link the community to East Palmdale Boulevard to the north as well as the existing residential projects to both the east and west of the project. All public right-of-way would be constructed to the width shown on the TTM and would include road, sidewalks, and curbs and gutters. ADA curb ramps, appropriate street signage, fire hydrants, and streetlights would also be installed for each street both inside and outside of the development.

Figure 1 Regional Location



Basemap provided by Esri and its licensors © 2022.

Figure 2 Project Location

Imagery provided by Microsoft Bing and its licensors © 2022.

Figure 3 Site Plan

2 Background

2.1 Air Quality

Local Climate and Meteorology

The project site is within the Mojave Desert Air Basin (MDAB), an inland region in southern California includes the desert portions of northwestern Los Angeles County, eastern Kern County, northeastern Riverside County, and San Bernardino County. The region is closed off from southern coast of California and central California by mountain ranges with the Sierra Nevada Mountains to the north, the Tehachapi Mountains to the northwest and the San Gabriel and San Bernardino Mountains to the south. The Sonoran Desert borders the eastern and southern portions of the MDAB. The regional climate in the MDAB is dry-host desert climate characterized by little cloud formation, daytime solar heating, and infrequent precipitation. The air quality within the MDAB is primarily influenced by meteorology, topography, and a wide range of emission sources, such as dense population centers, substantial vehicular traffic, and industry. The Antelope Valley Air Quality Management District (AVAQMD) monitors and regulates local air quality in the eastern portion of the MDAB, which includes the cities of Lancaster and Palmdale (AVAQMD 2022a).

Air Quality Regulations

Federal Air Quality Regulations

Ambient Air Quality Standards represent the maximum levels of background pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The federal Clean Air Act (CAA) was enacted in 1970 and amended in 1977 and 1990 [42 United States Code (USC) 7401] for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity.

The U.S. Environmental Protection Agency (USEPA) has set primary and secondary National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with a diameter of up to ten microns (PM_{10}) and up to 2.5 microns ($PM_{2.5}$), and lead (Pb). Primary standards are those levels of air quality deemed necessary, with an adequate margin of safety, to protect public health. Table 1 lists the current federal and state standards for regulated pollutants.

Table 1 Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	–	0.09 ppm
	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.00 ppm	9.00 ppm
	1-Hour	35.00 ppm	20.00 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.100 ppm	0.180 ppm

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Sulfur Dioxide	Annual	0.030 ppm	–
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	0.075 ppm	0.25 ppm
PM_{10}	Annual	–	20 μg/m³
	24-Hour	150 μg/m³	50 μg/m³
PM_{25}	Annual	12 μg/m³	12 μg/m³
	24-Hour	35 μg/m³	–
Lead	30-Day Average	–	1.5 μg/m³
	3-Month Average	0.15 μg/m³	–

ppm = parts per million; μg/m³ = micrograms per cubic meter

Source: CARB 2016

State Air Quality Regulations

CALIFORNIA AMBIENT AIR QUALITY STANDARDS

The California Clean Air Act (CCAA) was enacted in 1988 (California Health & Safety Code (H&SC) Section 39000 et seq.). While USEPA is the federal agency designated to administer air quality regulation, the California Air Resources Board (CARB) is the State equivalent in the California Environmental Protection Agency (CalEPA). Under the CCAA the State has developed the California Ambient Air Quality Standards (CAAQS), which are generally more stringent than the NAAQS. Table 1 lists the current State standards for regulated pollutants. In addition to the federal criteria pollutants, the CAAQS also specify standards for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. Like the federal CAA, the CCAA classifies specific geographic areas as either “attainment” or “nonattainment” areas for each pollutant, based on the comparison of measured data within the CAAQS.

California is divided geographically into 15 air basins for managing the air resources of the State on a regional basis. Areas within each air basin are considered to share the same air masses and, therefore, are expected to have similar ambient air quality. If an air basin is not in either federal or State attainment for a criteria pollutant, the basin is classified as a nonattainment area for that pollutant. Under the CAA, once a nonattainment area has achieved the air quality standards for a criteria pollutant, it may be re-designated to an attainment area for that pollutant. To be re-designated, the area must meet air quality standards and have a 10-year plan for continuing to meet and maintain air quality standards, as well as satisfy other requirements of the federal CAA. Areas that have been re-designated to attainment are called maintenance areas.

The MDAB is designated a nonattainment area for the federal and State eight-hour ozone standards, State one-hour ozone standards, and for State PM_{10} standards. The AVAQMD portion of the MDAB is designated unclassifiable or in attainment for all other federal and State standards (AVAQMD 2022b).

TOXIC AIR CONTAMINANTS

A toxic air contaminant (TAC) is an air pollutant that may cause or contribute to an increase in mortality or serious illness or which may pose a present or potential hazard to human health. TACs may result in long-term health effects such as cancer, birth defects, neurological damage, asthma, or genetic damage, or short-term acute effects such as eye watering, respiratory irritation, runny nose, throat pain, and headaches. TACs are considered either carcinogenic or non-carcinogenic based on the nature of the health effects associated with exposure. For carcinogenic TACs, potential health impacts are evaluated in terms of overall relative risk expressed as excess cancer cases per one million exposed individuals. Non-carcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

TACs include both organic and inorganic chemical substances. One of the main sources of TACs in California is diesel engines that emit exhaust containing solid material known as diesel particulate matter (DPM); however, TACs may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. TACs commonly associated with gasoline dispensing stations include the organic compounds of benzene, toluene, and xylene. Benzene is a known human carcinogen and can result in short-term acute and long-term chronic health impacts (USEPA n.d.).

In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (Assembly Bill [AB] 1807: Health and Safety Code Sections 39650–39674). The Legislature established a two-step process to address the potential health effects from TACs. The first step is the risk assessment (or identification) phase. The second step is the risk management (or control) phase of the process.

The California Air Toxics Program establishes the process for the identification and control of TACs and includes provisions to make the public aware of significant toxic exposures and for reducing risk. Additionally, the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly Bill) was enacted in 1987 and requires stationary sources to report the types and quantities of certain substances routinely released into the air. The goals of the Air Toxics "Hot Spots" Act are to collect emission data, identify facilities having localized impacts, ascertain health risks, notify nearby residents of significant risks, and reduce those significant risks to acceptable levels. The Children's Environmental Health Protection Act, California Senate Bill 25 (Chapter 731, Escutia, Statutes of 1999), focuses on children's exposure to air pollutants. The act requires CARB to review its air quality standards from a children's health perspective, evaluate the statewide air quality monitoring network, and develop any additional air toxic control measures needed to protect children's health.

State Implementation Plan

The federal CAA Amendments mandate that states submit and implement a State Implementation Plan (SIP) for areas not meeting air quality standards. The SIP includes pollution control measures to demonstrate how the standards will be met through those measures. The SIP is established by incorporating measures established during the preparation of air quality attainment plans and adopted rules and regulations by each local air district, which are submitted for approval to CARB and the USEPA. The goal of an air quality attainment plan is to reduce pollutant concentrations below the NAAQS through the implementation of air pollutant emissions controls. Local air districts and other agencies, such as the Department of Pesticide Regulation and the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the USEPA for approval and publication in the Federal Register. All of the items included in the California SIP are listed in the Code of Federal Regulations (CFR) at 40 CFR 52.220.

As the regional air quality management district, the AVAQMD is responsible for preparing and implementing the portion of the SIP applicable to the portion of the MDAB within its jurisdiction. The air pollution control district for each county adopts rules, regulations, and programs to attain federal and state air quality standards and appropriates money (including permit fees) to achieve these objectives.

Local Air Quality Regulations

AVAQMD Ozone Attainment Plan

Under state law, air districts are required to prepare a plan for air quality improvement for pollutants for which the district is in non-compliance. The AVAQMD adopted the Federal 75 parts per billion (ppb) Ozone Attainment Plan for the Western Mojave Desert Nonattainment Area in March 2017 to reach attainment for federal and State standards. The Ozone Attainment Plan incorporates new scientific data and notable regulatory actions that have occurred since adoption of the 2010 Ozone Attainment Plan including the approval of the new federal 8-hour ozone standard of 0.070 parts per million (ppm) that was finalized in 2015. The Final 2017 Ozone Attainment Plan addresses several State and federal planning requirements and incorporates new scientific information, primarily in the form of updated emissions inventories, ambient measurements, and meteorological air quality models. The Southern California Association of Governments' (SCAG) projections for socio-economic data (e.g., population, housing, employment by industry) and transportation activities from the 2016 Regional Transportation Plan/Sustainable Communities Strategy (2016 RTP/SCS) are integrated into the 2017 Ozone Attainment Plan. To minimize potential impacts from project emissions, the AVAQMD implements rules and regulations for emissions that may be generated by various uses and activities. Rules and regulations relevant to the proposed project include Rule 403 (Fugitive Dust), Rule 402 (Nuisance), and Rule 1113 (Architectural Coatings).

2020-2045 Regional Transportation Plan/Sustainable Communities Strategy

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties. On September 3, 2020, SCAG's Regional Council formally adopted the 2020-2045 RTP/SCS (titled Connect SoCal). The 2020-2045 RTP/SCS builds upon the progress made through implementation of the 2016-2040 RTP/SCS and includes 10 goals focused on promoting economic prosperity, improving mobility, protecting the environment, and supporting healthy/complete communities. The SCS implementation strategies include focusing growth near destinations and mobility options, promoting diverse housing choices, leveraging technology innovations, and supporting implementation of sustainability policies. The SCS establishes a land use vision of center-focused placemaking, concentrating growth in and near Priority Growth Areas, transferring of development rights, urban greening, creating greenbelts and community separators, and implementing regional advance mitigation (SCAG 2020). The RTP/SCS pertains to air quality because the strategies set forth in the plan would reduce air pollutant emissions from mobile sources.

City of Palmdale General Plan

The City of Palmdale General Plan (2022) contains goals, policies, and strategies for enhancing community character and quality of life, expanding economic development opportunities, managing growth, addressing impacts of climate change, and improving outcomes for public health and sustainability. The General Plan includes numerous goals and policies in the Air Quality Element through which air quality would be improved and project impacts reduced, as follows:

- **Goal AQ-2: Minimize particulates less than 10 microns in size (PM_{10}) and minimizes activities that generate dust.**
  - **Policy AQ 2-4: Erosion and Dust Control Measures.** Require erosion and dust control measures for new construction, including covering soil with straw mats or use of chemical soil and dust binders during site grading, followed by hydroseeding and watering disturbed construction areas as soon as possible after grading to prevent fugitive dust.
- **Goal AQ-3: Reduction and/or elimination of unnecessary sources of air pollution.**
  - **Policy AQ 3-4: Reduce Reactive Organic Gas.** Reduce reactive organic gas (ROG) and particulate emissions from building materials and construction methods, by promoting the use of nonsolvent-based, high-solid, or water-based coatings, and requiring compliance with all pertinent AVAQMD rules.
- **Goal AQ-4: Reduce air pollution caused by energy consumption.**
  - **Policy AQ 4-2: Energy Conservation.** Encourage energy conservation from all sectors of the community by promoting and/or requiring the use of energy efficient appliances, processes, and equipment, and promoting energy audits and retrofits of existing structures.
  - **Policy AQ 4-3: Recycling.** Require local government, Palmdale citizens, and local businesses and industries to recycle, as mandated by state law, and to otherwise recycle to the maximum extent possible in accordance with the requirements of the Palmdale Municipal Code.
  - **Policy AQ 4-4: Solar Energy.** Require new developments to minimize obstruction of direct sunlight for solar energy systems on adjacent properties.

Criteria Pollutants

Ozone

Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases[1] (ROG). NO_X are formed during the combustion of fuels, while ROG are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it usually occurs in substantial concentrations between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

[1] Organic compound precursors of ozone are routinely described by several variations of three terms: hydrocarbons (HC), organic gases (OG), and organic compounds (OC). These terms are often modified by adjectives such as total, reactive, or volatile, and result in various acronyms, such as TOG (total organic gases), ROG (reactive organic gases), ROC (reactive organic compounds), and VOC (volatile organic compounds). While most of these differ in some significant way from a chemical perspective, two groups are important from an air quality perspective: non-photochemically reactive in the lower atmosphere, or photochemically reactive in the lower atmosphere (ROG and VOC).

Carbon Monoxide

CO is a local pollutant produced by the incomplete combustion of carbon-containing fuels, such as gasoline, natural gas, oil, coal, and wood. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic. Therefore, elevated concentrations are usually found near areas of high traffic volumes. The health effects from CO are related to its affinity for hemoglobin in the blood. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulty in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Sulfur Dioxide

SO_2 is a combustion product, with the primary source being power plants and heavy industries that use coal or oil as fuel. SO_2 is also a product of diesel engine combustion. The health effects of SO_2 include lung disease and breathing problems for people with asthma. SO_2 in the atmosphere contributes to the formation of acid rain.

Nitrogen Dioxide

NO_2 is a byproduct of fuel combustion, with the primary sources being motor vehicles and industrial boilers and furnaces. The principal form of NO_2 produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. NO_2 absorbs blue light, gives a reddish-brown cast to the atmosphere, and reduces visibility. It can also contribute to the formation of ozone/smog and acid rain.

Particulate Matter

Suspended atmospheric PM_{10} and $PM_{2.5}$ are comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. The characteristics, sources, and potential health effects associated with PM_{10} and $PM_{2.5}$ can be different. Major man-made sources of PM_{10} are agricultural operations, industrial processes, combustion of fossil fuels, construction, demolition operations, and entrainment of road dust into the atmosphere. Natural sources include windblown dust, wildfire smoke, and sea spray salt. The finer $PM_{2.5}$ particulates are generally associated with combustion processes as well as formation in the atmosphere as a secondary pollutant through chemical reactions. $PM_{2.5}$ is more likely to penetrate deeply into the lungs and poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the $PM_{2.5}$ that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Current Air Quality

CARB operates a network of air quality monitoring stations throughout the MDAB. The purpose of the monitoring stations is to measure ambient concentrations of pollutants and determine whether ambient air quality meets the California and federal standards. The monitoring station located closest to the project site is the Lancaster – 43301 Division Street station located approximately eight miles northwest of the project site. This monitoring station measures ozone, NO_2, PM_{10}, and $PM_{2.5}$.

Table 2 reports ambient air quality measurements and indicates the number of days that each standard has been exceeded at the Lancaster – 43301 Division Street station. The ambient air quality in the area exceeded the State and Federal 8-hour ozone standard in 2020, 2021, and 2022. The area also exceeded the State 1-hour ozone standard in 2020 and 2022 and the Federal PM_{10} and $PM_{2.5}$ standards in 2020 and 2021. The area did not exceed other air quality standards in 2020, 2021, or 2022.

Table 2 Ambient Air Quality at the Monitoring Station

Pollutant	2020	2021	2022
8 Hour Ozone (ppm), 8-Hour Average	0.083	0.079	0.082
Number of days above State and Federal standards (>0.070 ppm)	8	3	33
Ozone (ppm), Worst Hour	0.099	0.086	0.098
Number of days above State standard (>0.09 ppm)	4	0	3
Number of days above Federal standard (>0.112 ppm)	0	0	0
Nitrogen Dioxide (ppm) - Worst Hour (Federal Measurements)	0.052	0.046	0.044
Number of days above State standard (>0.18 ppm)	0	0	0
Number of days above Federal standard (0.10 ppm)	0	0	0
Particulate Matter 10 microns, $\mu g/m^3$, Worst 24 Hours	192.3	411.2	76.2
Number of days above Federal standard (>150 $\mu g/m^3$)	1	1	0
Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours	74.7	35.7	15.1
Number of days above Federal standard (>35 $\mu g/m^3$)	9	1	0

Source: CARB 2023

Sensitive Receptors

The term "sensitive receptor" refers to a person in the population who is more susceptible to health effects due to exposure to an air contaminant than the population at large or to a land use that may reasonably be associated with such a person. Examples include residences, schools, playgrounds, childcare centers, churches, athletic facilities, retirement homes, and long-term health care facilities. Sensitive receptors that may be affected by air quality impacts associated with construction and operation of the proposed project include the residents of the single-family developments located adjacent to the western, southern, and eastern project boundaries, and single-family residences located 800 feet to north of the project site. There are no other sensitive receptor groups within 1,000 feet of the project site.

2.2 Greenhouse Gases

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. The term "climate change" is often used interchangeably with the term "global warming," but climate change is preferred because it conveys that other changes are happening in addition to rising temperatures. The baseline against which these changes are measured originates in historical records that identify temperature changes that occurred in the past, such as during previous ice ages. The global climate is changing continuously, as evidenced in the geologic record which indicates repeated episodes of substantial warming and cooling. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming over the past 150 years. The United Nations Intergovernmental Panel on Climate Change (IPCC) expressed that the rise and continued growth of atmospheric CO_2 concentrations is unequivocally due to human activities in the IPCC's Sixth Assessment Report (2021). Human influence has warmed the atmosphere, ocean, and land, which has led the climate to warm at an unprecedented rate in the last 2,000 years. It is estimated that between the period of 1850 through 2019, that a total of 2,390 gigatonnes of anthropogenic CO_2 was emitted. It is likely that anthropogenic activities have increased the global surface temperature by approximately 1.07 degrees Celsius between the years 2010 through 2019 (IPCC 2021). Furthermore, since the late 1700s, estimated concentrations of CO_2, methane, and nitrous oxide in the atmosphere have increased by over 43 percent, 156 percent, and 17 percent, respectively, primarily due to human activity (USEPA 2021a). Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature.

Gases that absorb and re-emit infrared radiation in the atmosphere are called GHGs. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons and perfluorocarbons and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere, and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are usually by-products of fossil fuel combustion, and CH_4 results from off-gassing associated with agricultural practices and landfills. Human-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6 (USEPA 2021a).

Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" (CO_2e), which is the amount of GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a GWP of 30, meaning its global warming effect is 30 times greater than CO_2 on a molecule per molecule basis (IPCC 2021).[2]

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat-trapping effect of GHGs, the earth's surface would be about 33 degrees Celsius (°C) cooler (World Meteorological Organization 2021). However, since 1750, estimated concentrations of CO_2, CH_4, and N_2O in the atmosphere have increased by 47 percent, 156 percent, and 23

[2] The Intergovernmental Panel on Climate Change's (2021) *Sixth Assessment Report* determined that methane has a GWP of 30. However, the 2017 Climate Change Scoping Plan published by the California Air Resources Board uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change's (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes a GWP of 25.

percent, respectively, primarily due to human activity (IPCC 2021). GHG emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, are believed to have elevated the concentration of these gases in the atmosphere beyond the level of concentrations that occur naturally.

Greenhouse Gas Emissions Inventory

Global

In 2015, worldwide anthropogenic total 47,000 million MT of CO_2e, which is a 43 percent increase from 1990 GHG levels (USEPA 2021b). Specifically, 34,522 million metric tons (MMT) of CO_2e of CO_2, 8,241 MMT of CO_2e of CH_4, 2,997 MMT of CO_2e of N_2O, and 1,001 MMT of CO_2e of fluorinated gases were emitted in 2015. The largest source of GHG emissions were energy 14production and use (includes fuels used by vehicles and buildings), which accounted for 75 percent of the global GHG emissions. Agriculture uses and industrial processes contributed 12 percent and six percent, respectively. Waste sources contributed for three percent and two percent was due to international transportation sources. These sources account for approximately 98 percent because there was a net sink of two percent from land-use change and forestry. (USEPA 2021b).

Federal

United States GHG emissions were 6,347.7 MMT of CO_2e in 2021 or 5,593.5 MMT CO_2e after accounting for sequestration. Emissions increased by 6.8 percent from 2020 to 2021. The increase from 2020 to 2021 was driven by an increase in CO_2 emissions from fossil fuel combustion which increased seven percent relative to previous years and is primarily due to the economic rebounding after the COVID-19 Pandemic. In 2020, the energy sector (including transportation) accounted for 81 percent of nationwide GHG emissions while agriculture, industrial and waste accounted for approximately 10 percent, six percent, and three percent respectively (USEPA 2023).

California

Based on a review of the California Air Resource Board (CARB) California Greenhouse Gas Inventory for the years between 2000-2020, California produced 369.2 MMT of CO_2e in 2020, which is 35.3 MMT of CO_2e lower than 2019 levels. The 2019 to 2020 decrease in emissions is likely due in large part to the impacts of the COVID-19 pandemic. The major source of GHG emissions in California is the transportation sector, which comprises 37 percent of the State's total GHG emissions. The industrial sector is the second largest source, comprising 20 percent of the State's GHG emissions while electric power accounts for approximately 16 percent. The magnitude of California's total GHG emissions is due in part to its large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions as compared to other states is its relatively mild climate. In 2016, California achieved its 2020 GHG emission reduction target of reducing emissions to 1990 levels as emissions fell below 431 MMT of CO_2e (CARB 2022). The annual 2030 statewide target emissions level is 260 MMT of CO_2e (CARB 2017).

Regional

The City of Palmdale' Climate Action Plan (CAP) includes GHG inventories for the City (City of Palmdale 2022). In 2017, total community GHG emissions were estimated at 1,042,284 MT CO_2e. Out of the total 2017 GHG emissions inventory, on-road transportation (i.e., gasoline and diesel consumption from motor vehicles on local roads and highways) accounted for 59 percent of the emissions, residential energy consumption accounted for 19 percent, and nonresidential energy consumption accounted for 16 percent. The remaining six percent of GHG emissions was due to solid waste, off-road equipment, water and wastewater, and industrial sources.

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long-term trends have found that each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The observed global mean surface temperature for the decade from 2006 to 2015 was approximately 0.87°C (0.75°C to 0.99°C) higher than the global mean surface temperature over the period from 1850 to 1900. Furthermore, several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations agree that LSAT as well as sea surface temperatures have increased. Due to past and current activities, anthropogenic GHG emissions are increasing global mean surface temperature at a rate of 0.2°C per decade. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC 2021).

According to *California's Fourth Climate Change Assessment*, statewide temperatures from 1986 to 2016 were approximately 1°F to 2°F higher than those recorded from 1901 to 1960. Potential impacts of climate change in California may include loss in water supply from snowpack, sea level rise, more extreme heat days per year, more large forest fires, and more drought years (State of California 2018). Below is a summary of some of the potential effects that could be experienced in California as a result of climate change.

Air Quality

Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. As temperatures have increased in recent years, the area burned by wildfires throughout the state has increased, and wildfires have been occurring at higher elevations in the Sierra Nevada Mountains (State of California 2018). If higher temperatures continue to be accompanied by an increase in the incidence and extent of large wildfires, air quality would worsen. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby improving the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (California Natural Resources Agency 2009).

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future precipitation trends and water supplies in California. This uncertainty regarding future precipitation trends complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. However, the average early spring snowpack in the western United States, including the Sierra Nevada Mountains, decreased by about 10 percent during the last century. During the same period, sea level rose over 5.9 inches along the central and southern California coast (State of California 2018). The Sierra snowpack provides most of California's water supply by accumulating snow during the state's wet winters and releasing it slowly during the state's dry springs and summers (April and July). The snowmelt currently provides an annual average of 15 million acre-feet of water each year, and it is predicted that the snowpack will be reduced by 25 to 40 percent compared to its historic average by 2050 (California Department of Water Resources 2013). Climate change will also result in less snowfall at lower elevations and reduce the total snowpack, resulting in less available water (California Department of Water Resources 2013). The State of California projects that average spring snowpack in the Sierra Nevada and other mountain catchments in central and northern California will decline by approximately 66 percent from its historical average by 2050 (State of California 2018).

Hydrology and Sea Level Rise

Climate change has the potential to induce substantial sea level rise in the coming century (State of California 2018). The rising sea level increases the likelihood and risk of flooding. The rate of increase of global mean sea levels over the 2001-2010 decade, as observed by satellites, ocean buoys and land gauges, was approximately 3.2 mm per year, which is double the observed 20th century trend of 1.6 mm per year (World Meteorological Organization [WMO] 2013). As a result, global mean sea levels averaged over the last decade were about 8 inches higher than those of 1880 (WMO 2013). Sea levels are rising faster now than in the previous two millennia and the rise is expected to accelerate, even with robust GHG emission control measures. The most recent IPCC report predicts a mean sea–level rise of 10 to 37 inches by 2100 (IPCC 2021). A rise in sea levels could completely erode 31 to 67 percent of southern California beaches, result in flooding of approximately 370 miles of coastal highways during 100-year storm events, jeopardize California's water supply due to saltwater intrusion, and induce groundwater flooding and/or exposure of buried infrastructure (State of California 2018). In addition, increased CO_2 emissions can cause oceans to acidify due to the carbonic acid it forms. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture

California has a $50 billion annual agricultural industry that produces over a third of the country's vegetables and two-thirds of the country's fruits and nuts (California Department of Food and Agriculture 2020). Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, certain regions of agricultural production could experience water shortages of up to 16 percent; water demand could increase as hotter conditions lead to the loss of soil moisture; crop-yield could be threatened by water-induced stress and extreme heat waves; and plants may be susceptible to new and changing pest and disease outbreaks (State of California 2018). In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (California Climate Change Center 2006).

Ecosystems and Wildlife

Climate change, and the potential resulting changes in weather patterns, could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists project that the annual average maximum daily temperatures in California could rise by 4.4 to 5.8°F in the next 50 years and by 5.6 to 8.8°F in the next century (State of California 2018). Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals related to (1) timing of ecological events; (2) geographic distribution and range; (3) species' composition and the incidence of nonnative species within communities; and (4) ecosystem processes, such as carbon cycling and storage (Parmesan 2006; State of California 2018). Increases in wildfire would further remove sensitive habitat; increased severity in droughts would potentially starve plants and animals of water; and sea level rise will affect sensitive coastal ecosystems.

Greenhouse Gas Regulations

Federal Regulations

The U.S. Supreme Court in *Massachusetts et al. v. Environmental Protection Agency et al*. ([2007] 549 U.S. 05-1120) held that the USEPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act. The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines and requires annual reporting of emissions. In 2012, the USEPA issued a Final Rule that establishes the GHG permitting thresholds that determine when CAA permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

In 2014, the U.S. Supreme Court in *Utility Air Regulatory Group v. EPA* (134 S. Ct. 2427 [2014]) held that USEPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other pollutants) may continue to require limitations on GHG emissions based on the application of Best Available Control Technology (BACT).

State Regulations

ASSEMBLY BILL 1493 - CALIFORNIA ADVANCED CLEAN CARS PROGRAM

AB 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, USEPA granted the waiver of CAA preemption to California for its GHG emission standards for motor vehicles beginning with the 2009 model year. Pavley I regulates model years from 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs, and should provide major reductions in GHG emissions. By 2025, when the rules will be fully implemented, new automobiles will emit

34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB 2011).

CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006 (ASSEMBLY BILL 32, AND SENATE BILL 32)

The "California Global Warming Solutions Act of 2006," (AB 32), outlines California's major legislative initiative for reducing GHG emissions. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 target of 431 MMT CO2e, which was achieved in 2016. CARB approved the Scoping Plan on December 11, 2008, which included GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among others (CARB 2008). Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since the Scoping Plan's approval.

The CARB approved the 2013 Scoping Plan update in May 2014 (CARB 2014). The update defined the CARB's climate change priorities for the next five years, set the groundwork to reach post-2020 statewide goals, and highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the state's longer term GHG reduction strategies with other state policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014).

On September 8, 2016, the governor signed Senate Bill (SB) 32 into law, extending the California Global Warming Solutions Act of 2006 by requiring the state to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, the CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, and implementation of recently adopted policies and legislation, such as SB 1383 and SB 100 (discussed later). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of six MT CO2e by 2030 and two MT CO2e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, sub-regional, or regional level), but not for specific individual projects because they include all emissions sectors in the state (CARB 2017).

ASSEMBLY BILL 1279

AB 1279, the California Climate Crisis Act, was passed on September 16, 2022, and declares the State would achieve net zero GHG emissions as soon as possible, but no later than 2045, and to achieve and maintain net negative GHG emissions thereafter. In addition, the bill states that the State would reduce GHG emissions by 85 percent below 1990 levels no later than 2045.

In response to the passage of AB 1279 and the identification of the 2045 GHG reduction target, CARB published the Final 2022 Climate Change Scoping Plan in November 2022 (CARB 2022b). The 2022 Update builds upon the framework established by the 2008 Climate Change Scoping Plan and previous updates while identifying new, technologically feasible, cost-effective, and equity-focused path to achieve California’s climate target. The 2022 Update includes policies to achieve a significant reduction in fossil fuel combustion, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands (NWL) to reduce emissions and sequester carbon, and the capture and storage of carbon.

The 2022 Update assesses the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan, addresses recent legislation and direction from Governor Gavin Newsom, extends and expands upon these earlier plans, and implements a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045, as well as taking an additional step of adding carbon neutrality as a science-based guide for California’s climate work. As stated in the 2022 Update, “The plan outlines how carbon neutrality can be achieved by taking bold steps to reduce GHGs to meet the anthropogenic emissions target and by expanding actions to capture and store carbon through the state’s NWL and using a variety of mechanical approaches” (CARB 2022b). Specifically, the 2022 Update:

- Identifies a path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030.
- Identifies a technologically feasible, cost-effective path to achieve carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels.
- Focuses on strategies for reducing California’s dependency on petroleum to provide consumers with clean energy options that address climate change, improve air quality, and support economic growth and clean sector jobs.
- Integrates equity and protecting California’s most impacted communities as driving principles throughout the document.
- Incorporates the contribution of NWL to the State’s GHG emissions, as well as their role in achieving carbon neutrality.
- Relies on the most up-to-date science, including the need to deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration, as well as direct air capture.
- Evaluates the substantial health and economic benefits of taking action.
- Identifies key implementation actions to ensure success.

In addition to reducing emissions from transportation, energy, and industrial sectors, the 2022 Update includes emissions and carbon sequestration in NWL and explores how NWL contribute to long-term climate goals. Under the Scoping Plan Scenario, California’s 2030 emissions are anticipated to be 48 percent below 1990 levels, representing an acceleration of the current SB 32 target. Cap-and-Trade regulation continues to play a large factor in the reduction of near-term emissions for meeting the accelerated 2030 reduction target. Every sector of the economy will need to begin to transition in this decade to meet our GHG emissions reduction goals and achieve carbon neutrality no later than 2045. The 2022 Update approaches decarbonization from two perspectives, managing a phasedown of existing energy sources and technologies, as well as increasing, developing, and deploying alternative clean energy sources and technology.

SENATE BILL 97 - CEQA: GREENHOUSE GAS EMISSIONS

SB 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in CEQA documents. In March 2010, the California Natural Resources Agency

(Resources Agency) adopted amendments to the CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

SENATE BILL 375 - 2008 SUSTAINABLE COMMUNITIES AND CLIMATE PROTECTION ACT

SB 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPOs) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. SCAG was assigned targets of an 8 percent reduction in GHGs from transportation sources by 2020 and a 19 percent reduction in GHGs from transportation sources by 2035. In the SCAG region, SB 375 also provides the option for the coordinated development of sub regional plans by the sub regional councils of governments and the county transportation commissions to meet SB 375 requirements.

SENATE BILL 1383 - SHORT-LIVED CLIMATE POLLUTANTS

Adopted in September 2016, SB 1383 requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. The bill requires the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with CARB, to adopt regulations that achieve:

- 50-percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020; and
- 75-percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2025.

The bill also mandates various state and local agencies develop further strategies to reduce emissions generated by specific industries such as agriculture. The stated goal is to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SENATE BILL 100 - CALIFORNIA RENEWABLES PORTFOLIO STANDARD PROGRAM

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's Renewables Portfolio Standard Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

EXECUTIVE ORDER B-55-18 TO ACHIEVE CARBON NEUTRALITY

On September 10, 2018, Governor Brown issued Executive Order B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

ASSEMBLY BILL 341 - CALIFORNIA INTEGRATED WASTE MANAGEMENT ACT

The California Integrated Waste Management Act of 1989, as modified by AB 341, requires each jurisdiction's source reduction and recycling element to include an implementation schedule that shows: (1) diversion of 25 percent of all solid waste by January 1, 1995, through source reduction, recycling, and composting activities; (2) diversion of 50 percent of all solid waste on and after January 1, 2000; and (3) diversion of 75 percent of all solid waste by 2020, and annually thereafter. CalRecycle is required to develop strategies to implement AB 341, including source reduction.

CLEAN ENERGY, JOBS, AND AFFORDABILITY ACT OF 2022 (SENATE BILL 1020)

Adopted on September 16, 2022, SB 1020 creates clean electricity targets for eligible renewable energy resources and zero-carbon resources to supply 90 percent of retail sale electricity by 2035, 95 percent by 2040, 100 percent by 2045, and 100 percent of electricity procured to serve all state agencies by 2035. This bill shall not increase carbon emissions elsewhere in the western grid and shall not allow resource shuffling.

California Building Standards Code

The California Code of Regulations (CCR) Title 24 is referred to as the California Building Standards Code. It consists of a compilation of several distinct standards and codes related to building construction including plumbing, electrical, interior acoustics, energy efficiency, and handicap accessibility for persons with physical and sensory disabilities. The current iteration is the 2022 Title 24 standards. The California Building Standards Code's energy-efficiency and green building standards are outlined below.

PART 6 – BUILDING ENERGY EFFICIENCY STANDARDS/ENERGY CODE

CCR Title 24, Part 6 is the Building Energy Efficiency Standards or California Energy Code. This code, originally enacted in 1978, establishes energy-efficiency standards for residential and non-residential buildings in order to reduce California's energy demand. New construction and major renovations must demonstrate their compliance with the current Energy Code through submittal and approval of a Title 24 Compliance Report to the local building permit review authority and the California Energy Commission (CEC). The 2022 Title 24 standards are the applicable building energy efficiency standards for the proposed project because they became effective on January 1, 2023.

PART 11 – CALIFORNIA GREEN BUILDING STANDARDS

The California Green Building Standards Code, referred to as CALGreen, was added to Title 24 as Part 11, first in 2009 as a voluntary code, which then became mandatory effective January 1, 2011 (as part of the 2010 California Building Standards Code). The 2022 CALGreen includes mandatory minimum environmental performance standards for all ground-up new construction of residential and non-residential structures. It also includes voluntary tiers with stricter environmental performance standards for these same categories of residential and non-residential buildings. Local jurisdictions must enforce the minimum mandatory CALGreen standards and may adopt additional amendments for stricter requirements.

Regional and Local Regulations

2020 – 2045 SCAG Regional Transportation Plan

On September 3, 2020, the SCAG's Regional Council formally adopted the 2020-2045 RTP/SCS entitled Connect SoCal. The 2020-2045 RTP/SCS builds upon the progress made through implementation of the 2016-2040 RTP/SCS and includes 10 goals focused on promoting economic prosperity, improving mobility, protecting the environment, and supporting healthy/complete communities. The SCS implementation strategies include focusing growth near destinations and mobility options, promoting diverse housing choices, leveraging technology innovations, and supporting implementation of sustainability policies. The SCS establishes a land use vision of center- focused placemaking, concentrating growth in and near Priority Growth Areas, transferring of development rights, urban greening, creating greenbelts and community separators, and implementing regional advance mitigation (SCAG 2020).

City of Palmdale General Plan 2045

The City of Palmdale has established a series of goals and policies in the 2045 City of Palmdale General Plan to reduce GHG emissions and increase sustainability. The Sustainability, Climate, and Resilience chapter of the Plan serves as the Climate Action Plan (CAP) for the City of Palmdale. The City of Palmdale developed the CAP to reduce emissions and make Palmdale a more sustainable, healthier, and resilient community. Pursuant with CEQA Guidelines Section 15183.5, the CAP would meet the requirements of a qualified CAP and future residential projects developed under the Plan would be able to tier from the CAP for analysis purposes (City of Palmdale 2022). The CAP includes the following goals and policies that would be applicable to the project:

Clean Energy

- **Goal SCR-2: Utilize a fossil fuel free energy system (SB 100).**
  - **SCR-2.1 Carbon Free Energy.** Direct EPIC to provide 75% carbon-free or renewable electricity to residents and businesses by 2030, achieving 100% carbon-free electricity by 2045.
  - **SCR-2.2 Community Solar.** Explore the development of community solar projects and microgrids.

Buildings

- **Goal SCR-3: Green and decarbonized buildings for new construction and major renovations.**
  - **SCR-3.1 Energy Efficient New Construction.** Integrate CALGreen Tier 1 and Tier 2 green building and energy efficiency standards into new construction and major remodels.
  - **SCR-3.2 All-Electric Reach Code.** Consider adopting a local reach code to encourage new buildings to be all-electric.
  - **SCR-3.3 Solar + Storage.** Require installation of photovoltaic panels and battery storage on all residential new construction and nonresidential new construction over 5,000 sq. ft.

Transportation

- **Goal SCR-4: Reduced greenhouse gas emissions from transportation (SB 379, EO N-79-20).**

  - **SCR-4.1 Bike Facilities.** Promote bicycle use with new private development projects through requirements for bicycle parking, lockers and showers, bike share facilities, and when feasible, connections to City bike lanes.
  - **SCR-4.2 Public Transit.** Expand the public transit system, increase frequency of service, and provide shade at transit stops.
  - **SCR-4.4 EV Reach Code.** Adopt EV requirements beyond CALGreen in both number of chargers and charger capacity.
  - **SCR-4.7 Pedestrian and Cyclist Safety.** Improve bicycle and pedestrian modes of travel by improving pedestrian and cyclist safety. Example techniques include increasing the number of sidewalks, pending connected and protected bike lanes, and redesigning high incidence intersections.

Solid Waste

- **Goal SCR-5: Increased resource capture and reduced waste sent to landfills (SB 1383).**
  - **SCR-5.1 Zero Waste Plan.** Create a zero-waste plan that institutes cost-effective diversion programs for municipal operations and the community.
  - **SCR-5.2 Organic Waste Diversion.** Establish programs to comply with State-established requirements for organics and food waste diversion.

Water and Wastewater

- **Goal SCR-6: Safe and secure water supply.**
  - **SCR-6.1 Recycled Water.** Increase availability of local recycled water.
  - **SCR-6.4 Rainwater Capture.** Encourage rainwater capture and use of cisterns for outdoor watering purposes.

3 Impact Analysis

3.1 Methodology

Criteria pollutant and GHG emissions for project construction and operation were calculated using the California Emissions Estimator Model (CalEEMod), Version 2022.1. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide (CAPCOA 2022). The input data and subsequent construction and operation emission estimates for the proposed project are discussed below. CalEEMod output files for the project are included in Appendix A to this report.

Construction Emissions

Project construction would primarily generate temporary criteria pollutant and GHG emissions from construction equipment operation on-site, construction worker vehicle trips to and from the site, and from import of materials to the site. Construction input data for CalEEMod include, but are not limited to: (1) the anticipated start and finish dates of construction activity; (2) inventories of construction equipment to be used; and (3) areas to be excavated and graded. The analysis assessed maximum daily emissions from individual construction activities, including site preparation, grading, building construction, paving, and architectural coating. Construction would require heavy equipment during demolition, site preparation, grading, building construction, and paving. Construction equipment estimates are based on surveys of construction projects within California conducted by members of CAPCOA. Note that there would be no demolition phase since the existing site is vacant.

Construction emissions were modeled in CalEEMod to occur over 18 months, starting in January 2024 with completion anticipated in July 2025. Although construction would likely begin in summer of 2024, this analysis conservatively assumes an earlier start date, as emissions factors for construction equipment are lower in later years. Construction emissions associated with development of the proposed project were quantified using the types and quantities of equipment for each construction phase as provided by the applicant. CalEEMod also estimates off-site emissions from worker, vendor, and hauling truck trips. The number of worker and vendor trips are based on CalEEMod defaults. Cut material would be used for construction of the proposed drainage basin; therefore, the project would not require material export or import.

The quantity, duration, and the intensity of construction activity influences the amount of construction emissions and their related pollutant concentrations that occur at any one time. The emission forecasts modeled for this report reflect conservative assumptions where a relatively large amount of construction is occurring in a relatively intensive manner. If construction is delayed or occurs over a longer period, emissions could be reduced because of (1) a more modern and cleaner-burning construction equipment fleet mix than assumed in the CalEEMod, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval).

Consistent with the industry standard, total construction GHG emissions resulting from a project were amortized over 30 years and added to operational GHG emissions to account for their contribution to GHG emissions over the lifetime of the project.

Operational Emissions

In CalEEMod, operational sources of criteria pollutant emissions include area, energy, and mobile sources; GHG emissions include water and solid waste sources in addition to area, energy, and mobile sources. The project's single-family, ADU, and junior ADU uses were combined and attributed to the "Single Family Housing" land use subtype, while the proposed community amenities were modeled as a 2,630-square foot "Racquet Club." Uncovered parking spaces and internal roadways were modeled as "Parking Lot." The modeling analyzed 191 total dwelling units.

Energy Sources

Emissions from energy use typically include electricity and natural gas use. However, the proposed project would not include natural gas connections, and such emissions are therefore excluded from this analysis. Electricity emissions only apply to GHG emissions (as the energy is generated off-site and therefore may not be relevant for local and regional air quality conditions) and are calculated by multiplying the energy use times the carbon intensity of the utility district per kilowatt hour (CAPCOA 2022). The default electricity consumption values in CalEEMod include the CEC-sponsored California Commercial End Use Survey and Residential Appliance Saturation Survey studies.

Electricity emissions are calculated by multiplying the energy use times the carbon intensity of the utility district per kilowatt hour (CAPCOA 2022). The project would be served by Southern California Edison (SCE). Therefore, SCE's specific energy intensity factors (i.e., the amount of CO_2, CH_4, and N_2O per kilowatt-hour) are used in the calculations of GHG emissions.

Area Sources

Emissions associated with area sources, including consumer products, landscape maintenance, and architectural coating were calculated in CalEEMod and standard emission rates were utilized from CARB, USEPA, and emission factor values provided by the local air district (CAPCOA 2022).

Waste Sources

Operational emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CAPCOA 2022). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Water and Wastewater Sources

Operational emissions from water and wastewater usage calculated in CalEEMod were based on the default electricity intensity from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for northern and southern California.

Mobile Sources

Mobile emissions are estimated by multiplying the project trip rate, average trip length, and the vehicle emission factors. The traffic consultant, General Technologies and Solutions (GTS), provided project-specific trip generations based on the Institute of Transportation Engineers (ITE) rates for "Single-Family Detached Housing" and "Multifamily Housing (Low-Rise)". The trip rate was estimated to be 1,460 total trips. The project-specific trip generation rates provided are included in the CalEEMod outputs in Appendix A.

3.2 Significance Thresholds

Air Quality

To determine whether a project would result in a significant impact to air quality, Appendix G of the CEQA Guidelines requires consideration of whether a project would:

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

The AVAQMD has adopted numerical significant emissions thresholds to determine whether an air pollution source could contribute individually or cumulatively to the worsening local or regional air quality. These thresholds, which would apply to temporary construction and long-term operational emission, are shown in Table 3.

Table 3 AVAQMD Significance Thresholds

Pollutant	Annual Threshold (tons/year)	Daily Threshold (lbs/day)
CO	100	548
NO_X	25	137
VOC	25	137
SO_X	25	137
PM_{10}	15	82
$PM_{2.5}$	12	65

Source: AVAQMD 2016

AVAQMD guidance states that a project would have a significant impact related to TACs if the project would expose sensitive receptors to pollutant concentrations resulting in a cancer risk greater than or equal to 10 in one million and/or a non-cancerous Hazard Index (HI) greater than or equal to one.

Greenhouse Gas Emissions

Based on Appendix G of the CEQA Guidelines, impacts related to GHG emissions from the project would be significant if the project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions.

The majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15064[h][1]).

Section 15064.4 of the CEQA Guidelines recommends that lead agencies quantify GHG emissions of projects and consider several other factors that may be used in the determination of significance of GHG emissions from a project, including the extent to which the project may increase or reduce GHG emissions; whether a project exceeds an applicable significance threshold; and the extent to which the project complies with regulations or requirements adopted to implement a plan for the reduction or mitigation of GHG emissions. The City of Palmdale has prepared a qualified CAP pursuant to CEQA Guidelines Section 15183.5(b). The CAP serves as a "qualified plan for the reduction of greenhouse gases" and provides a mechanism for tiering and streamlining of GHG emissions analysis for projects that are consistent with such a plan.

As part of the CAP, the City of Palmdale has established GHG reduction targets consistent with the statewide goal of reducing GHG emissions to 40 percent below 1990 levels by 2030 (478,418 MT CO_2e). Additionally, the CAP provides additional reductions beyond what is needed to achieve the 2017 Scoping Plan 2030 goal and advances the City's progress toward the goal of carbon neutrality by 2045 contained in the 2022 Scoping Plan. To achieve these reductions, the City's CAP has established per-service population emissions targets that are used for this analysis, which are: 2 MT CO_2e per service population by 2030; 1.3 MT CO_2e per service population by 2035; and 1.2 MT CO_2e per service population by 2045. Per-service population emissions are calculated by dividing total community emissions by the residents plus employees.

3.3 Impact Analysis

Air Quality

Air Quality Threshold 1
Would the project conflict with or obstruct implementation of the applicable air quality plan? *(Less Than Significant)*.

The AVAQMD is required, pursuant to the federal Clean Air Act, to reduce emissions of criteria pollutants for which the AVAQMD portion of the MDAB is in nonattainment. Strategies to achieve these emissions reductions are developed in the 2023 Federal 70 ppb Ozone Attainment Plan (2023

Ozone Plan), prepared by AVAQMD for the region. Forecasts used in the 2023 Ozone Plan are developed by SCAG, which are based on local general plans and other related documents that are used to develop population, employment, and traffic projections. Consistency with the 2023 Ozone Plan is determined by analyzing a project with the assumptions in the Plan. As such, projects that propose development that is consistent with the growth anticipated by the local land use plan would be consistent with the SCAG growth projections and the 2023 Ozone Plan emissions estimates.

The project involves the construction of 191 residential units that would result in an increase in the city's population. Based on an average household size of 3.4 persons per dwelling unit in the city, the project would house approximately 649 residents (California Department of Finance 2023). The population growth projections used in the 2023 Ozone Plan forecast show that the population of Palmdale will reach 207,000 residents by 2045, an increase of 48,400 from 2016 projections (SCAG 2020). The project's buildout would not exceed the 2023 Ozone Plan population growth forecast for Palmdale. The project's population growth represents approximately 1.3 percent of the total population growth expected in Palmdale between 2016 and 2045. Therefore, the proposed project would be consistent with AQMP growth assumptions and accommodated within and consistent with the 2023 Ozone Plan, and impacts would be less than significant.

Air Quality Threshold 2
Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard *(Less Than Significant)*.

Construction

Table 4 and Table 5 summarizes maximum daily and annual emissions of pollutants throughout the construction period of the project, respectively. Detailed modeling results are provided in Appendix A. Emissions would not exceed AVAQMD significance thresholds during project construction. Therefore, project construction would not result in a cumulatively considerable net increase of a criteria pollutant, and impacts would be less than significant.

Table 4 Daily Construction Criteria Pollutant Emissions

	Maximum Emissions (lbs/day)					
	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Year 2024	5	38	52	<1	7	4
Construction Year 2025	70	24	51	<1	5	2
Maximum Emissions	70	38	52	<1	7	4
AVAQMD Significance Thresholds	137	137	548	137	82	65
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Table 2.2 "Construction Emissions by Year, Unmitigated" emissions. Highest of summer and winter emissions results are shown for maximum daily emissions. See CalEEMod worksheets in Appendix A.

Table 5 Annual Construction Criteria Pollutant Emissions

	Maximum Emissions (tons/year)					
	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Year 2024	1	3	5	<1	1	<1
Construction Year 2025	1	2	3	<1	<1	<1
Maximum Emissions	1	3	5	<1	1	<1
AVAQMD Significance Thresholds	25	25	100	25	15	12
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Table 2.2 "Construction Emissions by Year, Unmitigated" emissions. See CalEEMod worksheets in Appendix A.

Operational

Table 6 summarizes emissions associated with operation of the project. The majority of operational emissions generated would be due to mobile emissions from vehicle trips to and from the project site. As shown in Table 6 and Table 7, emissions generated during the operation of project would not exceed AVAQMD significance thresholds. Therefore, the project would not result in a cumulatively considerable net increase of a criteria pollutant, and impacts would be less than significant.

Table 6 Daily Operational Criteria Pollutant Emissions

	Maximum Daily Emissions (lbs/day)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Area	8	<1	27	<1	<1	<1
Energy	0	0	0	0	0	0
Mobile	8	6	59	<1	10	2
Project Emissions	16	6	86	<1	10	2
AVAQMD Thresholds	137	137	548	137	82	65
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Project emissions may not sum exactly due to rounding

Source: Table 2.5 "Operations Emissions by Sector, Unmitigated" emissions. Highest summer and winter emissions results are shown for maximum daily emissions. See CalEEMod worksheets in Appendix A.

Table 7 Annual Operational Criteria Pollutant Emissions

	Maximum Annual Emissions (tons/year)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Area	<1	<1	2	<1	<1	<1
Energy	0	0	0	0	0	0
Mobile	1	1	9	<1	2	<1
Project Emissions	2	1	12	<1	2	<1
AVAQMD Thresholds	25	25	100	25	15	12
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Note: Project emissions may not sum exactly due to rounding

Source: Table 2.5 "Operations Emissions by Sector, Unmitigated" emissions. See CalEEMod worksheets in Appendix A.

Air Quality Threshold 3
Expose sensitive receptors to substantial pollutant concentrations *(Less Than Significant)*.

Toxic Air Contaminants

CONSTRUCTION

Construction-related activities would result in short-term, project-generated emissions of DPM exhaust emissions from off-road, heavy-duty diesel equipment for site preparation grading, building construction, and other construction activities. DPM was identified as a TAC by CARB in 1998. The potential cancer risk from the inhalation of DPM (discussed in the following paragraphs) outweighs the potential non-cancer health impacts (CARB 2021b).

Generation of DPM from construction projects typically occurs in a single area for a short period. Construction of the proposed project would occur over approximately 18months. The dose to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that a person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the Maximally Exposed Individual. The risks estimated for a Maximally Exposed Individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period (assumed to be the approximate time that a person spends in a household). OEHHA recommends this risk be bracketed with 9-year and 70-year exposure periods. Health risk assessments should be limited to the period/duration of activities associated with the project.

The maximum $PM_{2.5}$ emissions, which is used to represent DPM emissions for this analysis, would occur during site preparation and grading activities. While site preparation and grading emissions represent the worst-case condition, such activities would occur for three months, less than 3 percent for a 9-year health risk calculation period and less than one percent for a 30-year and 70-year health risk calculation period. $PM_{2.5}$ emissions would decrease for the remaining construction period because construction activities such as building construction, architectural coating, and paving would require less construction equipment. Therefore, DPM generated by project, construction is not expected to create conditions where the probability that the Maximally Exposed Individual would contract cancer is greater than 10 in one million. This impact would be less than significant.

Operation

CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) provides recommendations regarding the siting of new sensitive land uses near potential sources of air toxic emissions (e.g., freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing facilities). CARB guidelines provide the recommended siting distances both for the development of sensitive land uses in proximity to TAC sources and for the addition of new TAC sources in proximity to existing sensitive land uses. Residential land uses do not generate substantial TAC emissions based on the air toxic sources listed in CARB's guidelines. Therefore, the expected hazardous TACs generated on site (e.g., cleaning solvents, paints, landscape pesticides, etc.) for the proposed land uses would be below thresholds warranting further study under the California Accidental Release Program. The project would not expose off-site sensitive receptors to significant amounts of carcinogenic or TACs. Therefore, operational impacts would be less than significant.

Air Quality Threshold 4
Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people *(Less Than Significant)*.

Sensitive receptors in the project vicinity include single-family residences at the project boundaries to the east, south and west, and approximately 800 feet to the north. Construction activities would be temporary and transitory and associated odors would cease upon construction completion. Such odors disperse rapidly with distance. Accordingly, the proposed project would not create objectionable odors affecting a substantial number of people during construction, and short-term impacts would be less than significant.

The project does not include land uses typically associated with odor complaints such as sewage treatment plants, landfills, recycling facilities, and agricultural uses. Vehicles approaching, idling, and leaving the site may release odorous exhaust emissions. Odors of this nature disperse rapidly with distance and do not typically result in odor impacts. Additionally, the project site is located adjacent to Palmdale Boulevard, an arterial road, so vehicle exhaust is already prevalent in the project area. For these reasons, operational odor impacts would be less than significant.

Greenhouse Gas Emissions

GHG Emissions Threshold 1
Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment? *(Less Than Significant With Mitigation Incorporated)*.

GHG Emissions Threshold 2
Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions? *(Less Than Significant With Mitigation Incorporated)*.

Project-generated Greenhouse Gas Emissions

The City of Palmdale CAP is a qualified GHG reduction plan consistent with the requirements of CEQA Guidelines Section 15183.5. In accordance with the CAP, project GHG emissions would be less than significant if it can be demonstrated that the project would be consistent with the CAP and generate less than 2 MT CO_2e per service population per year.

Project construction would generate temporary short-term GHG emissions through travel to and from the worksite and from the operation of construction equipment such as graders, backhoes, and generators. Construction of the project would generate approximately 1,546 MT CO_2e over the entire construction period. As shown in Table 4, the proposed project's amortized construction-related emissions would be 52 MT CO_2e.

Operation of the proposed project would generate GHG emissions associated with area sources (e.g., landscape maintenance), energy and water usage, vehicle trips, and wastewater and solid waste generation. Table 8 combines the estimated construction and operational GHG emissions associated with development of the project. As shown therein, the project would generate approximately 2,206 MT of CO_2e per year during operation. Total emissions (amortized construction emissions plus annual operation emissions) would be 3.5 MT of CO_2e per year per SP (conservatively rounded up to the nearest tenth). These emissions would exceed the 2.0 MT of CO_2e per year per service person goal of the City CAP, and impacts would be potentially significant. Implementation of Mitigation Measure GHG-1 below would be required to reduce impacts to a less than significant level.

Table 8 Combined Annual GHG Emissions

Emission Source	Annual Emissions (MT CO_2e per year)
Construction	
2024	1,047
2025	499
Construction Total	**1,546**
Amortized over 30 years	**52**
Operational	

Emission Source	Annual Emissions (MT CO_2e per year)
Area	8
Energy	325
Mobile	1,779
Solid Waste	59
Water	35
Refrigerants	<1
Operational Total	**2,206**
Total Emissions	**2,258**
Service Population (Residents)	**657**
Emissions per Service Person[2]	**3.5**
Threshold	**2.0**
Threshold Exceeded?	**Yes**

MT = metric tons; CO_2e = carbon dioxide equivalents

[2] Emissions per SP rounded up to the nearest tenth.

Notes: Emissions modeling was completed using CalEEMod. See Appendix A for modeling results.

Consistency with Applicable Plans

2022 Scoping Plan

The principal state plans and policies for reducing GHG emissions are AB 32, SB 32, and AB 1279. The quantitative goal of AB 32 is to reduce GHG emissions to 1990 levels by 2020; the goal of SB 32 is to reduce GHG emissions to 40 percent below 1990 levels by 2030; and the goal of AB 1279 is to achieve net zero greenhouse gas emissions no later than 2045, and reduce GHG emissions by 85 percent below 1990 levels no later than 2045. The 2022 Scoping Plan expands upon earlier plans to include the AB 1279 targets. The 2022 Scoping Plan's strategies that are applicable to the proposed project include reducing fossil fuel use and vehicle miles traveled; decarbonizing the electricity sector, maximizing recycling and diversion from landfills; and increasing water conservation. The project would be consistent with these goals through project design, which includes 100% electric project design, complying with the latest Title 24 Green Building Code and Building Efficiency Energy Standards, and complying with the AB 341 waste diversion goal of 75 percent. In addition, the project would receive electricity from SCE, which is required to reduce GHG emissions by increasing procurement from eligible renewable energy by set target years as required by SB 100. Therefore, the project would not conflict with the 2022 Scoping Plan.

Connect SoCal: 2020-2045 SCAG RTP/SCS

According to the 2020-2045 RTP/SCS, the updated targets for the SCAG region are eight percent below 2005 per capita emission levels by 2020 (this value is unchanged from the previous 2020 CARB target) and 19 percent below 2005 per capita emissions levels by 2035. The revised 2035 target is higher than the previous CARB target of 13 percent for the SCAG region. The 2020-2045 RTP/SCS includes implementation strategies for focusing growth near destinations and mobility options, promoting diverse housing choices, leveraging technology innovations, supporting implementation of sustainability policies, and promoting a green region. Further specific actions to reduce GHG emissions under the 2020-2045 RTP/SCS include designing transportation options that reduce the reliance on solo car trips, promoting low emission technologies such as electric vehicles and ride sharing, supporting statewide GHG emissions legislation, and pursuing funding opportunities to support local sustainable development projects that reduce GHG emissions.

Table 9 Project Consistency with the SCAG 2020-2045 RTP/SCS

Goals	Consistency
Goal 2: Improve mobility, accessibility, reliability, and travel safety for people and goods	**Consistent.** The project would include interior roadways, sidewalks, and trails to provide vehicle, bicycle, and pedestrian access to residences. This expanded pedestrian network would provide pedestrian access to local schools and parks, including Domenic Massari Park and Knight High School to the southeast, as well as commercial uses to the west. Therefore, the project would have accessible and reliable travel options and be designed to reduce reliance on solo vehicle trips.
Goal 5: Reduce greenhouse gas emissions and improve air quality	**Consistent.** The project would include several sustainable design features, including those required by Title 24 and CALGreen standards. The project would include photovoltaic systems and battery storage installed on each residential building. All proposed residences would be equipped with energy-efficient appliances and lighting, water-efficient fixtures, and water-efficient irrigation systems. The project would meet the requirements of the 2022 California Energy Code.
Goal 6: Support healthy and equitable communities	**Consistent.** The project would provide housing near city parks, commercial areas, and schools. Furthermore, the project would include design features such as sidewalks and multiple access points to the project site. These features would promote active transportation and foster efficient development patterns within the project site vicinity.
Goal 9: Encourage development of diverse housing types in areas that are supported by multiple transportation options	**Consistent.** The project would include interior roadways, sidewalks, and trails to provide vehicle, bicycle, and pedestrian access to residences. This expanded pedestrian network would provide pedestrian access to local schools and parks, including Domenic Massari Park and Knight High School to the southeast. The project would be near a commercial downtown area along 47th Street and East Avenue R. The project would include improvement of pedestrian and bicycle facilities, and site access would be provided along several access points. Proposed on-site facilities would establish residences on an underutilized lot adjacent to existing development. Therefore, the project would provide connectivity with planned neighboring residential developments.

Source: SCAG 2020

City of Palmdale Climate Action Plan

The project's consistency with the City of Palmdale General Plan and CAP policies aimed at reducing GHG emissions are shown in Table 10. Although the project would be consistent with applicable policies from the City of Palmdale General Plan and CAP shown in Table 9, it would exceed the CAP's per service population thresholds as shown in Table 6, above. Therefore, the project would be inconsistent with the CAP, and impacts would be potentially significant.

Table 10 Project Consistency with the Palmdale General Plan

Policy	Consistency
Goal SCR-4: Reduced greenhouse gas emissions from transportation. **Policy SCR-4.1 Bike Facilities:** Promote bicycle use with new private development projects through requirements for bicycle parking, lockers and showers, bike share facilities, and when feasible, connections to City bike lanes.	**Consistent.** The project would create sidewalks and pathways within the project site to accommodate pedestrians and cyclists, which would connect to existing and planned off-site pedestrian and bicycle facilities.
Goal SCR-3: Green and decarbonized buildings for new construction and major renovations. **Policy SCR3.2: All-Electric Reach Code.** Consider adopting a local reach code to encourage new buildings to be all-electric. **Policy SCR-3.3: Solar + Storage.** Require installation of photovoltaic panels and battery storage on all residential new construction and nonresidential new construction over 5,000 sq. ft.	**Consistent.** The project would comply with all standards set forth in the CBC Title 24, which would minimize the wasteful, inefficient, or unnecessary consumption of energy resources during operation. Furthermore, in accordance with the 2022 California Green Building Standards for residential developments, low-rise residences (three stories or less) are required to install on-site photovoltaic arrays. The project would include solar rooftop photovoltaic systems, in addition to battery storage. All proposed residences would be equipped with energy-efficient appliances and lighting, water-efficient fixtures, and water-efficient irrigation systems. As mentioned above under the 2022 Scoping Plan, the project would be consistent with the State's climate goals by increasing renewable energy and providing energy efficiency in the buildings.

Source: City of Palmdale 2022

In summary, the plan consistency analysis provided above demonstrates that the project complies with or exceeds the plans, policies, regulations and GHG reduction actions/strategies outlined in SCAG's 2020-2045 RTP/SCS and the 2022 Scoping Plan. However, the project would exceed the per service population threshold established by the City and would therefore be inconsistent with the City's 2045 General Plan and CAP. Therefore, the project would conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing emissions of GHG emissions. Implementation of Mitigation Measure GHG-1 below would reduce project related emissions to a less than significant level.

Mitigation Measures

GHG-1 Greenhouse Gas Reduction Plan

The project applicant shall prepare and implement a GHG Reduction Plan (GHGRP) that demonstrates emissions reductions from project operation by approximately 1,004 MT of CO_2e per year to 1,254 MT of CO_2e per year for the lifetime of the project, or by an amount determined through further analysis of project GHG emissions at the time of GHGRP preparation. Potential GHG reduction measures included in the GHGRP may include, but would not be limited to, the following on-site measures:

- Construction of buildings that achieve energy and water efficiencies beyond those specified in the California Code of Regulations, Title 24 requirements
- Implementation of green building practices and/or cool roofs
- Installation of energy-efficient equipment and appliances exceeding California Green Building Code standards

- Installation of outdoor water conservation and recycling features, such as smart irrigation controllers and reclaimed water usage
- Installation of low-flow bathroom and kitchen fixtures and fittings
- Installation of light emitting diode (LED) lights
- Implementation of waste reduction programs that may include waste minimization, waste diversion, composting, and material reuse/recycling
- Provision of incentives and outreach that promote alternative transportation and transit use to future employees and patrons
- Promotion of alternative fuel vehicles, including through the installation of electric vehicle charging infrastructure beyond those required

If GHG emissions cannot be feasibly reduced through implementation of on-site measures, the following off-site measures may be implemented:

- Directly undertake or fund activities that reduce or sequester GHG emissions ("Direct Reduction Activities") and retire the associated "GHG Mitigation Reduction Credits." A "GHG Mitigation Reduction Credit" shall mean an instrument issued by an Approved Registry and shall represent the estimated reduction or sequestration of 1 MT of CO_2e that shall be achieved by a Direct Reduction Activity that is not otherwise required (CEQA Guidelines Section 15126.4[c][3]). A "GHG Mitigation Reduction Credit" must achieve GHG emission reductions that are real, permanent, quantifiable, verifiable, enforceable, and in addition to any GHG emission reduction required by law or regulation or any other GHG emission reduction that otherwise would occur in accordance with the criteria set forth in the California Air Resources Board's most recent Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation (2013). An "Approved Registry" is an accredited carbon registry that follows approved California Air Resources Board Compliance Offset Protocols. At this time, Approved Registries include American Carbon Registry, Climate Action Reserve, and Verra (California Air Resources Board 2018). Credits from other sources will not be allowed unless they are shown to be validated by protocols and methods equivalent to or more stringent than the California Air Resources Board standards. In the event that a project or program providing GHG Mitigation Reduction Credits to the project applicant loses its accreditation, the project applicant shall comply with the rules and procedures of retiring GHG Mitigation Reduction Credits specific to the registry involved and shall undertake additional direct investments to recoup the loss.
- Obtain and retire "Carbon Offsets." "Carbon Offset" shall mean an instrument issued by an Approved Registry and shall represent the past reduction or sequestration of 1 MT of CO2e achieved by a Direct Reduction Activity or any other GHG emission reduction project or activity that is not otherwise required (CEQA Guidelines Section 15126.4[c][3]). A "Carbon Offset" must achieve GHG emission reductions that are real, permanent, quantifiable, verifiable, enforceable, and in addition to any GHG emission reduction required by law or regulation or any other GHG emission reduction that otherwise would occur in accordance with the criteria set forth in the California Air Resources Board's most recent *Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation* (2013). If the project applicant chooses to meet some of the GHG reduction requirements by purchasing offsets on an annual and permanent basis, the offsets shall be purchased according to the City's preference, which is, in order of the City's preference: (1) within Palmdale; (2) within the air basin; (3) within the State of California; then (4) elsewhere in the United States. In the event

that a project or program providing offsets to the project applicant loses its accreditation, the project applicant shall comply with the rules and procedures of retiring offsets specific to the registry involved and shall purchase an equivalent number of credits to recoup the loss.

The GHGRP shall be submitted by the project developer and reviewed and approved by the City of Palmdale as being in compliance with this measure prior to building permit issuance. Applicable elements of the approved GHGRP shall be reflected on project site plans prior to certificate of occupancy. Condition compliance shall include monitoring and verifying implementation of measures included in the GHGRP.

Significance After Mitigation

To implement Mitigation Measure GHG-1, the project applicant may choose to apply a wide variety of GHG emission reduction measures, including carbon offsets, to reduce project-related emissions to 1,254 MT of CO_2e per year. Therefore, implementation of Mitigation Measure GHG-1 would reduce project-related emissions below the threshold of significance of 1,254 MT of CO_2e per year or 2 MT of CO_2e per service population per year. Impacts would be less than significant with mitigation incorporated.

4 Conclusions

4.1 Air Quality Summary

As shown in Table 4, Table 5, and Table 6, project construction and operational emissions would not exceed applicable significance thresholds for all criteria pollutants. Furthermore, growth facilitated by the proposed project would not exceed SCAG growth projections, and would not conflict with the AVAQMD's 2023 Ozone Attainment Plan. The project's criteria pollutant emissions impacts would be less than significant.

The project would generate TAC emissions including DPM exhaust emissions associated with use of heavy-duty diesel construction equipment. As discussed under Air Quality Threshold 3, health risks at the nearest sensitive receptors resulting from construction and operation of the project would be well below applicable thresholds. Thus, impacts from the project's TAC emissions would be less than significant.

The project does not include land uses typically associated with odor complaints such as sewage treatment plants, landfills, recycling facilities, and agricultural uses. During construction, the project would temporarily generate diesel exhaust odors from use of heavy-duty equipment and during operation the project would generate vehicle exhaust and fugitive fuel vapors may be released. These types of odors dissipate quickly with distance and do not typically result in odor impacts. Additionally, as the project site is located adjacent to an arterial road, East Palmdale Boulevard, vehicle exhaust is already prevalent. For these reasons, operational odor impacts would be less than significant.

As detailed above, construction and operation of the project would not result in significant air quality impacts.

4.2 Greenhouse Gas Emissions Summary

The project would result in an overall GHG emissions of 2,284 MT CO_2e per year. The majority of these emissions would result from vehicle trips to and from the site.

The City of Palmdale has adopted a CAP that meets the requirements under CEQA Guidelines Section 15183.5 for a qualified GHG reduction plan. Therefore, this project-level analysis is streamlined by tiering off the Palmdale CAP. As discussed above, the proposed project's emissions per service population would be approximately 3.5 MT CO_2e per year, which exceeds the threshold set forth in the CAP of 2.0 MT CO_2e per service population per year. Therefore, the project's incremental contribution to a global climate would be potentially significant. Implementation of Mitigation Measure GHG-1 would require the developer to implement a GHG Reduction Plan. Such mitigation would reduce project emissions to below the established threshold and ensure that the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions.

5 References

Antelope Valley Air Quality Management District (AVAQMD). 2016. Antelope Valley AQMD CEQA and Federal Conformity Guidelines. https://avaqmd.ca.gov/files/e5b34d385/AV%20CEQA%20Guides%202016.pdf (accessed September 2023).

____. 2022a. District Boundaries. https://avaqmd.ca.gov/district-boundaries (accessed September 2023).

____. 2022b. Antelope Valley AQMD Attainment Status. https://avaqmd.ca.gov/files/e0986ab83/AVAQMD+2017+Attainment+Status+Table.pdf (accessed September 2023).

____. 2023. AVAQMD Federal 70 ppb Ozone Attainment Plan. https://avaqmd.ca.gov/files/1e287138b/70+ppb+Ozone+Plan+Final+Draft+AV+01.04.2023.pdf (accessed September 2023).

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model User's Guide Version 2022.1. April. https://caleemod.com/documents/user-guide/01_User%20Guide.pdf (accessed September 2023).

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. April. https://www.arb.ca.gov/ch/handbook.pdf (accessed September 2023).

____. 2011. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the "LEV III" Amendments to the California Greenhouse Gas and Criteria Pollutant Exhaust and Evaporative Emission Standards and Test Procedures and to the On-Board Diagnostic System Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and to the Evaporative Emission Requirements for Heavy-Duty Vehicles. December. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2012/leviiighg2012/levisor.pdf (accessed September 2023).

____. 2014. First Update to the Climate Change Scoping Plan. May. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf (accessed September 2023).

____. 2016. Ambient Air Quality Standards. Last modified: May 4, 2016. https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf (accessed September 2023).

____. 2017. California's 2017 Climate Change Scoping Plan. December 14, 2017. https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf

____. 2021b. Overview: Diesel Exhaust & Health. n.d. https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health (accessed September 2023). ____. 2021c. California Greenhouse Gas Emissions for 2000 to 2019 Trends of Emissions and Other Indicators. July. https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2019/ghg_inventory_trends_00-19.pdf (accessed September 2023).

____. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. November 16. Available at: https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp.pdf (accessed September 2023).

____. 2023. *Top 4 Summary: Select Pollutant, Years, & Area*, iADAM: Air Quality Data Statistics. [database]. N.d. https://www.arb.ca.gov/adam/topfour/topfour1.php (accessed September 2023).

California Climate Action Registry (CCAR) General Reporting Protocol. 2009. Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1. http://sfenvironment.org/sites/default/files/fliers/files/ccar_grp_3-1_january2009_sfe-web.pdf (accessed September 2023).

California Climate Change Center. 2006. Climate Scenarios for California. March. https://research.fit.edu/media/site-specific/researchfitedu/coast-climate-adaptation-library/united-states/west-coast-amp-hawaix27i/california---statewide/CCCC.--2006.--Climate-Scenarios-for-California.pdf (accessed September 2023).

California Department of Finance. 2023. E-5 Population and Housing Estimates for Cities Counties and the State 2020-2022. https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2023/ (accessed September 2023).

California Department of Food and Agriculture. 2020. California Agricultural Statistics Review. August. https://www.cdfa.ca.gov/Statistics/PDFs/2020_Ag_Stats_Review.pdf (accessed September 2023).

California Department of Water Resources. 2013. Managing an Uncertain Future: Climate Change Adaption Strategies for California's Water, volume 4 reference guide. https://cawaterlibrary.net/wp-content/uploads/2017/05/Climate_Adaptation_Strategies.pdf (accessed September 2023).

California Natural Resources Agency. 2009. 2009 California Climate Adaptation Strategy. March 2009. https://resources.ca.gov/CNRALegacyFiles/docs/climate/Statewide_Adaptation_Strategy.pdf (accessed September 2023).

Intergovernmental Panel on Climate Change (IPCC). 2007. Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-spm-1.pdf (accessed September 2023).

____. 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)] Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf (accessed September 2023).

Office of Environmental Health Hazard Assessment. 2015. Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf (accessed September 2023).

Southern California Association of Governments (SCAG). 2020. 2020-2045 Regional Transportation Plan and Sustainable Communities Strategy – Demographics & Regional Growth Forecast Technical Report. September 2020. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_demographics-and-growth-forecast.pdf (accessed September 2023).

____. 2020. Connect SoCal: The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy of the Southern California Association of Governments. Adopted May 7, 2020. https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176 (accessed September 2023).

Palmdale, City of. 2022. City of Palmdale General Plan. https://www.palmdale2045.org/general-plan (accessed September 2023).

State of California. 2018. California's Fourth Climate Change Assessment Statewide Summary Report. August 27, 2018. https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf (accessed September 2023).

United States Environmental Protection Agency (USEPA). N.d. Benzene. https://www.epa.gov/sites/production/files/2016-09/documents/benzene.pdf (accessed September 2023).

____. 2021a. Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases. Last updated April 2021. https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases (accessed September 2023).

____. 2021b. Climate Change Indicators: Global Greenhouse Gas Emissions. Last updated April 2021. https://www.epa.gov/climate-indicators/climate-change-indicators-global-greenhouse-gas-emissions (accessed September 2023).

____. 2023. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021. April 2023. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021 (accessed September 2023).

World Meteorological Organization (WMO). 2013. A summary of current and climate change findings and figures: a WMO information note. March 2013. https://library.wmo.int/opac/index.php?lvl=notice_display&id=15892#.Wt9-Z8gvzIU (accessed September 2023).

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Appendix A

California Emission Estimator Model (CalEEMod) Outputs

TTM 83359 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	TTM 83359
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	34.578207008203336, -118.0374843667876
County	Los Angeles-Mojave Desert
City	Palmdale
Air District	Antelope Valley AQMD
Air Basin	Mojave Desert
TAZ	3637
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.19

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Single Family Housing	191	Dwelling Unit	20.0	173,714	749,623	—	657	—
Racquet Club	2.63	1000sqft	0.00	2,630	0.00	—	—	—
Parking Lot	20.0	Space	0.00	0.00	0.00	—	—	—
Other Asphalt Surfaces	360	1000sqft	0.00	360,000	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.03	70.2	38.3	52.4	0.08	1.54	5.10	6.64	1.42	0.87	2.01	—	9,861	9,861	0.37	0.50	20.8	10,039
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.01	4.22	38.3	44.9	0.08	1.54	6.68	7.28	1.42	3.40	3.95	—	9,500	9,500	0.37	0.50	0.54	9,658
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.01	4.93	18.6	29.6	0.04	0.69	2.97	3.66	0.64	0.80	1.43	—	6,233	6,233	0.22	0.28	4.88	6,326
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.55	0.90	3.40	5.40	0.01	0.13	0.54	0.67	0.12	0.15	0.26	—	1,032	1,032	0.04	0.05	0.81	1,047

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	5.03	4.23	38.3	52.4	0.08	1.54	5.10	6.64	1.42	0.87	2.01	—	9,861	9,861	0.37	0.50	20.8	10,039
2025	4.32	70.2	23.9	50.8	0.06	0.80	3.57	4.37	0.73	0.87	1.60	—	9,758	9,758	0.31	0.48	19.8	9,929
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	5.01	4.22	38.3	44.9	0.08	1.54	6.68	7.28	1.42	3.40	3.95	—	9,500	9,500	0.37	0.50	0.54	9,658
2025	4.19	3.60	24.1	43.7	0.06	0.80	3.57	4.37	0.73	0.87	1.60	—	9,405	9,405	0.32	0.48	0.51	9,557
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	3.01	2.58	18.6	29.6	0.04	0.69	2.97	3.66	0.64	0.80	1.43	—	6,233	6,233	0.22	0.28	4.88	6,326
2025	1.36	4.93	7.97	14.6	0.02	0.27	1.07	1.34	0.25	0.26	0.51	—	2,969	2,969	0.10	0.14	2.57	3,017
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.55	0.47	3.40	5.40	0.01	0.13	0.54	0.67	0.12	0.15	0.26	—	1,032	1,032	0.04	0.05	0.81	1,047
2025	0.25	0.90	1.45	2.66	< 0.005	0.05	0.19	0.24	0.05	0.05	0.09	—	492	492	0.02	0.02	0.42	499

2.4. Operations Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	12.3	15.6	6.08	85.3	0.11	0.12	9.45	9.56	0.10	2.40	2.50	116	13,508	13,624	12.3	0.56	48.1	14,146

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.48	11.1	6.36	46.4	0.10	0.08	9.45	9.53	0.08	2.40	2.48	116	12,434	12,550	12.3	0.58	2.47	13,034
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	9.43	12.9	6.63	63.3	0.10	0.10	9.37	9.47	0.09	2.38	2.47	116	12,707	12,823	12.3	0.59	21.5	13,329
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.72	2.36	1.21	11.5	0.02	0.02	1.71	1.73	0.02	0.43	0.45	19.2	2,104	2,123	2.04	0.10	3.55	2,207

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	8.46	7.93	5.84	58.7	0.11	0.08	9.45	9.53	0.08	2.40	2.48	—	11,305	11,305	0.52	0.51	46.8	11,517
Area	3.83	7.71	0.24	26.6	< 0.005	0.03	—	0.03	0.03	—	0.03	0.00	93.8	93.8	< 0.005	< 0.005	—	94.2
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	1,956	1,956	0.12	0.01	—	1,964
Water	—	—	—	—	—	—	—	—	—	—	—	13.9	153	167	1.44	0.04	—	213
Waste	—	—	—	—	—	—	—	—	—	—	—	102	0.00	102	10.2	0.00	—	357
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	1.26
Total	12.3	15.6	6.08	85.3	0.11	0.12	9.45	9.56	0.10	2.40	2.50	116	13,508	13,624	12.3	0.56	48.1	14,146
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	7.48	6.94	6.36	46.4	0.10	0.08	9.45	9.53	0.08	2.40	2.48	—	10,325	10,325	0.56	0.53	1.21	10,499
Area	0.00	4.15	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00

Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	1,956	1,956	0.12	0.01	—	1,964
Water	—	—	—	—	—	—	—	—	—	—	—	13.9	153	167	1.44	0.04	—	213
Waste	—	—	—	—	—	—	—	—	—	—	—	102	0.00	102	10.2	0.00	—	357
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	1.26
Total	7.48	11.1	6.36	46.4	0.10	0.08	9.45	9.53	0.08	2.40	2.48	116	12,434	12,550	12.3	0.58	2.47	13,034
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	7.54	7.00	6.51	50.2	0.10	0.08	9.37	9.45	0.08	2.38	2.46	—	10,552	10,552	0.56	0.54	20.2	10,747
Area	1.89	5.91	0.12	13.1	< 0.005	0.02	—	0.02	0.01	—	0.01	0.00	46.3	46.3	< 0.005	< 0.005	—	46.4
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	1,956	1,956	0.12	0.01	—	1,964
Water	—	—	—	—	—	—	—	—	—	—	—	13.9	153	167	1.44	0.04	—	213
Waste	—	—	—	—	—	—	—	—	—	—	—	102	0.00	102	10.2	0.00	—	357
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	1.26
Total	9.43	12.9	6.63	63.3	0.10	0.10	9.37	9.47	0.09	2.38	2.47	116	12,707	12,823	12.3	0.59	21.5	13,329
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.38	1.28	1.19	9.16	0.02	0.02	1.71	1.72	0.01	0.43	0.45	—	1,747	1,747	0.09	0.09	3.35	1,779
Area	0.34	1.08	0.02	2.39	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	7.66	7.66	< 0.005	< 0.005	—	7.69
Energy	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	324	324	0.02	< 0.005	—	325
Water	—	—	—	—	—	—	—	—	—	—	—	2.31	25.3	27.6	0.24	0.01	—	35.3
Waste	—	—	—	—	—	—	—	—	—	—	—	16.9	0.00	16.9	1.69	0.00	—	59.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.21	0.21
Total	1.72	2.36	1.21	11.5	0.02	0.02	1.71	1.73	0.02	0.43	0.45	19.2	2,104	2,123	2.04	0.10	3.55	2,207

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.64	1.38	13.4	12.7	0.02	0.60	—	0.60	0.55	—	0.55	—	2,040	2,040	0.08	0.02	—	2,047
Dust From Material Movement	—	—	—	—	—	—	6.55	6.55	—	3.37	3.37	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.10	1.04	< 0.005	0.05	—	0.05	0.05	—	0.05	—	168	168	0.01	< 0.005	—	168
Dust From Material Movement	—	—	—	—	—	—	0.54	0.54	—	0.28	0.28	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.20	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	27.8	27.8	< 0.005	< 0.005	—	27.9
Dust From Material Movement	—	—	—	—	—	—	0.10	0.10	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.07	0.72	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	131	131	0.01	< 0.005	0.02	133
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.1	11.1	< 0.005	< 0.005	0.02	11.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.83	1.83	< 0.005	< 0.005	< 0.005	1.86
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2024) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.86	4.08	38.1	32.3	0.08	1.54	—	1.54	1.42	—	1.42	—	8,820	8,820	0.36	0.07	—	8,850

Dust From Material Movement	—	—	—	—	—	—	4.77	4.77	—	0.52	0.52	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.86	4.08	38.1	32.3	0.08	1.54	—	1.54	1.42	—	1.42	—	8,820	8,820	0.36	0.07	—	8,850
Dust From Material Movement	—	—	—	—	—	—	4.77	4.77	—	0.52	0.52	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.51	0.42	3.97	3.36	0.01	0.16	—	0.16	0.15	—	0.15	—	918	918	0.04	0.01	—	921
Dust From Material Movement	—	—	—	—	—	—	0.50	0.50	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.08	0.72	0.61	< 0.005	0.03	—	0.03	0.03	—	0.03	—	152	152	0.01	< 0.005	—	153
Dust From Material Movement	—	—	—	—	—	—	0.09	0.09	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.15	0.15	2.65	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	369	369	0.02	0.01	1.56	374
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.13	0.17	1.80	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	327	327	0.02	0.01	0.04	332
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.02	0.21	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	35.1	35.1	< 0.005	< 0.005	0.07	35.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.81	5.81	< 0.005	< 0.005	0.01	5.89
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2024) - Unmitigated

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

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

Off-Road Equipment	3.02	2.52	21.2	28.0	0.04	0.87	—	0.87	0.80	—	0.80	—	4,166	4,166	0.17	0.03	—	4,180
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.02	2.52	21.2	28.0	0.04	0.87	—	0.87	0.80	—	0.80	—	4,166	4,166	0.17	0.03	—	4,180
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.61	1.34	11.3	14.9	0.02	0.46	—	0.46	0.42	—	0.42	—	2,217	2,217	0.09	0.02	—	2,225
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	0.24	2.06	2.72	< 0.005	0.08	—	0.08	0.08	—	0.08	—	367	367	0.01	< 0.005	—	368
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.52	1.32	1.36	23.4	0.00	0.00	2.89	2.89	0.00	0.68	0.68	—	3,259	3,259	0.14	0.11	13.8	3,309
Vendor	0.09	0.08	2.56	1.00	0.02	0.04	0.68	0.72	0.04	0.19	0.22	—	2,437	2,437	< 0.005	0.36	6.98	2,550
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.31	1.19	1.46	15.9	0.00	0.00	2.89	2.89	0.00	0.68	0.68	—	2,895	2,895	0.15	0.11	0.36	2,932

Vendor	0.08	0.08	2.70	1.02	0.02	0.04	0.68	0.72	0.04	0.19	0.22	—	2,439	2,439	< 0.005	0.36	0.18	2,546
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.70	0.64	0.83	9.47	0.00	0.00	1.53	1.53	0.00	0.36	0.36	—	1,586	1,586	0.08	0.06	3.18	1,608
Vendor	0.05	0.04	1.44	0.54	0.01	0.02	0.36	0.38	0.02	0.10	0.12	—	1,298	1,298	< 0.005	0.19	1.60	1,356
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.15	1.73	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	263	263	0.01	0.01	0.53	266
Vendor	0.01	0.01	0.26	0.10	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	215	215	< 0.005	0.03	0.26	224
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.85	2.37	20.2	27.9	0.04	0.76	—	0.76	0.70	—	0.70	—	4,166	4,166	0.17	0.03	—	4,180
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.85	2.37	20.2	27.9	0.04	0.76	—	0.76	0.70	—	0.70	—	4,166	4,166	0.17	0.03	—	4,180
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.82	0.69	5.84	8.08	0.01	0.22	—	0.22	0.20	—	0.20	—	1,207	1,207	0.05	0.01	—	1,211
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	1.07	1.47	< 0.005	0.04	—	0.04	0.04	—	0.04	—	200	200	0.01	< 0.005	—	200
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.38	1.27	1.26	21.9	0.00	0.00	2.89	2.89	0.00	0.68	0.68	—	3,197	3,197	0.13	0.11	12.9	3,246
Vendor	0.09	0.08	2.44	0.94	0.02	0.04	0.68	0.72	0.04	0.19	0.22	—	2,395	2,395	< 0.005	0.34	6.96	2,503
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.26	1.15	1.36	14.8	0.00	0.00	2.89	2.89	0.00	0.68	0.68	—	2,841	2,841	0.14	0.11	0.33	2,878
Vendor	0.08	0.08	2.59	0.97	0.02	0.04	0.68	0.72	0.04	0.19	0.22	—	2,398	2,398	< 0.005	0.34	0.18	2,499
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.37	0.34	0.42	4.82	0.00	0.00	0.83	0.83	0.00	0.19	0.19	—	847	847	0.04	0.03	1.61	859
Vendor	0.03	0.02	0.75	0.28	0.01	0.01	0.20	0.21	0.01	0.05	0.06	—	694	694	< 0.005	0.10	0.87	724
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.08	0.88	0.00	0.00	0.15	0.15	0.00	0.04	0.04	—	140	140	0.01	0.01	0.27	142

Vendor	< 0.005	< 0.005	0.14	0.05	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	115	115	< 0.005	0.02	0.14	120
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Paving (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	0.64	7.38	9.68	0.01	0.31	—	0.31	0.28	—	0.28	—	1,514	1,514	0.06	0.01	—	1,519
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.40	0.53	< 0.005	0.02	—	0.02	0.02	—	0.02	—	82.9	82.9	< 0.005	< 0.005	—	83.2
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.7	13.7	< 0.005	< 0.005	—	13.8
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	0.09	1.49	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	217	217	0.01	0.01	0.87	220
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	0.02	11.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.80	1.80	< 0.005	< 0.005	< 0.005	1.83
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Architectural Coating (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.54	1.28	9.71	11.9	0.02	0.40	—	0.40	0.37	—	0.37	—	1,756	1,756	0.07	0.01	—	1,762

Architectural	—	68.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.53	0.65	< 0.005	0.02	—	0.02	0.02	—	0.02	—	96.2	96.2	< 0.005	< 0.005	—	96.5
Architectural Coatings	—	3.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.10	0.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.9	15.9	< 0.005	< 0.005	—	16.0
Architectural Coatings	—	0.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.25	0.25	4.39	0.00	0.00	0.58	0.58	0.00	0.14	0.14	—	639	639	0.03	0.02	2.58	649
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.02	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	32.0	32.0	< 0.005	< 0.005	0.06	32.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.30	5.30	< 0.005	< 0.005	0.01	5.38
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	8.46	7.93	5.84	58.7	0.11	0.08	9.45	9.53	0.08	2.40	2.48	—	11,305	11,305	0.52	0.51	46.8	11,517
Racquet Club	0.00	0.00	0.00	0.00	0.00	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	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Total	8.46	7.93	5.84	58.7	0.11	0.08	9.45	9.53	0.08	2.40	2.48	—	11,305	11,305	0.52	0.51	46.8	11,517
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	7.48	6.94	6.36	46.4	0.10	0.08	9.45	9.53	0.08	2.40	2.48	—	10,325	10,325	0.56	0.53	1.21	10,499
Racquet Club	0.00	0.00	0.00	0.00	0.00	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	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	7.48	6.94	6.36	46.4	0.10	0.08	9.45	9.53	0.08	2.40	2.48	—	10,325	10,325	0.56	0.53	1.21	10,499
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	1.38	1.28	1.19	9.16	0.02	0.02	1.71	1.72	0.01	0.43	0.45	—	1,747	1,747	0.09	0.09	3.35	1,779
Racquet Club	0.00	0.00	0.00	0.00	0.00	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	0.00
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.38	1.28	1.19	9.16	0.02	0.02	1.71	1.72	0.01	0.43	0.45	—	1,747	1,747	0.09	0.09	3.35	1,779

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,919	1,919	0.12	0.01	—	1,927
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	—	36.8	36.8	< 0.005	< 0.005	—	36.9
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,956	1,956	0.12	0.01	—	1,964
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	1,919	1,919	0.12	0.01	—	1,927
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	—	36.8	36.8	< 0.005	< 0.005	—	36.9
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	1,956	1,956	0.12	0.01	—	1,964
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	318	318	0.02	< 0.005	—	319

Racquet Club	—	—	—	—	—	—	—	—	—	—	—	—	6.09	6.09	< 0.005	< 0.005	—	6.11
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	324	324	0.02	< 0.005	—	325

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

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

Racquet Club	0.00	0.00	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
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Racquet Club	0.00	0.00	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
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.1. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	—	3.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architect Coatings	—	0.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	3.83	3.56	0.24	26.6	< 0.005	0.03	—	0.03	0.03	—	0.03	—	93.8	93.8	< 0.005	< 0.005	—	94.2
Total	3.83	7.71	0.24	26.6	< 0.005	0.03	—	0.03	0.03	—	0.03	0.00	93.8	93.8	< 0.005	< 0.005	—	94.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	—	3.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.00	4.15	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	—	0.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.34	0.32	0.02	2.39	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.66	7.66	< 0.005	< 0.005	—	7.69
Total	0.34	1.08	0.02	2.39	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	7.66	7.66	< 0.005	< 0.005	—	7.69

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	13.6	151	165	1.41	0.03	—	210
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	0.30	1.31	1.60	0.03	< 0.005	—	2.59
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	13.9	153	167	1.44	0.04	—	213
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	13.6	151	165	1.41	0.03	—	210
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	0.30	1.31	1.60	0.03	< 0.005	—	2.59
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	13.9	153	167	1.44	0.04	—	213
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2.26	25.1	27.3	0.23	0.01	—	34.8
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	0.05	0.22	0.27	0.01	< 0.005	—	0.43
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	2.31	25.3	27.6	0.24	0.01	—	35.3

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	93.9	0.00	93.9	9.39	0.00	—	329
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	8.08	0.00	8.08	0.81	0.00	—	28.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	102	0.00	102	10.2	0.00	—	357

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	93.9	0.00	93.9	9.39	0.00	—	329
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	8.08	0.00	8.08	0.81	0.00	—	28.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	102	0.00	102	10.2	0.00	—	357
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	15.6	0.00	15.6	1.55	0.00	—	54.4
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	1.34	0.00	1.34	0.13	0.00	—	4.68
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	16.9	0.00	16.9	1.69	0.00	—	59.1

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.24	1.24
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	1.26
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.24	1.24
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.26	1.26
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.21	0.21
Racquet Club	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	< 0.005	< 0.005
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.21	0.21

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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

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

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

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

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

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

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

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

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

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

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

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

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

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

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description

Site Preparation	Site Preparation	1/1/2024	2/9/2024	5.00	30.0	—
Grading	Grading	2/12/2024	4/3/2024	5.00	38.0	—
Building Construction	Building Construction	4/4/2024	5/28/2025	5.00	300	—
Paving	Paving	5/29/2025	6/25/2025	5.00	20.0	—
Architectural Coating	Architectural Coating	6/26/2025	7/23/2025	5.00	20.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Site Preparation	Pumps	Diesel	Average	1.00	8.00	11.0	0.74
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Plate Compactors	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Rubber Tired Loaders	Diesel	Average	1.00	8.00	423	0.48
Grading	Scrapers	Diesel	Average	4.00	8.00	367	0.40
Grading	Off-Highway Tractors	Diesel	Average	1.00	8.00	38.0	0.44
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Air Compressors	Diesel	Average	4.00	8.00	37.0	0.48
Building Construction	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Building Construction	Forklifts	Diesel	Average	2.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	4.00	8.00	14.0	0.74
Building Construction	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36

Building Construction	Skid Steer Loaders	Diesel	Average	4.00	8.00	71.0	0.37
Building Construction	Trenchers	Diesel	Average	1.00	8.00	40.0	0.50
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Surfacing Equipment	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	4.00	6.00	37.0	0.48
Architectural Coating	Forklifts	Diesel	Average	2.00	8.00	82.0	0.20
Architectural Coating	Generator Sets	Diesel	Average	4.00	8.00	14.0	0.74
Architectural Coating	Rubber Tired Loaders	Diesel	Average	1.00	8.00	150	0.36

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	10.0	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	25.0	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	221	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	79.9	10.2	HHDT,MHDT

Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	44.2	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	351,771	117,257	3,945	1,315	—

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	—	—	15.0	0.00	—

Grading	—	—	171	0.00	—
Paving	0.00	0.00	0.00	0.00	2.10

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
Single Family Housing	2.10	0%
Racquet Club	0.00	0%
Parking Lot	0.00	100%
Other Asphalt Surfaces	0.00	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
Single Family Housing	1,461	1,461	1,461	533,320	13,336	13,336	13,336	4,867,676
Racquet Club	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

Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	19
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
351770.85	117,257	3,945	1,315	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00

Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

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

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	1,316,973	532	0.0330	0.0040	0.00
Racquet Club	25,229	532	0.0330	0.0040	0.00
Parking Lot	0.00	532	0.0330	0.0040	0.00
Other Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	7,119,296	14,828,146
Racquet Club	155,546	0.00
Parking Lot	0.00	0.00
Other Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	174	—
Racquet Club	15.0	—

Parking Lot	0.00	—
Other Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Racquet Club	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Racquet Club	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

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

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

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

5.16.2. Process Boilers

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

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

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

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

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

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	31.1	annual days of extreme heat
Extreme Precipitation	1.45	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	4	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	4	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	16.0
AQ-DPM	11.0
Drinking Water	20.4

Lead Risk Housing	39.2
Pesticides	0.00
Toxic Releases	88.4
Traffic	22.2
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	46.8
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	85.0
Cardio-vascular	83.5
Low Birth Weights	73.3
Socioeconomic Factor Indicators	—
Education	80.2
Housing	57.9
Linguistic	83.1
Poverty	65.7
Unemployment	79.0

7.2. Healthy Places Index Scores

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

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	15.87321956
Employed	4.196073399

Median HI	38.27794174
Education	—
Bachelor's or higher	13.93558322
High school enrollment	100
Preschool enrollment	11.61298601
Transportation	—
Auto Access	93.63531374
Active commuting	44.07801873
Social	—
2-parent households	49.98075196
Voting	23.23880405
Neighborhood	—
Alcohol availability	78.19838316
Park access	15.21878609
Retail density	53.27858334
Supermarket access	47.76081098
Tree canopy	16.14269216
Housing	—
Homeownership	80.14885153
Housing habitability	18.72192994
Low-inc homeowner severe housing cost burden	4.324393687
Low-inc renter severe housing cost burden	2.45091749
Uncrowded housing	26.21583472
Health Outcomes	—
Insured adults	25.31759271
Arthritis	53.0
Asthma ER Admissions	28.7

High Blood Pressure	47.4
Cancer (excluding skin)	74.5
Asthma	19.7
Coronary Heart Disease	43.7
Chronic Obstructive Pulmonary Disease	25.1
Diagnosed Diabetes	21.5
Life Expectancy at Birth	13.5
Cognitively Disabled	25.4
Physically Disabled	38.4
Heart Attack ER Admissions	10.4
Mental Health Not Good	16.4
Chronic Kidney Disease	35.4
Obesity	14.7
Pedestrian Injuries	19.6
Physical Health Not Good	18.1
Stroke	29.9
Health Risk Behaviors	—
Binge Drinking	58.7
Current Smoker	16.1
No Leisure Time for Physical Activity	24.4
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	5.3
Elderly	88.9
English Speaking	47.0
Foreign-born	61.0

Outdoor Workers	15.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	74.7
Traffic Density	15.8
Traffic Access	23.0
Other Indices	—
Hardship	81.7
Other Decision Support	—
2016 Voting	16.6

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	51.0
Healthy Places Index Score for Project Location (b)	18.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Based on average SF of each dwelling type. Landscape area calculated using default value for 64 Single Family units. Internal roadways modeled as other asphalt surfaces
Construction: Construction Phases	Phase durations adjusted to match applicant provided duration of 18 months (total). No demolition required.
Construction: Off-Road Equipment	per applicant provided equipment list
Operations: Vehicle Data	per Traffic Memorandum (GTS 2023) Exhibit 4, Phase I trip generation.
Operations: Hearths	All electric; no wood or gas stoves/fireplaces per project description
Operations: Energy Use	No natural gas; development is all electric

Appendix B

Biological Resources Assessment

Tentative Tract Map 83359

Biological Resources Assessment

prepared for

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Tentative Tract Map 83359

Biological Resources Assessment

prepared for

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Executive Summary

This report analyzes potential impacts to biological resources from a proposed single-family residential development project (project) covering 20-gross acres in the city of Palmdale, Los Angeles County, California (Assessor Parcel Number [APN] 3023-002-184). The project includes the development of single story, single-family homes on a total of 66 lots with community amenities. Prior to construction activities, clearing, brushing, and grubbing of vegetation and trees will occur throughout the project site. Following vegetation removal, the entire project site will be graded. An on-site construction staging area will provide space to store materials, vehicles, waste, and for parking. Drainage improvements for the development will consist of catch basins connected to underground storm drain which outlets into a detention basin located in the northeastern most plot of the TTM.

A biologist conducted a survey of the Biological Study Area (BSA) for the project to document biological resources and assess the potential for sensitive resources to occur. The BSA is defined for this project as the 20-gross acre project site and a 100-foot survey buffer where accessible. One vegetation community, *Yucca brevifolia* Woodland Alliance (Joshua tree woodland), was identified in the BSA. This community generally occurs in alluvial fans, ridges, and gentle to moderate slopes. Canopy, shrub layer, and herbaceous layer is open to intermittent with perennial grasses and seasonal annuals.

A query of the California Natural Diversity Database (CNDDB) and California Native Plant Society (CNPS) Rare Plant Inventory includes 19 special status plant species recorded in the 9-quad search area surrounding the project site. One species, short-joint beavertail (*Opuntia basilaris* var. *brachyclada*), has a low potential to occur on the project site. In addition, western Joshua tree (*Yucca brevifolia*), a candidate species for listing under the California Endangered Species Act (CESA), is present on the project site.

The CNDDB query results include 31 special status wildlife species recorded within the 9-quad search area surrounding the project site. The following 5 species have moderate to high potential to occur on the project site: California glossy snake (*Arizona elegans occidentalis*), coast horned lizard (*Phrynosoma blainvillii*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), LeConte's thrasher (*Toxostoma lecontei*). In addition, desert kit fox (*Vulpes macrotis arsipus*), a California Fish and Game Code (CFGC) furbearing mammal, was determined to have a moderate potential to occur on the project site.

One shallow, ephemeral drainage intersects the project site and an adjacent parcel to the east. It may generally convey stormwater runoff from the residential development to the south of the project site and from Palmdale Avenue to the north of the project site during significant rain events. Due to the presence of a defined bed and bank, indicated by the break in slope, the CDFW may assert jurisdiction over this drainage.

Mitigation measures to reduce potential project impacts to special status plants and animals, nesting birds, sensitive natural communities, jurisdictional features, and resources protected by local jurisdictions are included.

1 Introduction

Rincon Consultants, Inc. (Rincon) prepared this Biological Resources Assessment (BRA) to document the existing biological conditions for a proposed single-family residential development project (project) within Assessor Parcel Number (APN) 3023-002-184 located in the City of Palmdale, Los Angeles County, California. This BRA is prepared with the intent of serving as the basis for suitable analysis of the potential impacts to biological resources pursuant to the California Environmental Quality Act (CEQA) environmental review process.

1.1 Project Location

The project site is located on 20-gross acres in the City of Palmdale, Los Angeles County, California (APN 3023-002-184). The site is situated along East Palmdale Boulevard, approximately 4.7 miles east of the intersection of Palmdale Boulevard and Sierra Highway (Figure 1 and Figure 2). The site is depicted within the *Palmdale, California* United States Geological Survey (USGS) 7.5-minute topographic quadrangle map and in Township 06N, Range 11W, Section 27, San Bernardino base and meridian.

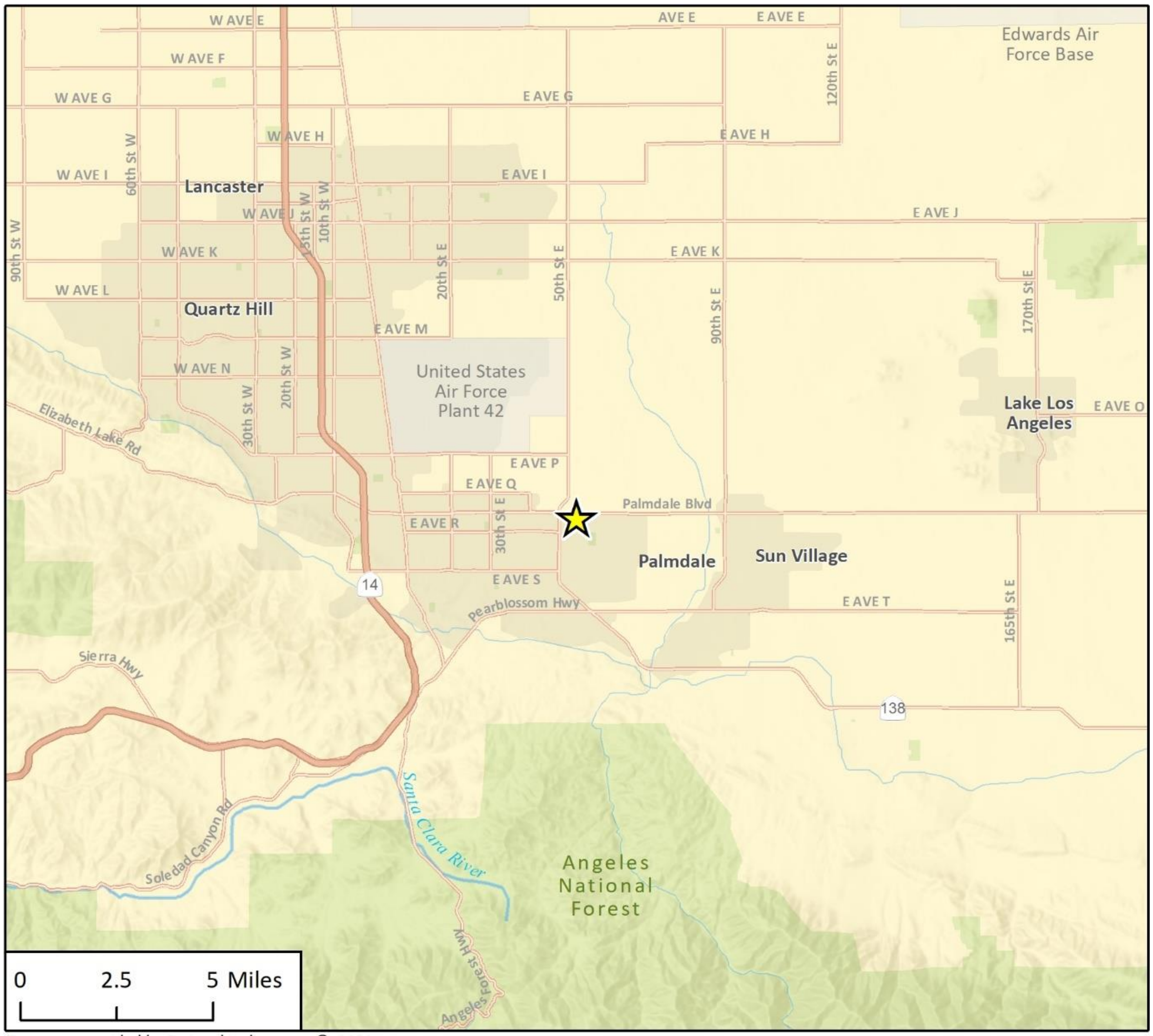
1.2 Project Description

The project includes the development of single story, single-family homes with community amenities. Prior to construction activities, clearing, brushing, and grubbing of vegetation and trees will occur throughout the project site. Following vegetation removal, the entire project site will be graded. Standard construction equipment for residential development will be utilized, including backhoes, front end loaders, excavators, dump trucks, concrete trucks, water trucks, forklifts, grade-alls, and manlifts. An on-site construction staging area will provide space to store materials, vehicles, waste, and for parking. Drainage improvements for the development will consist of catch basins connected to underground storm drain which outlets into a detention basin located in the northeastern most plot of the TTM. This basin will accept flows from the community and detain from flowing offsite while also infiltrating water back into the groundwater basin.

1.3 Regulatory Summary

Regulated or sensitive resources studied and analyzed herein include special status plant and wildlife species, nesting birds and raptors, sensitive plant communities, jurisdictional waters and wetlands, wildlife movement, regionally protected resources (e.g., from county-wide Habitat Conservation Plans [HCPs] and Natural Community Conservation Plans [NCCPs]), and locally protected resources, such as protected trees. Regulatory authority over biological resources is shared by Federal, State, and local authorities. Primary authority for regulation of general biological resources lies within the land use control and planning authority of local jurisdictions (in this instance, the City of Palmdale).

Figure 1 Regional Location Map



Basemap provided by Esri and its licensors © 2022.

Project Location

N

Figure 2 Project Location Map

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1.3.1 Definition of Special Status Species

For the purposes of this report, special status species include:

- Species listed as threatened or endangered under the federal Endangered Species Act (ESA); including proposed and candidate species
- Species listed as candidate, threatened, or endangered under the California Endangered Species Act (CESA)
- Species designated as Fully Protected by the California Fish and Game Code (CFGC), and Species of Special Concern (SSC) or Watch List by the California Department of Fish and Wildlife (CDFW)
- Native Plant Protection Act (NPPA) – State Rare (SR)
- California Native Plant Society (CNPS) California Rare Plant Ranks (CRPR) 1A, 1B, 2A and 2B
- Species designated as locally important by the City of Palmdale and/or otherwise protected through ordinances or the General Plan

1.3.2 Environmental Statutes

For the purpose of this report, the analysis of potential impacts to biological resources was guided by the following statutes (Appendix A):

- California Environmental Quality Act (CEQA)
- ESA
- CESA
- Federal Clean Water Act (CWA)
- CFGC
- Migratory Bird Treaty Act (MBTA)
- The Bald and Golden Eagle Protection Act
- Porter-Cologne Water Quality Control Act
- City of Palmdale Municipal Code
- City of Palmdale General Plan

1.3.3 Guidelines for Determining CEQA Significance

The following threshold criteria, as defined by the CEQA Guidelines Appendix G Initial Study Checklist, were used to evaluate potential environmental effects. Based on these criteria, the proposed project would have a significant effect on biological resources if it would:

a) Have substantial adverse effects, either directly or through habitat modifications, on any species identified as a candidate, sensitive or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

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

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

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

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

2 Methodology

2.1 Biological Study Area

The Biological Study Area (BSA) is defined for this project as the 20-gross acre project site and a 100-foot survey buffer where accessible (Figure 3).

2.2 Literature Review

Rincon conducted a literature review to characterize the nature and extent of biological resources on and adjacent to the BSA. The literature review included an evaluation of current and historical aerial photographs of the site (Google Earth), regional and site-specific topographic maps, and climatic data.

Queries of the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation system (IPaC; UFWS 2022a), CDFW California Natural Diversity Database (CNDDB; CDFW 2022a), and California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants of California (2022) were conducted to obtain comprehensive information regarding State and federally listed species, and other special status species, considered to have potential to occur within the *Palmdale, California* USGS 7.5-minute topographic quadrangle and the surrounding eight quadrangles (Ritter Ridge, Lancaster West, Lancaster East, Alpine Butte, Littlerock, Juniper Hills, Pacifico Mountains, and Acton). The results of database-queries and lists of special status species were reviewed by Rincon's regional biological experts for accuracy and completeness. The final list of special status biological resources (species and sensitive natural communities) was evaluated based on documented occurrences within the nine-quadrangle search area and biologist's expert opinions on species known to occur in the region. The evaluation results and justification were compiled into a table (Appendix B).

The following resources were reviewed for additional information on existing conditions relating to biological resources within the BSA:

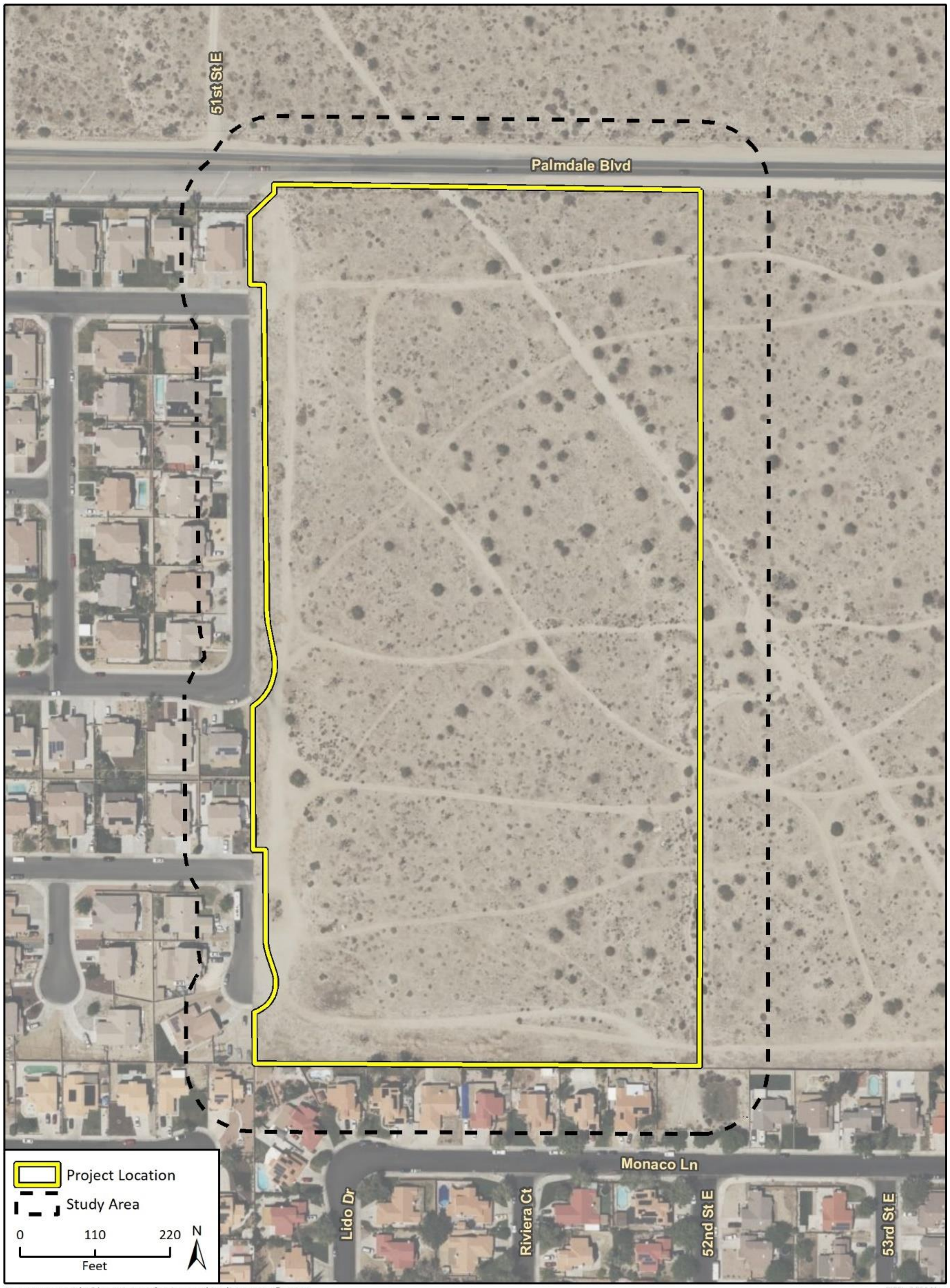
- United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey (2022)
- USFWS Critical Habitat Portal (2022b)
- CDFW Biogeographic Information and Observation System (CDFW 2022b)
- CDFW Special Vascular Plants, Bryophytes, and Lichens List (2022c)
- CDFW Special Animals List (2022d)

The vegetation community characterizations for this analysis were based on the classification systems presented in *A Manual of California Vegetation, Second Edition* (MCV2; Sawyer et al. 2009).

A review of the jurisdictional delineation report for the project site and adjacent parcel to the east was conducted (Rincon 2021).

The potential for wildlife movement corridors was evaluated based on the California Essential Habitat Connectivity Project commissioned by the California Department of Transportation and CDFW (Spencer et al. 2010).

Figure 3 Biological Study Area



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2.3 Field Surveys

2.3.1 Reconnaissance Survey

A field reconnaissance survey of the BSA was conducted by Rincon Biologist Amy Leigh Trost on September 21, 2022, to document the existing site conditions and evaluate the potential for presence of sensitive biological resources including special status plant and wildlife species, sensitive plant communities, potentially jurisdictional waters, wildlife corridors and nursery sites, and locally protected resources. Weather conditions during the survey included temperatures of 57 to 68 degrees Fahrenheit, winds of up to three miles per hour, sunny and clear skies. The biologist surveyed the entire BSA on foot where accessible using meandering transects.

The habitat requirements for each regionally occurring special status species were assessed and compared to the type and quality of the habitats observed within the project site during the site visit. The survey was conducted to make an initial determination regarding the presence or absence of terrestrial biological resources including plants, birds, and other wildlife. Site photographs are included in Appendix C.

2.3.2 Western Joshua Tree Survey

Western Joshua trees were documented on the project site during a western Joshua tree assessment conducted by Rincon desert botanist Kipp Marzullo on July 21, 2021. The survey was conducted following the *DRAFT Joshua Tree ITP Field Work and Application Guidance* (CDFW 2021). Full coverage pedestrian surveys were conducted and the locations of all western Joshua trees on the site were documented using GPS technology. During the survey, attributes recorded for each individual tree included: single tree or clonal, height/age class; number of branching terminal panicles and phenophase. Each western Joshua tree was assigned a unique identification number, and a physical tag affixed to the north side of the tree at 4.5 feet above natural grade, where feasible/accessible.

2.4 Impact Evaluation

Impacts are defined as project-related activities that destroy, damage, alter, or otherwise affect biological resources. This may include injury or mortality to plant or wildlife species, effects on an animal's behavior (such as through harassment or frightening off an animal by construction noise), as well as the loss, modification, or disturbance of natural resources or habitats. Impacts are defined as either direct or indirect, and either permanent or temporary. This section includes a brief overview of the types of impacts analyzed in Section 5 (Impact Analysis and Mitigation Measures) of the BRA.

Direct Impacts are generally those that occur during project implementation and at the same time and location as the cause of the impact. Direct impacts for this project may include injury, death, and/or harassment of special status wildlife species, if present in the work areas or vicinity. Direct impacts may also include the destruction of vegetation communities necessary for special status species breeding, feeding, or sheltering. Direct impacts to plants can include crushing of plants, bulbs, or seeds where present in the impact areas.

Indirect Impacts are those that are reasonably foreseeable and caused by a project but occur later in time and/or potentially at locations of some distance from the source of the impact. If a direct physical change in the environment in turn causes another change in the environment, then the other change is an indirect impact. Specific examples for this project may include soil compaction that, in the future, following completion of the project, prevents wildlife from digging burrows or allows weedy plant species to thrive. Other examples may include dust that drifts outside of project disturbance areas and covers native plants, thereby decreasing their photosynthetic capacity, and unintentional introduction of invasive species (particularly weedy plant species that outcompete native plant species) that over time negatively affect the local ecology.

Permanent Impacts are those that result in the long-term or irreversible loss of biological resources. Grading a site to make way for urban development that will be present for years to come is an example of a permanent impact.

Temporary Impacts to biological resources are those that are reversible over time, either inherently or with implementation of Mitigation Measures. Examples include the generation of fugitive dust and noise during project implementation. These temporary impacts are anticipated to last during project implementation and shortly thereafter. However, the biological resources are anticipated to return to baseline conditions after project completion.

3 Existing Conditions

3.1 Physical Characteristics

3.1.1 Topography and Geography

The project site is located in the Antelope Valley, which constitutes the western tip of the Mojave Desert. The Antelope Valley is situated between the Tehachapi, Sierra Pelona, and San Gabriel Mountains. The valley opens up to the Victor Valley and Great Basin to the east and the region is largely composed of mid-elevation desert scrub with areas of residential and industrial development primarily concentrated in the Lancaster and Palmdale areas. Vegetation occurring in the Lancaster and Palmdale areas includes California juniper (*Juniperus californica*) woodland, Joshua tree (*Yucca brevifolia*) woodland, and creosote scrub (*Larrea tridentata*). The site is relatively flat and gently slopes northward, with elevations ranging from approximately 2,622 to 2,632 feet above mean sea level. The project site is disturbed throughout by off-highway-vehicle (OHV) use and trash dumping.

3.1.2 Watershed and Drainages

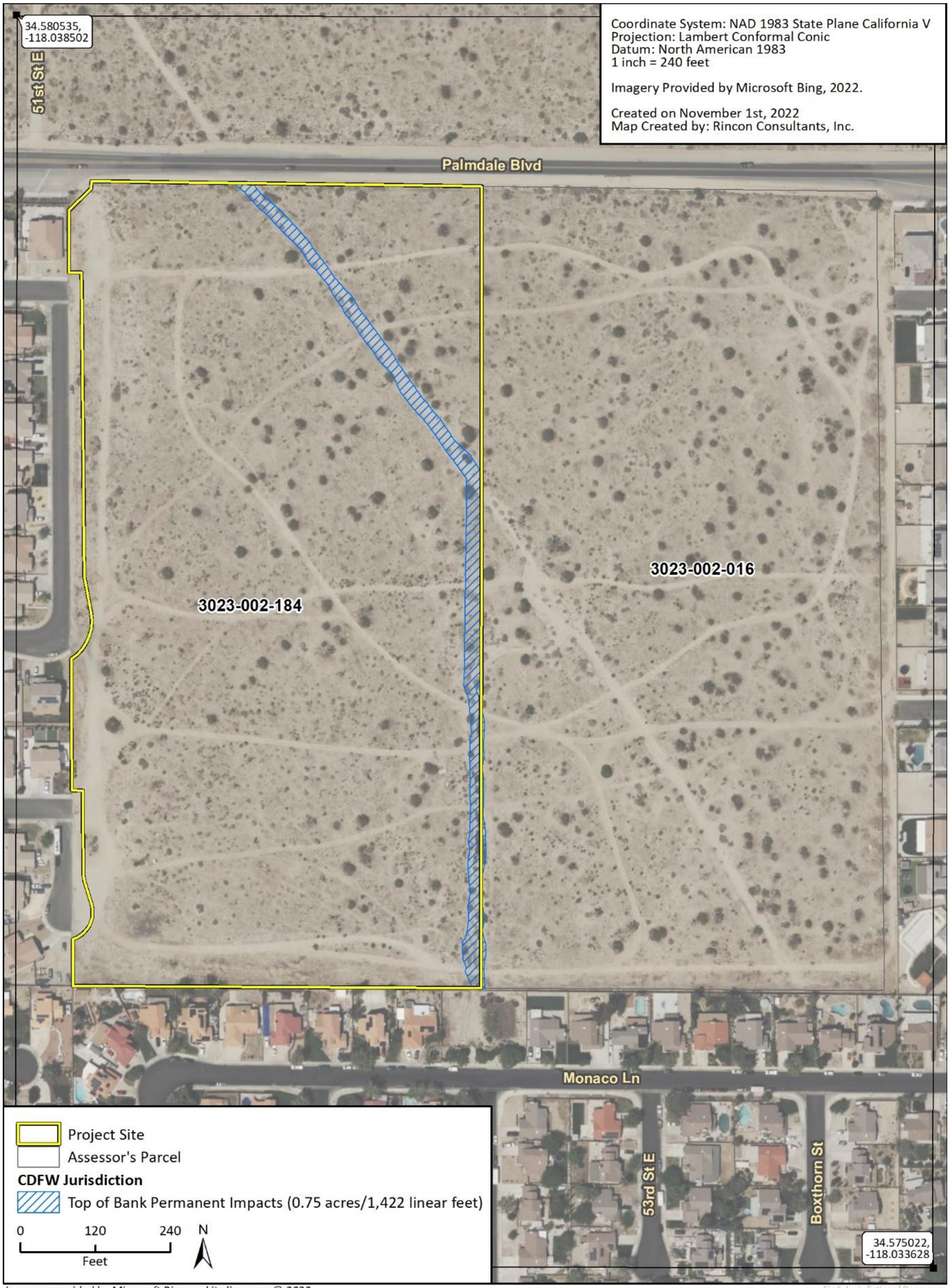
The BSA is located in the northeastern section of the Lake Palmdale watershed (HUC-12 180902061501), which is situated within the southern sections of the greater Antelope Valley-Fremont Valley watershed (HUC-8 18090206). The entire Antelope Valley Watershed is a closed basin with a system of Rosamond, Buckhorn, and Rogers dry lakes as the central watershed terminus. Rosamond, Buckhorn, and Rogers Lakes and their tributaries function as an isolated intrastate watershed system, which lacks the presence of a traditionally navigable water (TNW); therefore, not considered jurisdictional with the USACE (SPL-2011-01084-SLP). In past approved jurisdictional determinations by the USACE (SPL-2004-00063-AOA, SPL-2004-00073-KW, 2009-00634-PHT), however, Lake Palmdale and its tributaries have demonstrated a potential nexus to commerce, and are therefore considered within federal jurisdiction. The waters that may occur within the BSA do not provide surface flow to Lake Palmdale or its tributaries and therefore does not support federally jurisdictional waters.

Within in the BSA, one shallow, ephemeral drainage intersects the project site and adjacent parcel which may generally convey stormwater runoff from the residential development to the south and Palmdale Avenue to the north during significant rain events (Figure 4). This drainage feature is not identified in the NHD or NWI; however, it is identified as a “blue-line stream” in USGS topographic maps. The drainage is isolated and restricted to the extent of the property boundaries within the BSA and therefore does not provide surface flows to adjacent waters, including Rosamond, Buckhorn, Rogers, or Palmdale Lakes (Rincon 2021).

3.1.3 Soils

According to the USDA NRCS Web Soil Survey data for Los Angeles County, California (USDA NRCS 2022), one soil map unit occurs within the BSA: Cajon loamy fine sand (73%), 0 to 2 percent slopes. This soil type is not considered hydric.

Figure 4 Jurisdictional Resources



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Cajon Series

The Cajon series is a soil series composed of deep, well drained soils that formed in sandy alluvium from granite rocks. The soil type is common in the Antelope Valley and typical in locations with arid climates with hot, dry summers and somewhat moist winters. Average annual precipitation is 2 to 9 inches, mostly in the form of winter rain. Cajon soils excessively drain and have negligible to low runoff, with rapid permeability. Flooding on Cajon soils is none to rare.

3.2 Vegetation and Other Land Cover

Vegetation classification was based on the classification systems provided in *A Manual of California Vegetation, Second Edition* (MCV2; Sawyer et al. 2009). One vegetation community, *Yucca brevifolia* Woodland Alliance (Joshua tree woodland), was identified in the BSA. This community generally occurs in alluvial fans, ridges, and gentle to moderate slopes. Canopy, shrub layer, and herbaceous layer is open to intermittent with perennial grasses and seasonal annuals. The BSA was dominated by Joshua tree (*Yucca brevifolia*), with 1 to 5% tree cover and occurrences of Nevada Mormon tea (*Ephedra nevadensis)*, common fiddleneck (*Amsinckia intermedia)*, fourwing saltbush (*Atriplex canescens)*, downy brome (*Bromus tectorum),* annual bursage *(Ambrosia acanthicarpa)*, California buckwheat (*Eriogonum fasciculatum)*, angled stem buckwheat (*Eriogonum angulosum)*, telegraph weed (*Heterotheca grandiflora)*, Acton brittlebush (*Encelia actonii)*, westerm tansymustard (*Descurainia pinnata)*, creosote bush (*Larrea tridentata)*, winterfat (*Krascheninnikovia lanata*), jimsonweed (*Datura wrightii)*, Russian thistle (*Salsola tragus)*, California croton (*Croton californicus)*, chia (*Salvia columbariae)*, Cooper's box thorn (*Lycium cooperi)*, Indian rice grass (*Stipa hymenoides),* silver cholla (*Cylindropuntia echinocarpa)*, cotton thorn (*Tetradymia comosa)*, and sticky snakeweed (*Gutierrezia microcephala)*.

3.3 General Wildlife

Wildlife detected during the reconnaissance survey were common to the region and areas adjacent to residential developments including California ground squirrel (*Otospermophilus beecheyi*), desert cottontail (*Sylvilagus audubonii*), European starling (*Sturnus vulgaris*), house finch (*Haemorhous mexicanus),* common raven (*Corvus corax*), house sparrow (*Passer domesticus*), song sparrow (*Melospiza melodia*), Eurasian collared dove (*Streptopelia decaocto*), and northern mockingbird (*Mimus polyglottos*).

4 Sensitive Biological Resources

This section discusses special status species and sensitive biological resources observed in the BSA, and evaluates the potential for the project site to support additional sensitive biological resources. Assessments for the potential occurrence of special status species are based upon known ranges, habitat preferences for the species, species occurrence records from the CNDDB and other sources, species occurrence records from other sites in the vicinity of the survey area, previous reports for the project site, and the results of surveys of the project site. The potential for each special status species to occur in the BSA was evaluated according to the following criteria:

- **No Potential.** Habitat on and adjacent to the site is clearly unsuitable for the species requirements (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime), and species would have been identifiable on the site if present (e.g., oak trees). Protocol surveys (if conducted) did not detect species.
- **Low Potential.** Few of the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site. Protocol surveys (if conducted) did not detect species.
- **Moderate Potential**. Some of the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.
- **High Potential.** All the habitat components (foraging, breeding, cover, substrate, elevation, hydrology, plant community, site history, disturbance regime) meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.
- **Present.** Species is observed on the site or has been recorded (e.g., CNDDB, other reports) on the site recently (within the last 5 years).

4.1 Special Status Species

Local, state, and federal agencies regulate special status species and may require an assessment of their presence or potential presence to be conducted on site prior to the approval of proposed development on a property. A list of special status plant and wildlife species with potential to occur on site was developed based on a review of a 9-quad search of the CNDDB and the CNPS' online Inventory of Rare and Endangered Vascular Plants of California and can be found in Attachment B.

4.1.1 Special Status Plant Species

The CNDDB/CNPS query results include 19 special status plant species recorded within the 9-quad search area (Appendix B). Special status plant species typically have specialized habitat requirements, including plant community types, soils and elevational ranges. Of the 19 species, 18 are not expected to occur based on the project site's location and clear lack of suitable habitat (e.g., mountains, forest, elevational ranges). One species, short-joint beavertail (*Opuntia basilaris* var. *brachyclada*, CRPR 1B.2), has a low potential to occur on the project site.

In addition, a total of 181 western Joshua trees (*Yucca brevifolia*), a candidate species for listing under CESA, were documented throughout the project site (Appendix D).

4.1.2 Special Status Wildlife Species

The CNDDB query results include 31 special status wildlife species within the 9-quad search area (Attachment B). The potential for special status wildlife species to occur on the site was assessed based on known distribution, habitat requirements, and existing site conditions. Of the 31 species, 4 species were determined to have low potential to occur on the project site. The following 5 species have moderate to high potential to occur on the project site:

- California glossy snake (*Arizona elegans occidentalis*); CDFW SSC
  - The project site provides suitable desert habitat with sandy soils. However, the project site is disturbed by trash dumping and OHV use. This species has a moderate potential to occur on the project site.
- Coast horned lizard (*Phrynosoma blainvillii*); CDFW SSC
  - The project site provides suitable desert habitat with sandy soils. However, the project site is disturbed by trash dumping and OHV use. This species has a moderate potential to occur on the project site.
- Burrowing owl (*Athene cunicularia*); CDFW SSC
  - The project site provides suitable desert habitat with suitable burrows made by California ground squirrels and an abundant prey population (insect, lizard, and small mammal species). However, the project site is disturbed by trash dumping and OHV use. In addition, extensive surveys have been conducted on the adjacent parcel which has similar habitat and no owls have been disturbed. The adjacent parcel is currently under construction. This species has a moderate potential to occur on the project site. Extensive surveys of the adjacent site, which has similar habitat, have not documented any burrowing owls.
- Loggerhead shrike (*Lanius ludovicianus*); CDFW SSC
  - The project site provides suitable Joshua tree woodland habitat with suitable areas for perching, an abundant prey population (lizard and insect species), and shrubs for nesting. This species has a high potential to occur on the project site.
- LeConte's thrasher (*Toxostoma lecontei*); CDFW SSC
  - The project site provides suitable desert habitat for foraging and thorny shrubs for nesting. This species has a high potential to occur on the project site.

In addition, desert kit fox (*Vulpes macrotis arsipus*), a furbearing mammal protected from take under CDFW regulations (14 CCR §460), was determined to have a moderate potential to occur on the project site. The project site provides suitable desert scrub habitat with an abundant prey population (California ground squirrels) in addition to soils suitable for burrowing. However, the project site is on the western edge of the species range. Mohave ground squirrel protocol surveys were conducted in 2022 and no Mohave ground squirrels were detected. Additionally, all records of the species within the area are more than 20 years old. The results of the 2022 surveys have been included in Appendix E.

4.2 Sensitive Natural Communities and Critical Habitat

The project site is comprised entirely of Joshua tree woodland, a CDFW Rank S3 natural community which is considered sensitive. No USFWS-designated Critical Habitat occurs on the project site.

4.3 Jurisdictional Waters and Wetlands

One shallow, ephemeral drainage intersects the project site and adjacent parcel which may generally convey stormwater runoff from the residential development to the south and from Palmdale Avenue to the north during significant rain events. This drainage feature is not identified in the NHD or NWI; however, it is identified as a dashed "blue-line stream" in USGS topographic maps. Due to the presence of a defined bed and bank, indicated by the break in slope, the CDFW may assert jurisdiction over this drainage (Rincon 2021). As of October 2022, the portion of the drainage in APN 3023-002-016 is under construction and will be filled in pursuant to Streambed Alteration Agreement EPIMS-LAN-23730-R5 and a new temporary 9-foot dirt swale will be constructed to divert flow from the portion of the drainage on APN 3023-002-184 to a stormwater basin south of the project. Grading associated with the project will eliminate the entirety of the remainder of the drainage, as well as the new temporary swale, approximately 0.75 acre (Figure 5), and replace it with underground storm drains which will outlet into an on-site basin. The drainage does not provide surface flows to adjacent waters of the state or waters of the US.

4.4 Wildlife Movement

The project site is surrounded by residential developments on the west, south, and east sides and heavily travelled Palmdale Boulevard to the north. The project site is disturbed by dumping and recreational use, pedestrian and OHVs. Potential wildlife movement on the project site could only occur between the natural habitat block to the north and the surrounding residential developments and does not significantly contribute to a wildlife movement corridor.

4.5 Resources Protected by Local Policies and Ordinances

Protected Joshua Trees and Native Vegetation

A total of 181 western Joshua tree were recorded within the project site in 2021 (Appendix D). Attributes recorded for each individual tree included single tree or clonal, height/age class, number of branching terminal panicles, and phenophase (Appendix D). Of the western Joshua trees observed on site, 134 (74%) were characterized as single-growth trees while 47 (26%) were characterized as clonal (Table 1).

Table 1 Summary of Western Joshua Trees on the Project Site

Joshua Tree Type	Total Number	Single	Clonal
Mature	108	85	23
Seedling/Juvenile	73	49	24
Total	**181**	**134**	**47**

4.6 Habitat Conservation Plans

The project site is not located within any HCP, NCCP, or other approved local, regional, or state habitat conservation plan area.

Figure 5 Jurisdictional Resources to be Impacted

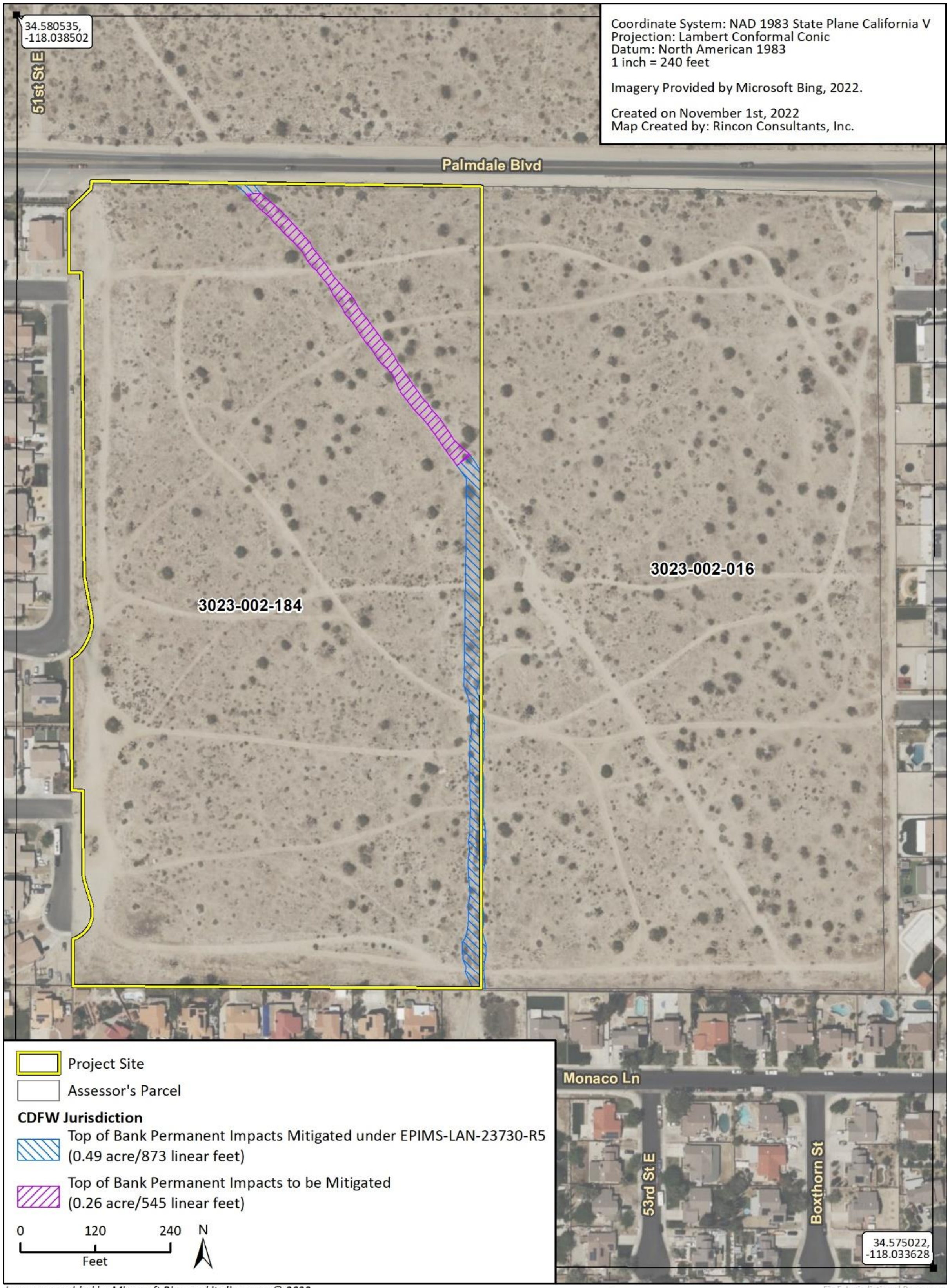

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Fig 5 Jurisdictional Resources

5 Impact Analysis and Mitigation Measures

5.1 Special Status Species

The proposed project would have a significant effect on biological resources if it would:

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.*

The BSA contains suitable habitat for special status plant species (western Joshua tree and short-joint beavertail cactus), wildlife species (California glossy snake, coast horned lizard, burrowing owl, loggerhead shrike, LeConte's thrasher), and nesting birds. Direct and potentially indirect impacts to these species may occur as a result of construction activities.

Western Joshua Trees and Short-Joint Beavertail Cacti

Western Joshua tree (State Candidate) has been documented across the project site and short-joint beavertail cactus (CRPR 1B.2) has a moderate potential to occur. Because short-joint beavertail is identifiable at any season but was not observed during the reconnaissance survey, its abundance on the site is expected to be low, if any. Construction of the project will impact these species directly on-site (by permanent removal of 181 western Joshua tree individuals and habitat) and potentially indirectly in the native habitat to the north (through construction dust and other human disturbances that may prevent photosynthesis or degrade habitat). The extensive areas of natural habitat to the north would remain suitable for short-joint beavertail cactus and large enough to support robust populations of this species, and proposed activity at the project site would not substantially affect those regional populations. Absent mitigation, impacts to western Joshua trees would be potentially significant and impacts to short-joint beavertail would be less than significant. Implementation of mitigation measures BIO-1 and BIO-2 would reduce impacts to western Joshua trees to less than significant and further reduce impacts to short-joint beavertail cacti.

Burrowing Owls

Burrowing owl are a ground-dwelling species that rely on small mammals and large insects for prey. If owls are present, construction of the project could impact individuals directly (by construction-related injury or mortality and permanent removal of habitat) and potentially indirectly in the native habitat to the north (construction noise, dust, and other human disturbances that may cause a nest to fail). The relatively small project footprint of the site, compared to the amount of available suitable habitat for these species, suggests that site development is unlikely to result in population-level impacts. The presence of extensive areas of natural habitat to the north would remain suitable and large enough to support robust populations of these species, and proposed activity at the project site would not substantially affect those regional populations; therefore, impacts would not be significant. However, implementation of mitigation measures BIO-1, BIO-3, and BIO-4 would ensure compliance with federal and state law by avoiding the take of burrowing owls or destruction of their nests.

Special Status Reptiles

California glossy snake and coast horned lizard (CDFW SSCs) both have a moderate potential to occur on the project site. If the animals are present, construction of the project would impact these species directly (by permanent removal of habitat) and potentially indirectly (construction noise, dust, and other human disturbances) in the native habitat to the north. The relatively small project footprint of the site, compared to the amount of available suitable habitat for these species, suggests that site development is unlikely to result in population-level impacts. The extensive areas of natural habitat to the north would remain suitable and large enough to support robust populations of these species, and proposed activity at the project site would not substantially affect those regional populations. Therefore, potential impacts to special status reptiles would be less than significant and no further action is recommended.

Special Status and Nesting Birds

Loggerhead shrike and LeConte's thrasher (CDFW SSCs) as well as migratory or other common nesting birds are protected by the CFGC Sections 3503 and 3503.5, and the federal MBTA and may nest in ornamental trees, grass, bare ground, burrows/cavities, man-made structures and shrubs on or adjacent to the project site. Construction of the project thus has the potential to directly (by destroying a nest) or potentially indirectly (construction noise, dust, and other human disturbances that may cause a nest to fail) impact nesting birds protected under the CFGC and MBTA. Absent mitigation, impacts to special status birds would be potentially significant. Implementation of mitigation measures BIO-1 and BIO-4 would reduce impacts to these species to less than significant and would also ensure compliance with federal and state law by avoiding take of all nesting birds.

Desert Kit Fox

While the desert kit fox is not a special-status species, take of this species is prohibited by CDFW regulations (14 CCR 760) and must be avoided. Desert kit fox has moderate potential to occur on the site due to the presence of suitable habitat, and individuals could be killed or injured by construction equipment if present on the site during construction. Because it is a common species, impacts to the desert kit fox would not rise to the level of significance under CEQA. However, the survey and avoidance measures described in recommended mitigation measure BIO-5 would ensure compliance with CDFW regulations.

BIO-1 Environmental Worker Education Training Program

Before any ground disturbing work (including vegetation clearing and grading) occurs in the construction footprint, a qualified biologist shall conduct a mandatory biological resources awareness training for all construction personnel. Topics to discuss include sensitive species that may be encountered in the project area, photographs to aid in identification of sensitive species that may be encountered, the laws and codes that regulate these species, and the protection measures that must be followed to avoid and minimize impacts. The training shall also include good housekeeping measures and best management practices. If new construction personnel are added to the project, the contractor shall ensure that the new personnel receive the mandatory training before starting work. The subsequent training of personnel may include video of the initial training and/or the use of written materials rather than in-person training by a biologist.

BIO-2 Western Joshua Tree Avoidance and Compensatory Mitigation

- A Desert Vegetation Preservation Plan shall be developed and submitted to the City of Palmdale. The plan shall include:
  - A report and site plan prepared by a desert native plant specialist which depicts the location of each Joshua tree, discusses their age and health, identifies and locates all trees and shrubs which can be saved in place or relocated.
  - A site landscaping plan showing the proposed location of those Joshua trees or, and any other native desert vegetation that will remain on-site.
  - A long-term maintenance program for any desert vegetation preserved on the site. The minimum term of any maintenance program shall be two growing seasons, unless a shorter length of time is determined by the City's Landscape Architect, or in cases where the trees retained on the site are of such health and vigor after one growing season that their survival is assured.
- A desert vegetation removal permit shall be obtained from the City's Landscape Architect, prior to the removal of any native desert vegetation as defined in this chapter.
- A Western Joshua Tree Conservation Act Permit shall be obtained prior to the removal of any Joshua trees.
- Prior to receiving take authorization from the participating agency, the project proponent shall pay mitigation fees to the participating agency for deposit into the Western Joshua Tree Conservation Fund.

BIO-3 Burrowing Owl Pre-construction Clearance Survey

A qualified wildlife biologist shall conduct a pre-construction survey of proposed impact areas to confirm presence/absence of burrowing owl individuals no more than 14 days prior to construction. The survey methodology shall be consistent with the methods outlined in the CDFW *Staff Report on Burrowing Owl Mitigation* (2012). If no active breeding or wintering owls are identified, no further mitigation is required.

If burrowing owl is detected on-site, the following mitigation measures shall be implemented in accordance with the *CDFW Staff Report on Burrowing Owl Mitigation* (2012):

- The project proponent shall hire a qualified wildlife biologist that should be on-site during initial ground-disturbing activities in potential burrowing owl habitat identified throughout the habitat assessment.
- No ground-disturbing activities shall be permitted within a buffer no less than 200 meters (656 feet) from an active burrow, depending on the level of disturbance, unless the qualified biologist determines a reduced buffer would not adversely affect the burrowing owl(s).
- Occupied burrows shall not be disturbed during the nesting season (February 1 to August 31).
- During the nonbreeding (winter) season (September 1 to January 31), ground-disturbing work can proceed near active burrows as long as the work occurs no closer than 50 meters (165 feet) from the burrow, depending on whether the level of disturbance is low, and if the active burrow is not directly affected by the project activity. A smaller/larger buffer may be established by the qualified biologist following monitoring and assessments of the project's effects on the burrowing owls. If active winter burrows are found that would be directly affected by ground-disturbing activities, owls can be excluded from winter burrows according to recommendations

made in the *Staff Report on Burrowing Owl Mitigation* (2012). Additionally, if burrowing owls are found on-site, a qualified biologist shall prepare and submit a passive relocation program in accordance with Appendix E (i.e., Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans) of the *CDFW Staff Report on Burrowing Owl Mitigation* (2012) for CDFW review and approval prior to the commencement of disturbance activities on-site.

- Burrowing owls shall not be excluded from burrows until a Burrowing Owl Exclusion Plan is developed based on the recommendations made in Appendix E (i.e., Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans) of the CDFW St*aff Report on Burrowing Owl Mitigation* (2012). The Burrowing Owl Exclusion Plan shall be submitted to CDFW for review and approval prior to the commencement of disturbance activities on-site.
- Prior to passive relocation, the project proponent shall be responsible for acquiring compensatory mitigation at a ratio of 1:1 for lost breeding and/or wintering habitat. Mitigation shall be implemented on- or off-site including permanent conservation and management of burrowing owl habitat through the recordation of a conservation easement, funding of a non-wasting endowment, and implementation of a Mitigation Land Management Plan based on the CDFW *Staff Report on Burrowing Owl Mitigation* (2012) and CDFW guidance. Mitigation lands shall be identified through coordination with CDFW and on, adjacent, or proximate to the impact site where possible and where habitat is suitable to support burrowing owl. If required, compensatory mitigation shall be completed prior to passive relocation of owls and completion of construction.
- When a qualified biologist determines that burrowing owls are no longer occupying the project site and passive relocation is complete, construction activities may begin. A final letter shall be prepared by the qualified biologist documenting the results of the passive relocation. The letter shall be submitted to CDFW.

BIO-4 Pre-construction Nesting Bird Surveys

The following measure is required to maintain compliance with the CFGC Sections 3503 and 3503.5 and the MBTA with respect to nesting birds:

- If construction activities take place during the bird nesting season (generally February 1 through August 31, but variable based on seasonal and annual climatic conditions), nesting bird surveys shall be performed by a qualified biologist within three days prior to project activities to determine the presence/absence, location, and status of any active nests on site and within 100 feet of the site.
- If nesting birds are found on site, a construction buffer of appropriate size (as determined by the qualified biologist) shall be implemented around the active nests and demarcated with fencing or flagging. If ground/burrow nesting birds are identified, demarcation materials that do not provide perching habitat for predatory bird species shall be used. Nests shall be monitored at a minimum of once per week by the qualified biologist until it has been determined that the nest is no longer being used by either the young or adults. No ground disturbance shall occur within this buffer until the qualified biologist confirms that the breeding/nesting is complete, and all the young have fledged and are capable of surviving independently of the nest. If project activities must occur within the buffer, they shall be conducted at a distance that will prevent project-related disturbances, as determined by the qualified biologist.

If no nesting birds are observed during pre-construction surveys, no further actions are necessary.

BIO-5 Desert Kit Fox

A qualified biologist shall conduct a preconstruction survey for desert kit fox no more than 30 days prior to initiation of construction activities. Inactive dens directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse. Potentially active dens directly impacted by construction activities shall be monitored for three consecutive nights using a tracking medium such as diatomaceous medium or fire clay and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand. If tracks are observed, dens shall be fitted with the one-way trap doors to encourage animals to move off-site. After 48 hours post installation, the den shall be excavated by hand and collapsed. If an active natal den is detected, construction buffer of appropriate size (as determined by the qualified biologist) shall be implemented around the natal den and demarcated with fencing or flagging.

5.2 Sensitive Natural Communities and Critical Habitat

The proposed project would have a significant effect on biological resources if it would:

b) *Have a substantial adverse impact 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 US Fish and Wildlife Service.*

The proposed project would directly impact 20-gross acres of Joshua tree woodland, as the entire project is subject to clearing and grading. In addition, the proposed project would also indirectly impact the parcel to the north through excessive dust potentially limiting photosynthesis. Implementation of mitigation measures BIO-1 through BIO-3 would reduce impacts to sensitive natural communities to less than significant.

5.3 Jurisdictional Waters and Wetlands

The proposed project would have a significant effect on biological resources if it would:

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.*

The drainage discussed in Section 4.3 above is potentially subject to CDFW jurisdiction. The drainage contains a distinct bed and bank and generally conveys surface water flow from stormwater runoff from the southern residential development to the south. Grading associated with project construction will eliminate the entirety of the drainage, approximately 0.75 acre, and replace it with underground storm drains which will outlet into an on-site basin. These impacts to jurisdictional areas would be considered significant but mitigable. Of the 0.75 acres to be impacted, the project proponent has already mitigated 0.49 acres as part of the adjacent project (Streambed Alteration Agreement EPIMS-LAN-23730-R5). As such the remaining 0.26 acres still need to be mitigated as part of the proposed project.

Obtaining a permit from CDFW and potentially providing compensatory mitigation, as required by mitigation measure BIO-6, would reduce potential direct and indirect impacts to this feature to a less than significant level.

BIO-6 Jurisdictional Waters and Wetlands

Prior to ground disturbance activities, the project proponent shall consult with CDFW. Based on such consultation, if permits are required for the project, appropriate permits shall be obtained prior to disturbance of jurisdictional resources. In addition, compensatory mitigation for impacts to jurisdictional features shall be identified prior to disturbance of the features. A 1:1 mitigation ratio shall be used, unless a higher ratio is required by CDFW. Mitigation may take the form of permittee-responsible on-site or off-site mitigation, or purchasing credits from an approved mitigation bank. The project proponent shall comply with the compensatory mitigation required and proof of compliance, along with copies of permits obtained from CDFW shall be provided to the City.

5.4 Wildlife Movement

The proposed project would have a significant effect on biological resources if it would:

d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites.

The project site is surrounded by residential developments on the west, south, and east sides and heavily travelled Palmdale Boulevard to the north. The project site is disturbed by dumping and recreational use, pedestrian and OHVs. Potential wildlife movement on the project site could only occur between the natural habitat block to the north and the surrounding residential developments and does not significantly contribute to a wildlife movement corridor. Therefore, the project would not interfere with the movement of any native wildlife species. Impacts would be less than significant.

5.5 Resources Protected by Local Policies and Ordinances

The proposed project would have a significant effect on biological resources if it would:

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

Implementation of the proposed project would result in permanent direct impacts to all western Joshua trees onsite, as the entire project site is subject to clearing and grading. In addition, the proposed project would also indirectly impact the parcel to the north through excessive dust potentially limiting photosynthesis. As part of compliance with the City of Palmdale Municipal Code, implementation of mitigation measures BIO-1 and BIO-2 would reduce potential impacts to western Joshua trees and native desert vegetation to less than significant. No other tree species would be affected by the project. In addition, the proposed project would be compliant with the City of Palmdale General Plan.

5.6 Habitat Conservation Plans

The proposed project would have a significant effect on biological resources if it would:

f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan.*

The project is not located within any HCP, NCCP, or other approved local, regional, or state habitat conservation plan area. Therefore, the project would not conflict with any existing conservation plans. No impact would occur.

6 Limitations, Assumptions, and Use Reliance

This Biological Resources Assessment has been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The biological investigation is limited by the scope of work performed. Reconnaissance biological surveys for certain taxa may have been conducted as part of this assessment but were not performed during a particular blooming period, nesting period, or particular portion of the season when positive identification would be expected if present, and therefore, cannot be considered definitive. The biological surveys are limited also by the environmental conditions present at the time of the surveys. In addition, general biological (or protocol) surveys do not guarantee that the organisms are not present and will not be discovered in the future within the site. In particular, mobile wildlife species could occupy the site on a transient basis, or re-establish populations in the future. Our field studies were based on current industry practices, which change over time and may not be applicable in the future. No other guarantees or warranties, expressed or implied, are provided. The findings and opinions conveyed in this report are based on findings derived from site reconnaissance, jurisdictional areas, review of CNDDB RareFind5, and specified historical and literature sources. Standard data sources relied upon during the completion of this report, such as the CNDDB, may vary with regard to accuracy and completeness. In particular, the CNDDB is compiled from research and observations reported to CDFW that may or may not have been the result of comprehensive or site-specific field surveys. Although Rincon believes the data sources are reasonably reliable, Rincon cannot and does not guarantee the authenticity or reliability of the data sources it has used. Additionally, pursuant to our contract, the data sources reviewed included only those that are practically reviewable without the need for extraordinary research and analysis.

7 References

California Department of Fish and Wildlife (CDFW). 2012. Staff Report on Burrowing Owl Mitigation.

_____. 2021. DRAFT Joshua Tree ITP Field Work and Application Guidance. Version date: April 20, 2021.

_____. 2022a. California Natural Diversity Database, Rarefind V5. Accessed September 26, 2022.

_____. 2022b. Biogeographic Information and Observation System (BIOS). Retrieved September 26, 2022 from www.wildlife.ca.gov/data/BIOS

_____. 2022c. Special Vascular Plants, Bryophytes, and Lichens List. Biogeographic Data Branch, California Natural Diversity Database. October 2022.

_____. 2022d. Special Animals List. Biogeographic Data Branch, California Natural Diversity Database. October 2022.

California Native Plant Society. 2022. Inventory of Rare and Endangered Plants. v9-01 1.5. Updated online and accessed via: www.rareplants.cnps.org.

Rincon Consultants, Inc. 2021. TTM 73068 Development Project Jurisdictional Waters and Wetlands Delineation Report. September 2021.

Sawyer, J. O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, California.

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

United States Department of Agricultural, Natural Resources Conservation Service. 2022. Web Soil Survey. Accessed September 26, 2022. Soil Survey Area: Los Angeles County, California.

United States Fish and Wildlife Service (USFWS). 2022a. Information for Planning and Consultation online project planning tool. Available at: https://ecos.fws.gov/ipac/

_____. 2022b. Critical Habitat Portal. Available at: https://ecos.fws.gov/ecp/report/table/critical-habitat.html

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Appendix A

Regulatory Framework

Regulatory Framework

The following is a brief summary of the regulatory context under which biological resources are managed at the federal, state, and local levels. A number of federal and state statutes provide a regulatory structure that guides the protection of biological resources. Agencies with the responsibility for protection of biological resources within the project site include the following:

- U.S. Army Corps of Engineers (wetlands and other waters of the United States)
- U.S. Fish and Wildlife Service (federally listed species and migratory birds)
- National Marine Fisheries Service (marine wildlife and anadromous fishes)
- Lahontan Regional Water Quality Control Board (waters of the State)
- California Department Fish and Wildlife (riparian areas, streambeds, and lakes; state-listed species; nesting birds, marine resources)
- California Coastal Commission
- City of Palmdale

United States Army Corps of Engineers

The United States Army Corps of Engineers (USACE) is responsible for administering several federal programs related to ensuring the quality and navigability of the nation's waters.

Clean Water Act Section 404

Congress enacted the Clean Water Act (CWA) "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 404 of the CWA authorizes the Secretary of the Army, acting through the USACE, to issue permits regulating the discharge of dredged or fill materials into the "navigable waters at specified disposal sites."

Section 502 of the CWA further defines "navigable waters" as "waters of the United States, including the territorial seas." "Waters of the United States" are broadly defined at 33 CFR Part 328.3 to include navigable waters, perennial and intermittent streams, lakes, rivers, ponds, as well as wetlands, marshes, and wet meadows. In recent years, the USACE and US Environmental Protection Agency (USEPA) have undertaken several efforts to modernize their regulations defining "waters of the United States" (e.g., the 2015 Clean Water Rule and 2020 Navigable Waters Protection Rule), but these efforts have been frustrated by legal challenges which have invalidated the updated regulations. Thus, the agencies' longstanding definition of "waters of the United States," which dates from 1986, remains in effect albeit with supplemental guidance interpreting applicable court decisions as described below.

Waters of the U.S.

In summary, USACE and USEPA regulations define "waters of the United States" as follows:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
   i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
   ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
   iii. Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States;
5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in items 1-6 above.

Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the USEPA.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of the United States.

The lateral limits of USACE jurisdiction in non-tidal waters is defined by the "ordinary high-water mark" (OHWM) unless adjacent wetlands are present. The OHWM is a line on the shore or edge of a channel established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed upon the bank, shelving, changes in the character of soil, destruction of vegetation, or the presence of debris (33 CFR 328.3(e)). As such, waters are recognized in the field by the presence of a defined watercourse with appropriate physical and topographic features. If wetlands occur within, or adjacent to, waters of the United States, the lateral limits of USACE jurisdiction extend beyond the OHWM to the outer edge of the wetlands (33 CFR 328.4 (c)). The upstream limit of jurisdiction in the absence of adjacent wetlands is the point beyond which the OHWM is no longer perceptible (33 CFR 328.4; see also 51 FR 41217).

Wetlands

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3). The USACE's delineation procedures identify wetlands in the field based on indicators of three wetland parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. The following is a discussion of each of these parameters.

Hydrophytic Vegetation

Hydrophytic vegetation dominates areas where frequency and duration of inundation or soil saturation exerts a controlling influence on the plant species present. Plant species are assigned wetland indicator status according to the probability of their occurring in wetlands. More than fifty percent of the dominant plant species must have a wetland indicator status to meet the hydrophytic vegetation criterion. The USACE published the National Wetland Plant List (USACE 2018), which separates vascular plants into the following four basic categories based on plant species frequency of occurrence in wetlands:

- **Obligate Wetland (OBL).** Almost always occur in wetlands
- **Facultative Wetland (FACW).** Usually occur in wetlands, but occasionally found in non-wetlands
- **Facultative (FAC).** Occur in wetlands or non-wetlands
- **Facultative Upland (FACU).** Usually occur in non-wetlands, but may occur in wetlands
- **Obligate Upland (UPL).** Almost never occur in wetlands

The USACE considers OBL, FACW and FAC species to be indicators of wetlands. An area is considered to have hydrophytic vegetation when greater than 50 percent of the dominant species in each vegetative stratum (tree, shrub, and herb) fall within these categories. Any species not appearing on the United States Fish and Wildlife Service's list is assumed to be an upland species, almost never occurring in wetlands. In addition, an area needs to contain at least 5% vegetative cover to be considered as a vegetated wetland.

Hydric Soils

Hydric soils are saturated or inundated for a sufficient duration during the growing season to develop anaerobic or reducing conditions that favor the growth and regeneration of hydrophytic vegetation. Field indicators of wetland soils include observations of ponding, inundation, saturation, dark (low chroma) soil colors, bright mottles (concentrations of oxidized minerals such as iron), gleying (indicates reducing conditions by a blue-grey color), or accumulation of organic material. Additional supporting information includes documentation of soil as hydric or reference to wet conditions in the local soils survey, both of which must be verified in the field.

Wetland Hydrology

Wetland hydrology is inundation or soil saturation with a frequency and duration long enough to cause the development of hydric soils and plant communities dominated by hydrophytic vegetation. If direct observation of wetland hydrology is not possible (as in seasonal wetlands), or records of wetland hydrology are not available (such as stream gauges), assessment of wetland hydrology is frequently supported by field indicators, such as water marks, drift lines, sediment deposits, or drainage patterns in wetlands.

Applicable Case Law and Agency Guidance

The USACE's regulations defining "waters of the United States" have been subject to legal interpretation, and two influential Supreme Court decisions have narrowed the definition to exclude certain classes of waters that bear an insufficient connection to navigable waters. In *Solid Waste Agency of Northern Cook County v. Army Corps of Engineers* (2001), the United States Supreme Court stated that the USACE's CWA jurisdiction does not extend to ponds that "are not adjacent to open water." In reaching its decision, the Court concluded that the "Migratory Bird Rule," which served as the basis for the USACE's asserted jurisdiction, was not supported by the CWA. The Migratory Bird Rule extended CWA jurisdiction to intrastate waters "which are or would be used as habitat by birds protected by Migratory Bird Treaties or which are or would be used as habitat by other migratory birds which cross state lines…" The Court was concerned that application of the Migratory Bird Rule resulted in "reading the term 'navigable waters' out of the statute. Highlighting the language of the CWA to determine the statute's jurisdictional reach, the Court stated, "the term 'navigable' has at least the import of showing us what Congress had in mind as its authority for enacting the CWA: its traditional jurisdiction over waters that were or had been navigable in fact or which could reasonably be so made." This decision stands for the proposition that non-navigable isolated, intrastate waters are not waters of the United States and thus are not jurisdictional under the CWA.

In 2006 the United States Supreme Court decided *Rapanos v. United States* and *Carabell v. United States* (collectively "Rapanos"), which were consolidated cases determining the extent of CWA jurisdiction over waters that carry only an infrequent surface flow. The court issued no majority opinion in Rapanos. Instead, the justices authored five separate opinions including the "plurality" opinion, authored by Justice Scalia (joined by three other justices), and a concurring opinion by Justice Kennedy. To guide implementation of the decision, the USACE and USEPA issued a joint guidance memorandum ("Rapanos Guidance Memorandum") in 2008 stating that "regulatory jurisdiction under the CWA exists over a water body if either the plurality's or Justice Kennedy's standard is satisfied."

According to the plurality opinion in Rapanos, "the waters of the United States include only relatively permanent, standing or flowing bodies of water" and do not include "ordinarily dry channels through which water occasionally or intermittently flows." In addition, while all wetlands that meet the USACE definition are considered adjacent wetlands, only those adjacent wetlands that have a continuous surface connection because they directly abut the tributary (e.g., they are not separated by uplands, a berm, dike, or similar feature) are considered jurisdictional under the plurality standard.

Under Justice Kennedy's opinion, "the USACE's jurisdiction over wetlands depends upon the existence of a significant nexus between the wetlands in question and navigable waters in the traditional sense. Wetlands possess the requisite nexus, and thus come within the statutory phrase 'navigable waters,' if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.' When, in contrast, wetlands' effects on water quality are speculative or insubstantial, they fall outside the zone fairly encompassed by the statutory term 'navigable waters.'" Justice Kennedy identified "pollutant trapping, flood control, and runoff storage" as some of the critical functions wetlands can perform relative to other waters. He concluded that, given wetlands' ecological role, "mere adjacency" to a non-navigable tributary was insufficient to establish CWA jurisdiction, and that "a more specific inquiry, based on the significant nexus standard, is therefore necessary."

Interpreting these decisions, and according to the Rapanos Guidance Memorandum, the USACE and USEPA will assert jurisdiction over the following waters:

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and,
- Wetlands that directly abut such tributaries.

The USACE and USEPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and,
- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

Where a significant nexus analysis is required, the USACE and USEPA will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters; and,
- Significant nexus includes consideration of hydrologic and ecologic factors.

The USACE and USEPA generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); and,
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States. Structures or work outside the limits defined for navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, or any other modification of a navigable water of the United States, and applies to all structures and work. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent, or semi-permanent obstacle or obstruction. It is important to note that Section 10 applies only to navigable waters, and thus does not apply to work in non-navigable wetlands or tributaries. In some cases, Section 10 authorization is issued by the USACE concurrently with CWA Section 404 authorization, such as when certain Nationwide Permits are used.

Regional Water Quality Control Board

The State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) have jurisdiction over “waters of the State,” which are defined as any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code sec. 13050(e)). These agencies also have responsibilities for administering portions of the CWA.

Clean Water Act Section 401

Section 401 of the CWA requires an applicant requesting a federal license or permit for an activity that may result in any discharge into navigable waters (such as a Section 404 Permit) to provide state certification that the proposed activity will not violate state and federal water quality standards. In California, CWA Section 401 Water Quality Certification (Section 401 Certification) is issued by the RWQCBs and by the SWRCB for multi-region projects. The process begins when an applicant submits an application to the RWQCB and informs the USACE (or the applicable agency from which a license or permit was requested) that an application has been submitted. The USACE will then determine a "reasonable period of time" for the RWQCB to act on the application; this is typically 60 days for routine projects and longer for complex projects but may not exceed one year. When the period has elapsed, if the RWQCB has not either issued or denied the application for Section 401 Certification, the USACE may determine that Certification has been waived and issue the requested permit. If a Section 401 Certification is issued it may include binding conditions, imposed either through the Certification itself or through the requested federal license or permit.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and ground water and to both point and nonpoint sources of pollution. Pursuant to the Porter-Cologne Act (California Water Code section 13000 et seq.), the policy of the State is as follows:

- The quality of all the waters of the State shall be protected
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation

The Porter-Cologne Act established nine RWQCBs (based on watershed boundaries) and the SWRCB, which are charged with implementing its provisions and which have primary responsibility for protecting water quality in California. The SWRCB provides program guidance and oversight, allocates funds, and reviews RWQCB decisions. In addition, the SWRCB allocates rights to the use of surface water. The RWQCBs have primary responsibility for individual permitting, inspection, and enforcement actions within each of nine hydrologic regions. The SWRCB and RWQCBs have numerous nonpoint source related responsibilities, including monitoring and assessment, planning, financial assistance, and management.

Section 13260 of the Porter-Cologne Act requires any person discharging or proposing to discharge waste that could affect the quality of waters of the State to file a Report of Waste Discharge with the appropriate RWQCB. The RWQCB may then authorize the discharge, subject to conditions, by issuing Waste Discharge Requirements (WDRs). While this requirement was historically applied primarily to outfalls and similar point source discharges, the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*, effective May 2020, make it clear that the agency will apply the Porter-Cologne Act's requirements to discharges of dredge and fill material as well. The *Procedures* state that they are to be used in issuing CWA Section 401 Certifications and WDRs, and largely mirror the existing review requirements for CWA

Section 404 Permits and Section 401 Certifications, incorporating most elements of the USEPA's *Section 404(b)(1) Guidelines*. Following issuance of the *Procedures*, the SWRCB produced a consolidated application form for dredge/fill discharges that can be used to obtain a CWA Section 401 Water Quality Certification, WDRs, or both.

Non-Wetland Waters of the State

The SWRCB and RWQCBs have not established regulations for field determinations of waters of the state except for wetlands currently. In many cases the RWQCBs interpret the limits of waters of the State to be bounded by the OHWM unless isolated conditions or ephemeral waters are present. However, in the absence of statewide guidance each RWQCB may interpret jurisdictional boundaries within their region and the SWRCB has encouraged applicants to confirm jurisdictional limits with their RWQCB before submitting applications. As determined by the RWQCB, waters of the State may include riparian areas or other locations outside the OHWM, leading to a larger jurisdictional area over a given water body compared to the USACE.

Wetland Waters of the State

Procedures for defining wetland waters of the State pursuant to the SWRCB's *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* went into effect May 28, 2020. The SWRCB defines an area as wetland if, under normal circumstances:

(i) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both;
(ii) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and
(iii) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

The SWRCB's *Implementation Guidance for the Wetland Definition and Procedures for Discharges of Dredge and Fill Material to Waters of the State* (2020), states that waters of the U.S. and waters of the State should be delineated using the standard USACE delineation procedures, taking into consideration that the methods shall be modified only to allow for the fact that a lack of vegetation does not preclude an area from meeting the definition of a wetland.

United States Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) implements several laws protecting the Nation's fish and wildlife resources, including the Endangered Species Act (ESA; 16 United States Code [USC] Sections 153 et seq.), the Migratory Bird Treaty Act (MBTA; 16 USC Sections 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668).

Endangered Species Act

The USFWS and National Marine Fisheries Service (NMFS) share responsibility for implementing the ESA. Generally, the USFWS implements the FESA for terrestrial and freshwater species, while the NMFS implements the FESA for marine and anadromous species. Projects that would result in "take" of any threatened or endangered wildlife species, or a threatened or endangered plant species if occurring on federal land, are required to obtain permits from the USFWS or NMFS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan) of the ESA, depending on the involvement by the federal government in funding, authorizing, or carrying out the project. The permitting process is used to determine if a project would jeopardize the continued existence of a listed species and what measures would be required to avoid jeopardizing the species. "Take" under federal definition means to harass, harm (which includes habitat modification), pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Proposed or candidate species do not have the full protection of the ESA; however, the USFWS and NMFS advise project applicants that they could be elevated to listed status at any time.

Migratory Bird Treaty Act

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

The list of migratory bird species protected by the law, in regulations at 50 CFR Part 10.13, is primarily based on bird families and species included in the four international treaties. A migratory bird species is included on the list if it meets one or more of the following criteria:

1. It occurs in the United States or U.S. territories as the result of natural biological or ecological processes and is currently, or was previously listed as, a species or part of a family protected by one of the four international treaties or their amendments.
2. Revised taxonomy results in it being newly split from a species that was previously on the list, and the new species occurs in the United States or U.S. territories as the result of natural biological or ecological processes.
3. New evidence exists for its natural occurrence in the United States or U.S. territories resulting from natural distributional changes and the species occurs in a protected family.

In 2004, the Migratory Bird Treaty Reform Act limited the scope of the MBTA by stating the MBTA applies only to migratory bird species that are native to the United States or U.S. territories, and that a native migratory bird species is one that is present as a result of natural biological or ecological processes. The MBTRA requires the USFWS to publish a list of all nonnative, human-introduced bird species to which the MBTA does not apply, and an updated list was published in 2020. The 2020 update identifies species belonging to biological families referred to in treaties the MBTA implements but are not protected because their presence in the United States or U.S. territories is solely the result of intentional or unintentional human-assisted introductions.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act prohibits anyone, without a permit issued by the USFWS, from "taking" bald or golden eagles, including their parts (including feathers), nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

"Disturb" means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) derives its authority from the Fish and Game Code of California and administers several State laws protecting fish and wildlife resources and the habitats upon which they depend.

California Endangered Species Act

The California Endangered Species Act (CESA) (Fish and Game Code Section 2050 et. seq.) prohibits take of state listed threatened or endangered. Take under CESA is defined as "Hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (Fish and Game Code sec. 86). This definition does not prohibit indirect harm by way of habitat modification, except where such harm is the proximate cause of death of a listed species. Where incidental take would occur during construction or other lawful activities, CESA allows the CDFW to issue an Incidental Take Permit upon finding, among other requirements, that impacts to the species have been minimized and fully mitigated. Unlike the federal ESA, CESA's protections extend to candidate species during the period (typically one year) while the California Fish and Game Commission decides whether the species warrants CESA listing.

Native Plant Protection Act

The CDFW also has authority to administer the Native Plant Protection Act (NPPA) (Fish and Game Code Section 1900 et seq.). The NPPA requires the CDFW to establish criteria for determining if a species, subspecies, or variety of native plant is endangered or rare, and prohibits the take of listed plant species. Effective in 2015, CDFW promulgated regulations (14 CCR 786.9) under the authority of the NPPA, establishing that the CESA's permitting procedures would be applied to plants listed under the NPPA as "Rare." With this change, there is little practical difference for the regulated public between plants listed under CESA and those listed under the NPPA.

Fully Protected Species Laws

The CDFW enforces Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code, which prohibit take of species designated as Fully Protected. The CDFW is not allowed to issue an Incidental Take Permit for Fully Protected species; therefore, impacts to these species must be avoided. The exception is situations where a Natural Community Conservation Plan (NCCP) is in place that authorizes take of the fully protected species.

Avian Protection Laws

California Fish and Game Code sections 3503, 3503.5, and 3513 describe unlawful take, possession, or destruction of native birds, nests, and eggs. Section 3503.5 of the Code protects all birds-of-prey and their eggs and nests against take, possession, or destruction of nests or eggs. Section 3513 makes it a state-level offense to take any bird in violation of the federal Migratory Bird Treaty Act.

Protection of Lakes and Streambeds

California Fish and Game Code section 1602 states that it is unlawful for any person to "substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake" without first notifying the California Department of Fish and Wildlife (CDFW) of that activity. Thereafter, if CDFW determines and informs the entity that the activity will not substantially adversely affect any existing fish or wildlife resources, the entity may commence the activity. If, however, CDFG determines that the activity may substantially adversely affect an existing fish or wildlife resource, the entity may be required to obtain from CDFW a Streambed Alteration Agreement (SAA), which will include reasonable measures necessary to protect the affected resource(s), before the entity may conduct the activity described in the notification. Upon receiving a complete Notification of Lake/Streambed Alteration, CDFW has 60 days to present the entity with a Draft SAA. Upon review of the Draft SAA by the applicant, any problematic terms are negotiated with CDFW and a final SAA is executed.

The CDFW has not defined the term "stream" for the purposes of implementing its regulatory program under Section 1602, and the agency has not promulgated regulations directing how jurisdictional streambeds may be identified, or how their limits should be delineated. However, four relevant sources of information offer insight as to the appropriate limits of CDFW jurisdiction as discussed below.

- **The plain language of Section 1602 of CFGC** establishes the following general concepts:
  - References "river," "stream," and "lake"
  - References "natural flow"
  - References "bed," "bank," and "channel"
- **Applicable court decisions**, in particular *Rutherford v. State of California* (188 Cal App. 3d 1276 (1987), which interpreted Section 1602's use of "stream" to be as defined in common law. The Court indicated that a "stream" is commonly understood to:
  - Have a source and a terminus
  - Have banks and a channel
  - Convey flow at least periodically, but need not flow continuously and may at times appear outwardly dry
  - Represent the depression between the banks worn by the regular and usual flow of the water
  - Include the area between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including intervening sand bars
  - Include the land that is covered by the water in its ordinary low stage
  - Include lands below the OHWM

- **CDFW regulations** defining “stream” for other purposes, including sport fishing (14 CCR 1.72) and streambed alterations associated with cannabis production (14 CCR 722(c)(21)), which indicate that a stream:
  - Flows at least periodically or intermittently
  - Flows through a bed or channel having banks
  - Supports fish or aquatic life
  - Can be dry for a period of time
  - Includes watercourses where surface or subsurface flow supports or has supported riparian vegetation
- **Guidance documents**, *including A Field Guide to Lake and Streambed Alteration Agreements* (CDFG 1994) and *Methods to Describe and Delineate Episodic Stream Processes on Arid Landscapes for Permitting Utility-Scale Solar Power Plants* (Brady and Vyverberg 2013), which suggest the following:
  - A stream may flow perennially or episodically
  - A stream is defined by the course in which water currently flows, or has flowed during the historic hydrologic course regime (approximately the last 200 years)
  - Width of a stream course can reasonably be identified by physical or biological indicators
  - A stream may have one or more channels (single thread vs. compound form)
  - Features such as braided channels, low-flow channels, active channels, banks associated with secondary channels, floodplains, islands, and stream-associated vegetation, are interconnected parts of the watercourse
  - Canals, aqueducts, irrigation ditches, and other means of water conveyance can be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife
  - Biologic components of a stream may include aquatic and riparian vegetation, all aquatic wildlife including fish, amphibians, reptiles, invertebrates, and terrestrial species which derive benefits from the stream system
  - The lateral extent of a stream can be measured in different ways depending on the particular situation and the type of fish or wildlife resource at risk

The tenets listed above, among others, are applied to establish the boundaries of streambeds in various environments. Importance of each factor may be weighted based on site-specific considerations and the applicability of the indicators to the streambed at hand.

Local Jurisdiction

City of Palmdale, California

City of Palmdale General Plan

Within the Environmental Resources Element of the City of Palmdale General Plan, the policies applicable to the proposed project include the following:

- **CON-1.1 Endangered species protection.** Ensure local compliance with the CESA and FESA.
- **CON-1.2 Joshua and Juniper trees.** Continue enforcing the City's Native Vegetation Ordinance to protect western Joshua trees and Juniper trees.
- **CON-1.3 West Mojave Plan.** Comply with the required implementation of the West Mojave Plan for protection of desert tortoise and Mohave ground squirrel.
- **CON-1.4 Significant ecological areas**. Identify and preserve to the greatest extent feasible significant ecological areas (SEA's). Areas to consider for open space preservation include, but are not limited to, Tejon Park, Barrel Springs Southern Trailhead, and the Una Lake area.
- **CON-1.5 Preserve ecological resource areas.** Preserve natural drainage courses and riparian areas where ecological resources exist in significant concentrations.
- **CON-1.6 Increase conservation areas**. Coordinate with state agencies to help achieve the goals of 30x30: to protect 30 percent of California's land by 2030 by identifying optimal sites for land conservation.
- **CON-1.7 Wetland and floodplain areas.** Solicit and utilize all available sources of local, regional, state, and federal funds to acquire significant wetland areas and floodplains to minimize disturbance and prevent damage from erosion, turbidity, siltation, loss of wildlife and vegetation, or the destruction of the natural habitat.

City of Palmdale Code of Ordinances

14.04.040 Requirements for removal.

A. Desert vegetation shall not be removed, nor caused to be removed, on or from any parcel of land, except as provided by the provisions of this chapter.

B. A native desert vegetation removal permit shall be obtained from the City's Landscape Architect, or in lieu thereof, the Director of Public Works' designee, prior to the removal of any native desert vegetation as defined in this chapter.

C. The project proponent or its agent may remove a detached dead western Joshua tree or detached limb of a western Joshua tree. All other removals and all trimming of western Joshua trees authorized by permits issued pursuant to this subsection shall be completed by a desert native plant specialist. A permit may be issued, without payment of mitigation fees, provided that the dead western Joshua tree or the limb(s) to be removed:

   1. Has fallen over and is within 30 feet of a structure;
   2. Is leaning against an existing structure; or
   3. Creates an imminent threat to public health or safety.

D. Census.

   1. The project proponent proposing to relocate or remove a western Joshua tree shall cause a census of western Joshua trees to be conducted on the project site. The census shall count all western Joshua trees on the project site and classify them by size class.
   2. Prior to receiving take authorization from the participating agency, the project proponent shall submit to the participating agency a census report that shall include the following:
      a. The name of the desert native plant specialist who conducted the census and the employer of the desert native plant specialist.
      b. The name of the desert native plant specialist who will relocate western Joshua trees, if applicable, and the employer of the desert native plant specialist.
      c. The date of the census.

   d. The date or dates of the proposed relocation of western Joshua trees, if applicable.
   e. A map of the project site that depicts: the location of the proposed single-family residence, accessory structure, or public works project; the number and location of all western Joshua trees on the project site; and the proposed placement of each relocated western Joshua tree.
   f. Photographs of each western Joshua tree on the project site, including a visual representation of the scale of the height of each tree.

E. Avoidance. To the maximum extent practicable, the project proponent shall avoid take of western Joshua trees on the project site.

F. Minimization.
   1. The project proponent shall avoid all ground-disturbing activities within 10 feet of any western Joshua tree if those activities will disturb the soil to a depth of greater than 12 inches.
   2. To the maximum extent feasible, the project proponent shall relocate all western Joshua trees that cannot be avoided to another location on the project site.
   3. For purposes of this subsection, relocation of a western Joshua tree shall be determined to be infeasible if either of the following applies:
      a. Relocation of the western Joshua tree on the project site would pose a threat to public health or safety.
      b. Relocation of the western Joshua tree on the project site would interfere with existing roadways, sidewalks, curbs, gutters, utility lines, sewer lines, drainage improvements, foundations, existing structures, or setbacks to any of those structures or improvements.
      c. There is no location on the project site that satisfies the requirements listed above.
   4. The project proponent shall ensure that relocation of western Joshua trees pursuant to this section satisfies the following requirements:
      a. All western Joshua tree relocations shall be completed by a desert native plant specialist.
      b. All western Joshua trees to be relocated shall be placed at least 25 feet from any existing or proposed structure or improvement and at least 10 feet from any other western Joshua tree.
      c. Within 30 days of completing the relocation, the project proponent shall provide the participating agency with a map of the project site indicating where each western Joshua tree was relocated.

G. Removal. A project proponent may remove western Joshua trees that cannot feasibly be avoided or relocated.

H. Mitigation. Prior to receiving take authorization from the participating agency, the project proponent shall pay mitigation fees to the participating agency for deposit into the Western Joshua Tree Mitigation Fund as follows:
   1. For single-family residential projects undertaken on undeveloped parcels and public works projects to erect or construct a new public structure, building, road, or improvement, the project proponent shall pay mitigation fees.

2. For accessory structure projects undertaken on developed parcels and for public works projects to alter, maintain, or repair an existing public structure, building, road, or improvement, the project proponent shall pay mitigation fees.

I. All projects not identified above will be required to obtain an Incidental Take Permit (2081) from the California Department of Fish and Wildlife. (Ord. 1556 § 1, 2020; Ord. 952 § 2, 1992)

14.04.050 Desert vegetation preservation plan requirements.

All development proposal applications for sites containing native desert vegetation shall include a desert vegetation preservation plan, submitted with the development application, containing the following:

A. A written report and a site plan which depicts the location of each Joshua tree and California juniper, discusses their age and health, identifies and locates all trees and shrubs which can be saved in place or relocated. The report shall be prepared by a desert native plant specialist.
B. A site landscaping plan showing the proposed location of those Joshua trees or California junipers, and any other native desert vegetation that will remain on-site.
C. A long-term maintenance program for any desert vegetation preserved on the site. The minimum term of any maintenance program shall be two growing seasons, unless a shorter length of time is determined by the City's Landscape Architect, or in lieu thereof, the Director of Public Works' designee in cases where the trees retained on the site are of such health and vigor after one growing season that their survival is assured.
D. Such other and further information as the Director of Planning may deem necessary to fulfill the purposes and intent of this chapter in a particular case. (Ord. 952 § 2, 1992)

14.04.060 Joshua tree relocation methodology.

A. A tree spade shall be used to prepare the transplant site and excavate the Joshua tree and root system. Soil profile can influence Joshua tree root mass and should be taken into consideration when selecting tree spade size. General tree spade sizing guidelines as follows:
   1. Forty-two-inch spade for western Joshua trees under one meter in height.
   2. Fifty-four-inch spade for western Joshua trees one to two meters in height.
   3. Ninety-inch spade for western Joshua trees two to four and one-half +/- meters in height.
B. Joshua trees to be transplanted shall be prepared by creating earthen berms around the perimeter of the tree for pre-soaking operations.
C. The northern face of each tree shall be marked at the base with spray paint to aid in proper orientation during transplanting. The trees shall be orientated at the receiving site in the same direction as the original location.
D. Only trees less than or equal to 15 feet in height, and in good condition are recommended for transplanting. Each western Joshua tree that is transplanted shall have tree inventory data collected according to the tree inventory technical specifications.
E. A water regimen shall be conducted to insure survivability. All trees shall receive a pre-soaking approximately one week prior to transplanting. Each tree shall have an earthen berm built around the perimeter, large enough to accommodate 20 gallons of water to ensure the root ball will hold together and to minimize transplant shock.
F. Each tree shall be placed in the receiving hole in the appropriate geographic orientation and backfilled with native or mineral amended soil. The original soil line on the trunk should be slightly higher than adjacent grade to allow the transplanted tree to settle to the appropriate

grade. The hole shall be filled with water and the tree will be slightly agitated to dislodge any air bubbles that could create root rot.

G. Earthen berms shall be created around each tree after transplant to ensure western Joshua trees can receive up to five gallons of water per watering event. Each western Joshua tree will be hand watered (top to bottom) every two weeks for up to six weeks following transplanting. All trees shall be watered for one year: The trees should be watered three times in the spring, one time in the summer, and one time in the fall with three gallons of water per watering event. The proponent must notify the Landscape Superintendent, City Arborist or appointed designee in advance of each watering event to ensure compliance with the watering regimen maintenance period.

H. A daily pre-transplant operation safety briefing shall be conducted to ensure all applicable safety regulatory requirements have been met. All personnel working in and around equipment shall wear hard hats, reflective safety vests and protective eye wear.

I. Protection of Public and Private Property. The proponent shall be responsible for the protection of all public and private property and improvements within and adjacent to all work areas including but not limited to: plant material, lawns, sprinkler systems, drains, fencing, block walls, brick or masonry work, sidewalks, street paving, street lights, traffic signals, utility pedestals and all other public or private improvements.

J. Restitution for Public or Private Property Damage. Any improvements removed or damaged, other than those scheduled for removal shall be replaced in kind at the proponent's expense to the absolute satisfaction of the Grounds and Green Spaces Superintendent and/or private property owner. Replacement shall take place no later than five working days from the date of damage, unless otherwise authorized by the Grounds and Green Spaces Superintendent.

K. Underground Service Alert. The proponent shall be responsible for contacting Underground Service Alert, securing a dig-alert ticket, and allowing the time required by law for members to respond and mark their underground infrastructure prior to conducting any western Joshua tree transplanting operations. The proponent shall analyze and respect all utility markings and transplant western Joshua trees with care to avoid contact with any underground infrastructure within the transplant zone. (Ord. 1556 § 1, 2020)

14.04.070 Desert vegetation preservation criteria.

All development proposals for land which contains desert vegetation shall be subject to the following provisions regarding the preservation of native desert vegetation both on- and off-site:

A. The minimum standard of preservation shall be:

   1. Two California junipers per gross acre, averaged for the gross site area covered by the development application; or
   2. Where soil conditions or conditions of the California juniper prohibit the preservation of two trees per acre, or where the total number of healthy trees per gross acre is not equal to two per acre, the minimum standard of preservation will be determined by a desert native plant specialist and confirmed by the City's Landscape Architect, or in lieu thereof, the Director of Public Works' designee, in accordance with the following criteria:
      a. Soil characteristics of a proposed area for relocation of vegetation,
      b. Health of the native desert vegetation, including damage to trunk or root system,
      c. Size of the Joshua tree and the location to where the tree will be transplanted,
      d. A suitable top-root ratio;

3. Where possible, a minimum of two California juniper trees per gross acre shall be retained undisturbed on site. California junipers are valuable components of the native desert vegetation and it is desirable to retain specimens whenever possible. However, California junipers do not transplant well, are large plants which are difficult to incorporate into landscaping and are not readily available as nursery stock;
4. To enhance the likelihood of survival, native desert vegetation that cannot be fenced and left undisturbed will not be left in place while grading. The options for preserving trees on site after grading are the following:
   a. Move the vegetation slated to remain on site to a holding area. After grading has been completed, move vegetation once again to a permanent location.
   b. Grade in Phases. Ready the area to receive vegetation first, then transplant and complete grading.

B. The quantity of California junipers calculated under the minimum standard of preservation as determined above shall be preserved by any combination of the following means:
   1. The development proposal shall be prepared in a manner which retains on site those plants that can be incorporated into the design of the development. Development proposals should use native desert vegetation to landscape on-site detention basins, entry statement areas, and other open space sites whenever possible, where xeric landscaping is appropriate;
      a. California junipers retained on site shall be credited toward the two trees per gross acre or other minimum standard of preservation,
      b. Other methods of preservation as shown in subsection (B)(2) shall not apply to California junipers;
   2. Only after all other options are exhausted, proponents may pay an in-lieu fee to the City to fulfill their obligation of preservation of native desert vegetation. The fee will be used to provide partial funding for the maintenance and coordination of the native desert vegetation banks and preserves. The in-lieu fee will be accepted only when preservation of Joshua and/or juniper trees is not possible due to site constraints that preclude the feasible preservation of desert vegetation, and no alternative preservation options remain. When a proponent must pay an in-lieu fee, the fee shall be calculated on the minimum standard of two trees per acre, less any trees preserved by other means. The in-lieu fee amount shall be determined by resolution of the City Council;
      a. Where California junipers are retained on site, they shall be credited toward the minimum standard or two trees per acre. However, where they cannot be retained undisturbed on site, no in-lieu fee is required;
   3. Any native desert vegetation in excess of the minimum standard for preservation may be removed after the public has had the opportunity to transplant native desert vegetation per subsection (B)(2)(a) of this section, and after the native desert vegetation preservation plan and native desert vegetation removal permit has been approved by the City, or, if applicable, after the payment of the in-lieu fee. (Ord. 1556 § 1, 2020; Ord. 952 § 2, 1992. Formerly 14.04.060)

Appendix B

Special Status Species Evaluation Tables

Special Status Plant and Wildlife Species in the Regional Vicinity of the Project Site

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Plants and Lichens				
Arctostaphylos glandulosa ssp. *gabrielensis* San Gabriel manzanita	None/None G5T3/S3 1B.2	Perennial evergreen shrub. Chaparral. Rocky outcrops; can be dominant shrub where it occurs. Elevations: 1950-4920ft. (595-1500m.) Blooms Mar.	No Potential	No suitable chaparral habitat occurs on the project site.
Astragalus hornii var. *hornii* Horn's milk-vetch	None/None GUT1/S1 1B.1	Annual herb. Meadows and seeps, playas. Alkaline, lake margins. Elevations: 195-2790ft. (60-850m.) Blooms May-Oct.	No Potential	No suitable wetland habitats occur on the project site.
Astragalus preussii var. *laxiflorus* Lancaster milk-vetch	None/None G4T2/S1 1B.1	Perennial herb. Chenopod scrub. Alkaline clay flats or gravelly or sandy washes and along draws in gullied badlands in California. Elevations: 2295-2295ft. (700-700m.) Blooms Mar-May.	No Potential	No suitable chenopod scrub or alkali soils occur on the project site.
Calochortus palmeri var. *palmeri* Palmer's mariposa-lily	None/None G3T2/S2 1B.2	Perennial bulbiferous herb. Chaparral, lower montane coniferous forest, meadows and seeps. Mesic. Elevations: 2330-7840ft. (710-2390m.) Blooms Apr-Jul.	No Potential	No chaparral or other suitable habitat types occur on the project site.
Calochortus striatus alkali mariposa-lily	None/None G3?/S2S3 1B.2	Perennial bulbiferous herb. Chaparral, chenopod scrub, meadows and seeps, mojavean desert scrub. Alkaline, mesic. Elevations: 230-5235ft. (70-1595m.) Blooms Apr-Jun.	No Potential	The project site does contain mojavean desert scrub; however, suitable alkaline or mesic soils do not occur on the project site.
Castilleja gleasoni Mt. Gleason paintbrush	None/SCR G2/S2 1B.2	Perennial herb (hemiparasitic). Chaparral, lower montane coniferous forest, pinyon and juniper woodland. Granitic. Elevations: 3805-7120ft. (1160-2170m.) Blooms May-Jun(Sep).	No Potential	No chaparral or other suitable habitat types occur on the project site.
Chorizanthe parryi var. *parryi* Parry's spineflower	None/None G3T2/S2 1B.1	Annual herb. Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Openings, Rocky (sometimes), sandy (sometimes). Elevations: 900-4005ft. (275-1220m.) Blooms Apr-Jun.	No Potential	No chaparral or other suitable habitat types occur on the project site.
Claytonia peirsonii ssp. *peirsonii* Peirson's spring beauty	None/None G2G3T2/S2 1B.2	Perennial herb. Subalpine coniferous forest, upper montane coniferous forest. Granitic, metamorphic, scree, talus. Elevations: 4955-9005ft. (1510-2745m.) Blooms (Mar)May-Jun.	No Potential	No suitable forest habitat occurs on the project site.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Eriastrum rosamondense Rosamond eriastrum	None/None G1?/S1? 1B.1	Annual herb. Chenopod scrub, vernal pools. Alkali pool beds separated by very low hummocks with open chenopod scrub. Often sandy soil. Elevations: 2295-3855ft. (700-1175m.) Blooms Apr-May (Jun-Jul).	No Potential	No suitable chenopod scrub or alkali soils occur on the project site.
Lilium parryi lemon lily	None/None G3/S3 1B.2	Perennial bulbiferous herb. Lower montane coniferous forest, meadows and seeps, riparian forest, upper montane coniferous forest. Wet, mountainous terrain; generally in forested areas; on shady edges of streams, in open boggy meadows and seeps. Elevations: 4005-9005ft. (1220-2745m.) Blooms Jul-Aug.	No Potential	Wet, mountainous terrain does not occur on the project site.
Linanthus concinnus San Gabriel linanthus	None/None G2/S2 1B.2	Annual herb. Chaparral, lower montane coniferous forest, upper montane coniferous forest. Dry rocky slopes, often in Jeffrey pine/canyon oak forest. Elevations: 4985-9185ft. (1520-2800m.) Blooms Apr-Jul.	No Potential	No suitable forest habitat occurs on the project site.
Loeflingia squarrosa var. *artemisiarum* sagebrush loeflingia	None/None G5T3/S2 2B.2	Annual herb. Desert dunes, great basin scrub, sonoran desert scrub. Sandy flats and dunes. Sandy areas around clay slicks w/Sarcobatus, Atriplex, Tetradymia, etc. Elevations: 2295-5300ft. (700-1615m.) Blooms Apr-May.	No Potential	No suitable dune habitat or clay slicks occur on the project site.
Lupinus peirsonii Peirson's lupine	None/None G3/S3 1B.3	Perennial herb. Joshua tree woodland, lower montane coniferous forest, pinyon and juniper woodland, upper montane coniferous forest. Decomposed granite slide and talus, on slopes and ridges. Elevations: 3280-8205ft. (1000-2500m.) Blooms Apr-Jun.	No Potential	While Joshua tree woodland is present, no suitable soils or slopes occur on the project site. The project site is out of the elevation range for this species.
Nemacladus secundiflorus var. *robbinsii* Robbins' nemacladus	None/None G3T2/S2 1B.2	Annual herb. Chaparral, valley and foothill grassland. Dry, sandy or gravelly slopes. Openings. Elevations: 1150-5580ft. (350-1700m.) Blooms Apr-Jun.	No Potential	No chaparral or other suitable habitat types occur on the project site.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Opuntia basilaris var. *brachyclada* short-joint beavertail	None/None G5T3/S3 1B.2	Perennial stem. Chaparral, joshua tree woodland, mojavean desert scrub, pinyon and juniper woodland. Sandy soil or coarse, granitic loam. Elevations: 1395-5905ft. (425-1800m.) Blooms Apr-Jun(Aug).	Low Potential	The project site contains suitable Joshua tree woodland; however, the closest occurrence of this species was approximately 4 miles away in 1989.
Oreonana vestita woolly mountain-parsley	None/None G3/S3 1B.3	Perennial herb. Lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest. High ridges; on scree, talus, or gravel. Elevations: 5300-11485ft. (1615-3500m.) Blooms Mar-Sep.	No Potential	No suitable forest habitat occurs on the project site.
Stylocline masonii Mason's neststraw	None/None G1/S1 1B.1	Annual herb. Chenopod scrub, pinyon and juniper woodland. Sandy washes. Elevations: 330-3935ft. (100-1200m.) Blooms Mar-May.	No Potential	No suitable chenopod scrub or pinyon and juniper woodland occurs on the project site.
Symphyotrichum greatae Greata's aster	None/None G2/S2 1B.3	Perennial rhizomatous herb. Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, riparian woodland. Mesic canyons. Elevations: 985-6595ft. (300-2010m.) Blooms Jun-Oct.	No Potential	No suitable chaparral or forest habitat occurs on the project site.
Thysanocarpus rigidus rigid fringepod	None/None G1G2/S2 1B.2	Annual herb. Pinyon and juniper woodland. Dry, rocky slopes and ridges of oak and pine woodland in arid mountain ranges. Elevations: 1970-7220ft. (600-2200m.) Blooms Feb-May.	No Potential	No suitable woodland habitat occurs on the project site.
Invertebrates				
Euphydryas editha quino quino checkerspot butterfly	FE/None G5T1T2/S1 S2	Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties. Hills and mesas near the coast. Need high densities of food plants Plantago erecta, P. insularis, and Orthocarpus purpurescens.	No Potential	The project site is outside of the known range of this species.
Fish				
Catostomus santaanae Santa Ana sucker	FT/None G1/S1	Endemic to Los Angeles Basin south coastal streams. Habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.	No Potential	No suitable stream habitat occurs on the project site.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Gasterosteus aculeatus williamsoni unarmored threespine stickleback	FE/SE G5T1/S1 FP	Weedy pools, backwaters, and among emergent vegetation at the stream edge in small Southern California streams. Cool (<24 C), clear water with abundant vegetation.	No Potential	No suitable stream habitat occurs on the project site.
Amphibians				
Anaxyrus californicus arroyo toad	FE/None G2G3/S2S3 SSC	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc. Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range.	No Potential	No suitable washes or streams occur on the project site.
Rana draytonii California red-legged frog	FT/None G2G3/S2S3 SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	No Potential	No suitable deep-water habitat occurs on or near the project site.
Rana muscosa southern mountain yellow-legged frog	FE/SE G1/S1 WL	Disjunct populations known from southern Sierras (northern DPS) and San Gabriel, San Bernardino, and San Jacinto Mtns (southern DPS). Found at 1,000 to 12,000 ft in lakes and creeks that stem from springs and snowmelt. May overwinter under frozen lakes. Often encountered within a few feet of water. Tadpoles may require 2 - 4 yrs to complete their aquatic development.	No Potential	No suitable lakes or creeks occur on or near the project site.
Reptiles				
Anniella pulchra Northern California legless lizard	None/None G3/S3 SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.	No Potential	No suitable sandy soils with high moisture content occur on the project site.
Anniella spp. California legless lizard	None/None G3G4/S3S4 SSC	Contra Costa County south to San Diego, within a variety of open habitats.This element represents California records of Anniella not yet assigned to new species within the Anniella pulchra complex. Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	No Potential	No suitable sandy soils with high moisture content occur on the project site.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Arizona elegans occidentalis California glossy snake	None/None G5T2/S2 SSC	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	Moderate Potential	The project site contains suitable desert scrub habitat with sandy soils; however, it is frequently disturbed.
Emys marmorata western pond turtle	None/None G3G4/S3 SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	No Potential	No suitable ponds or other wetland habitat occur on the project site.
Gopherus agassizii desert tortoise	FT/ST G3/S2S3	Most common in desert scrub, desert wash, and Joshua tree habitats; occurs in almost every desert habitat. Require friable soil for burrow and nest construction. Creosote bush habitat with large annual wildflower blooms preferred.	No Potential	The project site contains suitable desert scrub habitat; however, the site is disturbed by trash dumping and OHV use. No tortoises have been seen in the vicinity in the last 30 years.
Phrynosoma blainvillii coast horned lizard	None/None G3G4/S3S4 SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Moderate Potential	The project site provides suitable sandy soils with open scrub habitat; however, occurrences of this species in the area are from more than 10 years ago.
Thamnophis hammondii two-striped gartersnake	None/None G4/S3S4 SSC	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	No Potential	No suitable freshwater habitats occur on the project site.
Birds				
Accipiter cooperii Cooper's hawk	None/None G5/S4 WL	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	No Potential	No suitable riparian habitat or nesting trees occur on the project site.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Agelaius tricolor tricolored blackbird	None/ST G1G2/S1S2 SSC	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	No Potential	No suitable open water occurs on the project site.
Aimophila ruficeps canescens southern California rufous-crowned sparrow	None/None G5T3/S3 WL	Resident in Southern California coastal sage scrub and sparse mixed chaparral. Frequents relatively steep, often rocky hillsides with grass and forb patches.	No Potential	No suitable chaparral or coastal sage scrub occurs on the project site.
Aquila chrysaetos golden eagle	None/None G5/S3 FP WL	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	Low Potential	The project site provides suitable foraging habitat; however, it does not contain suitable cliffs for nesting.
Artemisiospiza belli belli Bell's sage sparrow	None/None G5T2T3/S3 WL	Nests in chaparral dominated by fairly dense stands of chamise. Found in coastal sage scrub in south of range. Nest located on the ground beneath a shrub or in a shrub 6-18 inches above ground. Territories about 50 yds apart.	No Potential	No suitable chaparral or coastal sage scrub occurs on the project site.
Athene cunicularia burrowing owl	None/None G4/S3 SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Moderate potential	The project site contains suitable desert scrub habitat with California ground squirrel burrows; however, it is frequently disturbed. This species was documented approximately 1.5 miles from the project site in 2006.
Buteo regalis ferruginous hawk	None/None G4/S3S4 WL	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	Low Potential	The project site provides suitable foraging habitat; however, it does not contain suitable trees for nesting.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Buteo swainsoni Swainson's hawk	None/ST G5/S3	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	No Potential	No suitable grasslands or agricultural areas occur on the project site and the project site does not contain suitable trees for nesting.
Charadrius montanus mountain plover	None/None G3/S2S3 SSC	Short grasslands, freshly plowed fields, newly sprouting grain fields, and sometimes sod farms. Short vegetation, bare ground, and flat topography. Prefers grazed areas and areas with burrowing rodents.	No Potential	No suitable grassland habitats occur on the project site.
Falco columbarius merlin	None/None G5/S3S4 WL	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands and deserts, farms and ranches. Clumps of trees or windbreaks are required for roosting in open country.	No Potential	No suitable habitats occur on the project site and the project site does not contain suitable trees for nesting.
Falco mexicanus prairie falcon	None/None G5/S4 WL	Inhabits dry, open terrain, either level or hilly. Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.	Low Potential	The project site provides a suitable foraging habitat for this species; however, it does not provide suitable nesting habitat.
Lanius ludovicianus loggerhead shrike	None/None G4/S4 SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	High Potential	The project site, as well as the parcel to the north, provide suitable Joshua tree woodland for this species.
Toxostoma lecontei Le Conte's thrasher	None/None G4/S3 SSC	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats. Commonly nests in a dense, spiny shrub or densely branched cactus in desert wash habitat, usually 2-8 feet above ground.	High Potential	Suitable desert habitat occurs on the project site.
Vireo bellii pusillus least Bell's vireo	FE/SE G5T2/S2	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.	No Potential	No suitable riparian habitat occurs on the project site.

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Mammals				
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Found in a variety of habitats including deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts in crevices of rock outcrops, caves, mine tunnels, buildings, bridges, and hollows of live and dead trees which must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low Potential	Suitable desert habitat does occur on the project site. Joshua trees on site would provide suitable roosting habitat; however, the site is frequently disturbed.
Chaetodipus fallax pallidus pallid San Diego pocket mouse	None/None G5T3T4/S3 S4 SSC	Occurs in desert and arid coastal border areas in eastern San Diego, Riverside, and San Bernardino Counties. Habitats include desert wash, desert scrub, desert succulent scrub, and pinyon-juniper. Prefers sandy soils, usually with rocks or coarse gravel.	No Potential	The project site is outside of the known range of this species.
Corynorhinus townsendii Townsend's big-eared bat	None/None G4/S2 SSC	Occurs throughout California in a wide variety of habitats. Most common in mesic sites, typically coniferous or deciduous forests. Roosts in the open, hanging from walls & ceilings in caves, lava tubes, bridges, and buildings. This species is extremely sensitive to human disturbance.	No Potential	No suitable forests or roosting substrates occur on the project site.
Xerospermophilus mohavensis Mohave ground squirrel	None/ST G2G3/S2S3	Open desert scrub, alkali scrub and Joshua tree woodland. Also feeds in annual grasslands. Restricted to Mojave Desert. Prefers sandy to gravelly soils, avoids rocky areas. Uses burrows at base of shrubs for cover. Nests are in burrows.	No Potential	Trapping was conducted in 2022 and no Mohave ground squirrels were detected. All records of this species within the area are more than 20 years old.
Sensitive Natural Communities				
Mojave Riparian Forest	None/None G1/S1.1		Not present	
Southern California Threespine Stickleback Stream	None/None GNR/SNR		Not present	
Southern Cottonwood Willow Riparian Forest	None/None G3/S3.2		Not present	
Southern Riparian Scrub	None/None G3/S3.2		Not present	

Scientific Name Common Name	Status	Habitat Requirements	Potential to Occur in Project Area	Habitat Suitability/ Observations
Southern Sycamore Alder Riparian Woodland	None/None G4/S4		Not present	

Regional Vicinity refers to within a 9-quad search of site.

Status (Federal/State)

FE = Federal Endangered
FT = Federal Threatened
FPE = Federal Proposed Endangered
FPT = Federal Proposed Threatened
FD = Federal Delisted
FC = Federal Candidate
SE = State Endangered
ST = State Threatened
SCE = State Candidate Endangered
SCT = State Candidate Threatened
SR = State Rare
SD = State Delisted
SSC = CDFW Species of Special Concern
FP = CDFW Fully Protected
WL = CDFW Watch List

CRPR (CNPS California Rare Plant Rank)

1A = Presumed extirpated in California, and rare or extinct elsewhere
1B = Rare, Threatened, or Endangered in California and elsewhere
2A = Presumed extirpated in California, but common elsewhere
2B= Rare, Threatened, or Endangered in California, but more common elsewhere
3 = Need more information (Review List)
4 = Limited Distribution (Watch List)

CRPR Threat Code Extension

.1 = Seriously endangered in California (>80% of occurrences threatened/high degree and immediacy of threat)
.2 = Moderately threatened in California (20-80% of occurrences threatened/moderate degree and immediacy of threat)
.3 = Not very endangered in California (<20% of occurrences threatened/low degree and immediacy of threat)

Other Statuses

G1 or S1 Critically Imperiled Globally or Subnationally (state)
G2 or S2 Imperiled Globally or Subnationally (state)
G3 or S3 Vulnerable to extirpation or extinction Globally or Subnationally (state)
G4/5 or S4/5 Apparently secure, common and abundant
GH or SH Possibly Extirpated – missing; known from only historical occurrences but still some hope of rediscovery

Additional notations may be provided as follows

T – Intraspecific Taxon (subspecies, varieties, and other designations below the level of species)
Q – Questionable taxonomy that may reduce conservation priority
? – Inexact numeric rank

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Appendix C

Site Photographs

Photograph 1. Southwest corner of project site, facing northeast. September 21, 2022.

Photograph 2. Southeast corner of project site, facing northwest. September 21, 2022.

Photograph 3. Northeast corner of project site, facing southwest. September 21, 2022.

Photograph 4. Northwest corner of project site, facing southeast. September 21, 2022.

Photograph 5. Example of trash dumps throughout the project site. September 21, 2022.

Photograph 6. Example of vehicle tracks present throughout the project site. September 21, 2022.

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Appendix D

Western Joshua Tree Survey Data

Object ID*	Height (meters)	Type	Age Class	Number of Branches	Phenophase	Notes
1	1 - 5	Single Tree	mature	0	veg	1 basal sprout.
2	< 1	Clonal	young	0	veg	part of close spaced stand
3	< 1	Clonal	young	0	veg	<Null>
4	1 - 5	Clonal	mature	1	veg	<Null>
5	1 - 5	Clonal	mature	2	veg	<Null>
6	1 - 5	Clonal	mature	1	veg	tree is center of clonal group with 4 basal sprouts. in poor shape with two dead branches and one short live branch
7	1 - 5	Clonal	mature	0	veg	<Null>
8	< 1	Clonal	young	0	<Null>	<Null>
9	1 - 5	Clonal	mature	0	<Null>	<Null>
10	1 - 5	Clonal	mature	3	veg	<Null>
11	1 - 5	Clonal	mature	2	veg	<Null>
12	1 - 5	Clonal	mature	2	<Null>	<Null>
13	1 - 5	Clonal	mature	2	veg	<Null>
14	< 1	Clonal	young	0	veg	<Null>
15	1 - 5	Single Tree	mature	5	veg	<Null>
16	1 - 5	Single Tree	mature	9	<Null>	<Null>
17	> 5	Single Tree	mature	20	veg	two trunks each with dbh approximately 15 inches
18	1 - 5	Single Tree	juvenile	5	veg	3 basal sprouts included I. branch count
19	1 - 5	Single Tree	mature	4	veg	<Null>
20	1 - 5	Single Tree	mature	3	veg	<Null>
21	1 - 5	Clonal	mature	12	veg	4 trunks
22	1 - 5	Single Tree	mature	2	<Null>	<Null>
23	1 - 5	Single Tree	mature	6	<Null>	<Null>
24	1 - 5	Clonal	mature	0	veg	<Null>
25	< 1	Clonal	young	0	veg	<Null>
26	< 1	Clonal	young	2	veg	one basal sprout
27	1 - 5	Single Tree	mature	5	veg	two trunks with several small basal sprouts
28	1 - 5	Single Tree	mature	7	veg	two trunks arising from an older fallen tree
29	1 - 5	Single Tree	mature	0	veg	<Null>
30	1 - 5	Single Tree	mature	2	veg	three trunks.
31	1 - 5	Single Tree	mature	3	veg	4 trunks.
32	1 - 5	Clonal	mature	2	veg	7 basal sprouts
33	1 - 5	Single Tree	mature	7	veg	3 trunks
34	1 - 5	<Null>	<Null>	<Null>	<Null>	dead
35	1 - 5	Single Tree	mature	6	veg	two trunks

Object ID*	Height (meters)	Type	Age Class	Number of Branches	Phenophase	Notes
36	1 - 5	Single Tree	young	0	veg	two trunks less than 2m
37	< 1	Clonal	young	<Null>	<Null>	6 sprouts within 2 meter area
38	1 - 5	Clonal	mature	2	veg	3 sprouts within two meter area
39	1 - 5	Single Tree	mature	8	<Null>	5 live trunks 1 dead trunk
40	1 - 5	Single Tree	mature	6	veg	4 trunks
41	> 5	Clonal	mature	5	veg	two trunks. one with dbh 15 inch another 3 inch dbh. 5 sprouts within 2 meter area
42	1 - 5	Clonal	young	0	veg	two trees approximately 1.5 meter and a small sprout within 2 meter area
43	1 - 5	Single Tree	mature	3	veg	4 trunks
44	1 - 5	Single Tree	mature	2	veg	2 live trunks 1 dead trunk.
45	1 - 5	<Null>	<Null>	<Null>	<Null>	dead
46	1 - 5	Single Tree	young	0	veg	two trunks
47	< 1	Clonal	young	0	veg	two small trees from fallen canopy of a mostly dead larger tree
48	1 - 5	Clonal	mature	11	veg	3 trunks.
49	1 - 5	Clonal	mature	2	veg	3 trunks on main tree with 5 sprouts within 2 meter area
50	1 - 5	Clonal	young	0	veg	one sprout within 1 meter
51	1 - 5	Single Tree	mature	6	veg	3 trunks. 4 sprouts near base of tree.
52	1 - 5	Single Tree	mature	3	veg	3 trunks
53	1 - 5	Single Tree	mature	5	veg	3 trunks.
54	1 - 5	Single Tree	mature	4	veg	6 small trunks and one large
55	1 - 5	Single Tree	young	0	veg	4 trunks.
56	1 - 5	Single Tree	mature	4	veg	1 large trunk and 3 smaller trunks.
57	1 - 5	Single Tree	mature	2	veg	<Null>
58	1 - 5	Clonal	young	0	veg	6 young trees
59	1 - 5	Single Tree	mature	2	veg	<Null>
60	1 - 5	Single Tree	mature	4	veg	<Null>
61	1 - 5	Clonal	young	0	veg	1 tree 1.5 meter high with 4 small sprouts within 2 meters
62	1 - 5	Single Tree	young	0	veg	3 trunks.
63	1 - 5	Single Tree	mature	4	veg	<Null>
64	1 - 5	Single Tree	mature	3	veg	1 trunk sprout
65	1 - 5	Single Tree	young	0	veg	2 trunks
66	1 - 5	Single Tree	mature	3	veg	3 trunks
67	1 - 5	Single Tree	mature	3	<Null>	<Null>
68	1 - 5	Single Tree	mature	4	veg	5 trunks.
69	1 - 5	Single Tree	young	2	veg	two trunks.
70	1 - 5	Single Tree	mature	2	veg	<Null>

Object ID*	Height (meters)	Type	Age Class	Number of Branches	Phenophase	Notes
71	1 - 5	Single Tree	mature	6	veg	<Null>
72	1 - 5	Single Tree	mature	2	veg	3 sprouts at base
73	1 - 5	Single Tree	young	0	veg	two trunks from base of older dead trunk.
74	1 - 5	Single Tree	young	2	veg	two trunks and 2 basal sprouts
75	1 - 5	Single Tree	young	2	veg	two trunks from base of old dead tree
76	1 - 5	Clonal	mature	4	veg	3 sprouts within 1 meter
77	1 - 5	Single Tree	young	0	veg	two trunks 1 sprout
78	< 1	Clonal	young	0	veg	<Null>
79	1 - 5	Single Tree	young	0	veg	<Null>
80	1 - 5	Clonal	young	3	veg	7 trunks.
81	1 - 5	Single Tree	young	0	veg	2 trunks
82	1 - 5	Single Tree	mature	4	veg	3 basal sprouts
83	1 - 5	Single Tree	mature	4	veg	two trunks two basal sprouts
84	1 - 5	Single Tree	mature	3	veg	<Null>
85	< 1	Single Tree	young	0	veg	<Null>
86	1 - 5	Single Tree	young	0	veg	<Null>
87	1 - 5	Clonal	young	2	veg	3 trunks
88	1 - 5	Single Tree	mature	4	veg	<Null>
89	< 1	Single Tree	young	0	veg	3 trunks
90	1 - 5	Single Tree	mature	4	veg	<Null>
91	1 - 5	Single Tree	mature	3	v	2 trunks
92	1 - 5	Single Tree	mature	5	v	<Null>
93	1 - 5	Single Tree	young	0	v	2 trunks and 2 basal sprouts
94	1 - 5	Single Tree	mature	3	v	<Null>
95	1 - 5	Single Tree	young	0	v	2 trunks
96	1 - 5	Single Tree	young	2	v	from base of old dead tree
97	1 - 5	Single Tree	young	2	v	<Null>
98	1 - 5	Single Tree	mature	4	v	2 trunks
99	1 - 5	Single Tree	mature	0	v	from base of larger dead tree
100	1 - 5	Single Tree	mature	2	v	<Null>
101	1 - 5	Single Tree	mature	4	v	<Null>
102	1 - 5	Single Tree	young	0	v	5 trunks from base of old dead tree
103	< 1	Single Tree	young	0	v	<Null>
104	1 - 5	Single Tree	mature	2	v	2 trunks
105	1-5	Single Tree	young	0	v	from base of old dead tree
106	1-5	Clonal	young	2	v	4 sprouts near base
107	1-5	Single Tree	young	4	v	<Null>
108	1-5	Clonal	young	3	v	sprouts from trunk of fallen tree
109	1-5	Single Tree	young	0	v	two trunks with 4 basal sprouts

Object ID*	Height (meters)	Type	Age Class	Number of Branches	Phenophase	Notes
110	1-5	Single Tree	mature	0	v	3 trunks
111	1-5	Single Tree	mature	2	v	1 basal sprout
112	1-5	Clonal	young	2	v	7 trunks
113	1-5	Single Tree	young	0	v	<Null>
114	<1	Clonal	young	0	v	5 sprouts from fallen tree
115	1-5	Clonal	mature	3	v	2 trunks
116	1-5	Single Tree	mature	4	v	<Null>
117	1-5	Single Tree	young	2	v	<Null>
118	1-5	Clonal	mature	4	v	3 trunks 1 sprout
119	1-5	Single Tree	mature	3	v	<Null>
120	<1	Single Tree	young	0	v	3 sprouts from fallen tree
121	1-5	Single Tree	young	2	v	2 trunks
122	1-5	Single Tree	young	0	v	3 trunks
123	1-5	Single Tree	mature	3	v	<Null>
124	1-5	Single Tree	mature	4	<Null>	<Null>
125	1-5	Single Tree	young	2	v	3 trunks
126	1-5	Single Tree	mature	1	v	3 trunks
127	1-5	Single Tree	mature	3	v	2 trunks and 6 sprouts nearby
128	1-5	Single Tree	young	0	v	2 trunks
129	1-5	Clonal	mature	3	v	3 trunks and 3 small sprouts
130	1-5	Single Tree	young	3	v	sprout within 1 meter
131	1-5	Single Tree	mature	4	v	3 trunks
132	1-5	Single Tree	mature	2	v	4 trunks 2 sprouts
133	1-5	Single Tree	mature	5	v	<Null>
134	1-5	Clonal	young	2	v	12 trunks >1m 4 sprouts
135	1-5	Single Tree	young	2	v	2 trunks
136	1-5	Single Tree	mature	4	v	two branches leaning over on ground
137	1-5	Single Tree	mature	5	v	5 trunks
138	<Null>	<Null>	<Null>	<Null>	<Null>	dead
139	1-5	Single Tree	mature	4	v	2 trunks
140	1-5	Single Tree	mature	3	v	<Null>
141	1-5	Single Tree	mature	3	v	<Null>
142	1-5	Single Tree	young	1	v	<Null>
143	1-5	Clonal	young	2	v	3 trunks and 4 sprouts <1m
144	1-5	Single Tree	young	0	v	2 trunks
145	1-5	Single Tree	young	0	v	<Null>
146	1-5	Single Tree	young	0	v	<Null>
147	1-5	Single Tree	mature	3	v	<Null>
148	1-5	Single Tree	young	1	v	<Null>
149	1-5	Single Tree	mature	4	v	4 trunks

Object ID*	Height (meters)	Type	Age Class	Number of Branches	Phenophase	Notes
150	1-5	Single Tree	mature	5	v	<Null>
151	1-5	Clonal	mature	5	v	3 trunks
152	1-5	Single Tree	young	0	v	4 trunks
153	1-5	Single Tree	young	2	v	4 trunks
154	1-5	Single Tree	mature	3	v	4 trunks
155	1-5	Clonal	young	2	v	3 sprouts nearby
156	1-5	Single Tree	young	0	v	<Null>
157	1-5	Single Tree	mature	3	v	2 trunks 2 sprouts
159	1-5	Single Tree	mature	2	v	<Null>
160	1-5	Single Tree	mature	8	v	3 trunks
161	1-5	Single Tree	mature	8	v	<Null>
162	1-5	Single Tree	mature	5	v	3 trunks
163	1-5	Single Tree	mature	4	v	3 trunks 1 sprout
164	1-5	Single Tree	mature	3	v	<Null>
165	1-5	Single Tree	mature	6	v	2 trunks
166	1-5	Single Tree	young	0	v	4 trunks
167	1-5	Single Tree	young	0	<Null>	<Null>
168	1-5	Single Tree	young	0	v	<Null>
169	1-5	Clonal	young	0	v	6 trunks
170	1-5	Single Tree	mature	5	v	2 trunks
171	1-5	Clonal	young	0	v	3 trunks
172	1-5	Single Tree	young	0	v	<Null>
173	1-5	Single Tree	mature	2	v	<Null>
174	1-5	Single Tree	mature	3	v	<Null>
175	1-5	Clonal	mature	10	v	7 trunks with one long one leaning over with canopy on ground
176	1-5	Single Tree	mature	2	v	<Null>
177	<Null>	<Null>	<Null>	<Null>	<Null>	dead
178	1-5	Single Tree	mature	4	v	2 trunks
179	<1	Single Tree	young	0	v	<Null>
180	1-5	Single Tree	mature	5	v	<Null>
181	<1	Single Tree	young	0	v	<Null>
182	1-5	Single Tree	young	0	v	<Null>
183	1-5	Single Tree	mature	3	v	<Null>
184	1-5	Single Tree	mature	5	v	5 sprouts at bas3
185	1-5	Single Tree	mature	4	v	<Null>
186	1-5	Clonal	mature	6	v	2 trees and 5 sprouts
187	<Null>	<Null>	<Null>	<Null>	<Null>	dead

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Appendix E

Protocol Mohave Ground Squirrel Trapping Results

Rincon Consultants, Inc.

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Los Angeles, California 90012

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July 19, 2022
Project No: 21-11645

Maison's Palmdale Boulevard 150, LLC
2007 Cedar Avenue
Manhattan Beach, California 90266
Contact: Kevin Harbison
Via email: Kevin@ravelloholdings.com

Subject: Protocol Mohave Ground Squirrel Trapping Results for TTM 83359, Palmdale, Los Angeles County, California

Dear Mr. Harbison:

Rincon Consultants, Inc. (Rincon) is pleased to present the findings of a focused Mohave ground squirrel (MGS, *Xerospermophilus mohavensis*) live-trapping effort conducted on behalf of Maison's Palmdale Blvd. 150, LLC for the TTM 83359 Project (project). Rincon completed three sessions of trapping to determine presence/absence of the state listed Mohave ground squirrel. Trapping for the project was completed concurrently with the TTM 73068 Project; therefore, the trapping grid spans across both project sites. The results and methods relevant to the TTM 73068 Project were submitted in a separate report and all results presented herein are relevant only to the TTM 83359 Project. Protocol surveys for MGS were required under the Streambed Alteration Agreement (EPIMS-LAN-23730-R5) Measure 2.14.

Project Location and Description

The project site is located in the eastern portion of Los Angeles County, within the city of Palmdale, California (Attachment A: Figure 1). The approximate center of the trapping grid occurred at 11S 404960m E/3826752m N (UTM coordinate system) and the corner points are as follows:

- Northwest 0404801 m E/3826820 m N (labeled A1 in Attachment A: Figure 1)
- Northeast 0405119 m E/3826823 m N (labeled A10 in Attachment A: Figure 1)
- Southwest 0404801 m E/3826681 m N (labeled E1 in Attachment A: Figure 1)
- Southeast 0405120 m E/3826685 m N (labeled E10 in Attachment A:Figure 1)

The trapping grid covered both the project and the TTM 73068 Project.

The proposed project includes the development of 171 units of new affordable single-family housing units. Development of the project will occur under approved TTM 83359. The initial study and supporting technical studies will be prepared and submitted to the City of Palmdale Planning Commission for approval prior to development.

Mohave Ground Squirrel Characteristics and Distribution

The MGS is listed as threatened under the California Endangered Species Act. This species has been found in all major desert scrub habitats within the western Mojave Desert in California (Laabs 2006). MGS have been found between Palmdale and Victorville to the south, Owens Lake to the north, eastern escarpment of the Sierra Nevada Mountain range to the west, and to the Mojave River Valley to the east (Leitner 2008).

The MGS is a medium-sized ground squirrel averaging approximately nine inches from nose to tail and displays only slight size differences between sexes (Laabs 2006). The dorsal surface is light gray or brown with a cream-colored ventral surface (Best 1995). The MGS is easily distinguishable from the white-tailed antelope squirrel (*Ammospermophilus leucurus*) which has a white dorsal-lateral stripe along each side. The MGS emerge from aestivation in spring, typically between mid-February and March, when they actively forage for vegetation, seeds, arthropods, and fruit. MGS tend to stay close to its burrow while foraging (Best 1995). Burrows are used for aestivation and hibernation, predator avoidance, and thermoregulation. The breeding season occurs soon after emergence, and gestation lasts approximately 30 days (Best 1995). After acquiring fat stores, the MGS typically enters aestivation in July or August.

Habitat conversion due to agricultural development, suburban and urban land development, energy development, and military base development and operations has contributed to a decline in the abundance of the MGS (Laabs 2006). In addition, the species could be impacted where development occurs near the species habitat. Domestic cat (*Felis catus*) and dog (*Canis familiaris*) could be introduced predators and the use of pesticides or rodenticides may directly affect the species (Desert Managers Mohave Ground Squirrel Work Group 2011). In addition to introduced predators, endemic avian and terrestrial predators of the MGS include the Mohave green rattlesnake (*Crotalus scutulatus*), desert kit fox (*Vulpes macrotis arsipus*), coyote (*Canis latrans*), American badger (*Taxidea taxis*), bobcat (*Lynx rufus*), prairie falcon (*Falco mexicanus*), golden eagle (*Aquila chrysaetos*), and red-tailed hawk (*Buteo jamaicensis*) (Best 1995).

Methodology

The trapping surveys followed the guidelines described in the *Mohave Ground Squirrel Survey Guidelines* (California Department of Fish and Game [CDFG] 2010). Trapping was conducted by Memorandum of Understanding (MOU) holder Amy Leigh Trost. Three trapping sessions were conducted, the first from March 28 to April 1, 2022, the second from May 12 to May 16, 2022, and the third from June 15 to June 19, 2022. Sherman live traps measuring 3 inches wide, 3.75 inches tall, and 12 inches long were used. Traps were placed in six-inch cardboard box shades assuring air movement around the traps. Traps were spaced approximately 35 meters apart and the five trapping grid lines were oriented on an east-west axis with 10 traps on each line (totaling 50 traps across the two projects) (Attachment A: Figure 1). Each trap was labeled with a unique identifier (ID). Traps were opened within one hour of sunrise and baited with bait containing sunflower-free birdseed, rolled oats and peanut butter powder or sweet feed as suggested by the *Mohave Ground Squirrel Survey Guidelines*. Traps were checked every four hours or sooner and were closed beginning one hour before sunset or when temperatures reached 90 degrees Fahrenheit (^{o}F) in the shade measured one foot above ground. Weather conditions and start/stop times for each trap check were recorded. The Survey and Trapping Form found within the *Mohave Ground Squirrel Guidelines* (CDFG 2010) was completed.

The trap ID and species were recorded for each animal at first capture. Each animal was marked with a non-toxic marker to denote recapture. All animals were released unharmed at the trap site immediately following processing. In the event an MGS would be captured additional information was recorded including the weight, sex, age, health and reproductive status and a scat sample was taken.

Summary of Findings

The trapping grid is located within *Yucca brevifolia* Woodland Alliance (Joshua tree woodland). This community generally occurs in alluvial fans, ridges, gentle to moderate slopes. Canopy, shrub layer, and herbaceous layer is open to intermittent with perennial grasses and seasonal annuals. The trapping grid was dominated by Joshua tree, with occurrences of winterfat (*Krascheninnikovia lanata*), Nevada Mormon tea (*Ephedra nevadensis*), common fiddleneck (*Amsinckia intermedia*), fourwing saltbush (*Atriplex canescens*), downy brome (*Bromus tectorum*), annual bursage (*Ambrosia acanthicarpa*), California buckwheat (*Eriogonum fasciculatum*), angled stem buckwheat (*Eriogonum angulosum*), telegraph weed (*Heterotheca grandiflora*), Acton brittlebush (*Encelia actonii*), westerm tansymustard (*Descurainia pinnata*), creosote bush (*Larrea tridentata*), jimsonweed (*Datura wrightii*), Russian thistle (*Salsola tragus*), California croton (*Croton californicus*), chia (*Salvia columbariae*), Cooper's box thorn (*Lycium cooperi*), Indian rice grass (*Stipa hymenoides*), silver cholla (*Cylindropuntia echinocarpa*), cotton thorn (*Tetradymia comosa*), and sticky snakeweed (*Gutierrezia microcephala*). Vegetation classification was based on the classification systems provided in *A Manual of California Vegetation, Second Edition* (MCV) (Sawyer et al. 2009).

The topography of the trapping grid is relatively flat. Active burrows and sign of California ground squirrel species (*Otospermophilus beecheyi*) and kangaroo rat (*Dipodomys* sp.) were observed within the grid. Disturbance in the form of off-highway vehicle tracks and trash was observed throughout the site. Photographs are presented in Attachment B.

Dates of and conditions during each trapping session are detailed in Table 1, Table 2, and Table 3. Tables 1, 2, and 3 also summarize number of trap checks per day, times traps were opened to the time traps were closed and average weather conditions. High temperatures occurred for most of the May and June sessions resulting trap closures early in the day with less than two trap checks.

Table 1 March 28 – April 1 Session - Timing and Conditions

Trapping Date	Time Traps Open	No. of Trap Checks	Traps Closed	Begin Temp (F)	End Temp (F)	Windspeed (mph)	Precipitation
3/28/2022	0635	3	1900	52	58	0-10	No
3/29/2022	0830	3	1858	50	60	0-10	No
3/30/2022	0810	3	1900	52	64	0-5	No
3/31/2022	0725	3	1850	50	64	0-8	No
4/1/2022	0815	3	1845	50	78	0-5	No

Table 2 May 12 – May 16 Session - Timing and Conditions

Trapping Date	Time Traps Open	No. of Trap Checks	Traps Closed	Begin Temp (F)	End Temp (F)	Windspeed (mph)	Precipitation
5/12/2022	0730	3	2000	50	64	0-8	No
5/13/2022	0620	2	1490	50	88	0-3	No
5/14/2022	0558	2	1207	52	90	0-2	No
5/15/2022	0554	2	1138	63	90	0-6	No
5/16/2022	0546	2	1215	64	90	0-10	No

Table 3 June 15 – June 19 Session - Timing and Conditions

Trapping Date	Time Traps Open	No. of Trap Checks	Traps Closed	Begin Temp (F)	End Temp (F)	Windspeed (mph)	Precipitation
6/15/2022	0535	2	1130	62	90	0-7	No
6/16/2022	0540	1	1000	69	90	0-3	No
6/17/2022	0535	2	1327	60	89	0-16	No
6/18/2022	0540	4	2000	69	54	0-18	No
6/19/2022	0545	2	1310	53	90	0-8	No

A total of 4 white-tailed antelope squirrels and 268 California ground squirrels were captured over the three trapping sessions. Both juvenile and adult life stages were captured of both species and all individuals were in good health. No MGS individuals were captured or observed within the trapping grid. In addition, one white-crowned sparrow (*Zonotrichia leucophrys*) and two desert spiny lizards (*Sceloporus magister*) were incidentally captured and released.

Other species observed within the trapping grid moving though the site included, southern desert horned lizard (*Phrynosoma platyrhinos calidiarum),* Great Basin whiptail (*Aspidoscelis tigris tigris)*, desert cottontail (*Sylvilagus audubonii*), common raven (*Corvus corax),* western bluebird (*Sialia mexicana*), northern mockingbird (*Mimus polyglottos*), and mourning dove (*Zenaida macroura*).

Conclusions

No MGS individuals were observed or captured during the protocol trapping event within the project site. A total of 4 white-tailed antelope squirrels, including recaptures, and 269 California ground squirrels were captured and released. Therefore, as outlined in the *Mohave Ground Squirrel Survey Guidelines* (2003), the project site harbors no MGS. The results of this survey will expire on June 19, 2023.

Thank you for the opportunity to support with this project. Please do not hesitate to call with any questions.

Sincerely,
Rincon Consultants, Inc.

Amy Leigh Trost
Biologist

Christopher Julian
Principal/Senior Regulatory Specialist

Attachments

Attachment A Figures

Attachment B Representative Photographs

References

Best, T. L. 1995. *Spermophilus mohavensis*. Mammalian Species 509:1-7.

California Department of Fish and Game. 2003 (revised 2010). *Mohave ground squirrel survey guidelines*. Sacramento, California. 5 pp.

MGSWG (Desert Managers Mohave Ground Squirrel Work Group). 2011. Draft Mohave Ground Squirrel Conservation Strategy. Accessed March 2, 2011. http://www.dmg.gov/documents/DFT_MGS_Consv_Strategy_DMG_082906.pdf

Laabs, D. 2006. *"Mohave ground squirrel." West Mojave Plan Species Accounts*. U.S. Department of the Interior, Bureau of Land Management. January 2006. Accessed June 2, 2014. http://www.blm.gov/ca/pdfs/cdd_pdfs/Mgs1.pdf.

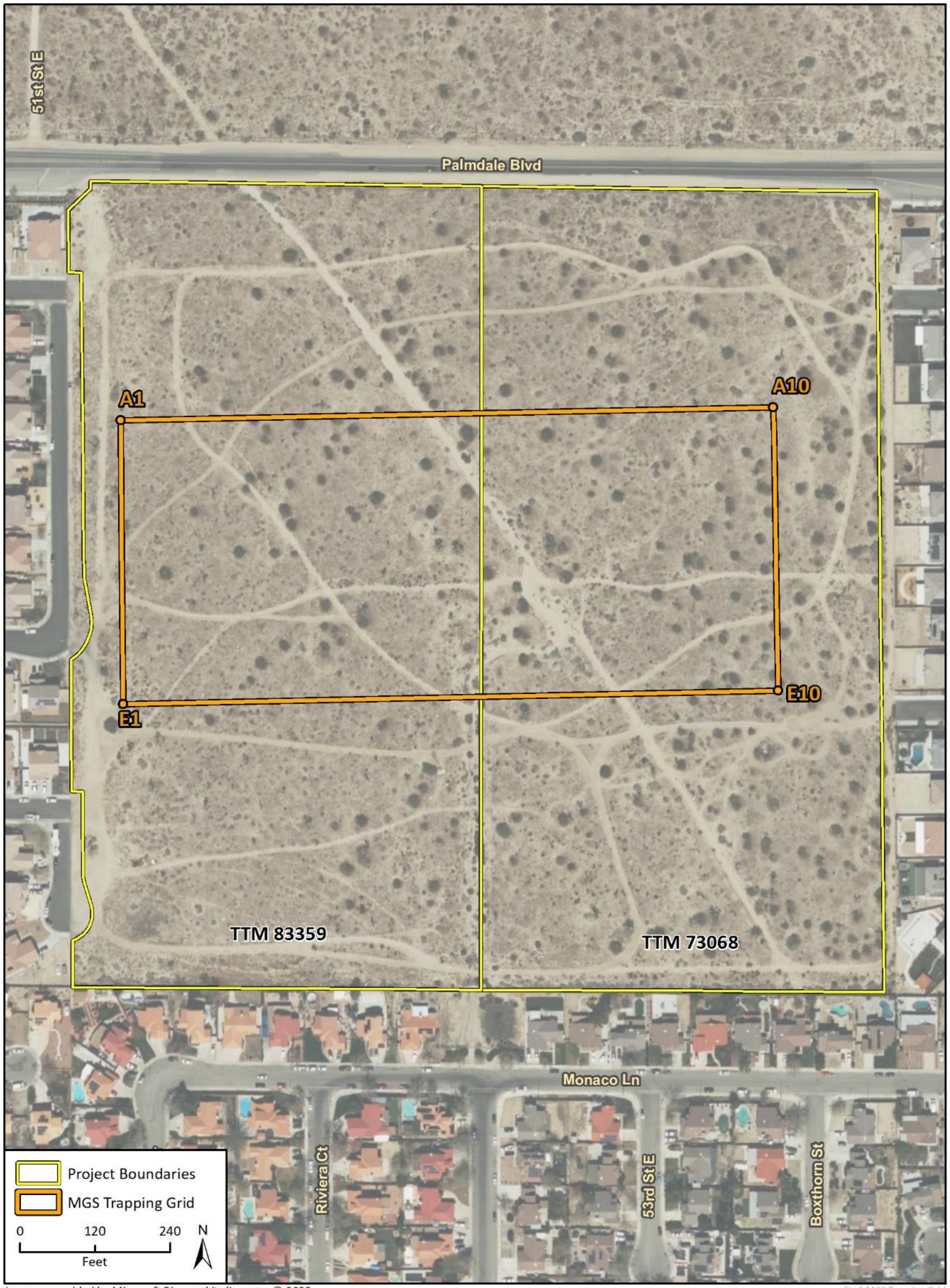
Leitner, P. 2008. *Current Status of the Mohave Ground Squirrel*. California State University-Stanislaus, Endangered Species Recovery Program, Fresno.

Sawyer, J. O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition (MCV2). California Native Plant Society, Sacramento, California.

Attachment 1

Figures

Figure 1 Project Trapping Location



Imagery provided by Microsoft Bing and its licensors © 2022.

Attachment 2

Representative Photographs

Photograph 1. Trapping grid facing southeast at trap A1.

Photograph 2. Trapping grid facing southwest at trap A10.

Photograph 3. Trapping grid facing northeast at trap E1.

Photograph 4. Trapping grid facing northwest at trap E10.

Photograph 5. Trap station setup under burrobush.

Appendix C1

Cultural Resources Study

CULTURAL RESOURCES STUDY FOR THE TTM 83359 PROJECT

CITY OF PALMDALE
LOS ANGELES COUNTY, CALIFORNIA

APN 3023-002-184

Lead Agency:

City of Palmdale
38300 Sierra Highway
Palmdale, California 93550

Preparer:

BFSA Environmental Services,
a Perennial Company
14010 Poway Road, Suite A
Poway, California 92064

Signature

Project Proponent:

Ravello Holdings, Inc.
211 Village Commons Boulevard, Suite 11
Camarillo, California 93012

November 11, 2022

BFSA Environmental Services
A Perennial Company

Archaeological Database Information

Authors:	Andrew J. Garrison, M.A. and Brian F. Smith, M.A.
Consulting Firm:	BFSA Environmental Services, a Perennial Company 14010 Poway Road, Suite A Poway, California 92064 (858) 484-0915
Client/Project Proponent:	Ravello Holdings, Inc. 211 Village Commons Boulevard, Suite 11 Camarillo, California 93012
Report Date:	November 11, 2022
Report Title:	Cultural Resources Study for the TTM 83359 Project, Palmdale, California (APNs 3023-002-184)
Type of Study:	Phase I Cultural Resources Study
New Site(s):	Temp-1 (historic trash scatter)
Updated Site(s):	None
USGS Quadrangle:	Section 27, Township 6 North, Range 11 West, of the San Bernardino Baseline and Meridian on the *Palmdale, California* (7.5-minute) topographic quadrangle
Acreage:	20 acres (gross)
Key Words:	Archaeological survey; historic trash scatter (Temp-1); not eligible for the CRHR; no impacts to historical resources as defined by CEQA; monitoring of grading recommended.

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MANAGEMENT SUMMARY/ABSTRACT

In response to a request from the project applicant, a cultural resources study was conducted by BFSA Environmental Services, a Perennial Company (BFSA) for the proposed Tentative Tract Map (TTM) 83359 Project located southeast of the intersection of East Palmdale Boulevard and 51st Street in the city of Palmdale, Los Angeles County, California. The project includes Assessor's Parcel Number (APN) 3023-002-184. On the United States Geological Survey (USGS) (7.5-minute), 1:24,000-scale *Palmdale, California* topographic quadrangle map, the project is situated within Section 27, Township 6 North, Range 11 West, of the San Bernardino Baseline and Meridian. As designed, the applicant proposes to subdivide the property for the development of 64 single family residential lots along with associated infrastructure.

The purpose of this investigation was to locate and record any cultural resources present within the project and subsequently evaluate any resources as part of the City of Palmdale's environmental review process conducted in compliance with the California Environmental Quality Act (CEQA) criteria. The cultural resources investigation included the review of an archaeological records search requested from the South Central Coastal Information Center (SCCIC) at California State University, Fullerton (CSU Fullerton) in order to assess previous archaeological studies and identify any previously recorded archaeological sites within the project. The search identified eight previously recorded resources within one mile of the project, none of which are recorded within the project. The records search also identified 29 previous studies conducted within one mile of the project, two of which include the subject property (Norwood 1989; ERCE 1991). Both previous reports include the study of approximately 2,500 acres conducted in support of the City of Palmdale's Eastside General Plan Amendment (GPA90-15). Norwood (1989) initially noted three trash scatters within the current project; however, the scatters were not formally recorded, and only cursory information was compiled. Based upon Norwood's assessment, these trash scatters were associated with period between the late 1940s and 1960s. The ERCE (1991) study consists of the Draft Environmental Impact Report (DEIR) for the General Plan Amendment. A Sacred Lands File (SLF) search was also requested from the Native American Heritage Commission (NAHC), which was returned with negative results.

During the survey, a 50- by 50-foot historic trash scatter (Temp-1) was identified within the northern third of the project area. It is not clear if Site Temp-1 corresponds with any of the three trash scatters previously noted within the property by Norwood (1989). However, based upon a review of the identified surface scatter, Site Temp-1 represents a single episode of transient refuse disposal which occurred between the late 1930s and 1950s. Based upon the results of the current study, Site Temp-1 is not considered eligible for the California Register of Historical Resources (CRHR) as the scatter does not retain any additional research value given the observable lack of a subsurface component and the limited information the historic artifacts can provide. Further, the integrity of the site has been impacted by recent disturbances to the property.

Although Temp-1 is not considered CRHR-eligible, the property still has potential to yield

additional archaeological resources that may have been obscured or buried by the previous impacts to the property. As a result, it is recommended that an archaeological monitor be present during future ground disturbances associated with the project to observe grading and identify any historic or prehistoric resources that may be exposed by earthwork. A copy of this report will be permanently filed with the SCCIC at CSU Fullerton. All notes, photographs, and other materials related to this project will be curated at the archaeological laboratory of BFSA in Poway, California.

1.0 INTRODUCTION

1.1 Project Description

The cultural resources study program for the TTM 83359 Project was conducted in order to comply with CEQA and City of Palmdale environmental guidelines. The 20-acre (gross) project is located southeast of the intersection of East Palmdale Boulevard and 51st Street in the city of Palmdale, Los Angeles County, California (Figure 1.1–1). On the USGS 7.5-minute, 1:24,000-scale *Palmdale, California* topographic quadrangle map, the project is situated in Section 27, Township 6 North, Range 11 West, of the San Bernardino Baseline and Meridian (Figure 1.1–2). The project includes APN 3023-002-184 which is currently vacant. As designed, the applicant proposes to subdivide the property for the development of 64 single family residential lots along with associated infrastructure (Figure 1.1–3). The decision to request a cultural resources study was based upon the cultural resource sensitivity of the locality as suggested by known site density and predictive modeling. Sensitivity for cultural resources in a given area is usually indicated by known settlement patterns, which in the Mojave Desert and Antelope Valley area of Los Angeles County were focused on freshwater resources, seasonally available plant resources, and migratory faunal species.

1.2 Environmental Setting

The project is situated in Antelope Valley northeast of the Sierra Pelona Mountains. Vegetation in the project area is classified as inland sage scrub habitat. Geologically, the project overlies late Holocene-aged alluvial fan deposits (Lancaster et al. 2012). The alluvial fan deposits are described as unconsolidated silt, sand, gravel, cobbles, and boulders. Holocene to late Pleistocene-aged young alluvial fan deposits are mapped immediately west of the project. Further, the specific soil types found within the property are characterized as cajon loamy fine sand, 0 to 2 percent slopes, hummocky (CcA2) (Web Soil Survey 2022).

The subject property is relatively flat, with elevations along the southern boundary averaging 2,630 feet above mean sea level (AMSL) and an average elevation of 2,640 feet AMSL along the southern boundary. A culvert found within the southeast corner of the property is directs water along the eastern boundary of the property before draining into a northwest-trending wash that cuts along the northeastern corner of the project. The property is located within a transitional area between the Creosote Bush Scrub and the Joshua Tree Woodland biotic communities. Vegetation found within the subject property primarily consists of Mojave Desert plant communities, including creosote bush scrub and Joshua trees. Common animal species found within the project vicinity include rattlesnakes, horned lizards, eagles, red-tailed hawks, antelope, ground squirrels, pack rats, Merriam's kangaroo rats, canyon mice, deer mice, desert night lizards, ladder-back woodpeckers, and orioles.

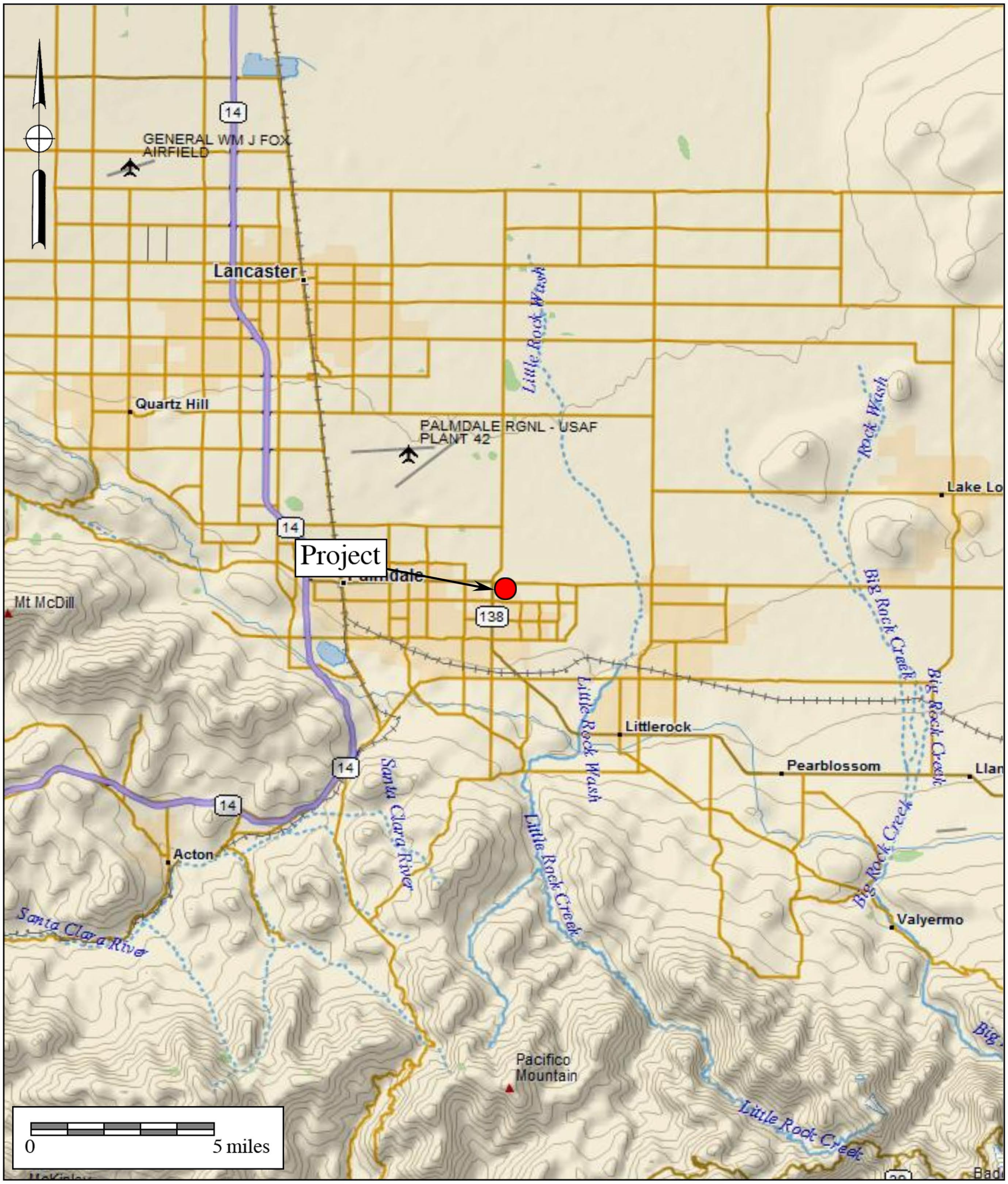

Figure 1.1–1

General Location Map

The TTM 83359 Project

DeLorme World Base Map Service (1:250,000 series)

BFSA Environmental Services
A Perennial Company

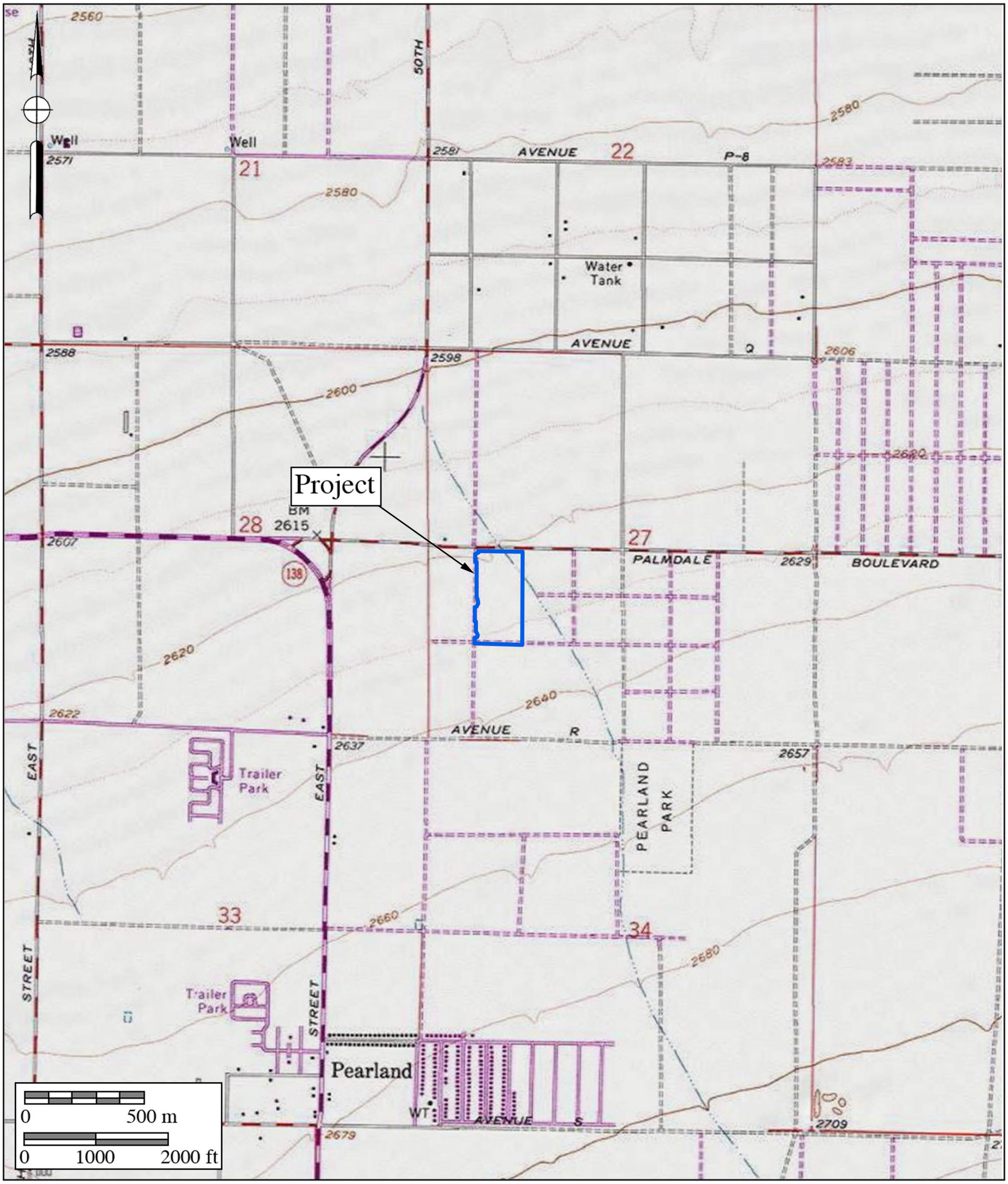

Figure 1.1–2

Project Location Map

The TTM 83359 Project

USGS *Palmdale* Quadrangle (7.5-minute series)

BFSA Environmental Services
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BFSA Environmental Services
A Perennial Company

Figure 1.1–3
Project Development Map
The TTM 83359 Project

1.3 Cultural Setting

1.3.1 Prehistoric Period

The Antelope Valley occupies the western portion of the Mojave Desert and is an area with limited prehistoric subsistence resources. However, this area has supported a long and occasionally dense prehistoric Native American population. Evidence of villages and camps, burials, quarries, rock features, and bedrock mortars has been documented at archaeological sites across the desert, some of which contain evidence of a lengthy prehistoric time period. The prehistoric cultural sequence for Antelope Valley is generally believed to have begun at the end of the Pleistocene, represented by the fluted point tradition (Glennan 1971, 1987). Although early archaeological remains are not frequently found, when they are, it is generally along the margins of former pluvial lakes or in areas of dune deflation. In contrast, artifacts on the desert floor may be sparse, widely scattered, and mixed with the desert pavements. For the region, archaeologists have reached a broad consensus regarding the general cultural chronology. The identified sequence includes the Paleo Indian Period, the Pinto Period, the Gypsum Period, the Saratoga Springs Period, and the Ethnohistoric Period.

Paleo Indian Period (12,000 to 7,000 Years Before the Present [YBP])

The earliest documented evidence of human occupation in the Mojave Desert comes from the Paleo Indian Period, a cultural expression referred to as the Western Pluvial Lakes Tradition (WPLT). The WPLT occurred in the western Great Basin and covered an area that stretched from the now arid lands of southern California to Oregon. A cultural adaptation to pluvial conditions (*e.g.,* lakes, marshes, and grasslands) flourished for thousands of years after approximately 9000 B.C., but it disappeared in response to the warming and drying trends of the Altithermal climatic period (Moratto 1984). One of the most well-known expressions of the WPLT is the Lake Mojave Complex, which is thought to have covered a vast area including parts of the southwestern Great Basin and the Mojave Desert and may have reached as far south as the San Diego area. Artifacts indicative of the Lake Mojave Complex include foliated points and knives, Lake Mojave points, Silver Lake points, and flaked-stone crescents. Similar artifacts have been subsequently recorded along the shoreline of many other pluvial lakes in the Mojave Desert.

Pinto Period (7,000 to 4,000 YBP)

The Pinto Period dates to the end of the Pleistocene, when the severe and dramatic environmental change from pluvial to arid conditions began. Pinto Period sites are found mostly near ephemeral lakes and now dry streams and springs, suggesting a wetter climate than the present. Projectile points associated with the Pinto Period are characterized as larger atlatl dart points, as opposed to arrowhead points, which were introduced later. This period has been described as a highly mobile desert economy, with an emphasis upon hunting, that is supplemented by the use of processed seeds (Moratto 1984). Pinto Period artifacts have been interpreted as indications of temporary or seasonal occupations by small groups of people. It is during the Pinto

Period that the familiar milling stone features begin to appear, represented by unshaped manos and metates (Warren and Crabtree 1986:185–187). By approximately 2000 B.C., in conjunction with the onset of the "Little Pluvial" climatic episode (*cf.* Harrington 1957), the transition from the Pinto Period into the Gypsum Period is apparent and characterized by several diagnostic types of medium- and large-sized projectile points among assemblages that seem to reflect a far greater range of cultural influence from areas outside the western Mojave Desert.

Gypsum Period (4,000 to 1,500 YBP)

The presence of Humboldt Concave Base, Gypsum Cave, Elko Eared, or Elko Corner-Notched points are believed to be indicative of the Gypsum Period (radiocarbon dated from 4,000 to 1,500 years ago). The Gypsum Period reflects a more intensive desert occupation. Indications of trade with coastal populations are evidenced by shell beads in the archaeological record. An increase in milling stones and manos has been found in association with this period, which indicates an increased use of hard seeds (Moratto 1984). Several scholars associate this period with the division of the Uto-Aztecan language, approximately 3,000 to 2,500 years ago. The major language groups that emerged from this division are Numic, spoken by the Kawaiisu and Piute; Takic, spoken by the Kitanemuk, Serrano, Gabrielino, and other southern California Shoshonean speakers; Hopic, spoken in the southwest; and Tubatulabalic, spoken by the Tubatulabal in the southern Sierra Nevada Mountains. A shift in settlement patterns toward a more sedentary lifestyle occurred during this period, characterized by the emergence of large permanent or semi-permanent village sites and associated cemeteries.

Saratoga Springs Period (1,500 to 800 YBP)

The Saratoga Springs Period is characterized by a transition from larger dart points to smaller arrow points. This, combined with evidence from rock art motifs, leads scholars to argue for a shift from atlatls to use of the bow and arrow either during the end of the Gypsum Period or the beginning of the Saratoga Springs Period. This period represents a significant shift in cultural development that demonstrates a seemingly effortless adaptive response to increasingly arid desert conditions in the western Mojave Desert. Major village occupations within Antelope Valley began to appear just prior to the Saratoga Springs Period (*cf.* Sutton 1980; Robinson 1987), at which point bedrock milling features became a common element for the processing of acorns and other resources associated with mortar and pestle use.

As a response to increasingly arid conditions, areas with fairly reliable fresh water sources were intensely occupied over vast lengths of time. This adaptation is of major significance when addressing the prehistory of the Leona Valley and sites along the San Andreas Rift Zone adjacent to Ritter Ridge. Springs and seeps are common occurrences along the San Andreas fault, and soils of the lowlands in the Leona Valley suggest that considerable water resources were present in the area until only fairly recently. It could be expected, then, that sites exhibiting at least some evidence of semi-sedentary habitation would be represented in the vicinity. This period saw an increase in trade with Arizona and other areas of the Southwest. Evidence in the archaeological record shows that Brown and Buff wares (pottery styles) characteristic of Arizona made their way to the California desert by A.D. 900. It is also believed that the Anasazi mined turquoise in the eastern California desert about this time.

Ethnohistoric Period (800 YBP to European Contact)

The presence of the cultures associated with the Late Prehistoric Period, or as it is sometimes referred to, the Shoshonean Period, can be clearly discerned through the comparison of archaeological and ethnohistorical records. Ethnographic data indicates that the Antelope Valley was occupied by speakers of the Takic Shoshonean languages. The Kitanemuk resided in much of the valley and the western foothill areas, while the Tataviam occupied much of the north-facing slopes of the San Gabriel and Sierra Pelona mountains, as well as the areas around Acton, Saugus, and Newhall. Prior to European contact, these cultures consisted of patrilineally organized family bands of advanced sociopolitical organization (Blackburn and Bean 1978:567), most likely related to a very well developed and maintained economic trade network wherein these groups served as intermediaries between coastal, desert, central valley, and southern Sierra Nevada groups (Robinson 1987; Sutton 1980).

The project area for this study is located in what is traditionally the homeland of the Kitanemuk, a small tribe principally located on the southern and western flanks of the Tehachapi Mountains (Blackburn and Bean 1978). The general ecological adaptation and subsistence technology of the Kitanemuk differed little from that of their neighbors to the north or west, such as the Southern Valley Yokuts. Linguistic evidence suggests the presence of some form of the patrilineal system found elsewhere in southern California, but the lineages were not totemic, nor was there evidence of moieties. Precise data on the demographic characteristics and political organization of the Kitanemuk can no longer be obtained. The Kitanemuk may have had contact with the Spanish colonies as early as the 1770s, but little historical information is available today on this small tribe, which had no more than 500 to 1,000 members at the peak of its population. The tribe was apparently represented at the San Fernando, San Gabriel, and San Buenaventura missions. Some Kitanemuks were found on the Tejon Reservation in the 1850s, and later at the Tule River Reservation, where some of their descendants still reside.

1.3.2 Historic Period

Scholars often attribute Father Francisco Garces as the first known European to travel through the Western Mojave in the late 1770s. However, it has been proposed that Pedro Fages, the first governor of Alta California, actually traversed the Western Mojave nearly 10 years before Garces in pursuit of military deserters (Stickel et al. 1980). One source indicates Fages passed Hughes Lake, northwest of the current study area, which would have placed Fages route through the Antelope Valley (Hoover et al. 1966). Nevertheless, little is actually known about Fages' expedition across the desert and Garces, a Jesuit priest, is the first European visitor to have documented visiting the general area (Stickel et al. 1980). Garces acted as a guide to Juan Bautista de Anza in 1774 on an expedition to establish shorter and quicker routes from the Colorado River to the coastal Spanish missions. Garces further explored the Mojave Desert in 1775 on his own expedition, under the orders of Anza, to better acquaint himself with the Mojave Desert (Stickel et al. 1980). Garces traveled from present day Needles through the Western Mojave with Native Americans from the Colorado River regions as his guides, eventually reaching Mission San Gabriel in March of 1776 (Stickel et al. 1980).

In 1842, Placerita Canyon, located to the south of the current study area, became one of the first important gold mines in southern California (Greenwood and McIntyre 1998), but it was not until Don Alexander and Phineas Banning established a stage line through the southern edge of the Antelope Valley from Los Angeles that the area became better known. Homesteading along the surface water deposits in the 1870s and the construction of the Southern Pacific Railroad line through Antelope Valley in 1876 led to development in the region. Further, the state legislature passed the Wright Act in 1887, which gave private corporations and unincorporated communities the authority to develop and maintain irrigation works (Dumke 1944). The Wright Act and rail travel led to an influx of land speculators to the area. Many farmers journeyed to the Antelope Valley unaware of the scarcity of water and unreliable annual rainfall. Palmdale (originally called “Palmnethal”) was founded by a group of approximately 60 to 70 German Lutheran families that had relocated during the mid-1880s to the Antelope Valley to establish homesteads (Conard 1989). By this time, other nearby communities, such as Acton and Lancaster, had been founded under similar circumstances and rail stations were established (Palmdale City Library 2004).

Water and irrigation dominated the history of the Antelope Valley into the mid-twentieth century. However, the development of improved ground water extraction technologies, particularly the electric driven water pump, improved agriculture in the region, leading to a new influx of farmers to the region (Padon and Crownover 1989). Agriculture in the region mainly focused on produce and cattle grazing.

The Antelope Valley was transformed by World War II and the establishment of Muroc Army Airfield in 1942. The population influx caused a boost to the economy and a need for more services. Muroc Army Airfield was put on hiatus shortly after the war, which caused a decline in the local economy. However, this was only temporary, as after the Korean War, the airfield was renamed Edward Air Force Base (Conard 1989). The establishment of Edwards Air Force Base led to the development of a large-scale aerospace industry. Palmdale grew out of the necessity to serve the needs of the military which transformed the region, converting former agricultural land into commercial and residential developments (Conard 1989). Today, the Antelope Valley is experiencing further development as a suburban outgrowth of the Los Angeles metropolitan area.

1.4 Results of the Archaeological Records Search

An archaeological records search for a one-mile radius was conducted by BFSA through the SCCIC at CSU Fullerton on October 20, 2022 (Appendix C). The SCCIC records search results identified eight previously recorded resources, all historic, located within one mile of the project, none of which are located within the project's boundaries (Table 1.4–1). The previously recorded resources consist of five trash scatters, one site containing foundations and a trash scatter, one site containing a septic box, pipe, and foundation remnants, and the Palmdale to Victorville Road.

Table 1.4–1

Cultural Resources Within One Mile of the Project

Site Number	Resource Type
P-19-003661; P-19-003662; P-19-003663; P-19-004187; P-19-004189	Historic trash scatter
P-19-004186	Historic foundations and trash scatter
P-19-004185	Historic septic box, pipe, and foundation remnants
P-19-192304	Historic Palmdale to Victorville Road

The records search also identified 29 previous studies conducted within one mile of the project. Two of the previous studies include the current project (Norwood 1989; ERCE 1991). Both previous studies were conducted in support of the City of Palmdale's Eastside General Plan Amendment (GPA90-15). The Norwood (1989) study consisted of a survey and site inventory for resources within the General Plan Amendment area (approximately 2,500 acres). The ERCE (1991) study is the DEIR for the General Plan Amendment, which includes the 1989 Norwood study as well as a cultural resources update compiled by Bert Rader and Richard Carrico.

When the current project was surveyed by Norwood in 1989, he noted multiple "trash dumps" within the DEIR area, three of which, identified as Temporary #10, Temporary #11, and Temporary #12, were mapped within the current project (Figure 1.4–1). Norwood compiled cursory information for the resources with an inventory sheet for the three resources which included measurements and locational information. Primarily, the sites were noted to be trash scatters, containing cans, glass, and ceramic artifacts. Although Norwood's map shows the three resources within the project, only the locational information presented for Temporary #11 and Temporary #12 corresponds to the current project location, indicating that Temporary# 10 was either mis-plotted or the descriptive locational data contains errors. Regardless, Norwood (1989) did not formally record any of these trash scatters:

> Trash Dumps - Numerous trash dumps were observed throughout the study area. Practically every road has a scatter and concentrated trash deposits. With the exception of the exploded stove site, the roadside dumps all date to relatively late periods. The age and nature of the dumps is a reflection of the population growth of Palmdale, with most dumps postdating [World War II]. These dumps were not formally recorded or considered significant in terms of CEQA criteria.

Figure 1.4–1
Trash Scatters Previously Identified by Norwood (1989)

(Deleted for Public Review; Bound Separately)

In the cultural resources update provided within the DEIR, Rader and Carrico questioned Norwood's methods for determining which resources were and were not formally recorded:

> The criteria used for recording archaeological sites during the 1989 Norwood may not be in accordance with CEQA guidelines. Under CEQA guidelines a historic resource 50+ years (pre 1939 at the time of their survey) needs to be addressed. Normally the resource is recorded as a historic archaeological site and then the significance of that site is considered on a case by case basis […] The trash deposits approximately 50 to 75 years of age were not part of the Norwood 1989 report on a case by case basis. They were "noted and inventoried, but not institutionally recorded." (ERCE 1991)

However, Rader and Carrico also did not record any of the trash scatters identified by Norwood, and instead recommended that they should be investigated on a case-by-case basis should the parcel containing the resources be slated for development (ERCE 1991). In addition, based upon the information presented in the Norwood (1989) report, none of the trash scatters within the project would have met the 50-year age threshold under CEQA criteria at the time of initial documentation.

In addition, BFSA reviewed the following historic sources:

- The National Register of Historic Places Index
- The Office of Historic Preservation (OHP), Archaeological Determinations of Eligibility
- The OHP, Built Environment Resources Directory
- BLM GLO Records
- 1958 *Lancaster* 15-minute USGS maps
- 1930, 1943, and 1957 *Pearland* 7.5-minute USGS maps
- 1959 and 1981 *Palmdale* 7.5-minute USGS maps
- Aerial photographs (1928 through 2021)

These sources did not indicate the presence of any additional archaeological resources within the project. Further, the historic maps or aerial photographs show that no structures have ever existed within the subject property. Further, no direct road access to the property is visible on the 1928 aerial photograph; however, a dry wash that cuts through the northeast corner of the project is visible. Norwood (1989) postulated that this wash could have been used as an access road prior to the development of other road alignments through the area. The 1930 *Pearland* 7.5-minute USGS map does show the alignment of a road north of the project which appears to match the alignment of the current East Palmdale Boulevard. By 1940, East Palmdale Boulevard appears firmly established and paved. A faint trail bisecting the property is visible on the 1948 aerial photograph, but it does not appear to be wide enough to have been used as an access road. By 1959, a dirt road is visible along the western boundary of the property. An adjacent residential development south of the subject property appears to have been constructed between 1987 and 1990. Impacts to the subject property that appear to have been tied to the development to the south include a culvert in the southeast corner of the project, an associated earthen channel along the southeastern boundary of the property, and a dirt access road in the southern third of the project. By 1994, multiple dirt access roads are visible on the project, while another residential development adjacent to the west was constructed between 2005 and 2008.

BFSA also requested a SLF search from the NAHC to search for the presence of any recorded Native American sacred sites or locations of religious or ceremonial importance within one mile of the project, which was returned with negative results. All correspondence is provided in Appendix D.

1.5 Applicable Regulations

Resource importance is assigned to districts, sites, buildings, structures, and objects that possess exceptional value or quality illustrating or interpreting the heritage of Los Angeles County in history, architecture, archaeology, engineering, and culture. A number of criteria are used in demonstrating resource importance. Specifically, the criteria outlined in CEQA provide the guidance for making such a determination. The following sections detail the criteria that a resource must meet in order to be determined important.

1.5.1 California Environmental Quality Act

According to CEQA (§15064.5a), the term "historical resource" includes the following:

1) A resource listed in, or determined to be eligible by the State Historical Resources Commission for listing in the California Register of Historical Resources (CRHR) (Public Resources Code [PRC] SS5024.1, Title 14 CCR. Section 4850 et seq.).
2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the PRC or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
3) Any object, building, structure, site, area, place, record, or manuscript, which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be

"historically significant" if the resource meets the criteria for listing on the CRHR (PRC SS5024.1, Title 14, Section 4852) including the following:

a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
b) Is associated with the lives of persons important in our past;
c) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
d) Has yielded, or may be likely to yield, information important in prehistory or history.

4) The fact that a resource is not listed on, or determined eligible for listing on, the CRHR, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the PRC), or identified in an historical resources survey (meeting the criteria in Section 5024.1(g) of the PRC) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC Section 5020.1(j) or 5024.1.

According to CEQA (§15064.5b), a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. CEQA defines a substantial adverse change as:

1) Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.
2) The significance of an historical resource is materially impaired when a project:

a) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion on, or eligibility for inclusion on, the CRHR; or
b) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or,
c) Demolishes or materially alters in an adverse manner those physical

characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

Section 15064.5(c) of CEQA applies to effects on archaeological sites and contains the following additional provisions regarding archaeological sites:

1. When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource, as defined in subsection (a).
2. If a lead agency determines that the archaeological site is an historical resource, it shall refer to the provisions of Section 21084.1 of the PRC, Section 15126.4 of the guidelines, and the limits contained in Section 21083.2 of the PRC do not apply.
3. If an archaeological site does not meet the criteria defined in subsection (a), but does meet the definition of a unique archaeological resource in Section 21083.2 of the PRC, the site shall be treated in accordance with the provisions of Section 21083.2. The time and cost limitations described in PRC Section 21083.2 (c-f) do not apply to surveys and site evaluation activities intended to determine whether the project location contains unique archaeological resources.
4. If an archaeological resource is neither a unique archaeological nor historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or Environmental Impact Report, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

Section 15064.5 (d) and (e) contain additional provisions regarding human remains. Regarding Native American human remains, paragraph (d) provides:

(d) When an initial study identifies the existence of, or the probable likelihood of, Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the NAHC as provided in PRC SS5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by the NAHC. Action implementing such an agreement is exempt from:

1) The general prohibition on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (Health and Safety Code Section 7050.5).

2) The requirements of CEQA and the Coastal Act.

2.0 RESEARCH DESIGN

The primary goal of the research design is to attempt to understand the way in which humans have used the land and resources within the project through time, as well as to aid in the determination of resource significance. For the current project, the study area under investigation is eastern Los Angeles County. The scope of work for the cultural resources study conducted for the TTM 83359 Project included the survey of the 20-acre project. Given the area involved, the research design for this project was focused upon realistic study options. Since the main objective of the investigation was to identify the presence of and potential impacts to cultural resources, the goal here is not necessarily to answer wide-reaching theories regarding the development of early southern California, but to investigate the role and importance of identified resources. Nevertheless, the assessment of the significance of a resource must take into consideration a variety of characteristics, as well as the ability of a resource to address regional research topics and issues.

Although elementary resource evaluation programs are limited in terms of the amount of information available, several specific research questions were developed that could be used to guide the initial investigations of any observed cultural resources. The following research questions take into account the size and location of the project discussed above.

Research Questions:

- Can located cultural resources be associated with a specific time period, population, or individual?
- Do the types of any located cultural resources allow a site activity/function to be determined from a preliminary investigation? What are the site activities? What is the site function? What resources were exploited?
- How do located sites compare to others reported from different surveys conducted in the area?
- How do located sites fit existing models of settlement and subsistence for valley environments of the region?

<u>Data Needs</u>

At the survey level, the principal research objective is a generalized investigation of changing settlement patterns in both the prehistoric and historic periods within the study area. The overall goal is to understand settlement and resource procurement patterns of the project area occupants. Therefore, adequate information on site function, context, and chronology from an archaeological perspective is essential for the investigation. The fieldwork and archival research were undertaken with the following primary research goals in mind:

1) To identify cultural resources occurring within the project;

2) To determine, if possible, site type and function, context of the resource(s), and chronological placement of each cultural resource identified;
3) To place each cultural resource identified within a regional perspective; and
4) To provide recommendations for the treatment of each cultural resource identified.

3.0 FIELD SURVEY

The cultural resources study of the project consisted of an institutional records search and an intensive cultural resource survey of the entire 20-acre project. This study was conducted in conformance with Section 21083.2 of the California PRC, and CEQA. Statutory requirements of CEQA (Section 15064.5) were followed for the identification and evaluation of resources. Specific definitions for archaeological resource type(s) used in this report are those established by the State Historic Preservation Office (SHPO 1995).

3.1 Survey Methods

The survey methodology employed during the current investigation followed standard archaeological field procedures and was sufficient to accomplish a thorough assessment of the project. Project Archaeologist Andrew Garrison and Director of Field Operations Clarence Hoff conducted the intensive pedestrian survey on October 25, 2022. The field methodology employed for the project included walking evenly spaced survey transects set approximately 10 meters apart while visually inspecting the ground surface. The entire project was covered by the survey process, and photographs were taken to document project conditions during the survey.

3.2 Results

Ground visibility during the survey was generally good with approximately 75 to 80 percent of the ground surface visible (Plate 3.2–1). Vegetation found within the project consisted of creosote community plants and Joshua trees (Plate 3.2–2). The dry wash which cuts through the northeastern corner of the project, as seen on the 1928 aerial photograph, was also identified during the survey.

The survey identified various impacts to the property. Multiple dirt access roads are located within the project; however, the review of historic aerial photographs (see Section 1.4 of this report) indicated that the dirt access roads are not visible on the property until after 1990s and are therefore not considered cultural resources requiring recordation. The culvert in the southeastern corner and associated earthen ditch along the southeastern boundary, as seen on the 1990 aerial photograph, were also noted (Plate 3.2–3). As stated previously, these features are tied to the development of the residential subdivision constructed between 1987 and 1990 just south of the project. In addition, piles of pushed dirt, modern building materials, and modern trash were noted throughout the project, with concentrations of material noted along the southern and eastern boundaries (Plate 3.2–4).

Plate 3.2–1: Overview of the project, facing southeast.

Plate 3.2–2: Overview of the project, facing south.

Plate 3.2–3: View of the modern culvert and earthen ditch located in the southeast corner of the project, facing southeast.

Plate 3.2–4: View of pushed dirt and modern building material found throughout the project, facing northwest.

No prehistoric artifacts or sites were identified during the survey of the project. Despite the previous study by Norwood (1989) indicating the presence of three potential historic trash scatters within the project, the current survey identified the presence of a single scatter of historic material (Figure 3.2–1). Given the ambiguity and lack of detail provided by the Norwood (1989) study, it was not possible to directly correspond the trash scatter identified during the current survey with any of those previously noted by Norwood in 1989. As Norwood (1989) never formally recorded any of the reported resources, the trash scatter located within the subject property as part of the current study was recorded as Site Temp-1 according to the OHP's manual, *Instructions for Recording Historical Resources*, using DPR forms (Appendix B).

3.2.1 Site Temp-1

Site Temp-1 was located in the northern third of the project situated 250 feet east of Hudson Street and 320 feet south of East Palmdale Boulevard, in between two dirt access roads created within the property between 1990 and 1994 (Figure 3.2–2). Site Temp-1 consists of a 50- by 50-foot scatter of approximately 100 vent hole/hole-in-top and sanitary cans, glass, and ceramic fragments (Plates 3.2–5 and 3.2–6). A 20- by 20-foot concentration of material is noted in the middle of the site area, indicating the initial pile of refuse was likely smaller, but has been dispersed by winds, erosion, and the establishment of dirt access roads over time. A close inspection of the artifact scatter and the surrounding soils indicates that the site has no depth. The site has clearly been heavily impacted, as one isolated can from the site was identified approximately 150 feet north of the concentration, just north of a dirt access road (Plate 3.2–7). Further, the presence of bullet holes in multiple cans suggest that further dispersion of the scatter has occurred as a result of rural target shooting activities.

Plate 3.2–7: View of the isolated vent hole/hole-in-top can from Site Temp-1.

Figure 3.2–1
Cultural Resource Location Map

(Deleted for Public Review; Bound Separately)

<u>Figure 3.2–2</u>
Feature Location Map
Site Temp-1

(Deleted for Public Review; Bound Separately)

Plate 3.2–5: Overview of Site Temp-1, facing southwest.

Plate 3.2–6: View of the central concentration of material at Site Temp-1, facing southwest.

The primary artifact type identified at Site Temp-1 are metal vent hole/hole-in-top and sanitary cans. The vent hole/hole-in-top, sometimes referred to as solder-dot or matchstick filler, cans allowed for excess moisture to be heated off filled containers through the small hole (Rock 1984). Although earlier iterations of these cans became popular in the 1880s, they were used more extensively by 1900, especially for condensed milk (Rock 1984; Reno 2012; Merritt 2014). By 1920, condensed milk was sold almost exclusively in vent hole/hole-in-top cans, which continued to be utilized through the mid-1980s. However, by the mid-1930s, many manufacturers had switched over to sanitary cans (Rock 1984; Reno 2012; Merritt 2014). Sanitary cans were first produced around 1904, became prevalent around the 1920s, and entirely replacing the vent hole/hole-in-top design during the mid-1930s (Rock 1984; Merritt 2014). In addition to vent hole/hole-in-top and sanitary cans, a cone-shaped beer can was also located within the site area. The cone-shaped beer cans were created in 1935 and utilized through the 1950s before being replaced by pull-tab cans in the 1960s (Romeo 2021).

Given the limited size of assemblage found at Temp-1, it is clear the resource represents a single rural dumping episode and not an episodic use of the location for the dumping of trash. Although the glass found at the site was fragmented, no solarized glass was identified, which generally can be used as a guide to temporally place trash scatters prior to World War I. The types of cans identified at the site were utilized most prevalently after the 1920s and 1930s. As stated previously, the subject property did not ever contain any structures and the review of aerial photographs and maps show that between 1928 and 1930, the alignment of East Palmdale Avenue was created and by 1940, the alignment appears to have been paved. Along with the addition of other access roads within and surrounding the project during the mid- to late twentieth century, Temp-1 was likely created as a result of increased access to the project location. Further, given the presence of a cone-top beer can at the site, the resource most likely dates to between the late 1930s and 1950s.

Based on the review of the historic materials identified within the site, Temp-1 represents a single episode of disposal between the late 1930s and 1950s. The lack of historic occupation of the property and the nature of transient rural dumping indicate that the artifact scatter cannot be directly associated with any historic events or individuals. Site Temp-1 is not considered eligible for the CRHR as the scatter does not retain any additional research value given the observable lack of a subsurface component, the overall lack of integrity demonstrated by previois impacts to the resource, and the limited information the historic artifacts can provide.

4.0 RECOMMENDATIONS

The cultural resources study for the TTM 83359 Project was completed in accordance with the City of Palmdale environmental policies and CEQA significance evaluation criteria. One historic trash scatter, Site Temp-1, was identified within the project. Based upon a review of the surface assemblage, Site Temp-1 represents a single episode of disposal which occurred between the late 1930s and 1950s. The site is not considered eligible for the CRHR; however, given that the material found at the site is older than 50 years, BFSA has prepared the applicable DPR forms for submittal to the SCCIC (see Appendix B).

While the current study did not identify any significant historical resources within the project, the property has been impacted by previous development of adjacent properties, the establishment of dirt access roads through the project, and disposal of modern trash. Further, previous studies indicated the possibility of up to three historic trash scatters that may have once bee present within the subject property (Norwood 1989; ERCE 1991). Site Temp-1 cannot be directly tied to any of the resources first identified by Norwood and it is possible that impacts to the project since the 1989 study have disturbed or obscured those resources. In addition, although the records search did not show any prehistoric resources recorded within one mile of the project, the subject property does contain a dry wash, which represents a seasonal source of water. Therefore, the potential for the indavertent discovery of prehistoric resources may exist.

The property still has potential to yield archaeological resources that may have been obscured by the previous impacts to the property. As a result, it is recommended that an archaeological monitor be present during future ground disturbances associated with the project to observe grading and identify any historic or prehistoric resources that may be exposed by earthwork. Monitoring of grading is recommended as a condition of approval for the project. The monitoring program should include Native American observers only in the event that prehistoric deposits are discovered. A copy of this report will be submitted to the SCCIC at CSU Fullerton.

5.0 LIST OF PREPARERS AND ORGANIZATIONS CONTACTED

The archaeological survey program for the TTM 83359 Project was directed by Principal Investigator Brian F. Smith. The archaeological fieldwork was conducted by Project Archaeologist Andrew Garrison and Director of Field Operations Clarence Hoff. The report text was prepared by Andrew Garrison and Brian Smith. Emily T. Soong requested the records search at the SCCIC at CSU Fullerton and created the report graphics. Technical editing and report production was conducted by Courtney McNair.

6.0 REFERENCES CITED

Blackburn, Thomas C. and Lowell John Bean
1978 Kitanemuk. In *Handbook of North American Indians* 8:564–569, edited by Robert F. Heizer. Smithsonian Institution, Washington, D.C.

Conard, Rebecca et al.
1989 Cultural Resources Assessment, Southern California Gas Company Proposed Line 335, Los Angeles and San Bernardino Counties. LSA Associates. Unpublished report on file at the South Central Coastal Information Center at California State University at Fullerton, Fullerton, California.

Dumke, Glenn S.
1944 *The Boom of the Eighties in Southern California.* Huntington Library Publications, San Marino, California.

ERCE
1991 Draft Environmental Impact Report, Eastside General Plan Amendment (GPA 90-15). Unpublished report on file at the South Central Coastal Information Center at California State University at Fullerton, Fullerton, California.

Glennan, William S.
1971 Concave-based Lanceolate Fluted Projectile Points from California. *The Masterkey* 45(1).

1987 Evidence for a Paleoeastern Culture in the Southwestern Great Basin. In *Antelope Valley Archaeological Society Occasional Paper* 1, edited by R.W. Robinson, Lancaster, CA.

Greenwood, Roberta S. and Michael J. McIntyre
1998 Cultural Resources Overview and Management Plan for Edwards Air Force Base, California Volume 2, Overview of Historic Cultural Resources. Environmental Management Office Air Force Flight Test Center. Edwards AFB California.

Harrington, Mark R.
1957 A Pinto Site at Little Lake, California. *Southwest Museum Papers* 17. Los Angeles.

Hoover, Mildred B., Hero E. Rensch, and Ethel G. Rensch
1966 *Historic Spots of California*, reviewed by William N. Abeloe. Stanford University Press, Stanford, California.

Lancaster, J.T., J.L. Hernandez, W.D. Haydon, T.E. Dawson, and C.A. Hayhurst
2012 Geologic map of Quaternary surficial deposits in southern California: Lancaster 30' x 60' Quadrangle. California Geological Survey Special Report 217, Plate 22.

Merritt, Christopher W.
2014 Historic Artifact Guide. Utah Division of State History, Salt Lake City, Utah.

Moratto, Michael J.
1984 *California Archaeology*. Academic Press, New York.

Norwood, Richard H.
1989 Eastside GPA Study: Cultural Resources. Pyramid Archaeology. Unpublished report on file at the South Central Coastal Information Center at California State University at Fullerton, Fullerton, California.

Padon, Beth and S. Crownover
1989 Cultural Resources Assessment Ritter Ranch Los Angeles County. LSA Associates, Inc. Unpublished report on file at the South Central Coastal Information Center at California State University at Fullerton, Fullerton, California.

Palmdale City Library
2004 Antelope Valley History. Electronic document, http://wwwpalmdalelibrary.org/ history/part1.shtml, accessed Aril 22, 2016.

Reno, Ron
2012 Revised Simones Can Dating Key. *In-Situ*, Vol. 16, No. 1. Nevada Archaeological Association.

Robinson, Rodger W., ed.
1987 Prehistory of the Antelope Valley: An Overview. *Antelope Valley Archaeological Society Occasional Paper* 1.

Rock, James T.
1984 Cans in the Countryside. *Historical Archaeology* Volume 18.

Romeo, Jess
2021 An Archaeologist's Guide to Beer Cans. *JSTOR Daily.* Electronic document, https://daily.jstor.org/an-archeologists-guide-to-beer-cans/, accessed November 11, 2022.

State Historic Preservation Office (SHPO)
1995 *Instructions for Recording Historical Resources*. Office of Historic Preservation, Sacramento.

Stickel E. Gary, Lois W. Roberts, and Eric W. Ritter
1980 An Overview of the Cultural Resources of the Western Mojave Desert. Cultural Resources Publications. Bureau of Land Management, California Desert District, Riverside, California.

Sutton, Mark Q.

1980 Some Aspects of Kitanemuk Prehistory. *Journal of California and Great Basin Archaeology* 2(2):214–225.

Warren, Claude N. and Robert H. Crabtree

1986 History of the Southwestern Area. In *Handbook of the North American Indians,* Volume 11: Great Basin, Warren L. D'Azevedo, vol. ed.; William C. Sturtevant, gen. ed. Washington D.C.: Smithsonian Institution

Web Soil Survey

2022 An online soil survey browser. Electronic document, https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx, accessed November 1, 2022.

APPENDIX A

Resumes of Key Personnel

Brian F. Smith, MA

Owner, Principal Investigator

Brian F. Smith and Associates, Inc.
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: bsmith@bfsa-ca.com

Education

Master of Arts, History, University of San Diego, California **1982**

Bachelor of Arts, History, and Anthropology, University of San Diego, California **1975**

Professional Memberships

Society for California Archaeology

Experience

Principal Investigator **1977–Present**
Brian F. Smith and Associates, Inc. **Poway, California**

Brian F. Smith is the owner and principal historical and archaeological consultant for Brian F. Smith and Associates. Over the past 32 years, he has conducted over 2,500 cultural resource studies in California, Arizona, Nevada, Montana, and Texas. These studies include every possible aspect of archaeology from literature searches and large-scale surveys to intensive data recovery excavations. Reports prepared by Mr. Smith have been submitted to all facets of local, state, and federal review agencies, including the US Army Corps of Engineers, the Bureau of Land Management, the Bureau of Reclamation, the Department of Defense, and the Department of Homeland Security. In addition, Mr. Smith has conducted studies for utility companies (Sempra Energy) and state highway departments (CalTrans).

Professional Accomplishments

These selected major professional accomplishments represent research efforts that have added significantly to the body of knowledge concerning the prehistoric life ways of cultures once present in the southern California area and historic settlement since the late 18th century. Mr. Smith has been principal investigator on the following select projects, except where noted.

<u>Downtown San Diego Mitigation and Monitoring Reporting Programs</u>: Large numbers of downtown San Diego mitigation and monitoring projects, some of which included Broadway Block (2019), 915 Grape Street (2019), 1919 Pacific Highway (2018), Moxy Hotel (2018), Makers Quarter Block D (2017), Ballpark Village (2017), 460 16th Street (2017), Kettner and Ash (2017), Bayside Fire Station (2017), Pinnacle on the Park (2017), IDEA1 (2016), Blue Sky San Diego (2016), Pacific Gate (2016), Pendry Hotel (2015), Cisterra Sempra Office Tower (2014), 15th and Island (2014), Park and G (2014), Comm 22 (2014), 7th and F Street Parking (2013), Ariel Suites (2013), 13th and Marker (2012), Strata (2008), Hotel Indigo (2008), Lofts at 707 10th Avenue Project (2007), Breeza (2007), Bayside at the Embarcadero (2007), Aria (2007), Icon (2007), Vantage Pointe (2007), Aperture (2007), Sapphire Tower (2007), Lofts at 655 Sixth Avenue (2007), Metrowork (2007), The Legend (2006), The Mark (2006), Smart Corner (2006), Lofts at 677 7th Avenue (2005), Aloft on Cortez Hill (2005), Front and Beech Apartments (2003), Bella Via Condominiums (2003), Acqua Vista Residential Tower (2003), Northblock Lofts (2003), Westin Park Place Hotel (2001), Parkloft

Apartment Complex (2001), Renaissance Park (2001), and Laurel Bay Apartments (2001).

1900 and 1912 Spindrift Drive: An extensive data recovery and mitigation monitoring program at the Spindrift Site, an important prehistoric archaeological habitation site stretching across the La Jolla area. The project resulted in the discovery of over 20,000 artifacts and nearly 100,000 grams of bulk faunal remains and marine shell, indicating a substantial occupation area (2013-2014).

San Diego Airport Development Project: An extensive historic assessment of multiple buildings at the San Diego International Airport and included the preparation of Historic American Buildings Survey documentation to preserve significant elements of the airport prior to demolition (2017-2018).

Citracado Parkway Extension: A still-ongoing project in the city of Escondido to mitigate impacts to an important archaeological occupation site. Various archaeological studies have been conducted by BFSA resulting in the identification of a significant cultural deposit within the project area.

Westin Hotel and Timeshare (Grand Pacific Resorts): Data recovery and mitigation monitoring program in the city of Carlsbad consisted of the excavation of 176 one-square-meter archaeological data recovery units which produced thousands of prehistoric artifacts and ecofacts, and resulted in the preservation of a significant prehistoric habitation site. The artifacts recovered from the site presented important new data about the prehistory of the region and Native American occupation in the area (2017).

The Everly Subdivision Project: Data recovery and mitigation monitoring program in the city of El Cajon resulted in the identification of a significant prehistoric occupation site from both the Late Prehistoric and Archaic Periods, as well as producing historic artifacts that correspond to the use of the property since 1886. The project produced an unprecedented quantity of artifacts in comparison to the area encompassed by the site, but lacked characteristics that typically reflect intense occupation, indicating that the site was used intensively for food processing (2014-2015).

Ballpark Village: A mitigation and monitoring program within three city blocks in the East Village area of San Diego resulting in the discovery of a significant historic deposit. Nearly 5,000 historic artifacts and over 500,000 grams of bulk historic building fragments, food waste, and other materials representing an occupation period between 1880 and 1917 were recovered (2015-2017).

Archaeology at the Padres Ballpark: Involved the analysis of historic resources within a seven-block area of the "East Village" area of San Diego, where occupation spanned a period from the 1870s to the 1940s. Over a period of two years, BFSA recovered over 200,000 artifacts and hundreds of pounds of metal, construction debris, unidentified broken glass, and wood. Collectively, the Ballpark Project and the other downtown mitigation and monitoring projects represent the largest historical archaeological program anywhere in the country in the past decade (2000-2007).

4S Ranch Archaeological and Historical Cultural Resources Study: Data recovery program consisted of the excavation of over 2,000 square meters of archaeological deposits that produced over one million artifacts, containing primarily prehistoric materials. The archaeological program at 4S Ranch is the largest archaeological study ever undertaken in the San Diego County area and has produced data that has exceeded expectations regarding the resolution of long-standing research questions and regional prehistoric settlement patterns.

Charles H. Brown Site: Attracted international attention to the discovery of evidence of the antiquity of man in North America. Site located in Mission Valley, in the city of San Diego.

Del Mar Man Site: Study of the now famous Early Man Site in Del Mar, California, for the San Diego Science Foundation and the San Diego Museum of Man, under the direction of Dr. Spencer Rogers and Dr. James R. Moriarty.

Old Town State Park Projects: Consulting Historical Archaeologist. Projects completed in the Old Town State Park involved development of individual lots for commercial enterprises. The projects completed in Old Town include Archaeological and Historical Site Assessment for the Great Wall Cafe (1992), Archaeological Study for the Old Town Commercial Project (1991), and Cultural Resources Site Survey at the Old San Diego Inn (1988).

Site W-20, Del Mar, California: A two-year-long investigation of a major prehistoric site in the Del Mar area of the city of San Diego. This research effort documented the earliest practice of religious/ceremonial activities in San Diego County (circa 6,000 years ago), facilitated the projection of major non-material aspects of the La Jolla Complex, and revealed the pattern of civilization at this site over a continuous period of 5,000 years. The report for the investigation included over 600 pages, with nearly 500,000 words of text, illustrations, maps, and photographs documenting this major study.

City of San Diego Reclaimed Water Distribution System: A cultural resource study of nearly 400 miles of pipeline in the city and county of San Diego.

Master Environmental Assessment Project, City of Poway: Conducted for the City of Poway to produce a complete inventory of all recorded historic and prehistoric properties within the city. The information was used in conjunction with the City's General Plan Update to produce a map matrix of the city showing areas of high, moderate, and low potential for the presence of cultural resources. The effort also included the development of the City's Cultural Resource Guidelines, which were adopted as City policy.

Draft of the City of Carlsbad Historical and Archaeological Guidelines: Contracted by the City of Carlsbad to produce the draft of the City's historical and archaeological guidelines for use by the Planning Department of the City.

The Mid-Bayfront Project for the City of Chula Vista: Involved a large expanse of undeveloped agricultural land situated between the railroad and San Diego Bay in the northwestern portion of the city. The study included the analysis of some potentially historic features and numerous prehistoric

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Audie Murphy Ranch, Riverside County, California: Project manager/director of the investigation of 1,113.4 acres and 43 sites, both prehistoric and historic—included project coordination; direction of field crews; evaluation of sites for significance based on County of Riverside and CEQA guidelines; assessment of cupule, pictograph, and rock shelter sites, co-authoring of cultural resources project report. February- September 2002.

Cultural Resources Evaluation of Sites Within the Proposed Development of the Otay Ranch Village 13 Project, San Diego County, California: Project manager/director of the investigation of 1,947 acres and 76 sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of San Diego and CEQA guidelines; co-authoring of cultural resources project report. May-November 2002.

Cultural Resources Survey for the Remote Video Surveillance Project, El Centro Sector, Imperial County: Project manager/director for a survey of 29 individual sites near the U.S./Mexico Border for proposed video surveillance camera locations associated with the San Diego Border barrier Project—project coordination and budgeting; direction of field crews; site identification and recordation; assessment of potential impacts to cultural resources; meeting and coordinating with U.S. Army Corps of Engineers, U.S. Border Patrol, and other government agencies involved; co-authoring of cultural resources project report. January, February, and July 2002.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee West GPA, Riverside County, California: Project manager/director of the investigation of nine sites, both prehistoric and historic—included project coordination and budgeting; direction of field crews; assessment of sites for significance based on County of Riverside and CEQA guidelines; historic research; co-authoring of cultural resources project report. January-March 2002.

Cultural Resources Survey and Test of Sites Within the Proposed French Valley Specific Plan/EIR, Riverside County, California: Project manager/director of the investigation of two prehistoric and three historic sites—included project coordination and budgeting; survey of project area; Native American consultation; direction of field crews; assessment of sites for significance based on CEQA guidelines; cultural resources project report in prep. July-August 2000.

Cultural Resources Survey and Test of Sites Within the Proposed Development of the Menifee Ranch, Riverside County, California: Project manager/director of the investigation of one prehistoric and five historic sites—included project coordination and budgeting; direction of field crews; feature recordation; historic structure assessments; assessment of sites for significance based on CEQA guidelines; historic research; co-authoring of cultural resources project report. February-June 2000.

Salvage Mitigation of a Portion of the San Diego Presidio Identified During Water Pipe Construction for the City of San Diego, California: Project archaeologist/director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Tyrian 3 Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Lamont 5 Project, Pacific Beach, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. April 2000.

Enhanced Cultural Resource Survey and Evaluation for the Reiss Residence Project, La Jolla, California: Project manager/director of the investigation of a single-dwelling parcel—included project coordination; assessment of parcel for potentially buried cultural deposits; authoring of cultural resources project report. March-April 2000.

Salvage Mitigation of a Portion of Site SDM-W-95 (CA-SDI-211) for the Poinsettia Shores Santalina Development Project and Caltrans, Carlsbad, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program; management of artifact collections cataloging and curation; data synthesis and authoring of cultural resources project report in prep. December 1999-January 2000.

Survey and Testing of Two Prehistoric Cultural Resources for the Airway Truck Parking Project, Otay Mesa, California: Project archaeologist/director—included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; authoring of cultural resources project report, in prep. December 1999-January 2000.

Cultural Resources Phase I and II Investigations for the Tin Can Hill Segment of the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for a survey and testing of a prehistoric quarry site along the border—NRHP eligibility assessment; project coordination and budgeting; direction of field crews; feature recordation; meeting and coordinating with U.S. Army Corps of Engineers; co-authoring of cultural resources project report. December 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Westview High School Project for the City of San Diego, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program including collection of material for specialized faunal and botanical analyses; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; co-authoring of cultural resources project report, in prep. October 1999-January 2000.

Mitigation of a Prehistoric Cultural Resource for the Otay Ranch SPA-One West Project for the City of Chula Vista, California: Project archaeologist/director—included direction of field crews; development of data recovery program; management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report, in prep. September 1999-January 2000.

Monitoring of Grading for the Herschel Place Project, La Jolla, California: Project archaeologist/ monitor—included monitoring of grading activities associated with the development of a single- dwelling parcel. September 1999.

Survey and Testing of a Historic Resource for the Osterkamp Development Project, Valley Center, California: Project archaeologist/ director—included direction of field crews; development and completion of data recovery program; budget development; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Testing of a Prehistoric Cultural Resource for the Proposed College Boulevard Alignment Project, Carlsbad, California: Project manager/director —included direction of field crews; development and completion of testing recovery program; assessment of site for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report, in prep. July-August 1999.

Survey and Evaluation of Cultural Resources for the Palomar Christian Conference Center Project, Palomar Mountain, California: Project archaeologist—included direction of field crews; assessment of sites for significance based on CEQA guidelines; management of artifact collections cataloging and curation; data synthesis; authoring of cultural resources project report. July-August 1999.

Survey and Evaluation of Cultural Resources at the Village 2 High School Site, Otay Ranch, City of Chula Vista, California: Project manager/director —management of artifact collections cataloging and curation; assessment of site for significance based on CEQA guidelines; data synthesis; authoring of cultural resources project report. July 1999.

Cultural Resources Phase I, II, and III Investigations for the Immigration and Naturalization Services Triple Fence Project Along the International Border, San Diego County, California: Project manager/director for the survey, testing, and mitigation of sites along border—supervision of multiple field crews, NRHP eligibility assessments, Native American consultation, contribution to Environmental Assessment document, lithic and marine shell analysis, authoring of cultural resources project report. August 1997- January 2000.

Phase I, II, and II Investigations for the Scripps Poway Parkway East Project, Poway California: Project archaeologist/project director—included recordation and assessment of multicomponent prehistoric and historic sites; direction of Phase II and III investigations; direction of laboratory analyses including prehistoric and historic collections; curation of collections; data synthesis; coauthorship of final cultural resources report. February 1994; March-September 1994; September-December 1995.

Andrew J. Garrison, MA, RPA

Project Archaeologist

Brian F. Smith and Associates, Inc.
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Education

Master of Arts, Public History, University of California, Riverside **2009**

Bachelor of Science, Anthropology, University of California, Riverside **2005**

Bachelor of Arts, History, University of California, Riverside **2005**

Professional Memberships

Register of Professional Archaeologists
Society for California Archaeology
Society for American Archaeology
California Council for the Promotion of History
Society of Primitive Technology
Lithic Studies Society
California Preservation Foundation
Pacific Coast Archaeological Society

Experience

Project Archaeologist **June 2017–Present**
Brian F. Smith and Associates, Inc. **Poway, California**

Project management of all phases of archaeological investigations for local, state, and federal agencies including National Register of Historic Places (NRHP) and California Environmental Quality Act (CEQA) level projects interacting with clients, sub-consultants, and lead agencies. Supervise and perform fieldwork including archaeological survey, monitoring, site testing, comprehensive site records checks, and historic building assessments. Perform and oversee technological analysis of prehistoric lithic assemblages. Author or co-author cultural resource management reports submitted to private clients and lead agencies.

Senior Archaeologist and GIS Specialist **2009–2017**
Scientific Resource Surveys, Inc. **Orange, California**

Served as Project Archaeologist or Principal Investigator on multiple projects, including archaeological monitoring, cultural resource surveys, test excavations, and historic building assessments. Directed projects from start to finish, including budget and personnel hours proposals, field and laboratory direction, report writing, technical editing, Native American consultation, and final report submittal. Oversaw all GIS projects including data collection, spatial analysis, and map creation.

Preservation Researcher **2009**
City of Riverside Modernism Survey **Riverside, California**

Completed DPR Primary, District, and Building, Structure and Object Forms for five sites for a grant-funded project to survey designated modern architectural resources within the City of Riverside.

Information Officer **2005, 2008–2009**
Eastern Information Center (EIC), University of California, Riverside **Riverside, California**

Processed and catalogued restricted and unrestricted archaeological and historical site record forms. Conducted research projects and records searches for government agencies and private cultural resource firms.

Reports/Papers

2019 A Class III Archaeological Study for the Tuscany Valley (TM 33725) Project National Historic Preservation Act Section 106 Compliance, Lake Elsinore, Riverside County, California. Contributing author. Brian F. Smith and Associates, Inc.

2019 A Phase I and II Cultural Resources Assessment for the Jack Rabbit Trail Logistics Center Project, City of Beaumont, Riverside County, California. Brian F. Smith and Associates, Inc.

2019 A Phase I Cultural Resources Assessment for the 10575 Foothill Boulevard Project, Rancho Cucamonga, California. Brian F. Smith and Associates, Inc.

2019 Cultural Resources Study for the County Road and East End Avenue Project, City of Chino, San Bernardino County, California. Brian F. Smith and Associates, Inc.

2019 Phase II Cultural Resource Study for the McElwain Project, City of Murrieta, California. Contributing author. Brian F. Smith and Associates, Inc.

2019 A Section 106 (NHPA) Historic Resources Study for the McElwain Project, City of Murrieta, Riverside County, California. Brian F. Smith and Associates, Inc.

2018 Cultural Resource Monitoring Report for the Sewer Group 818 Project, City of San Diego. Brian F. Smith and Associates, Inc.

2018 Phase I Cultural Resource Survey for the Stone Residence Project, 1525 Buckingham Drive, La Jolla, California 92037. Brian F. Smith and Associates, Inc.

2018 A Phase I Cultural Resources Assessment for the Seaton Commerce Center Project, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Assessment for the Marbella Villa Project, City of Desert Hot Springs, Riverside County, California. Brian F. Smith and Associates, Inc.

2017 Phase I Cultural Resources Survey for TTM 37109, City of Jurupa Valley, County of Riverside. Brian F. Smith and Associates, Inc.

2017 A Phase I Cultural Resources Assessment for the Winchester Dollar General Store Project, Riverside County, California. Brian F. Smith and Associates, Inc.

2016 John Wayne Airport Jet Fuel Pipeline and Tank Farm Archaeological Monitoring Plan. Scientific Resource Surveys, Inc. On file at the County of Orange, California.

2016 Historic Resource Assessment for 220 South Batavia Street, Orange, CA 92868 Assessor's Parcel Number 041-064-4. Scientific Resource Surveys, Inc. Submitted to the City of Orange as part of

Mills Act application.

2015 Historic Resource Report: 807-813 Harvard Boulevard, Los Angeles. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2015 Exploring a Traditional Rock Cairn: Test Excavation at CA-SDI-13/RBLI-26: The Rincon Indian Reservation, San Diego County, California. Scientific Resource Surveys, Inc.

2014 Archaeological Monitoring Results: The New Los Angeles Federal Courthouse. Scientific Resource Surveys, Inc. On file at the South Central Coastal Information Center, California State University, Fullerton.

2012 Bolsa Chica Archaeological Project Volume 7, Technological Analysis of Stone Tools, Lithic Technology at Bolsa Chica: Reduction Maintenance and Experimentation. Scientific Resource Surveys, Inc.

Presentations

2017 "Repair and Replace: Lithic Production Behavior as Indicated by the Debitage Assemblage from CA-MRP-283 the Hackney Site." Presented at the Society for California Archaeology Annual Meeting, Fish Camp, California.

2016 "Bones, Stones, and Shell at Bolsa Chica: A Ceremonial Relationship?" Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2016 "Markers of Time: Exploring Transitions in the Bolsa Chica Assemblage." Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2016 "Dating Duress: Understanding Prehistoric Climate Change at Bolsa Chica." Presented at the Society for California Archaeology Annual Meeting, Ontario, California.

2014 "New Discoveries from an Old Collection: Comparing Recently Identified OGR Beads to Those Previously Analyzed from the Encino Village Site." Presented at the Society for California Archaeology Annual Meeting, Visalia, California.

2012 Bolsa Chica Archaeology: Part Seven: Culture and Chronology. Lithic demonstration of experimental manufacturing techniques at the April meeting of The Pacific Coast Archaeological Society, Irvine, California.

APPENDIX B

Site Record Form

(Deleted for Public Review; Bound Separately)

APPENDIX C

Archaeological Records Search Results

(Deleted for Public Review; Bound Separately)

APPENDIX D

NAHC Sacred Lands File Search

(Deleted for Public Review; Bound Separately)

APPENDIX E

Confidential Maps

(Deleted for Public Review; Bound Separately)

Appendix C2

Paleontological Assessment

PALEONTOLOGICAL ASSESSMENT FOR THE TTM 83359 PROJECT

CITY OF PALMDALE
LOS ANGELES COUNTY, CALIFORNIA

APN 3023-002-184

Prepared on Behalf of:

Ravello Holdings, Inc.
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Prepared for:

City of Palmdale
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Palmdale, California 93550

Prepared by:

BFSA Environmental Services,
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October 25, 2022

BFSA Environmental Services
A Perennial Company

Paleontological Database Information

Author:	Todd A. Wirths, M.S., Senior Paleontologist, California Professional Geologist No. 7588
Consulting Firm:	BFSA Environmental Services, a Perennial Company 14010 Poway Road, Suite A Poway, California 92064 (858) 679-8218
Report Date:	October 25, 2022
Report Title:	Paleontological Assessment for the TTM 83359 Project, City of Palmdale, Los Angeles County, California
Prepared on Behalf of:	Ravello Holdings, Inc. 211 Village Commons Boulevard, Suite 11 Camarillo, California 93012
Prepared for:	City of Palmdale 38300 Sierra Highway Palmdale, California 93550
Prepared by:	Brian F. Smith and Associates, Inc. 14010 Poway Road, Suite A Poway, California 92064
Assessor's Parcel Number:	3023-002-184
USGS Quadrangle:	Section 27, Township 6 North, Range 11 West of the USGS *Palmdale*, *California* 7.5' Quadrangle.
Study Area:	Approximately 20 acres
Key Words:	Paleontological assessment; Holocene and Pleistocene alluvial fan deposits; monitoring recommended; City of Palmdale.

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I. INTRODUCTION AND LOCATION

A paleontological resource assessment has been completed for the Tentative Tract Map (TTM) 83359 Project, located southeast of the intersection of 51st Street East and East Palmdale Boulevard in the city of Palmdale, Los Angeles County, California (Figures 1 and 2). The approximately 20-acre project consists of one parcel, identified as Assessor's Parcel Number 3023-002-184. On the United States Geological Survey 7.5-minute, 1:24,000-scale *Palmdale, California* topographic quadrangle map, the project is located in Section 27, Township 6 North, Range 11 West, of the San Bernardino Baseline and Meridian. The project proposes the construction of a 64-lot residential subdivision, with one storm water detention basin, one common lot, and associated infrastructure. Currently, the property is undeveloped.

As the lead agency, the City of Palmdale has required the preparation of a paleontological assessment to evaluate the project's potential to yield paleontological resources. The paleontological assessment of the project included a review of paleontological literature and fossil locality records for a previous project in the area; a review of the underlying geology; and recommendations to mitigate impacts to potential paleontological resources, if necessary.

II. REGULATORY SETTING

The California Environmental Quality Act (CEQA), which is patterned after the National Environmental Policy Act, is the overriding environmental regulation that sets the requirement for protecting California's paleontological resources. CEQA mandates that governing permitting agencies (lead agencies) set their own guidelines for the protection of nonrenewable paleontological resources under their jurisdiction.

State of California

Under "Guidelines for Implementation of the California Environmental Quality Act," as amended in December 2018 (California Code of Regulations [CCR] Title 14, Division 6, Chapter 3, Sections 15000 et seq.), procedures define the types of activities, persons, and public agencies required to comply with CEQA. Section 15063 of the CCR provides a process by which a lead agency may review a project's potential impact to the environment, whether the impacts are significant, and provide recommendations, if necessary.

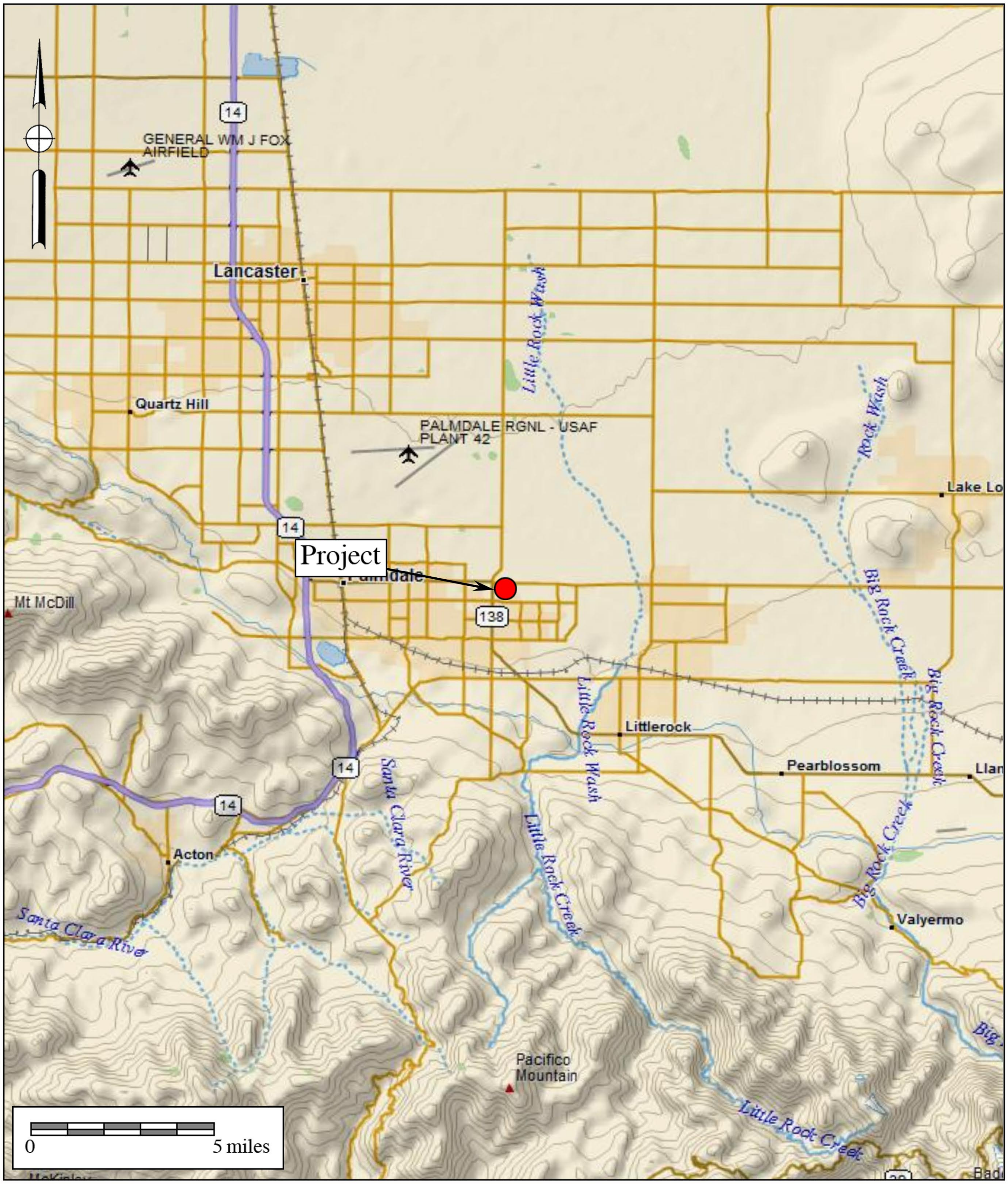

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Figure 1

General Location Map

The TTM 83359 Project

DeLorme World Base Map Service (1:250,000 series)

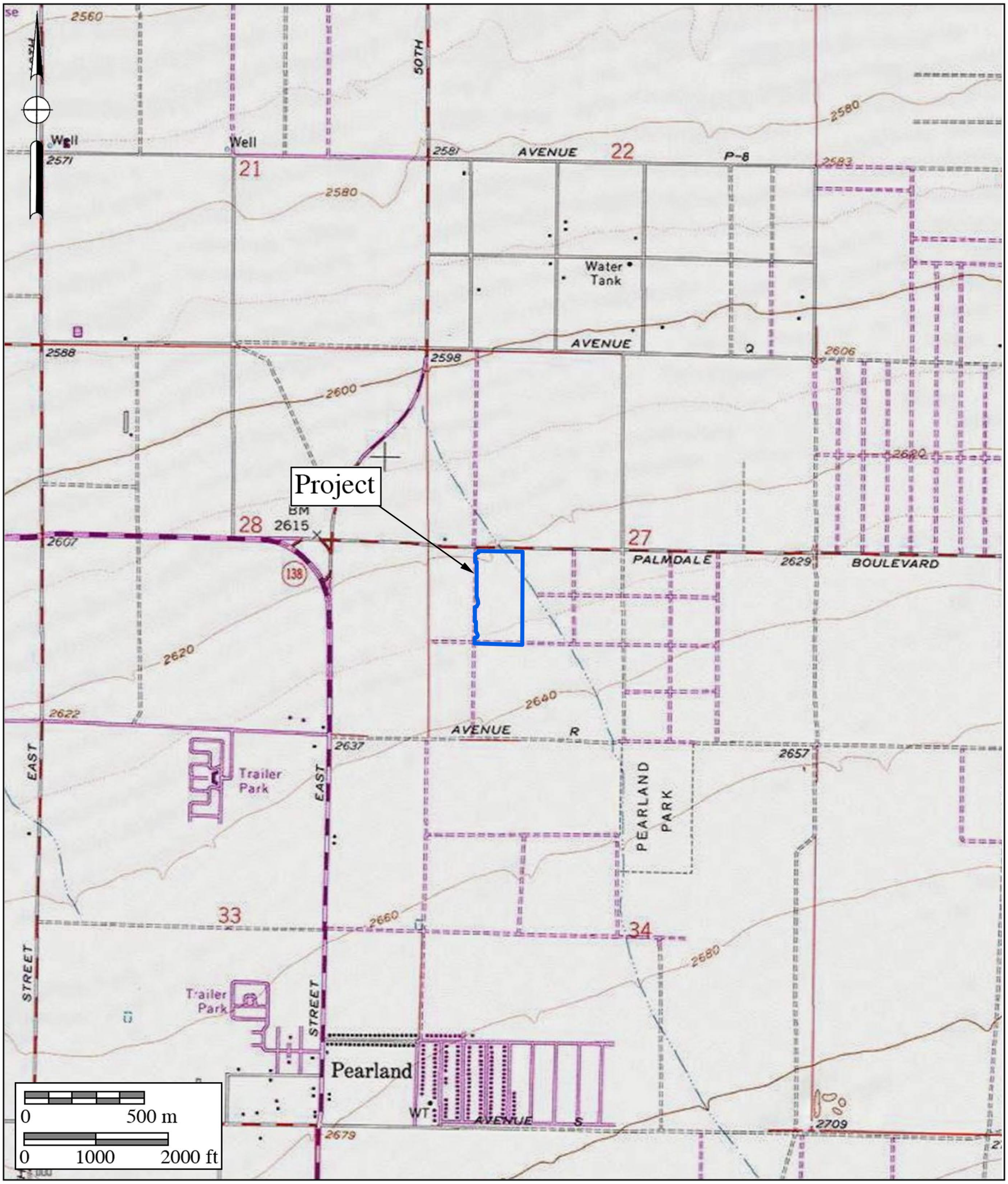

Figure 2

Project Location Map

The TTM 83359 Project

USGS *Palmdale* Quadrangle (7.5-minute series)

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In CEQA's Environmental Checklist Form, one of the questions to answer is, "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (Appendix G, Section VII, Part f). This is to ensure compliance with California Public Resources Code Section 5097.5, the law that protects nonrenewable resources, including fossils, which is paraphrased below:

a) 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 such lands.
b) As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.
c) A violation of this section is a misdemeanor.

City of Palmdale

The Environmental Resources Element of the General Plan of the City of Palmdale addresses the related issues of resource conservation and open space, and provides a basis to evaluate existing resources and plan for their protection (City of Palmdale 1993). In the Environmental Resources Element, Policy ER7.1.3 states:

> **Policy ER7.1.3:** Require that new development protect significant historic, paleontological, or archaeological resources, or provide for other appropriate mitigation. (City of Palmdale 1993: ER-14).

The City will implement the policy as follows:

> **V. Cultural Resources:** The City will map all known historic, archaeological, and paleontological resources and ensure the protection of these resources. The City will review plans for development in potentially sensitive areas. Development in paleontologically and archaeologically sensitive areas where impacts cannot be mitigated will be discouraged. (City of Palmdale 1993: ER-26)

Applications of paleontological resource sensitivity to geologic formations by the City of Palmdale are summarized in Section V of this report.

The City of Palmdale recently published a Draft Environmental Impact Report that identifies impacts to paleontological resources would be less than significant with mitigation (City of Palmdale 2022: 4.7-18). Since the potential for adverse impacts to paleontological resources during construction-related earth-disturbance activities exists, Mitigation Measure GEO-1 (presented below) is required:

> If paleontological resources are encountered during ground-disturbing activities, work within 60 feet shall be halted and the project paleontologist shall immediately evaluate the find. If necessary, the evaluation may require preparation of a treatment plan and paleontological testing. If the discovery proves to be significant under CEQA and cannot be avoided by the project, additional work may be warranted, such as data recovery excavation, to mitigate any significant impacts to historical resources. Any reports required to document and/or evaluate unanticipated discoveries shall be submitted to the City of Palmdale for review and approval. Recommendations contained therein shall be implemented throughout the remainder of ground disturbance activities. (City of Palmdale 2022)

III. GEOLOGY

As shown on Figure 3, the project overlies late Holocene-aged alluvial fan deposits (pale green areas labeled "Qf," after Lancaster et al. 2012). The alluvial fan deposits are described as unconsolidated silt, sand, gravel, cobbles, and boulders. Holocene to late Pleistocene-aged young alluvial fan deposits (pale yellow areas labeled "Qyf") are mapped immediately west of the project.

IV. PALEONTOLOGICAL RESOURCES

Definition

Paleontological resources are the remains of prehistoric life that have been preserved in geologic strata. These remains are called fossils and include bones, shells, teeth, and plant remains (including their impressions, casts, and molds) in the sedimentary matrix, as well as trace fossils such as footprints and burrows. Fossils are considered older than 5,000 years of age (Society of Vertebrate Paleontology [SVP] 2010) but may include younger remains (subfossils) when viewed in the context of local extinction of the organism or habitat, for example. Fossils are considered a nonrenewable resource under state and local guidelines (see Section II).

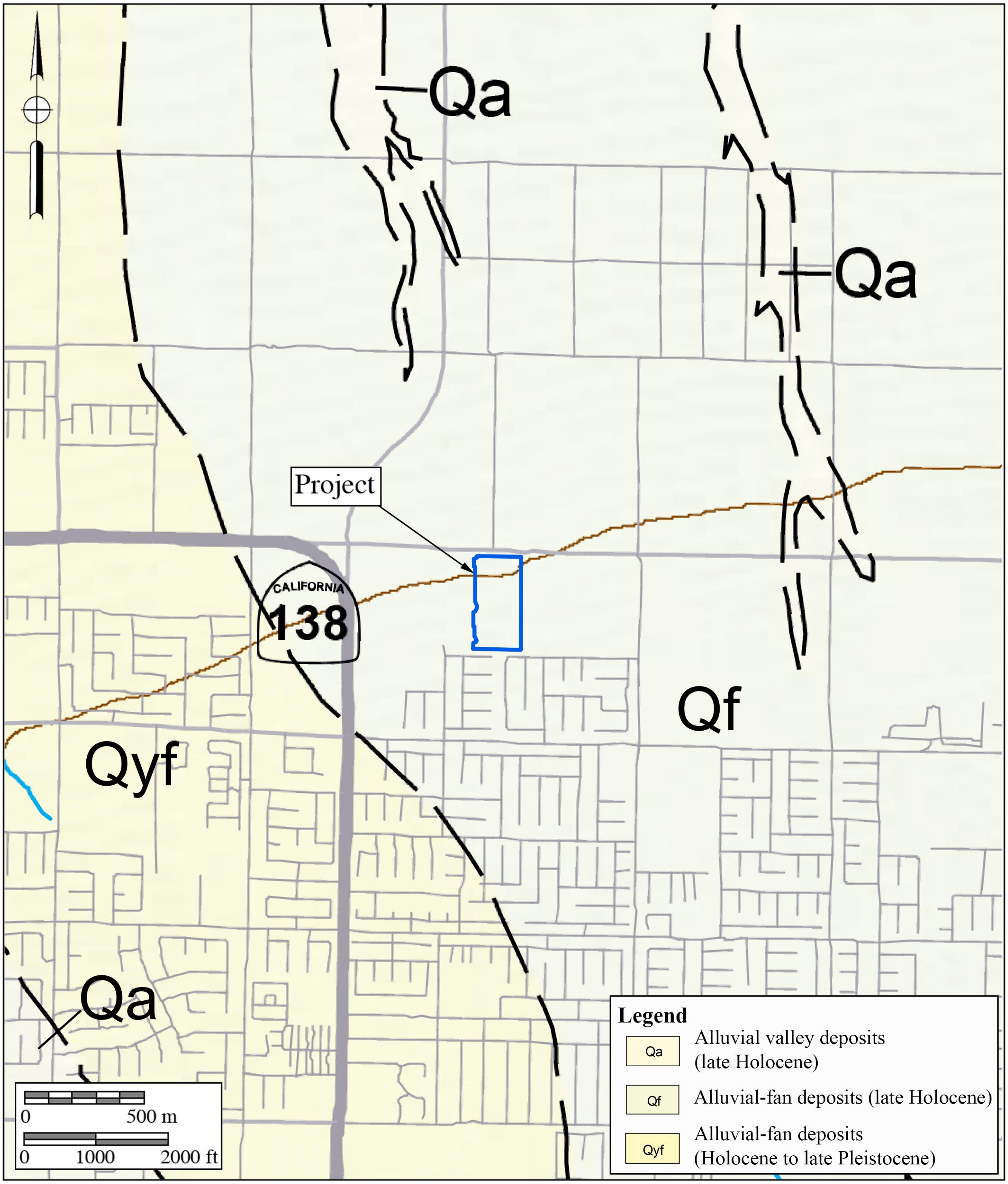

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Figure 3

Geologic Map

The TTM 83359 Project

Geology after Lancaster et al. (2012)

Fossil Locality Search

A paleontological records search was performed by the Los Angeles County Museum of Natural History (LACM) for a prior project located near Palmdale High School (Bell 2022, attached). The record search indicated the closest locality is approximately two to three miles to the southeast of the current project, consisting of Pleistocene microvertebrates represented by the fossilized bones of reptiles, mammals, and birds (LACM locs. 5942–5950). These localities ranged in depth from the near-surface to nine feet, but are mapped in areas identified as late Holocene alluvial fan deposits (Lancaster et al. 2012), implying that at least some Pleistocene-aged deposits are very near the surface with a minimal cover of Holocene deposits. The remaining fossil localities listed by Bell (2022) are several miles distant, mostly in northern Lancaster and beyond.

Record searches performed by the San Bernardino County Museum (SBCM) for prior projects by Brian F. Smith and Associates indicate the nearest fossil localities in similar deposits as the project are located between five and six miles to the west-northwest, consisting of early Holocene and late Pleistocene-aged lizards, birds, and mammals, including rodents, rabbits, and unidentifiable mammalian remains. The preservation of the specimens range from unaltered bones to fossilized bones, depending on the depth of the specimen and the age of the matrix. Also present were freshwater clams and snails. The depth of the specimens ranged from the surface to 15 feet deep, occurring in areas mapped as "Qf," "Qyf," and as late Pleistocene old alluval deposits ("Qoa") (SBCM locs. 9.2.3 – 9.2.7 and 9.2.15 – 9.2.31).

V. PALEONTOLOGICAL SENSITIVITY

Overview

The degree of paleontological sensitivity of any particular area is based on a number of factors, including the documented presence of fossiliferous resources on a site or in nearby areas, the presence of documented fossils within a particular geologic formation or lithostratigraphic unit, and whether or not the original depositional environment of the sediments is one that might have been conducive to the accumulation of organic remains that might have become fossilized over time. Holocene alluvium is generally considered to be geologically too young to contain significant nonrenewable paleontological resources (*i.e.,* fossils) and is thus typically assigned a low paleontological sensitivity. Pleistocene (more than 11,700-year-old) alluvial and alluvial fan deposits in the Inland Empire and Mojave Desert, however, often yield important Ice Age terrestrial vertebrate fossils, such as extinct mammoths, mastodons, giant ground sloths, extinct species of horse, bison, camel, saber-toothed cats, and others (Jefferson 1991, 2009). These Pleistocene sediments are thus accorded a High paleontological resource sensitivity.

Professional Standards

The SVP (2010) has drafted guidelines that include four categories of paleontological sensitivity for geologic units (formations) that might be impacted by a proposed project, as listed below:

- *High Potential:* Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered.
- *Undetermined Potential:* Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment, and that further study is needed to determine the potential of the rock unit.
- *Low Potential:* Rock units that are poorly represented by fossil specimens in institutional collections or based on a general scientific consensus that only preserve fossils in rare circumstances.
- *No Potential:* Rock units that have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks and plutonic igneous rocks.

Using these criteria, the presence of nearby significant fossil localities yielded by similar alluvial fan deposits as those at the project, the Holocene to late Pleistocene alluvial fan deposits may be considered to have an undetermined to high potential to yield paleontological resources.

City of Palmdale Assessment

In the Environmental Resources Element of the City's General Plan, the paleontological sensitivity of geologic formations mapped within the city are classified according to their potential to yield fossil resources (City of Palmdale 1993: ER-44). An assignment of "unknown potential" appears to be applied to the alluvial deposits mapped at the project, stating, "[t]he Pleistocene alluvium which is of high potential is covered by a thin layer of recent alluvium. This layer has an unknown potential for producing paleontologic resources" (City of Palmdale 1993). This statement is roughly in line with the disposition of the nearby fossil localities discussed in Section IV of this report. Correspondingly, Pleistocene lacustrine and fluvial deposits are accorded a high paleontological potential/sensitivity in the Environmental Resources Element.

The analysis of paleontological resources by the Environmental Resources Element concludes, "The City's low-lying areas consist of Quaternary alluvium which is known to contain numerous vertebrate fossils. Although no other paleontological resources have been recorded in the Planning Area, their existence should not be precluded or dismissed" (City of Palmdale 1993: ER-45). A map of paleontological sensitivity indicates the project is within an area designated as having an "undetermined" potential for paleontological resources (City of Palmdale 1993: ER-65).

VI. CONCLUSIONS AND RECOMMENDATIONS

Research has confirmed the existence of thin, Holocene alluvial deposits mapped at the surface of the project. These deposits overlie potentially fossiliferous Holocene to late Pleistocene-aged young alluvial fan deposits. The known occurrence of significant terrestrial vertebrate fossils at very shallow depths from alluvial deposits from the Mojave Desert and the moderate to high paleontological sensitivity rating assigned to Pleistocene-aged alluvial deposits for yielding paleontological resources all support paleontological monitoring be implemented during mass grading and excavation activities in undisturbed alluvial deposits in order to mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources. Full-time monitoring of undisturbed alluvial fan deposits at the project is warranted starting at the surface.

The following Paleontological Resource Impact Mitigation Program (PRIMP), outlined below, is based on the findings stated above. A PRIMP, when submitted to the City of Palmdale, should be approved by the City prior to the issuance and approval of grading permits for the project. This suggested PRIMP, when implemented, would reduce impacts to potential paleontological resources to a level below significant:

1. Prior to initiation of any grading, drilling, and/or excavation activities, a preconstruction meeting will be held and attended by the paleontologist of record, representatives of the grading contractor and subcontractors, the project owner or developer, and a representative of the lead agency. The nature of potential paleontological resources shall be discussed, as well as the protocol that is to be implemented following the discovery of any fossiliferous materials.
2. Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources shall be performed by a qualified/project paleontologist or paleontological monitor. Monitoring shall be performed starting at the surface on a full-time basis; Holocene alluvial deposits should be monitored part-time at the discretion of the project paleontologist. The timing and duration of the monitoring of excavation activities within the alluvial fan deposits shall be at the discussion of the project paleontologist based on the geological conditions observed by the paleontological monitor and/or the project paleontologist.
3. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays. The monitor must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or, if present, are determined upon exposure and examination by qualified paleontological personnel to have low potential to contain fossil resources. The monitor shall notify the project paleontologist, who will then notify the concerned

parties of the discovery.

4. Paleontological salvage during trenching and boring activities is typically from the generated spoils and does not delay the trenching or drilling activities. Fossils will be collected and placed in cardboard flats or plastic buckets and identified by field number, collector, and date collected. Notes will be taken on the map location and stratigraphy of the site, which is photographed before it is vacated, and the fossils are removed to a safe place. On mass grading projects, discovered fossil sites will be protected by flagging to prevent them from being overrun by earthmovers (scrapers) before salvage begins. Fossils will be collected in a similar manner, with notes and photographs being taken before removing the fossils. Precise location of the site is determined with the use of handheld GPS units. If the site involves remains from a large terrestrial vertebrate, such as large bone(s) or a mammoth tusk, that is/are too large to be easily removed by a single monitor, a fossil recovery crew shall excavate around the find, encase the find within a plaster and burlap jacket, and remove it after the plaster is set. For large fossils, use of the contractor's construction equipment may be solicited to help remove the jacket to a safe location.
5. Isolated fossils will be collected by hand, wrapped in paper, and placed in temporary collecting flats or five-gallon buckets. Notes will be taken on the map location and stratigraphy of the site, which is photographed before it is vacated, and the fossils are removed to a safe place.
6. Particularly small invertebrate fossils typically represent multiple specimens of a limited number of organisms, and a scientifically suitable sample can be obtained from one to several five-gallon buckets of fossiliferous sediment. If it is possible to dry screen the sediment in the field, a concentrated sample may consist of one or two buckets of material. For vertebrate fossils, the test is usually the observed presence of small pieces of bones within the sediments. If present, multiple five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment.
7. In accordance with the "Microfossil Salvage" section of the SVP guidelines (2010:7), bulk sampling and screening of fine-grained sedimentary deposits (including carbonate-rich paleosols) must be performed if the deposits are identified to possess indications of producing fossil "microvertebrates" to test the feasibility of the deposit to yield fossil bones and teeth.
8. In the laboratory, individual fossils will be cleaned of extraneous matrix, any breaks will be repaired, and the specimen, if needed, will be stabilized by soaking in an archivally approved acrylic hardener (*e.g.,* a solution of acetone and Paraloid B-72).
9. Recovered specimens will be prepared to a point of identification and permanent preservation (not display), including screen-washing sediments to recover small invertebrates and vertebrates. Preparation of individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.

10. Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.,* the LACM) shall be conducted. The paleontological program should include a written repository agreement prior to the initiation of mitigation activities. Prior to curation, the lead agency (*e.g.,* the City of Palmdale) will be consulted on the repository/museum to receive the fossil material.
11. A final monitoring and mitigation report of findings and significance will be prepared, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location(s). The report, when submitted to, and accepted by, the appropriate lead agency, will signify satisfactory completion of the project program to mitigate impacts to any potential nonrenewable paleontological resources (*i.e.,* fossils) that might have been lost or otherwise adversely affected without such a program in place.

VII. CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this paleontological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief, and have been compiled in accordance with CEQA criteria.

November 2, 2022

Todd A. Wirths
Senior Paleontologist
California Professional Geologist No. 7588

Date

PROFESSIONAL GEOLOGIST · TODD A. WIRTHS · No. 7588 · STATE OF CALIFORNIA

VIII. REFERENCES

Bell, A. 2022. Paleontological resources for the Beyond Market and Car Wash Project. Unpublished letter for Brian F. Smith and Associates, Inc., Poway, California, by the Natural History Museum of Los Angeles County, Los Angeles, California.

City of Palmdale. 1993. Environmental resources element of the general plan. https://cityofpalmdale.org/DocumentCenter/View/569/Environmental-Resources-Element-PDF.

City of Palmdale. 2022. City of Palmdale 2045 General Plan Update, Draft Environmental Impact Report, SCH# 2021060494. https://cityofpalmdale.org/DocumentCenter/View/11872/Palmdale-General-Plan-Public-Draft-Environmental-Impact-Report-PDF.

Jefferson, G.T. 1991. A catalogue of late Quaternary vertebrates from California: Part two, mammals. Natural History Museum of Los Angeles County, Technical Reports, no. 7: i-v + 1-129.

Jefferson, G.T. 2009. A catalogue of Blancan and Irvingtonian vertebrates and floras from Arizona, southern California, Nevada, Utah, and northwestern Mexico. Unpublished draft manuscript, Colorado Desert District Stout Research Center, Anza-Borrego Desert State Park, Borrego Springs, California.

Lancaster, J.T., Hernandez, J.L., Haydon, W.D, Dawson, T.E., and Hayhurst, C.A. 2012. Geologic map of Quaternary surficial deposits in southern California: Lancaster 30' x 60' Quadrangle. California Geological Survey Special Report 217, Plate 22.

Society of Vertebrate Paleontology. 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources; by the SVP Impact Mitigation Guidelines Revision Committee: Electronic document, https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf.

APPENDIX A

Qualifications of Key Personnel

Todd A. Wirths, MS, PG No. 7588

Senior Paleontologist

Brian F. Smith and Associates, Inc.
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: twirths@bfsa-ca.com

Education

Master of Science, Geological Sciences, San Diego State University, California **1995**

Bachelor of Arts, Earth Sciences, University of California, Santa Cruz **1992**

Professional Certifications

California Professional Geologist #7588, 2003
Riverside County Approved Paleontologist
San Diego County Qualified Paleontologist
Orange County Certified Paleontologist
OSHA HAZWOPER 40-hour trained; current 8-hour annual refresher

Professional Memberships

Board member, San Diego Geological Society
San Diego Association of Geologists; past President (2012) and Vice President (2011)
South Coast Geological Society
Southern California Paleontological Society

Experience

Mr. Wirths has more than a dozen years of professional experience as a senior-level paleontologist throughout southern California. He is also a certified California Professional Geologist. At BFSA, Mr. Wirths conducts on-site paleontological monitoring, trains and supervises junior staff, and performs all research and reporting duties for locations throughout Los Angeles, Ventura, San Bernardino, Riverside, Orange, San Diego, and Imperial Counties. Mr. Wirths was formerly a senior project manager conducting environmental investigations and remediation projects for petroleum hydrocarbon-impacted sites across southern California.

Selected Recent Reports

2019 *Paleontological Assessment for the 10575 Foothill Boulevard Project, City of Rancho Cucamonga, San Bernardino County, California*. Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Assessment for the MorningStar Marguerite Project, Mission Viejo, Orange County, California.* Prepared for T&B Planning. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Monitoring Report for the Nimitz Crossing Project, City of San Diego.* Prepared for Voltaire 24, LP. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Resource Impact Mitigation Program (PRIMP) for the Jack Rabbit Trail Logistics Center Project, City of Beaumont, Riverside County, California.* Prepared for JRT BP 1, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Monitoring Report for the Oceanside Beachfront Resort Project, Oceanside, San California.* Prepared for S.D. Malkin Properties. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Impact Mitigation Program for the Nakase Project, Lake Forest, Orange County, San California.* Prepared for Glenn Lukos Associates, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Impact Mitigation Program for the Sunset Crossroads Project, Banning, Riverside County*. Prepared for NP Banning Industrial, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Assessment for the Ortega Plaza Project, Lake Elsinore, Riverside County*. Prepared for Empire Design Group. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Record Search Update for the Green River Ranch III Project, Green River Ranch Specific Plan SP00-001, City of Corona, California*. Prepared for Western Realco. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Assessment for the Cypress/Slover Industrial Center Project, City of Fontana, San Bernardino County, California*. Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Monitoring Report for the Imperial Landfill Expansion Project (Phase VI, Segment C-2), Imperial County, California*. Prepared for Republic Services, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Assessment for the Manitou Court Logistics Center Project, City of Jurupa Valley, Riverside County, California*. Prepared for Link Industrial. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Resource Impact Mitigation Program for the Del Oro (Tract 36852) Project, Menifee, Riverside County*. Prepared for D.R. Horton. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Assessment for the Alessandro Corporate Center Project (Planning Case PR-2020-000519), City of Riverside, Riverside County, California*. Prepared for OZI Alessandro, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2021 *Paleontological Monitoring Report for the Boardwalk Project, La Jolla, City of San Diego*. Prepared for Project Management Advisors, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

APPENDIX B

Fossil Locality Search 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

June 12, 2022

Brian F. Smith and Associates, Inc.
Attn: Todd Wirths

re: Paleontological resources for the Beyond Market and Car Wash Project (22-195)

Dear Todd:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the Beyond Market and Car Wash Project area as outlined on the portion of the Palmdale USGS topographic quadrangle map that you sent to me via e-mail on June 6, 2022. 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).

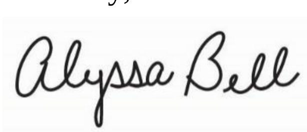
Locality Number	Location	Formation	Taxa	Depth
LACM VP CIT 451	Near intersection of E Barrel Springs Rd & 47th St E (Palmdale Quad)	Harold Formation	Mastodon (Mammutidae), horse family (Equidae)	Unknown
LACM VP 5942-5950	Along Avenue S from Palmdale to Lake Los Angeles	Unknown formation (Holocene)	Kingsnake (*Lampropeltis*), Lizard (Lacertilia), leopard lizard (*Gambelia*); snake (Ophidia), gopher snake (*Pituophis*); rabbit (*Lagomorpha*), rodent (Rodentia), Pocket gopher (*Thomomys*), pocket mouse (*Chaetodippus*), kangaroo rat (*Dipodomys*); birds (Aves)	0-9 ft 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 (*Camelops hesternus*)	4 feet bgs
LACM VP 7853	Waste Management of North America Lancaster Landfill	Unknown formation (Pleistocene; sandy loess under a dune deposit strand,	Rabbit (*Sylvagus*), camel family (Camelidae), antelope squirrel (*Ammospermophilus*), kangaroo rat (*Dipodymus*), pocket mouse	3-11 feet bgs

		sandy siltstone, siltstone to clayey siltstone)	(*Perognathus*), pack rat (*Neotoma*), deer mouse (*Peromyscus*), vole family (Microtinae), iguana (*Dipsosaurus*), pocket gopher (*Thomomys*), spiny lizard (*Sceloporus*), side blotched lizard (*Uta*), colubrid snakes (*Trimorphodon, Masticophis, Phyllorhynchus*), night lizard (*Xantusia*), western alligator lizard (*Elgaria*), toothy skinks (*Plestiodon*), whiptail lizard (*Aspidocelis*), spiny lizards (Phrynosomatidae), smelt (Osmeridae)	
LACM VP 7891	near the California Aqueduct between the Tehachapi Mountains & the Rosamond Hills north of Willow Springs	Unknown formation (Pleistocene)	Camel (*Hemiauchenia*)	21 feet bgs

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface
**Locality is 25 feet below carbon-14 accelerator mass spectrometry date of 43180 +/-710 years*

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 D

Fuel Consumption Calculations

Tentative Tract Map

Last Updated: 12/1/2022

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Pumps	1	8	84	0.74	Site Preparation Phase	6,137
Rubber Tired Dozers	1	8	247	0.4	Site Preparation Phase	8,774
Tractors/Loaders/Backhoes	2	8	97	0.37	Site Preparation Phase	7,086
Graders	1	8	187	0.41	Grading Phase	1,297
Off-Highway Tractors	1	8	124	0.44	Grading Phase	923
Plate Compactors	1	8	8	0.43	Grading Phase	65
Rubber Tired Dozers	1	8	247	0.4	Grading Phase	1,671
Scrapers	4	8	367	0.48	Grading Phase	11,919
Tractors/Loaders/Backhoes	3	8	97	0.37	Grading Phase	2,025
Air Compressors	4	8	78	0.48	Building Construction Phase	12,462
Excavators	2	8	158	0.38	Building Construction Phase	8,988
Forklifts	2	8	89	0.2	Building Construction Phase	2,962
Generator Sets	4	8	84	0.74	Building Construction Phase	20,689
Skid Steer Loaders	4	8	65	0.37	Building Construction Phase	8,005
Tractors/Loaders/Backhoes	3	7	97	0.37	Building Construction Phase	7,839
Trenchers	1	8	78	0.5	Building Construction Phase	3,245
Pavers	1	8	130	0.42	Paving Phase	577
Paving Equipment	1	8	132	0.36	Paving Phase	502
Surfacing Equipment	1	8	263	0.3	Paving Phase	834
Air Compressors	4	8	78	0.48	Architiectural Coating	1,408
Forklifts	2	8	89	0.2	Architiectural Coating	335
Generator Sets	4	8	84	0.74	Architiectural Coating	2,338
Rubber Tired Loaders	1	8	203	0.36	Architiectural Coating	618
					Total Fuel Used	**110,699 (Gallons)**

Construction Phase	Days of Operation
Site Preparation Phase	210
Grading Phase	40
Building Construction Phase	177
Paving Phase	25
Architectural Coating Phase	20
Total Days	472

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Site Preparation Phase	24.1	10	10.8	941.08
Grading Phase	24.1	28	10.8	501.91
Building Construction Phase	24.1	248	10.8	19671.24
Paving Phase	24.1	8	10.8	89.63
Architectural Coating Phase	24.1	50	10.8	448.13
			Total	**21,651.98**

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
		HAULING TRIPS		
Site Preparation Phase	7.5	0	20.0	0.00
Grading Phase	7.5	0	20.0	0.00
Building Construction Phase	7.5	0	20.0	0.00
Paving Phase	7.5	0	20.0	0.00
Architectural Coating Phase	7.5	0	20.0	0.00
			Total	-
		VENDOR TRIPS		
0	7.5	0	7.3	0.00
Site Preparation Phase	7.5	0	7.3	0.00
Grading Phase	7.5	0	7.3	0.00
Building Construction Phase	7.5	91	7.3	15677.48
Paving Phase	7.5	0	7.3	0.00
Architectural Coating Phase	7.5	0	7.3	0.00
			Total	**15,677.48**

Total Gasoline Consumption (gallons)	**21,652**
Total Diesel Consumption (gallons)	**126,376**

Sources:

[1] United States Environmental Protection Agency. 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2* . September. Available at: https://www.epa.gov/system/files/documents/2021-08/420r21021.pdf.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2021. *National Transportation Statistics* . Available at: https://www.bts.gov/topics/national-transportation-statistics.

Tentative Tract Map

Last Updated: 12/1/2022

Populate one of the following tables (Leave the other blank):

Annual VMT		OR	Daily Vehicle Trips	
Annual VMT:	3,788,152		Daily Vehicle Trips:	
			Average Trip Distance:	

Fleet Class	Fleet Mix
Light Duty Auto (LDA)	0.592914
Light Duty Truck 1 (LDT1)	0.051978
Light Duty Truck 2 (LDT2)	0.143358
Medium Duty Vehicle (MDV)	0.118868
Light Heavy Duty 1 (LHD1)	0.026746
Light Heavy Duty 2 (LHD2)	0.007323
Medium Heavy Duty (MHD)	0.011582
Heavy Heavy Duty (HHD)	0.009144
Other Bus (OBUS)	0.000678
Urban Bus (UBUS)	0.000678
Motorcycle (MCY)	0.000495
School Bus (SBUS)	0.002501
Motorhome (MH)	0.006531

Fuel Economy (MPG) [1]	
Passenger Vehicles	24.1
Light-Med Duty Trucks	17.6
Heavy Trucks/Other	7.5
Motorcycles	44

Fleet Mix

Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	*59.29%*	*Gasoline*	2,246,048	0.00	93,197
Light-Medium Duty Trucks	*31.42%*	*Gasoline*	1,190,253	0.00	67,628
Heavy Trucks/Other	*6.52%*	*Diesel*	246,923	0.00	32,923
Motorcycle	*0.05%*	*Gasoline*	1,875	0.00	43

Total Gasoline Consumption (gallons)	**160,868**
Total Diesel Consumption (gallons)	**32,923**

Sources:

[1] United States Department of Transportation, Bureau of Transportation Statistics. 2021. National Transportation Statistics. Available at: https://www.bts.gov/topics/national-transportation-statistics.

Appendix E

Geologic and Geotechnical Engineering Investigation

GEOLOGIC AND GEOTECHNICAL ENGINEERING INVESTIGATION,
PROPOSED SINGLE-FAMILY RESIDENTIAL DEVELOPMENT,
Tract 83359, East Palmdale Boulevard,
Palmdale, California

for

Ravello Holding, Inc.

October 27, 2021 W.O. 7648

MDN 22503

GeoSoils Consultants Inc.

GSC GeoSoils Consultants Inc.
GEOTECHNICAL GEOLOGIC ENVIRONMENTAL

October 27, 2021
W.O. 7648

RAVELLO HOLDINGS, INC.
2007 Cedar Avenue
Manhattan Beach, CA 90266

Attention: Mr. Kevin Harbison

Subject: Geologic and Geotechnical Engineering Investigation, Proposed Single-Family Residential Development, Tract 83359, East Palmdale Boulevard, Palmdale, California

Dear Mr. Harbison:

As requested, GeoSoils Consultants, Inc. (GSC) has performed a geologic and geotechnical engineering investigation on the subject tract. The purpose of this investigation is to provide geologic and geotechnical engineering recommendations for site grading and foundations. The report presents the results of our research, field mapping, subsurface exploration, laboratory testing, and provides geotechnical engineering recommendations for site grading. Grading of the site is considered feasible from a geologic and geotechnical engineering prospective, provided the recommendations presented herein are incorporated into the design and implemented during grading.

We appreciate this opportunity to be of service to you. If you have any questions regarding this report, or if we may be of further assistance to you, please do not hesitate to contact us.

Very truly yours,

GEOSOILS CONSULTANTS, INC.

CERTIFIED ENGINEERING GEOLOGIST
RUDY F. RUBERTI
No. 1708
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
KAREN L. MILLER
No. 2257
Exp. 3/31/22
GEOTECHNICAL
STATE OF CALIFORNIA

RUDY F. RUBERTI
CEG 1708

KAREN L. MILLER
GE 2257

cc: (1) Addressee

MDN 22503

6634 Valjean Avenue, Van Nuys, California 91406 Phone: (818) 785-2158 Fax: (818) 785-1548

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Enclosures

1.0 INTRODUCTION

The purpose of this study is to provide geologic and geotechnical engineering data and recommendations to aid in development of the subject site. The following sections provide a summary of past grading activity on the tract, geologic and geotechnical engineering conditions, and recommendations for site grading, fill placement, and foundations.

This report has been prepared in accordance with generally accepted geotechnical engineering practices in the City of Palmdale and the time it was prepared. The report presents a brief description of the site, the geotechnical engineering characteristics of the area, the seismicity of the area, an engineering analysis of the site characteristics, conclusions, and recommendations to develop the site.

Opinions presented in this report are based on an inspection of the site, geologic mapping, subsurface exploration, a review of the regional geologic maps and seismic hazard reports, and our general knowledge of the geologic and soils engineering conditions in the site area. The opinions presented have been arrived at through the exercise of the generally understood standard of care for our profession and standard of engineering practice for the City of Palmdale, as we understand it.

1.1 Scope of Services

Our scope of services included the following:

- Site reconnaissance.
- Review of regional geologic maps and seismic hazard reports.
- Excavating, logging, and sampling of 11 backhoe test pits and 3 exploratory boring. The locations of the test pits and borings are shown on the Plate 1 (Geologic Map) and test pit and boring logs are included in Appendix A.
- Preparation of a Geologic Map (Plate 1).

- Laboratory testing (Appendix B).
- Engineering analyses.
- Review of a previous reports by GSC for the adjacent property to the east of the subject site.
- Preparation of this report.

1.2 Limitations

The findings and recommendations of this report were prepared in accordance with generally accepted professional geotechnical engineering principles and practice for the City of Palmdale at this time. We make no other warranty, either express or implied. The conclusions and recommendations contained in this report are based on-site conditions disclosed in our subsurface investigation and the referenced reports. However, soil/rock conditions can vary significantly between test pits and borings; therefore, further refinements of our recommendations contained herein may be necessary due to changes in the building plans or what is encountered during site grading.

The recommendations provided in this report are applicable for preliminary development planning for the referenced tract provided that surface water will be kept from infiltrating into the subgrade adjacent to the house foundation systems. This may include, but not be limited to rainwater, roof water, landscape water and/or leaky plumbing. The lots are to be fine graded at the completion of construction to include positive drainage away from the structure and roof water will be collected via gutters, downspouts, and transported to the street in buried drainpipes. Home buyers should be cautioned against constructing open draining planters adjacent to the houses or obstructing the yard drainage in any way.

Since our investigation was based on the site conditions observed, selective laboratory testing, and engineering analyses, the conclusions and recommendations contained herein are professional opinions. Further, these opinions have been derived in accordance with standard engineering practices, and no warranty is expressed or implied.

2.0 SITE DISCRIPTION

The subject site is located within the City of Palmdale along the south side of East Palmdale Boulevard and east of Hudsonia Street (Figure 1). The site is vacant with scatter brush and a few dirt roads. The generally level site is bounded to the south and west by existing residential developments, to the north by East Palmdale Boulevard, and to the east by open space.

3.0 PROPOSED DEVELOPMENT

Proposed development of the site will consist of a cut/fill grading operation to create 67 lots for single-family residential construction and associated streets. Rough Grading Plans were prepared by Civil Design and Drafting and are included as the base map for Plate 1.

4.0 PREVIOUS STUDIES AND GRADING

4.1 Previous Studies

GSC prepared a report for Tract 73068 to the east of the subject tract (References). No other studies are known to exist on the subject tract.

4.2 Previous Grading

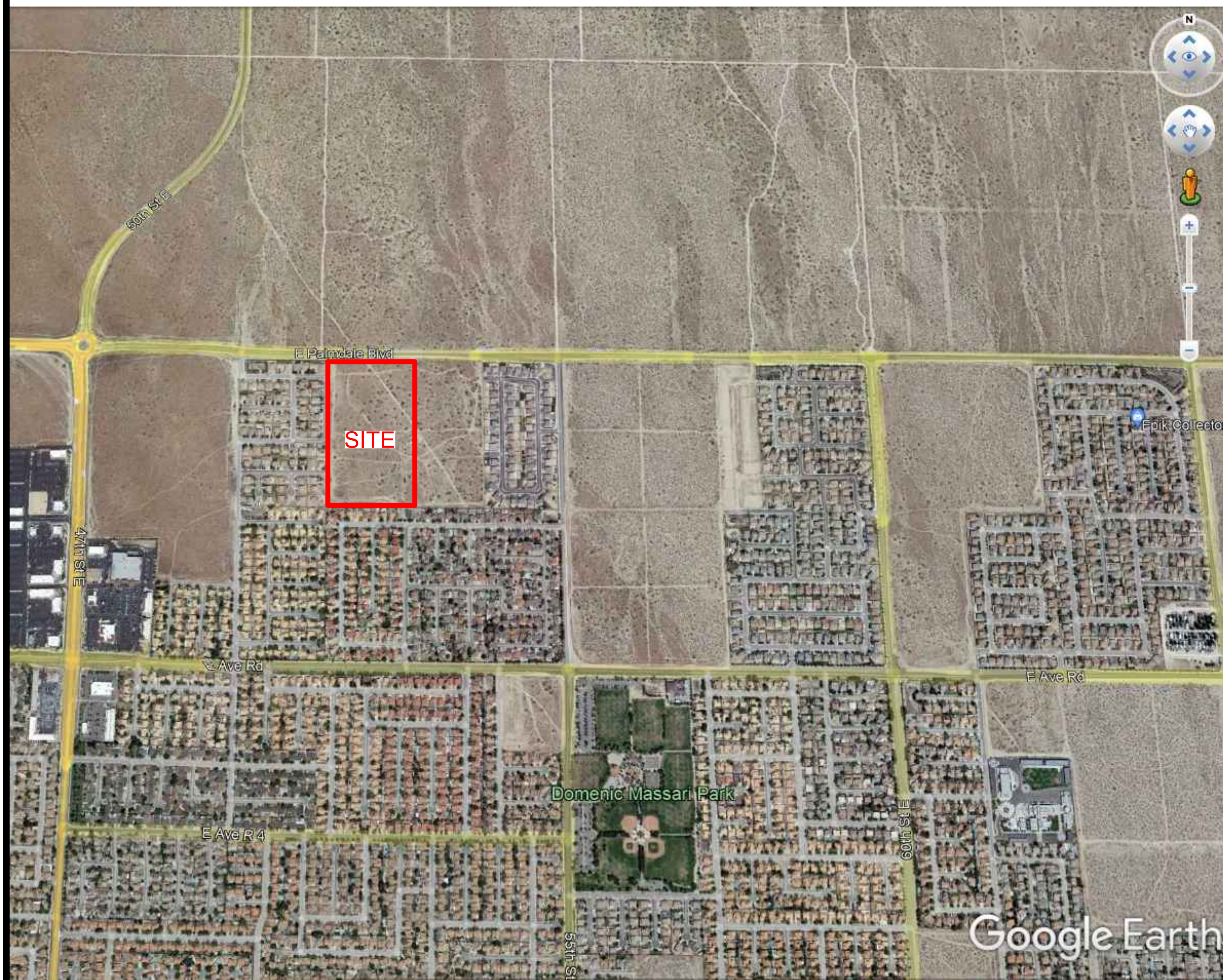
Grading has not been performed on the site. A few dirt roads traverse the site.

5.0 GEOLOGIC ENVIRONMENT

Geologic conditions on the subject site were determined through research, field mapping, and subsurface exploration, and the results were superimposed on the Geologic Map, Plate 1. During grading, a geologist should be present to confirm the geologic conditions encountered on the site are consistent with those presented herein. The following sections present our findings concerning subsurface and groundwater conditions.

5.1 Regional Geologic Setting

The subject tract is located within the Mojave Desert Geomorphic Provence. The Mojave is a broad interior region of isolated mountain ranges separated by expanses



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SITE LOCATION MAP
ENTATIVE TRACT 83359
PALMDALE, CALIFORNIA
RAVELLO HOLDINGS, LLC.

W.O. NO.:	7648
DATE:	10/2021

FIGURE 1

of desert plains. It has an interior enclosed drainage and many playas. There are two important fault trends that control topography, a prominent NW-SE trend and a secondary east-west trend (apparent alignment with Transverse Ranges is significant). The Mojave province is wedged in a sharp angle between the Garlock Fault (southern boundary Sierra Nevada) and the San Andreas Fault, where it bends east from its northwest trend. The northern boundary of the Mojave is separated from the prominent Basin and Range by the eastern extension of the Garlock Fault. A Regional Geologic Map is included as Figure 2.

5.2 Local Geologic Setting

The subject site is located within the Antelope Valley and is underlain by deep deposits of alluvium.

5.3 Earth Materials

Alluvium (Qal)

Alluvium underlies the site and consists of interbedded sand and gravelly sand, with variable amounts of silt. The alluvium is slightly moist and dense.

5.4 Geologic Structure

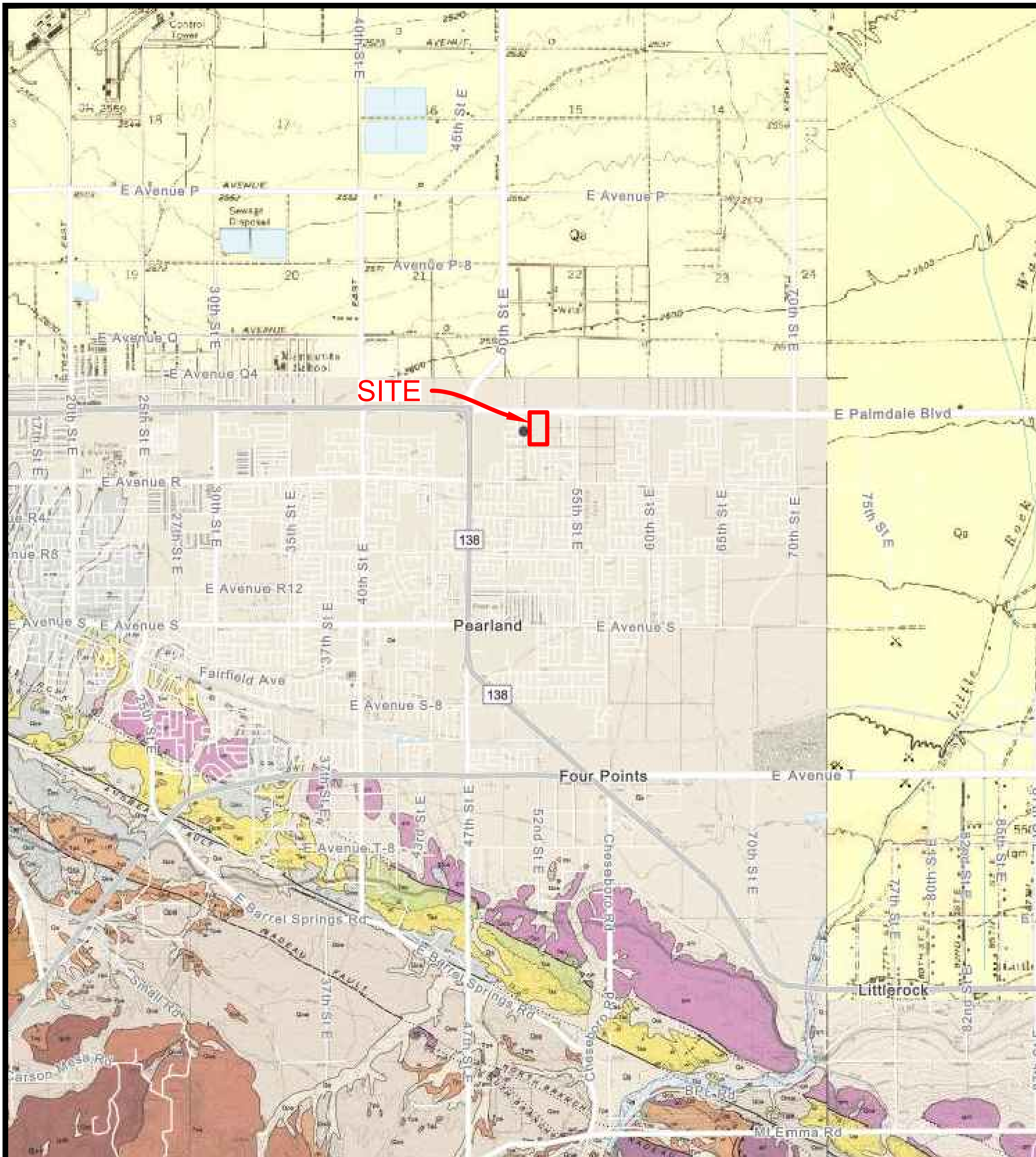
The site is underlain by alluvium and lacks geologic structure.

5.5 Mass Wasting

The site is flat and mass wasting does not present a hazard.

5.6 Groundwater

Groundwater was not encountered in any of the test pits or borings excavated as part of this study. Perched groundwater conditions may exist within the alluvium during wet periods of the year. Historic high groundwater is over 100 feet below the ground surface.



MDN 22503

REGIONAL GEOLOGIC MAP
ENTATIVE TRACT 83359
PALMDALE, CALIFORNIA
RAVELLO HOLDINGS, LLC.

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FIGURE 2

5.7 Expansive Soil

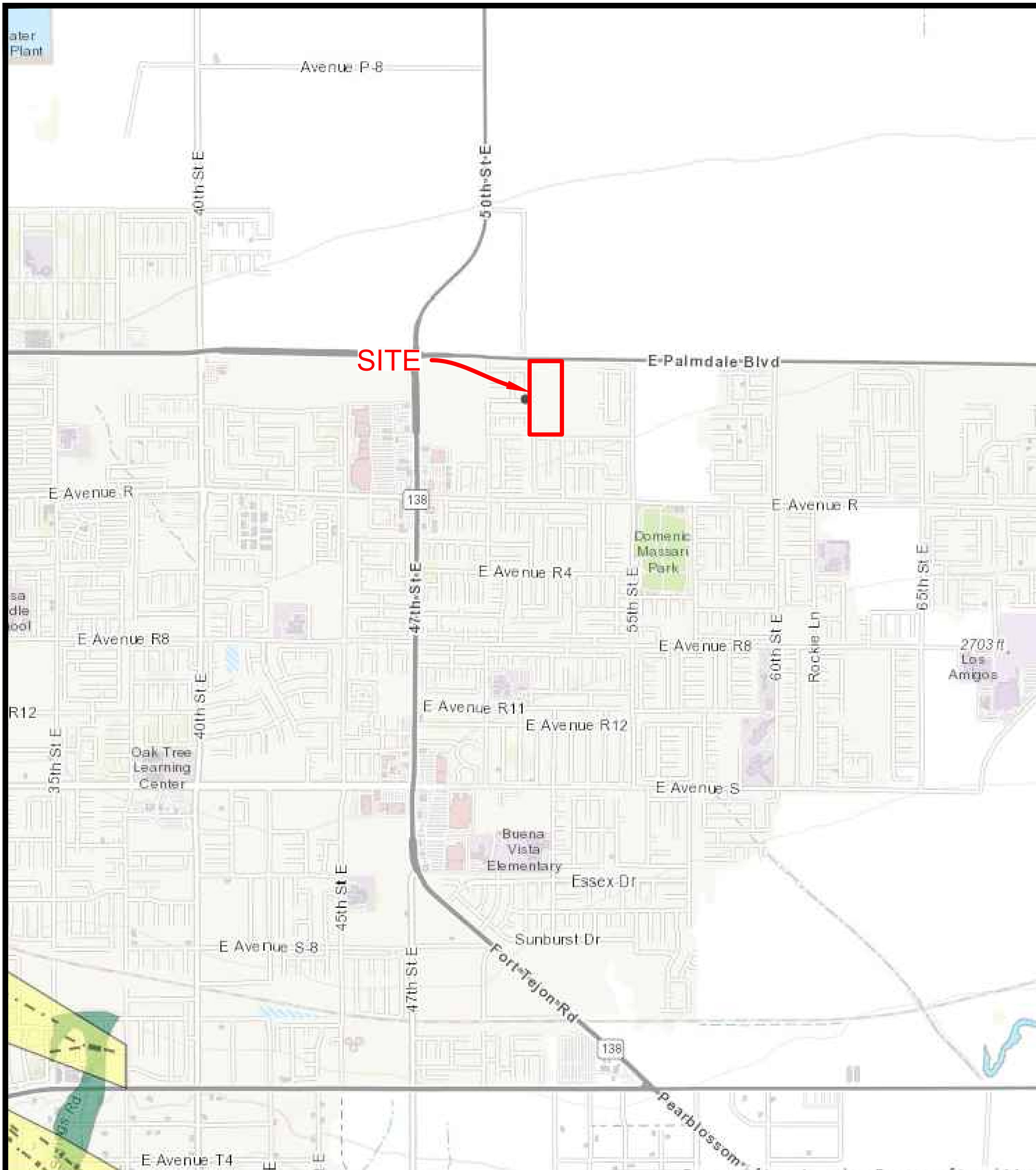
Onsite soil is anticipated to have a very low expansion index. Additional testing will be performed at the completion of grading and the results will be presented in a final compaction report.

6.0 FAULTING AND SEISMICITY

The project site is not located within an Alquist-Priolo Earthquake Fault Zone and there are no active faults on or adjacent to the property (Figure 3). Although there are no faults on or adjacent to the property, there are faults near the site that can cause moderate to intense ground shaking during the lifetime of the proposed development. Therefore, earthquake resistant design is recommended.

The closest active fault to the site is the San Andreas Fault, located approximately 3.2 miles to the southwest. The San Andreas Fault is a continental transform fault that extends roughly 1,200 kilometers (750 mi) through California. It forms the tectonic boundary between the Pacific Plate and the North American Plate, and its motion is right-lateral strike-slip. The fault divides into three segments, each with different characteristics and a different degree of earthquake risk. The slip rate along the fault ranges from 20 to 35 mm (0.79 to 1.38 in)/yr.

The southern segment (also known as the Mojave segment) begins near Bombay Beach, California. Box Canyon, near the Salton Sea, contains upturned strata associated with that section of the fault. The fault then runs along the southern base of the San Bernardino Mountains, crosses through the Cajon Pass and continues northwest along the northern base of the San Gabriel Mountains. These mountains are a result of movement along the San Andreas Fault and are commonly called the Transverse Range. In Palmdale, a portion of the fault is easily examined at a roadcut for the Antelope Valley Freeway. The fault continues northwest alongside the Elizabeth Lake Road to the town of Elizabeth Lake. As it passes the towns of Gorman, Tejon Pass and Frazier Park, the fault begins to bend northward, forming the "Big Bend". This restraining bend is thought to be where the fault locks up in Southern California, with an earthquake-recurrence interval of roughly 140 to 60



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SEISMIC HAZARD ZONE MAP
ENTATIVE TRACT 83359
PALMDALE, CALIFORNIA
RAVELLO HOLDINGS, LLC.

W.O. NO.:	7648
DATE:	10/2021

FIGURE 3

years. Northwest of Frazier Park, the fault runs through the Carrizo Plain, a long, treeless plain where much of the fault is plainly visible. The Elkhorn Scarp defines the fault trace along much of its length within the plain.

The southern segment, which stretches from Parkfield in Monterey County all the way to the Salton Sea, is capable of an 8.1-magnitude earthquake. At its closest, this fault passes about 35 miles (56 km) to the northeast of Los Angeles.

Earthquake Characterization: Earthquakes are characterized by magnitude, which is a quantitative measure of the earthquake strength, based on strain energy released during a seismic event. The magnitude of an earthquake is constant for any given site and is independent of the site in question.

Earthquake Intensity: The intensity of an earthquake at a random site is not constant and is subject to variations. The intensity is an indirect measurement of ground motion at a particular site and is affected by the earthquake magnitude, the distance between the site and the hypocenter (the location on the fault at depth where the energy is released), and the geologic conditions between the site and the hypocenter. Intensity, which is often measured by the Mercalli scale, generally increases with increasing magnitude and decreases with increasing distance from the hypocenter. Topography may also affect the intensity of an earthquake from one site to another. Topographic effects such as steep sided ridges or slopes may result in a higher intensity than sites located in relatively flat-lying areas.

6.1 2019 California Building Code (CBC), Seismic Design Criteria

The 2019 CBC (California Building Code) seismic coefficient criteria are provided here for structural design consideration.

Under the Earthquake Design Regulations of Chapter 19, Section 1613 of the CBC 2019, the following coefficients apply for the proposed structures at the site. Class D should be used for the site. The following seismic data is presented for preliminary design purposes.

2019 CBC Section 1613, Earthquake Loads	
Site Class Definition	D
Mapped Spectral Response Acceleration Parameter, S_s (Figure 1613.3.1 for 0.2 second)	1.889
Mapped Spectral Response Acceleration Parameter, S_1 (Figure 1613.3.1 for 1.0 second)	0.788
Site Coefficient, F_a (Table 1613.3.3(1) short period)	1.2
Site Coefficient, F_v (Table 1613.3.3(2) 1-second period)	1.7
Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter S_{MS}	2.266
Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter S_{M1}	1.3
Design Spectral Response Acceleration Parameter, S_{DS} (Eq. 16-39)	1.511
Design Spectral Response Acceleration Parameter, S_{D1} (Eq. 16-40)	0.893
Notes: **Longitude: -118.0361, Latitude: 34.5779** 1. Site Class Designation: Class D is recommended based on subsurface condition. 2. Ss, SMs, and SDs are spectral response accelerations for the period of 0.2 second. 3. S1, SM1, and SD1 are spectral response accelerations for the period of 1.0 second. 4. These values may only be utilized where the value of the seismic response coefficient, Cs, satisfies equation 12.8-3 or 12.8-4 of the ASCE Standard 7-16	

Conformance to the above criteria for seismic excitation does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a maximum level earthquake occurs. The primary goal of seismic design is to protect life and not to avoid all damage, since such design may be economically prohibitive. Following a major earthquake, a building may be damaged beyond repair, yet not collapse.

6.2 Secondary Earthquake Effects

Ground shaking produced during an earthquake can result in a number of potentially damaging phenomena classified as secondary earthquake effects. These secondary effects include ground rupture, landslides, seiches and tsunamis, seismically induced settlement, and liquefaction. Descriptions of each of these phenomena and how it could potentially affect the proposed site are described as follows:

6.2.1 Ground Rupture

Ground rupture occurs when movement on a fault breaks the ground surface and usually occurs along pre-existing fault traces where zones of weakness already exist. The State has established Earthquake Fault Zones for the purpose of mitigating the hazard of fault rupture by prohibiting the location of most human occupancy structures across the traces of active faults.

Earthquake fault zones are regulatory zones that encompass surface traces of active faults with a potential for future surface fault rupture. The site is not located within a State established Earthquake Fault Zone and there are no know active faults within the limits of the property (Figure 3); therefore, the ground rupture hazard potential for the site is considered remote.

6.2.2 Landsliding

Landslides are slope failures that occur where the horizontal seismic forces act to induce soil and/or bedrock failures. The most common affect is reactivation or movement on a pre-existing landslide. Typically, existing slides that are stable under static conditions (i.e., factor-of-safety above one) become unstable and move during strong ground shaking. The site is flat and not subject to landslides.

6.2.3 Seiches and Tsunamis

A seiche is the resonant oscillation of a body of water, typically a lake or swimming pool caused by earthquake shaking (waves). The hazard exists where water can be splashed out of the body of water and impact nearby structures. No bodies of constant water are near the site, therefore, the hazards associated with seiches are considered low.

Tsunamis are seismic sea waves generated by undersea earthquakes or landslides. When the ocean floor is offset or tilted during an earthquake, a set of waves are generated similar to the concentric waves caused by an object dropped in water.

Tsunamis can have wavelengths of up to 120 miles and travel as fast as 500 miles per hour across hundreds of miles of deep Ocean. Upon reaching shallow coastal waters, the once two-foot high wave can become up to 50 feet in height causing great devastation to structures within reach. Tsunamis can generate seiches as well. Due to the distance of the site relative to the ocean, seiches and tsunamis are not considered a hazard to the site.

6.2.4 Seismic Settlement

Granular soils, in particular, are susceptible to settlement during seismic shaking, whether the soils liquefy or not. During grading, all residual soil will be removed and recompacted in areas of proposed grading and all new fill should be placed on firm alluvium. Therefore, the potential for seismic settlement is considered low.

6.2.5 Liquefaction

Liquefaction describes a phenomenon where cyclic stresses, which are produced by earthquake-induced ground motions, create excess pore pressures in cohesionless soils. As a result, the soils may acquire a high degree of mobility, which can lead to lateral spreading, consolidation and settlement of loose sediments, ground oscillation, flow failure, loss of bearing strength, ground fissuring, and sand boils, and other damaging deformations. This phenomenon occurs only below the water table, but after liquefaction has developed, it can propagate upward into overlying, non-saturated soil as excess pore water escapes. Descriptions of each of the phenomena associated with liquefaction are described as follows:

Lateral Spreading: Lateral spreading is the lateral movement of stiff, surficial blocks of sediments as a result of a subsurface layer liquefying. The lateral movements can cause ground fissures or extensional, open cracks at the surface as the blocks move toward a slope face, such as a stream bank or in the direction of a gentle slope. When the shaking stops, these isolated blocks of sediments come to rest in a place different from their original location and may be tilted.

Ground Oscillation: Ground oscillation occurs when liquefaction occurs at depth but the slopes are too gentle to permit lateral displacement. In this case, individual blocks may separate and oscillate on a liquefied layer. Sand boils and fissures are often associated with this phenomenon.

Flow Failure: A more catastrophic mode of ground failure than either lateral spreading or ground oscillation, involves large masses of liquefied sediment or blocks of intact material riding on a liquefied layer moving at high speeds over large distances. Generally flow failures are associated with ground slopes steeper than those associated with either lateral spreading or ground oscillation.

Bearing Strength Loss: Bearing strength decreases with a decrease in effective stress. Loss of bearing strength occurs when the effective stresses are reduced due to the cyclic loading caused by an earthquake. Even if the soil does not liquefy, the bearing of the soil may be reduced below its value either prior to or after the earthquake. If the bearing strength is sufficiently reduced, structures supported on the sediments can settle, tilt, or even float upward in the case of lightly loaded structures such as gas pipelines.

Ground Fissuring and Sand Boils: Ground fissuring and sand boils are surface manifestations associated with liquefaction and lateral spreading, ground oscillation, and flow failure. As apparent from the above descriptions, the likelihood of ground fissures developing is high when lateral spreading, ground oscillations, and flow failure occur. Sand boils occur when the high pore water pressures are relieved by drainage to the surface along weak spots that may have been created by fissuring. As the water flows to the surface, it can carry sediments, and if the pore water pressures are high enough create a gusher (sand boils) at the point of exit.

- Sediments must be relatively young in age and must not have developed large amounts of cementation;
- Sediments must consist mainly of cohesionless sands and silts;
- The sediment must not have a high relative density;
- Free groundwater must exist in the sediment; and

- The site must be exposed to seismic events of a magnitude large enough to induce straining of soil particles.

The subject site is not located in an area of potential liquefaction (Figure 3). In addition, the site is underlain by dense alluvium and groundwater levels are below at least 50 feet. As a result, the site is not subject to liquefaction.

7.0 CONCLUSIONS

The grading of the subject tract is considered feasible from a geologic and geotechnical engineering viewpoint, provided that the recommendations presented in this report are followed during grading.

8.0 RECOMMENDATIONS

The following recommendations apply to rough grading of the site.

8.1 Removals

The upper 5 feet of alluvium shall be removed and recompacted in areas of proposed grading and below any proposed structures. Deeper removals may be required if soft or dry soil conditions are observed during grading. Removals shall extend a minimum of five feet beyond proposed buildings. Areas to receive fill shall be prepared as discussed below under *Site Preparation* section.

8.2 Grading

Grading of the site will consist of a cut/fill operation to create level pads and associated streets. The grading will involve the removing and recompacting of existing near surface alluvium. We offer the following recommendations and construction considerations concerning earthwork grading at the site.

8.2.1 General

Monitoring: We recommend that all earthwork (i.e., clearing, site preparation, fill placement, etc.) should be conducted with engineering control under observation and testing by the Geotechnical Engineer and in accordance with the requirements within the *Grading* section of this report.

Job Site Safety: At all times, safety should have precedence over production work. If an unsafe job condition is observed, it should be brought to the attention of the grading contractor or the developer's representative. Once this condition is noted, it should be corrected as soon as possible, or work related to the unsafe condition should be terminated.

The contractor for the project should realize that services provided by GSC do not include supervision or direction of the actual work performed by the contractor, his employees, or agents. GSC will use accepted geotechnical engineering and testing procedures; however, our testing and observations will not relieve the contractor of his primary responsibility to produce a completed project conforming to the project plans and specifications. Furthermore, our firm will not be responsible for job or site safety on this project, as this is the responsibility of the contractor.

8.2.2 Site Preparation

Existing Structure Location: The General Contractor should locate all surface and subsurface structures on the site or on the approved grading plan prior to preparing the ground.

Existing Structure Removal: Any underground structures (e.g., septic tanks, wells, pipelines, foundations, utilities, etc.) that have not been located prior to grading should be removed or treated in a manner recommended by the Geotechnical Engineer.

Clearing and Stripping: The construction areas should be cleared and stripped of all vegetation, trees, bushes, sod, topsoil, artificial fill, debris, asphalt, concrete, and other deleterious material prior to fill placement.

<u>Removals</u>: Please refer to the *Removals* section of this report for specific recommendations for removals.

<u>Subgrade Preparation:</u> We recommend that the subgrade for foundations, pavement areas, over-excavations, and for those areas receiving any additional fill be prepared by scarifying the upper 12 inches and moisture conditioning, as required to obtain at least optimum moisture, but not greater than 120 percent of optimum. The scarified areas shall be compacted to at least 90 percent of the maximum laboratory density, as determined by ASTM D-1557-12 compaction method. All areas to receive fill should be observed by the Geotechnical Engineer prior to fill placement.

<u>Subgrade Inspection</u>: Prior to placing fill, the ground surface to receive fill should be observed, tested, and approved by the Geotechnical Engineer.

8.2.3 <u>Fill Placement</u>

<u>Laboratory Testing</u>: Representative samples of materials to be utilized as compacted fill should be analyzed in a laboratory to determine their physical properties. If any material other than that previously tested is encountered during grading, the appropriate analysis of this material should be conducted.

<u>On-Site Fill Material</u>: The on-site soils, in our opinion, are adequate for re-use in controlled fills provided the soils do not contain any organic matter, debris, and that over-sized rocks are buried in accordance with the recommendations under *Rock Fragments*.

<u>Subgrade Verification and Compaction Testing</u>: Regardless of material or location, all fill material should be placed over properly compacted subgrades in accordance with the *Site Preparation* section of this report. The condition of all subgrades shall be verified by the Geotechnical Engineer before fill placement or earthwork grading begins. Earthwork monitoring and field density testing shall be performed during grading to provide a basis for opinions concerning the degree of soil compaction attained.

Fill Placement: Approved on-site material shall be evenly placed, watered, processed, and compacted in controlled horizontal layers not exceeding eight inches in loose thickness, and each layer should be thoroughly compacted with approved equipment. All fill material should be moisture conditioned, as required to obtain at least optimum moisture, but not greater than 120 percent of optimum moisture content. The fill should be placed and compacted in horizontal layers, unless otherwise recommended by the Geotechnical Engineer.

Compaction Criteria - Shallow Fills: For fills less than 40 feet in vertical thickness, each layer shall be compacted to at least 90 percent of the maximum laboratory density for material used as determined by ASTM D-1557-12. The field density shall be determined by the ASTM D-1556-07 method or equivalent. Where moisture content of the fill or density testing yields compaction results less than 90 percent, additional compaction effort and/or moisture conditioning, as necessary, shall be performed, until the fill material is in accordance with the requirements of the Geotechnical Engineer.

Fill Material - Moisture Content: All fill material placed must be moisture conditioned, as required to obtain at least optimum moisture, but not greater than 120 percent. If excessive moisture in the fill results in failing results or an unacceptable “pumping” condition, then the fill should be allowed to dry until the moisture content is within the necessary range to meet the required compaction requirements or reworked until acceptable conditions are obtained.

Keying and Benching: All fills should be keyed and benched through all topsoil, slopewash, alluvium or colluvium or creep material into firm material where the slope receiving fill is steeper than 5:1 (Horizontal: Vertical) or as determined by Geotechnical Engineer. The standard acceptable bench height is four feet into suitable material. The key for side hill fills should be a minimum of 15 feet within compacted fill or firm materials, with a minimum toe embankment of 2 feet into compacted fill, unless otherwise specified by the Geotechnical Engineer.

Slope Face - Compaction Criteria: The Contractor should be required to obtain a minimum relative compaction of 90 percent out to the finish slope face of fill slopes. This may be achieved by either overbuilding the slope a minimum of five feet, and cutting back to the compacted core, or by direct compaction of the slope face with suitable equipment, or by any other procedure which produces the required compaction. If the method of achieving the required slope compaction selected by the Contractor fails to produce the necessary results, the Contractor should rework or rebuild such slopes until the required degree of compaction is obtained, at no additional cost to the Owner or Geotechnical Engineer. Slope testing will include testing the outer 6 inches to 3 feet of the slope face during and after placement of the fill. In addition, during grading, density tests will be taken periodically on the flat surface of the fill three to five feet horizontally from the face of the slope.

Slope Face - Contractor's Responsibility: The Contractor should prepare a written detailed description of the method or methods he would employ to obtain the required slope compaction. Such documents should be submitted to the Geotechnical Engineer for review and comments prior to the start of grading.

Slope Face - Vegetation: All fill slopes should be planted or protected from erosion by methods specified in the geotechnical report, or required by the controlling governmental agency.

Subgrade Inspection: All processed ground to receive fill and over-excavations should be inspected and approved by the Geotechnical Engineer prior to placing any fill. The Contractor should be responsible for notifying the Geotechnical Engineer when such areas are ready for inspection. Inspection of the subgrade may also be required by the controlling governmental agency within the respective jurisdictions.

Subgrade Testing: Density tests should also be made on the prepared subgrade to receive fill, unless the areas are underlain by dense alluvium, as required by the Geotechnical Engineer.

Density Testing Intervals: In general, density tests should be conducted at minimum intervals of 2 feet of fill height or every 500 to 1,000 cubic yards. Due to the variability that can occur in fill placement and different fill material characteristics, a higher number of density tests may be warranted to verify that the required compaction is being achieved.

Grading Control: Earthwork monitoring and field density testing shall be performed by the Geotechnical Engineer during grading to provide a basis for opinions concerning the degree of soil compaction attained. The Contractor should receive a copy of the Geotechnical Engineer's *Daily Field Engineering Report* which will indicate the results of field density tests for that day. Where failing tests occur or other field problems arise, the Contractor shall be notified of such conditions by written communication from the Geotechnical Engineer in the form of a conference memorandum, to avoid any misunderstanding arising from oral communication.

Drainage Devices: Drainage terraces should be constructed in compliance with the ordinances of controlling governmental agencies, or with the recommendations of the Geotechnical Engineer or Engineering Geologist.

8.2.4 Construction Considerations

Erosion Control: Erosion control measures, when necessary, should be provided by the Contractor during grading and prior to the completion and construction of permanent drainage controls.

Compaction Equipment: It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the project site to handle the amount of fill being placed and the type of fill material to be compacted. If necessary, excavation equipment should be shut down to permit completion of compaction in accordance with the recommendations contained herein. Sufficient watering devices/equipment should also be provided by the Contractor to achieve optimum moisture content in the fill material.

Final Grading Considerations: Care should be taken by the Contractor during final grading to preserve any berms, drainage terraces, interceptor swales, or other devices of a permanent nature on or adjacent to the property.

8.3 Earthwork Adjustment Factors

The following table presents shrinkage factors as based on laboratory testing of the compacted fill.

EARTHWORK ADJUSTMENT FACTORS	
Material Type	**Adjustment Factor**
Alluvium	5 to 10%

8.4 Temporary Excavation

Where the necessary space is available, temporary unsurcharged embankments may be sloped back without shoring. The slope should not be cut steeper than the following gradient:

Height	Temporary Gradient (Horizontal:Vertical)
0 - 3'	Near Vertical
above 3'	1:1

In areas where soils with little or no binder are encountered, shoring or flatter excavation slopes shall be made. These recommended temporary excavation slopes do not preclude local ravelling or sloughing.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met.

Where sloped embankments are used, the top of the slope should be barricaded to prevent equipment and heavy storage loads within five feet of the top of the slope. If the temporary construction embankments are to be maintained for long periods, berms should be constructed along the top of the slope to prevent runoff water from eroding the slope faces. The soils exposed in the temporary backcut slopes during excavation should be observed by our personnel so that modifications of the slopes can be made if variations in the soil conditions occur. The temporary excavation slopes should be supported within three weeks.

8.5 Excavation Observation

All footing and other excavations should be observed by an Engineering Geologist or Geotechnical Engineering prior to placement of any steel to verify that the proper foundation material has been encountered. The City Inspector should also observe the excavation.

8.6 Utility Trenching and Backfill

Utility Trenching: Open excavations and excavations that are shored shall conform to all applicable Federal, State, and local regulations.

Backfill Placement: Approved on-site or imported fill material shall be evenly placed, watered, processed, and compacted in controlled horizontal layers not exceeding eight inches in loose thickness, and each layer should be thoroughly compacted with approved equipment. All fill material should be moisture conditioned, as required to obtain at least optimum moisture, but not greater than 120 percent of optimum moisture content. The fill should be placed and compacted on a horizontal plane, unless otherwise recommended by the Geotechnical Engineer.

Backfill Compaction Criteria: Each layer of utility trench backfill shall be compacted to at least 90 percent of the maximum laboratory density determined by ASTM D-1557-12. The field density shall be determined by the ASTM D-1556-07 method or equivalent. Where moisture content of the fill or density testing yields compaction results less than 90 percent, additional compaction effort and/or moisture conditioning, as necessary, shall be performed, until the compaction criteria is reached.

Exterior Trenches Adjacent to Footings: Exterior trenches, paralleling a footing and extending below a 1H:1V plane projected from the outside bottom edge of the footing, should be compacted to 90 percent of the laboratory standard. Sand backfill, unless it is similar to the in-place fill, should not be allowed in the trench backfill areas. Density testing, along with probing, should be accomplished to verify the desired results.

Pipe Bedding: We recommend that a minimum of 6 inches of bedding material should be placed in the bottom of the utility trench. All bedding materials shall extend at least 4 inches above the top of utilities which require protection during subsequent trench backfilling. All trenches shall be wide enough to allow for compaction around the haunches of the pipe.

Groundwater Migration: Backfilled utility trenches may act as French drains to some extent, and considerable groundwater flow along utility bedding and backfill should be expected. Wherever buried utilities, or structures which they may intersect, could be adversely affected by such drainage, provisions shall be made to collect groundwater migrating along the trench lines. These situations include where buried utilities enter buildings, particularly where they enter below grade mechanical rooms, and where buried utilities enter junction boxes or switching stations that are intended to remain dry. Mitigation measures include, but are not limited to, placement of perforated drain pipes below and continuous with bedding materials, and placement of seepage barriers such as lean mix concrete or controlled density fill (CDF).

9.0 FOUNDATION RECOMMENDATIONS

9.1 Conventional Foundation Recommendations

The following recommendations are provided for preliminary design purposes and the final expansion index should be determined following grading. In our opinion, conventional or post-tensioned foundations should be used to support the proposed structures. We offer the following site-specific recommendations and comments for purposes of footing design and construction. Foundations should be designed for low expansive soil conditions.

Bearing Subgrades: The proposed improvements should be founded into compacted fill.

Subgrade Verification: All footing subgrades for house foundations should consist of compacted fill. Under no circumstances should footings be cast atop loose, soft, or slough, debris, existing artificial fill, topsoil, or surfaces covered by standing water. We recommend that a representative of GSC verify the condition of all subgrades before any concrete is placed.

Footing Depth and Width: Footings should be continuous and be founded at a minimum depth of 18 inches into compacted fill and have a minimum width of 12 inches. Footings should be reinforced according to structural design.

Bearing Pressures: The allowable bearing capacity values shown in the following table include dead and live loads and may be used for design of footings and foundations. All foundations should be founded in compacted fill and should be reinforced according to structural design. The allowable bearing capacity values may be increased by one-third when considering short duration loading conditions such as seismic or wind loads.

Bearing Subgrade	Embedment Depth (inches)	Allowable Bearing Capacity (psf)	Bearing Capacity Increase per Foot Deeper	Bearing Capacity Increase per Foot Wider (%)	Maximum Allowable Bearing Capacity (psf)
Compacted Fill	18	2,000	20	10	4,000

Lateral Capacity: To resist lateral loads, the allowable passive earth pressures shown in the following table, expressed as an equivalent fluid pressure, may be used on that portion of shallow foundations which have a minimum embedment depth as previously recommended. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

Soil Type	Allowable Lateral Bearing Pressure (pcf)	Maximum Allowable Lateral Bearing Pressure (pcf)	Coefficient of Friction
Compacted Fill	250	2,500	0.4

9.2 Post-Tensioned Slab Foundation

Post-tensioned slabs should be designed in accordance with the recommendations of either the California Foundation Slab Method or Post-Tensioning Institute. Based on review of laboratory data for the on-site materials, the average soil modulus of subgrade reaction K, to be used for design is 100 pounds per cubic inch. This is equivalent to a surface bearing value of 1,000 pounds per square foot.

1. California Foundation Slab (Spanability) Method

It is recommended that slabs be designed for a free span of 15 feet. From a soil expansion/shrinkage standpoint, a common contributing factor to distress of structures using post-tensioned slabs is fluctuation of moisture in soils underlying the perimeter of the slab, compared to the center, causing a "dishing" or "arching" of the slabs. To mitigate this possibility, a combination of soil presaturation and construction of a perimeter "cut off" wall should be employed.

All slab foundation areas should be moisture conditioned to at least optimum moisture, but no more than 5 percent above optimum moisture for a depth of at least 12 inches below subgrade. A continuous perimeter curtain wall should extend to a depth of at least 12 inches below exterior grade for low EI soils to preserve this moisture. The cut-off walls may be integrated into the slab design or independent of the slab and should be a minimum of six inches wide.

2. **Post-Tensioning Institute Method**

Post-tensioned slabs should have sufficient stiffness to resist excessive bending due to non-uniform swell and shrinkage of subgrade soils. The differential movement can occur at the corner, edge, or center of slab. The potential for differential uplift can be evaluated using the design specifications of the Post-Tensioning Institute. The following table presents suggested minimum coefficients to be used in the Post-Tensioning Institute design method.

SUGGESTED COEFFICIENTS	
Thornthwaite Moisture Index	-20 in/yr
Depth to Constant Soil Suction	9 (feet)
Constant Soil Suction: (pf)	3.8

The coefficients are considered minimums and may not be adequate to represent worst case conditions such as adverse drainage, excess watering, and/or improper landscaping and maintenance. The above parameters are applicable provided structures have gutters and downspouts, yard drains, and positive drainage is maintained away from structure perimeters. Also, the values may not be adequate if the soils below the foundation become saturated or dry such that shrinkage occurs. The parameters are provided with the expectation that subgrade soils below the foundations are maintained in a relatively uniform moisture condition. Responsible irrigation of landscaping adjacent to the foundation must be practiced since over-irrigation of landscaping can cause problems. Therefore, it is important that information regarding drainage, site maintenance, settlements and effects of expansive soils be passed on to future homeowners.

Based on the above parameters, the following values were obtained from the Post Tension Institute Design manual. If a stiffer slab is desired, higher values of y_m may be warranted.

Expansion Index of Soil Subgrade	Low EI
e_m center lift	9.0 feet
e_m edge lift	4.7 feet
Y_m center lift	0.34 inch
Y_m edge lift	0.48 inch

Deepened footings/edges around the slab perimeter must be used as indicated above to minimize non-uniform surface moisture migration (from an outside source) beneath the slab. An edge depth of at least 12 inches should be considered for low EI soil. The bottom of the deepened footing/edge should be designed to resist tension, using cable or reinforcement per the Structural Engineer. Other applicable recommendations presented under conventional foundation and the California Foundation Slab Method should be adhered to during the design and construction phase of the project.

9.3 General Recommendations

1. The above parameters are applicable provided structures have gutters and downspouts and positive drainage is maintained away from structures. Therefore, it is important that information regarding drainage and site maintenance be passed on to future homeowners. All slab foundation areas should be moisture conditioned to at least optimum moisture, but no more than 5 percent above optimum moisture for a depth of at least 12 inches below subgrade for low EI soil. The post-tensioned slab designer should determine if the moisture penetration is sufficient for this design. The subgrade soil moisture should be observed by a Soil Engineer or his/her representative prior to pouring concrete. It is suggested the above stated moisture be obtained and maintained at least a suggested 2 days prior to pouring concrete.

2. A 10-mil Visqueen vapor barrier should be placed underneath habitable area slabs and/or slabs with floor coverings. This barrier can be placed directly on the subgrade soils, but should be overlain by a two-inch layer of imported

sand. This vapor barrier shall be lapped and sealed (especially around the utility perforations) adequately to provide a continuous waterproof barrier under the entire slab.

3. The above recommendations assume, and GeoSoils Consultants, Inc. strongly recommends, that surface water will be kept from infiltrating into the subgrade adjacent to the house foundation system. This may include, but not be limited to rainwater, roof water, landscape water and/or leaky plumbing. The lots are to be fine graded at the completion of construction to include positive drainage away from the structure and roof water will be collected via gutters, downspouts, and transported to the street in buried drainpipes. Homebuyers should be cautioned against constructing open draining planters adjacent to the houses or obstructing the yard drainage in any way.

4. Utility trenches beneath the slabs should be backfilled with compacted native soil materials, free of rocks.

5. Subgrade soil beneath footings and slabs should be premoistened prior to placement of concrete.

6. Standard City of Palmdale structural setback guidelines are applicable, except where superseded by specific recommendations by the Project Geologist and Geotechnical Engineer.

7. Building or structure footings shall be set back a horizontal distance, x, from the face of adjacent descending slope. The horizontal distance is calculated as $x=H/3$, where H is the height of slope. The distance x should not be less than 5 feet nor more than 40 feet. The distance x may be provided by deepening the footings.

8. Prior to placing concrete in the footing excavations, an inspection should be made by our representative to ensure that the footings are free of loose and disturbed soils and are embedded in the recommended material.

10. CEMENT TYPE AND CORROSION POTENTIAL

Based on preliminary testing by other consultants, onsite soil has a negligible to moderate sulfate content and is moderately corrosive. Additional testing will be performed at the completion of grading and the results will be presented in a final compaction report. A qualified corrosion engineer shall be consulted to further evaluate the corrosive properties of the soil.

11. PRELIMINARY PAVEMENT RECOMMENDATIONS

The R-Value of 54 was obtained from the adjacent Tract 73068 (Reference 6) and used in the following table. Additional R-Values will be taken from street subgrade following grading to confirm the following pavement sections.

The following pavement sections should be considered based on a traffic index provided by the City of Palmdale.

TABLE I PAVEMENT RECOMMENDATIONS			
Traffic Index	**Subgrade "R"-value**	**AC Thickness (inches)**	**Class 2 Aggregate[1] Base Thickness (inches)**
4.0	54	3.0	4,0
5.0	54	3.0	4.5
10.0	54	5.0	8.0
[1] CalTrans Class 2 Aggregate Base, R≥78, SE ≥ 22 (or approved equivalent).			

The recommended pavement sections provided above are meant as minimums. If thinner or highly variable pavement sections are constructed, increased maintenance and repair could be expected. If the ADT (average daily traffic) or ADTT (average daily truck traffic) increases beyond that intended, as reflected by the traffic indexes used for design, increased maintenance and repair could be required for the pavement section.

12.0 CLOSURE

We appreciate this opportunity to be of continued service to you. If you have any questions regarding the content of this report or any other aspects of the project, please do not hesitate to contact us.

REFERENCES

1. Barrows, A.G., Kahle, J.E. and Beeby, D.J., 1987, Earthquake hazards and tectonic history of the San Andreas Fault Zone, Los Angeles County, California in Hester, R.L. and Hollinger, D.E., editors, San Andreas Fault – Cajon Pass to Palmdale: Pacific Section American Association of Petroleum Geologists, Volume and Guidebook No. 59, p. 1-92.

2. California Geological Survey, dated 2005, Seismic Hazard Zone Report 095, Seismic Hazard Zone Report for the Lancaster West 7.5-Minute Quadrangle, Los Angeles County, California, California Department of Conservation, Division of Mines and Geology, 1997, Guidelines for evaluating and mitigating seismic hazards in California: California Division of Mines and Geology Special Publication 117, 74 p.

3. California Department of Conservation, Division of Mines and Geology, 2004, Recommended criteria for delineating seismic hazard zones: California Division of Mines and Geology Special Publication 118, 12 p.

4. Dibblee, T.W., Jr., 1997, Geologic Map of the Pacifico Mountain and Palmdale Quadrangles, Los Angeles

5. Dibblee, T.W. Jr., 1960, Geologic map of the Lancaster Quadrangle, Los Angeles County, California: U.S. Geological Survey Mineral Investigations Field Studies Map MF-76, map scale 1:62,500

6. GeoSoils Consultants, Inc. dated September 28, 2021, Geologic and Geotechnical Engineering Investigation, Proposed Single-Family Residential Development, Tract 73068, East Palmdale Boulevard, Palmdale, California

REFERENCE DOCUMENT:

PROVIDENT TITLE COMPANY. 615 N. NASH STREET, SUITE 308
EL SEGUNDO, CA 90245. PHONE: 800-794-8094

PRELIMINARY TITLE REPORT, ORDER NO.: 12386894
DATED AS OF FEBRUARY 25, 2021

ASSESSOR'S PARCEL NUMBERS:

A.P.N. **3023-002-184**

SITE AREA:

GROSS AREA = **20 ACRES**

UTILITY PURVEYORS/PUBLIC SERVICES

ELECTRICITY:	SOUTHERN CALIFORNIA EDISON COMPANIES
WATER:	LOS ANGELES COUNTY WATER WORKS DISTRICT # 40
WASTE WATER:	LOS ANGELES COUNTY SANITATION DISTRICT NO. 14
GAS:	SOUTHERN CALIFORNIA GAS COMPANY

LAND USE DATA

JURISDICTION:	CITY OF PALMDALE, LOS ANGELES COUNTY
EXISTING ZONING:	R-7,000 (MIN. LOT SIZE 7,000 SQ. FT.)
PROPOSED ZONING:	R-7,000 (MIN. LOT SIZE 7,000 SQ. FT.)
GENERAL PLAN:	SFR-3
EXISTING USE:	VACANT
PROPOSED USE:	65 SINGLE-FAMILY RESIDENTIAL DWELLING UNITS, BASIN LOT, COMMON AREA LOT
PROPOSED DENSITY:	3.30 DU/AC (GROSS)

LEGAL DESCRIPTION:

PROPERTY ADDRESS: VACANT LAND, , CA

ORDER NO: 00138235-994-LT2-DB
DATED: SEPTEMBER 9, 2020 AT 7:30 A.M.
SEE COVER PAGE FOR DETAILS.

PRELIMINARY REPORT

1. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:
FEE ESTATE
2. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:
MING JAW LIOU AND CHI LON LIOU, TRUSTEES OF THE MING & CHI LIOU TRUST DATED APRIL 14, 2011
3. THE LAND REFERRED TO IN THIS REPORT IS DESCRIBED AS FOLLOWS:

EXHIBIT "A"

LEGAL DESCRIPTION
THE LAND REFERRED TO HEREIN BELOW IS SITUATED , IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

LOT 10 OF TRACT NO, 2916, IN THE CITY OF PALMDALE, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 31, PAGE 13, OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

APN: 3023-002-184

END OF LEGAL DESCRIPTION

PLEASE NOTE:

LEGAL DESCRIPTION IS COPIED FROM TITLE REPORT EXHIBIT "A".

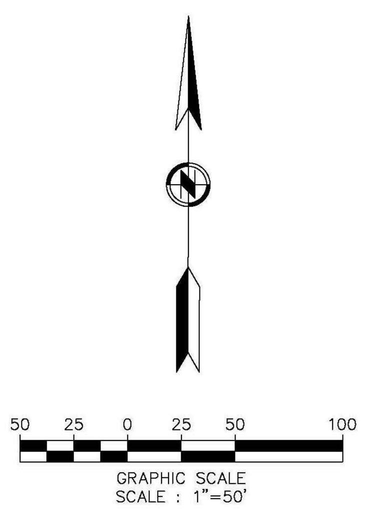
BASIS OF BEARINGS:

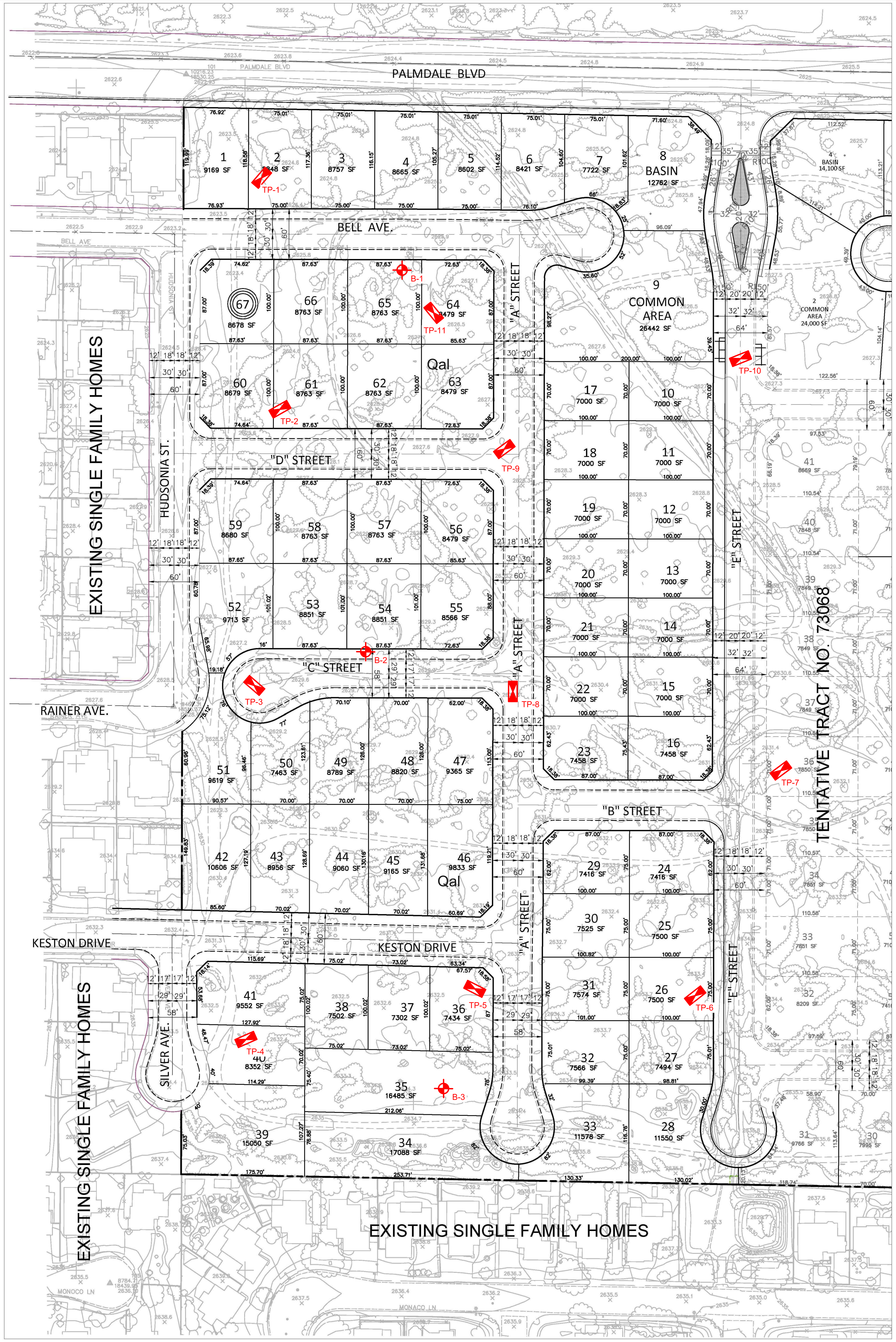
THE BASIS OF BEARINGS FOR THIS MAP IS NORTH 0˚7'01" EAST HELD ON THE CENTERLINE OF HUDSONIA STREET BETWEEN FOUND MONUMENTS AT LILAC DRIVE AND LILY WAY AS SHOWN ON TRACT No. 060954 RECORDED IN BOOK 1309 PAGES 45-48, INCLUSIVE OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF LOS ANGELES COUNTY, STATE OF CALIFORNIA.

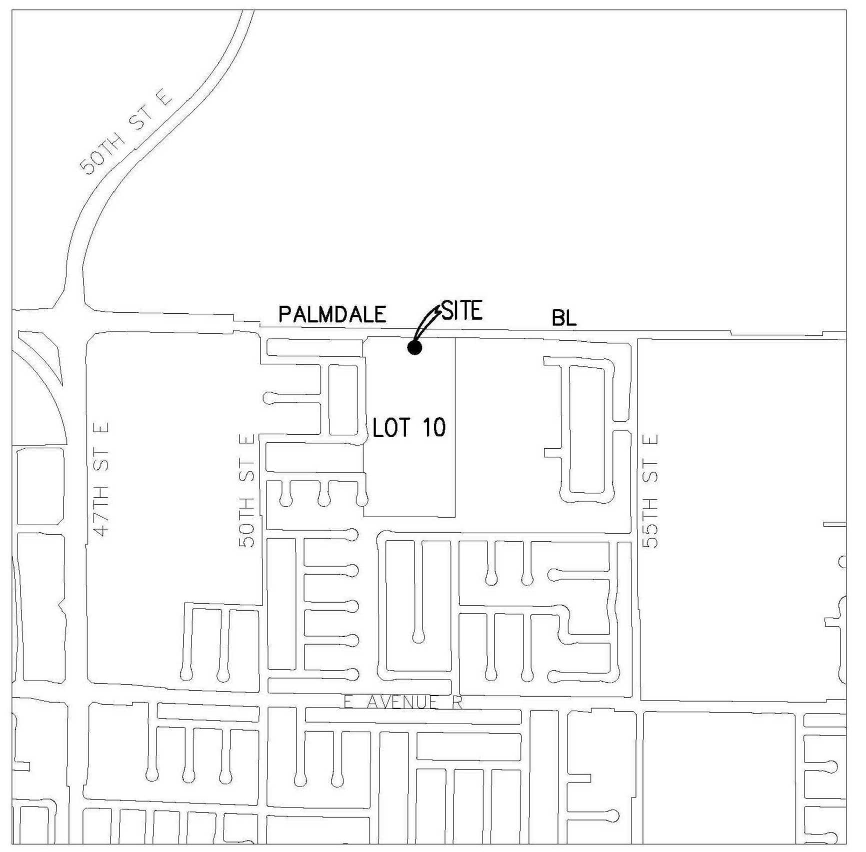
BENCHMARK:

BM NUMBER: UL4975

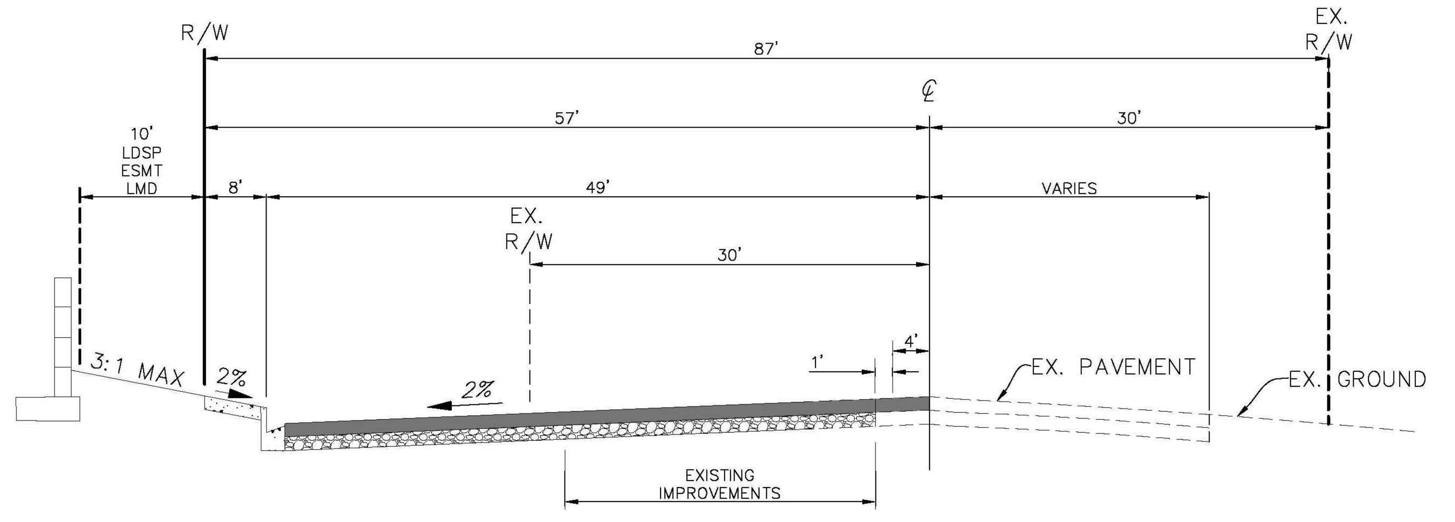
QUAD YEAR: 2010 **ELEVATION (FEET): 2627.325**
DESCRIPTION: 2" IP WITH DPW BM TAG IN WELL 6" DN 120' W & 45' N/O C/L INT PALMDALE BL & 55TH ST E 3' N/O PP #4040256E MKR POST 2' N/O MON



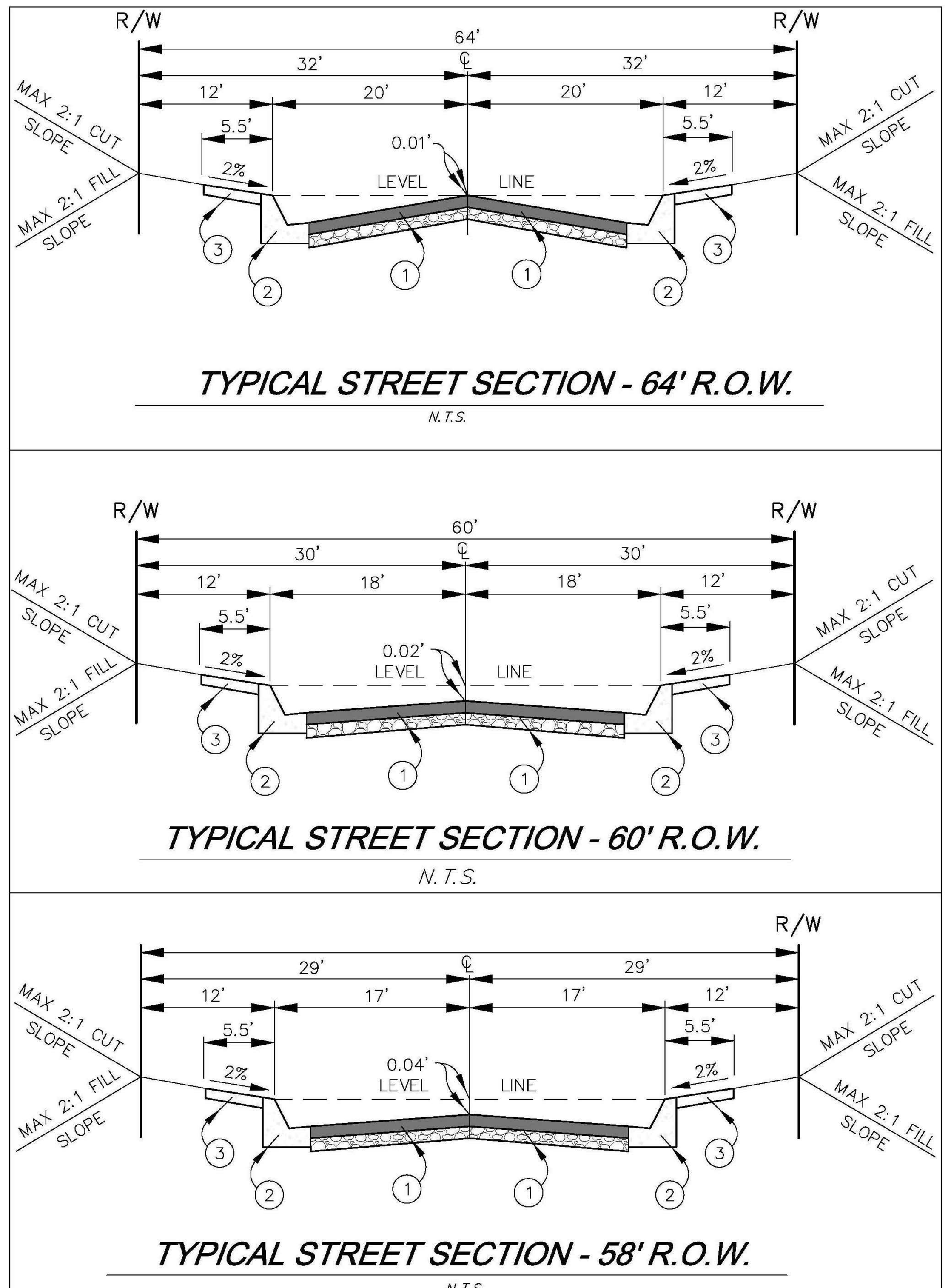




VICINITY MAP
N.T.S.



PALMDALE BLVD.
NTS



TYPICAL STREET SECTION - 64' R.O.W.
N.T.S.

TYPICAL STREET SECTION - 60' R.O.W.
N.T.S.

TYPICAL STREET SECTION - 58' R.O.W.
N.T.S.

MDN 22503

GSC GeoSoils Consultants Inc. 6634 Valjean Avenue Van Nuys, CA 91406

GEOLOGIC MAP
TENTATIVE TRACT 83359
PALMDALE, CALIFORNIA
RAVELLO HOLDINGS, LLC.

WORK ORDER	DATE	SCALE
7648	10/2021	1' = 50'
REVISED	PLATE 1	

EXPLANATION

B-3 APPROXIMATE LOCATION OF BORING
TP-1 APPROXIMATE LOCATION OF TEST PIT

OWNER/APPLICANT:
RAVELLO HOLDINGS
211 VILLAGE COMMONS, SUITE 11
CAMARILLO, CA. 93012
(310) 926-6363
REPRESENTATIVE: KEVIN HARBISON

ENGINEER'S STATEMENT
THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECTION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE
IMAD ABOUJAWDAH P.E. C51299 DATE

REGISTERED PROFESSIONAL ENGINEER IMAD ABOUJAWDAH No. 51299 Exp. 6-30-22 CIVIL STATE OF CALIFORNIA

APPROVED BY:
DRAWING SCALE: 1"=50'
DRAWN: ISA DESIGNED: ISA
JOB NUMBER: CDD JOB No.

Civil Design & Drafting inc.
885 PATRIOT DRIVE, Unit C MOORPARK, CA 93021 Phone 805-522-2622
email: CDD@civildesignanddrafting.com

CITY OF PALMDALE
TENTATIVE TRACT NO. 83359
DATE ISSUED: APRIL 21, 2021
SHEET 1 OF 1 SHEETS

APPENDIX A

FIELD EXPLORATION PROCEDURES

APPENDIX A

FIELD EXPLORATION PROCEDURES

Our backhoe test pits and borings were excavated by an independent company working under subcontract to GSC. Samples were obtained via the California ring sampler with a 140 lb hammer and 30-inch drop. Due to the loose sandy nature of the upper soil, undisturbed samples could not be obtained from the test pits.

A representative from our firm continuously observed the backhoe test pits and borings, logged the subsurface conditions, and collected representative soil samples. All samples were stored in watertight containers and later transported to our laboratory for further visual examination and testing, as deemed necessary. After the test pit was completed, the test pit was backfilled with soil cuttings.

The enclosed test pit logs (Plates TP-1 through TP-11) and boring logs (Plates A-1 through A-3) describes the vertical sequence of soils and materials encountered in each test pit, based primarily on our field classifications and supported by our subsequent laboratory examination and testing. Where a soil contact was observed to be gradational, our log indicates the average contact depth. Where a soil type changed between sample intervals, we inferred the contact depth. Our log also included moisture and density results from the laboratory testing performed on these soil samples.

TEST PIT LOG 1

GeoSoils Consultants, Inc.

CLIENT: Ravello Holdings

ELEVATION:

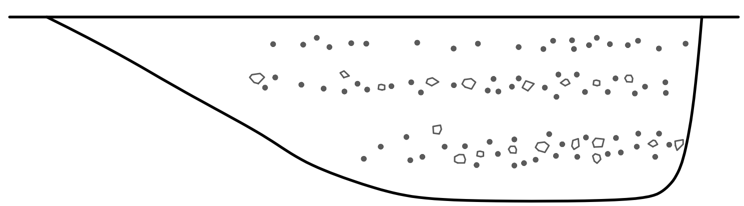
LOGGED BY: JM

W.O. 7648

DATE: 8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-5'	Alluvium (Qal)	Gray brown silty SAND and silty gravely SAND, dry, moderately loose horizontaly stratified with varying concentration of gravels and sands.	
at 4'		6 - inches of coarse SAND and gravels, gravels ar up to 3/4 inches in size and sabanaglar in shape	

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 5.0'



TP-1

TEST PIT LOG 2

GeoSoils Consultants, Inc.

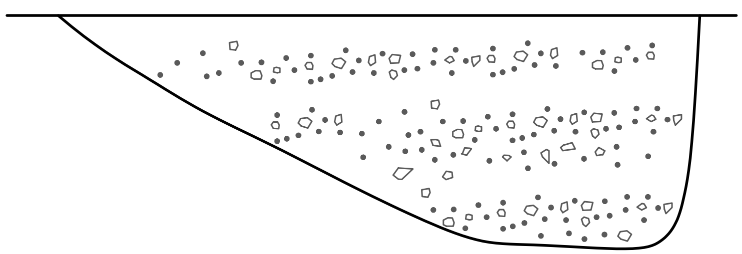
CLIENT: Ravello Holdings

ELEVATION:
LOGGED BY: JM

W.O. 7648
DATE: 8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-6'	Alluvium (Qal)	Gray brown, ceravelly SAND and sandy grave. Some silty, loose, dry, cohesinless. Abundent subrounded gravels and small cobble present. Gravels are concentated in horizontal strata, with larger gravels and small cobble concentrated at the bottom of the leaves	Abandant caving

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 6.0'



TEST PIT LOG 3

GeoSoils Consultants, Inc.

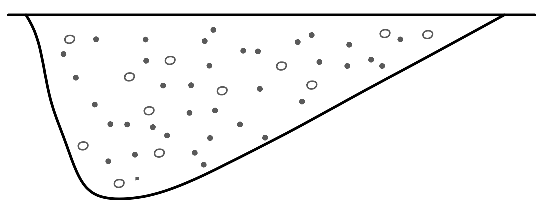
CLIENT: Ravello Holdings

ELEVATION:
LOGGED BY: JM

W.O. 7648
DATE: 8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-5'	Alluvium (Qal)	Gray brown, silty graveller SAND, loose, dry, locally stractundess, abundant subrounded pea gravls spread throughout, roots present.	

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 5.0'



TP-3

TEST PIT LOG 4

GeoSoils Consultants, Inc.

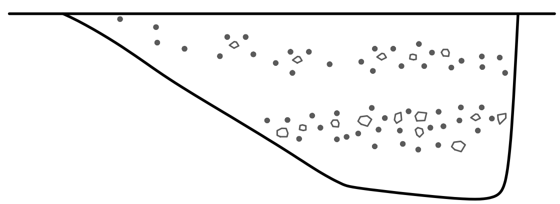
CLIENT: Rabello Holdings

ELEVATION:
LOGGED BY: JV

W.O. 7648
DATE: 8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-5	Alluvium (Qal)	Gray brown, silty gravelly SAND and grevelly SAND, dry, loose, some roots. Some horizontal stratification.	Abundant caving

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 5.0'



TP-4

TEST PIT LOG 5

GeoSoils Consultants, Inc.

CLIENT: Ravello Holdings

ELEVATION:

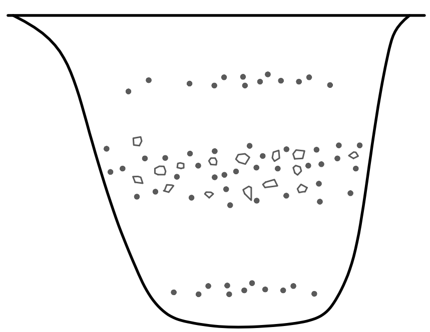
LOGGED BY: JV

W.O. 7648

DATE: 8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-8'	Alluvium (Qal)	Gray brown, silty SAND, and gravelly SAND, loose, dry, horizontal stratification of gravels and sands.	Abundant caving. Test pit logged from surface

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 8.0'



TP-5

TEST PIT LOG 6

GeoSoils Consultants, Inc.

CLIENT: Ravello Holdings

ELEVATION:

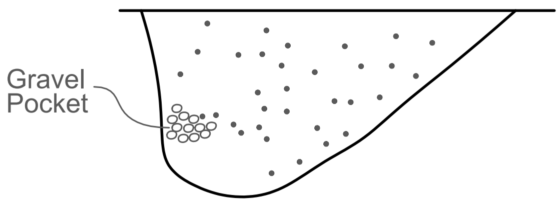
LOGGED BY: JM

W.O. 7648

DATE: 8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-5'	Alluvium (Qal)	Gray brown, silty SAND and sandy gravel, loose, dry	

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 5.0'



TP-6

TEST PIT LOG 7

GeoSoils Consultants, Inc.

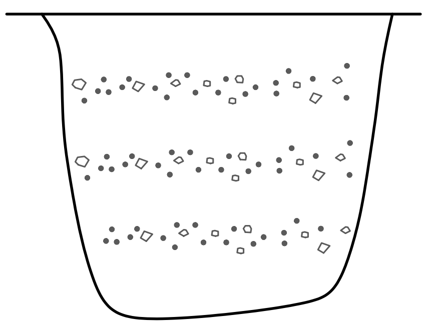
CLIENT: Ravello Holdings

ELEVATION:
LOGGED BY: JM

W.O. 7648
DATE: 8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-8'	Alluvium (Qal)	Gray brown, silty SAND, and gravelly SAND, loose, dry, horizontal stratification of gravels and sands.	Abundant caving. Test pit logged from surface

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 8.0'



TP-7

TEST PIT LOG 8

GeoSoils Consultants, Inc.

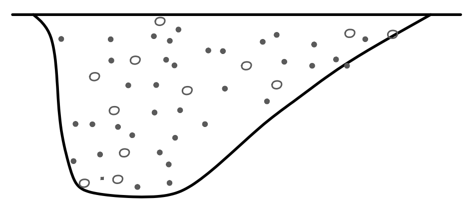
CLIENT: Ravello Holdings

ELEVATION:
LOGGED BY: JM

W.O. 7648
DATE: 8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-5'	Alluvium (Qal)	Gray brown, silty SAND and gravely SAND, dry, loose, sitlty soil and roots found in upper 2-feet, pea gravels and sands from 2-5 feet.	Caving in gravels from 2-5 feet deep

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 5.0'



TP-8

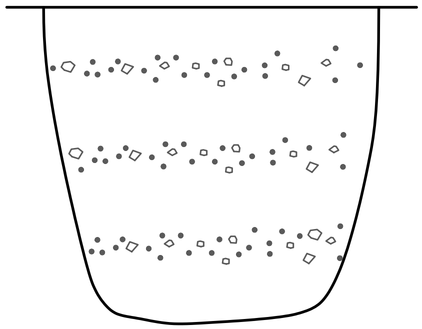
TEST PIT LOG 9

GeoSoils Consultants, Inc.

CLIENT:	Ravello Holdings	**ELEVATION:**		**W.O.**	7648
		LOGGED BY:	JM	**DATE:**	8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-8'	Alluvium (Qal)	Gray brown, silty SAND, and gravelly SAND, loose, dry, horizontal stratification of gravels and sands.	Abundant caving. Test pit logged from surface

SCALE H: ______ **V:** ______ **PIT ORIENT:** ______ **NATURAL SLOPE ANGLE** ______ **TD** 8.0'



TP-9

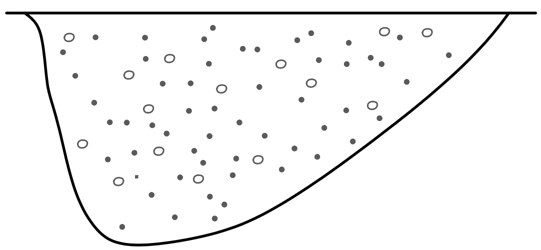
TEST PIT LOG 10

GeoSoils Consultants, Inc.

CLIENT:	Ravello Holdings	**ELEVATION:**		**W.O.**	7648
		LOGGED BY:	JM	**DATE:**	8/12/2021

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-6'	Alluvium (Qal)		
0-4'		Gray brown, silty goravelly SAND, loose, dry, abundant subangler to subroundere pea gravels	Abundant caving
4-6'		Gray brown, SAND, loose, dry, very fine to medium ground	

SCALE **H:** ___ **V:** ___ **PIT ORIENT:** ___ **NATURAL SLOPE ANGLE** ___ **TD** 6.0'



TP-10

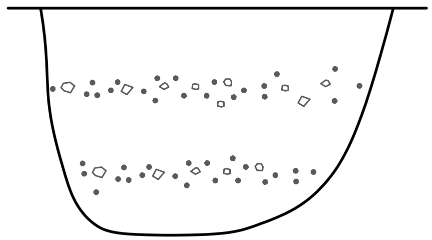
TEST PIT LOG 11

GeoSoils Consultants, Inc.

CLIENT: Rabello Holdings	**ELEVATION:**	**W.O.** 7648	
	LOGGED BY: JM	**DATE:** 8/12/2021	

DEPTH	MATERIAL	DESCRIPTION	COMMENTS
0-6'	Alluvium (Qal)	Gray brown, silty SAND, and gravelly SAND, loose, dry, horizontal stratification of gravels and sands.	Abundant caving. Test pit logged from surface

SCALE H: **V:** **PIT ORIENT:** **NATURAL SLOPE ANGLE** **TD** 6.0'



TP-11

GEOTECHNICAL BORING LOG

PROJECT NAME	**Ravello Holdings**			**W.O.**	**7648**
DRILLING COMPANY	Choice Drilling	DATE STARTED	8/17/2021	BORING NO.	B-1
TYPE OF DRILL RIG	Truck Mounted	LOGGED BY	JM	SHEET	
DRILLING METHOD	Hollow Stem	HAMMER WT (lbs)		GROUND ELEV.	
DIAMETER OF HOLE (IN)	8	DROP (IN)		GW ELEV.	
Boring Location:					

Depth (ft)	Sample Type	Blows / 6"	GEOTECHNICAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	Other Tests
0	Bulk Sample		**0-30', ALLUVIUM (Qal)**			ds max chem expan
5	California Ring	9/9/10	5', Gray, medium to coarse grained sand, cohesionless, dry, moderately dense	0.3	113.6	cons
10	California Ring	11/14/16	10', Gray, medium to coarse grained sand, cohesionless, dry, moderately dense	0.4		cons
15	California Ring	18/28/29	15', Gray, gravelly sand, well graded, dense, dry	0.5		
20	California Ring	23/30/29	20', Gray, gravelly sand, well graded, dense, dry, cohesionless			
25	California Ring	24/18/20	25', No recovery			
30	California Ring	50 for 4"	30', Gray and brown, sandy gravel, sand, and cobble, dense, dry, only partial sample recovery due to cobble	1.8	106	
			TD=30' No groundwater No caving			

LEGEND

- Standard Penetration Test
- California Ring
- Rock Core
- Bulk Sample

SIEVE:	Grain Size Analysis
MAX:	Maximum Dry Density
DS:	Direct Shear
CONS:	Consolidation
HYDR:	Hydrometer Analysis
EXPAN:	Expansion Index
CHEM:	Chemical Tests

PLATE **A-1**

GSC GeoSoils Consultants Inc.
GEOTECHNICAL · GEOLOGIC · ENVIRONMENTAL

GEOTECHNICAL BORING LOG

PROJECT NAME	**Ravello Holdings**			**W.O.**	**7648**
DRILLING COMPANY	Choice Drilling	DATE STARTED	8/17/2021	BORING NO.	B-2
TYPE OF DRILL RIG	Truck Mounted	LOGGED BY	JM	SHEET	
DRILLING METHOD	Hollow Stem	HAMMER WT (lbs)		GROUND ELEV.	
DIAMETER OF HOLE (IN)	8	DROP (IN)		GW ELEV.	
Boring Location:					

Depth (ft)	Sample Type	Blows / 6"	GEOTECHNICAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	Other Tests
0			**0-30', ALLUVIUM (Qal)**			
	California Ring	7/10/13	2.5', Brownish gray, very fine to coarse grained, gravelly sand, dry, cohesionless, minor rounded pea gravel	0.7	107.3	
5						
	California Ring	11/16/25	7.5', No recovery			
10						
	California Ring	23/24/26	12.5', Gray, gravelly sand, moderately dense, dry, well graded	0.7	118.7	
15						
	California Ring	28/37/38	17.5', Gray, fine to medium grained sand, dense, dry	0.9	113.2	cons
20						
	California Ring	40/44/50 for 5"	22.5', Gray, sandy gravel, dense, dry, small cobble present	0.9		
25						
	California Ring	50	27.5', Gray, sandy gravel, dense, dry, small cobble present	0.9		
			TD=27.5' No groundwater No caving			
30						

LEGEND

- Standard Penetration Test
- California Ring
- Rock Core
- Bulk Sample

SIEVE: Grain Size Analysis
MAX: Maximum Dry Density
DS: Direct Shear
CONS: Consolidation
HYDR: Hydrometer Analysis
EXPAN: Expansion Index
CHEM: Chemical Tests

PLATE **A-2**

GSC GeoSoils Consultants Inc.
GEOTECHNICAL · GEOLOGIC · ENVIRONMENTAL

GEOTECHNICAL BORING LOG

PROJECT NAME	**Ravello Holdings**			**W.O.**	**7648**
DRILLING COMPANY	Choice Drilling	DATE STARTED	8/17/2021	BORING NO.	B-3
TYPE OF DRILL RIG	Truck Mounted	LOGGED BY	JM	SHEET	
DRILLING METHOD	Hollow Stem	HAMMER WT (lbs)		GROUND ELEV.	
DIAMETER OF HOLE (IN)	8	DROP (IN)		GW ELEV.	
Boring Location:					

Depth (ft)	Sample Type	Blows / 6"	GEOTECHNICAL DESCRIPTION	Moisture Content (%)	Dry Density (pcf)	Other Tests
0			**0-30', ALLUVIUM (Qal)**			max expan
5	California Ring	8/10/11	5', Gray, gravelly sand, dry, cohesionless, well graded, moderately dense	0.8		
	California Ring	4/17/21	7.5', Gray, gravelly sand, dry, cohesionless, well graded, moderately dense	0.9		cons
10	California Ring	14/15/17	10', Gray, gravelly sand, well graded, slightly moist, moderately dense	2.4	109.4	cons
15	California Ring	14/24/40	15', Gray, gravelly sand, well graded, slightly moist, moderately dense	1.8	111.1	
20	California Ring	14/20/21	20', Brownish gray, sandy gravel, moderately dense, slightly moist, some small cobble	1.6	119.9	
25	California Ring	24/29/31	25', Brownish gray, sandy gravel, moderately dense, slightly moist, some small cobble	1.2		
30			TD = 30' No groundwater No caving			

LEGEND

- Standard Penetration Test
- California Ring
- Rock Core
- Bulk Sample

SIEVE: Grain Size Analysis
MAX: Maximum Dry Density
DS: Direct Shear
CONS: Consolidation
HYDR: Hydrometer Analysis
EXPAN: Expansion Index
CHEM: Chemical Tests

PLATE **A-3**

GSC GeoSoils Consultants Inc.
GEOTECHNICAL · GEOLOGIC · ENVIRONMENTAL

APPENDIX B

LABORATORY TESTING PROCEDURES AND RESULTS

APPENDIX B

LABORATORY TESTING PROCEDURES AND RESULTS

Moisture-Density

The in-situ moisture content and dry unit weights were determined for each of the undisturbed ring samples. The data obtained are shown on the boring logs.

Compaction Tests

Three compaction tests were performed to determine to moisture density relationships of the typical surficial soils encountered on the site. The laboratory standard used was in accordance with ASTM Test Designation D-1557-12. A summary of the compaction test results are shown in Table B-1.

TABLE B-1
COMPACTION TEST RESULTS

Test Pit No. and Sample Borimg Depth	Description	Maximum Dry Density (pcf)	Optimum Moisture (%)
B-1 @ 0-5'	Orange brown, silty fine to coarse SAND	124.0	9.5
TP-1 @ 5'	Gray brown, slightly silty, fine to coarse SAND	121.0	9.5
TP-8 @ 3'	Gray brown, slightly silty, fine to coarse SAND	122.5	11.5

Consolidation Tests

Six (6) consolidation tests were performed on selected ring samples. The samples were inundated at an approximate load of one ton per square foot to monitor the hydroconsolidation. Loads were applied to the samples in several increments in geometric progression and resulting deformations were recorded at selected time intervals. Results of the consolidation tests are presented on Plates C-1 to C-6.

Shear Tests

One shear test was performed in a strain-control type Direct Shear Machine. The shear testing was performed in series corresponding to the date the samples were collected. The sample was sheared under varying confining loads in order to determine the Coulomb shear strength parameters: cohesion (c), and angle of internal friction (ϕ) for peak and residual strength conditions. The sample was tested in an artificially-saturated condition. The results are plotted and a linear approximation is drawn of the failure curve. The results are shown on the Shear Test Diagram as Plate SH-1.

Ravello Holdings
W.O.: 7648

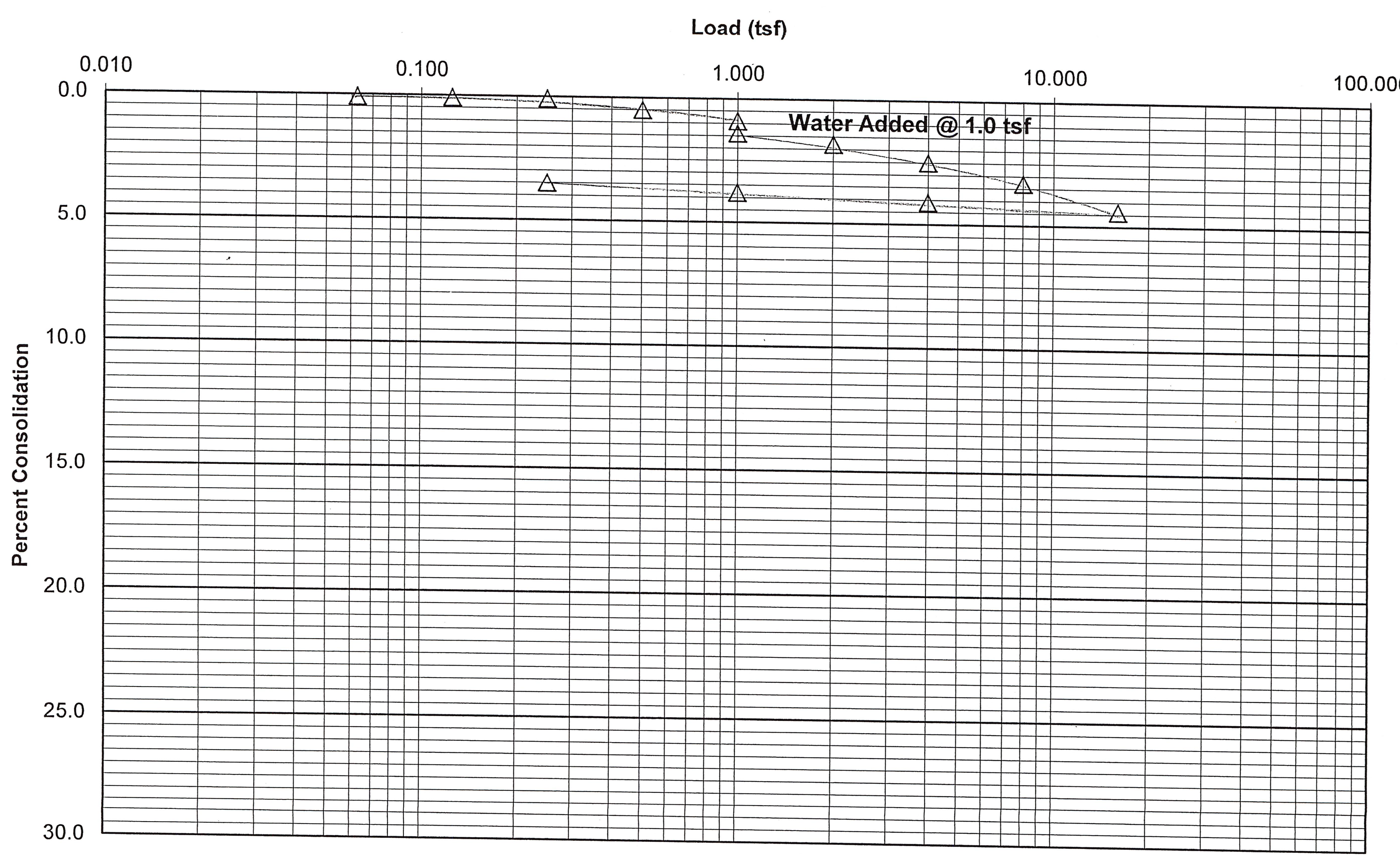
Date of Test: 9/21

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 0.3 After: 13.0

Sample(in.)
Height: 1.00 Diameter: 2.36



B-1 @ 5.0'
Light gray brown very fine to coarse SAND.

Consolidation Diagram

C7648.1

Plate C-1

Ravello Holdings
W.O.: 7648

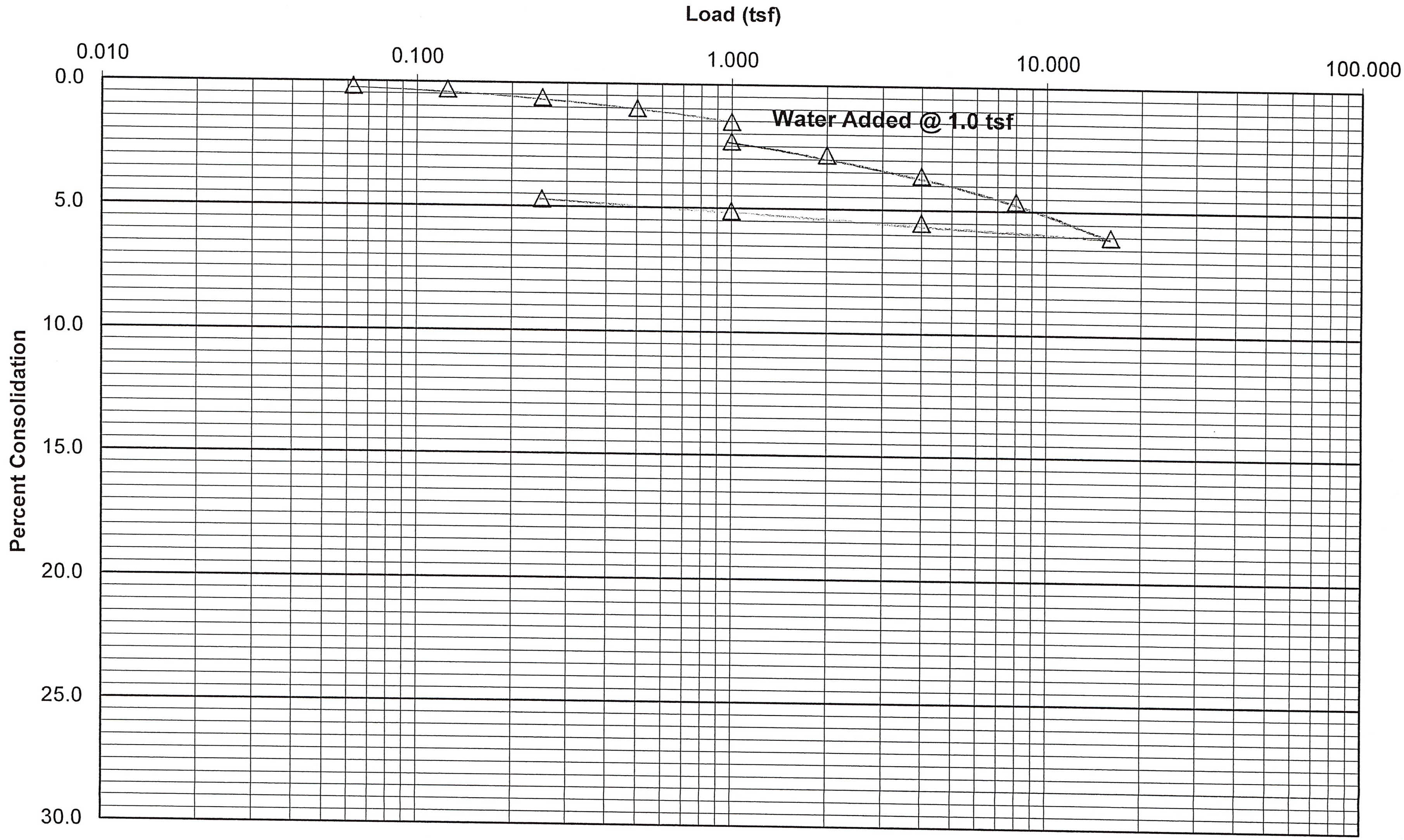
Date of Test: 9/21

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 0.4 After: 16.6

Sample(in.)
Height: 1.00 Diameter: 2.36



B-1 @ 10.0'
Light gray brown very fine to coarse SAND.

Consolidation Diagram

C7648.2

Plate C-2

Ravello Holdings
W.O.: 7648

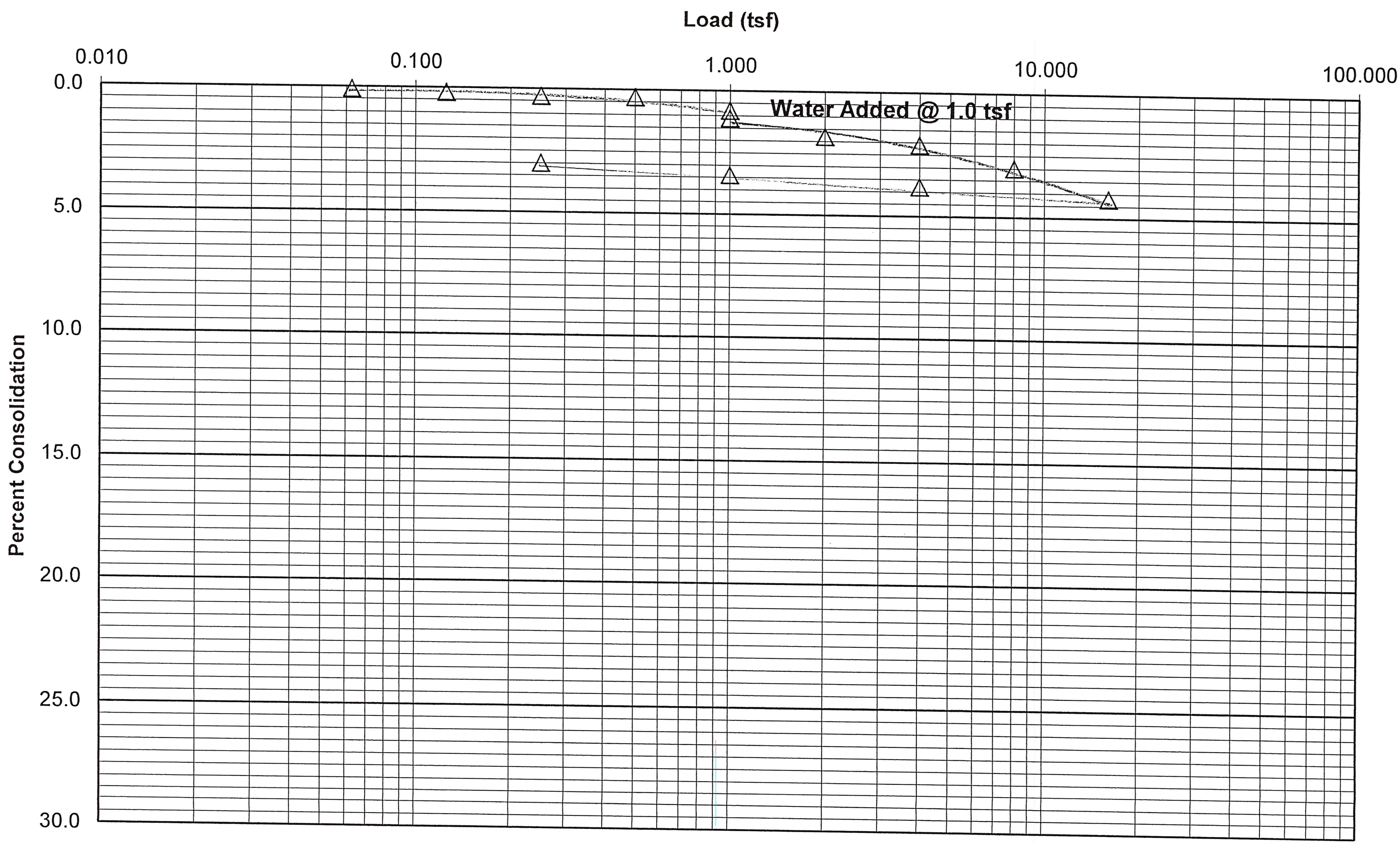
Date of Test: 9/21

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 0.9 After: 17.3

Sample(in.)
Height: 1.00 Diameter: 2.36



B-2 @ 17.5'
Light gray brown slightly silty very fine to fine SAND.

Consolidation Diagram

C7648.3

Plate C-3

Ravello Holdings
W.O.: 7648

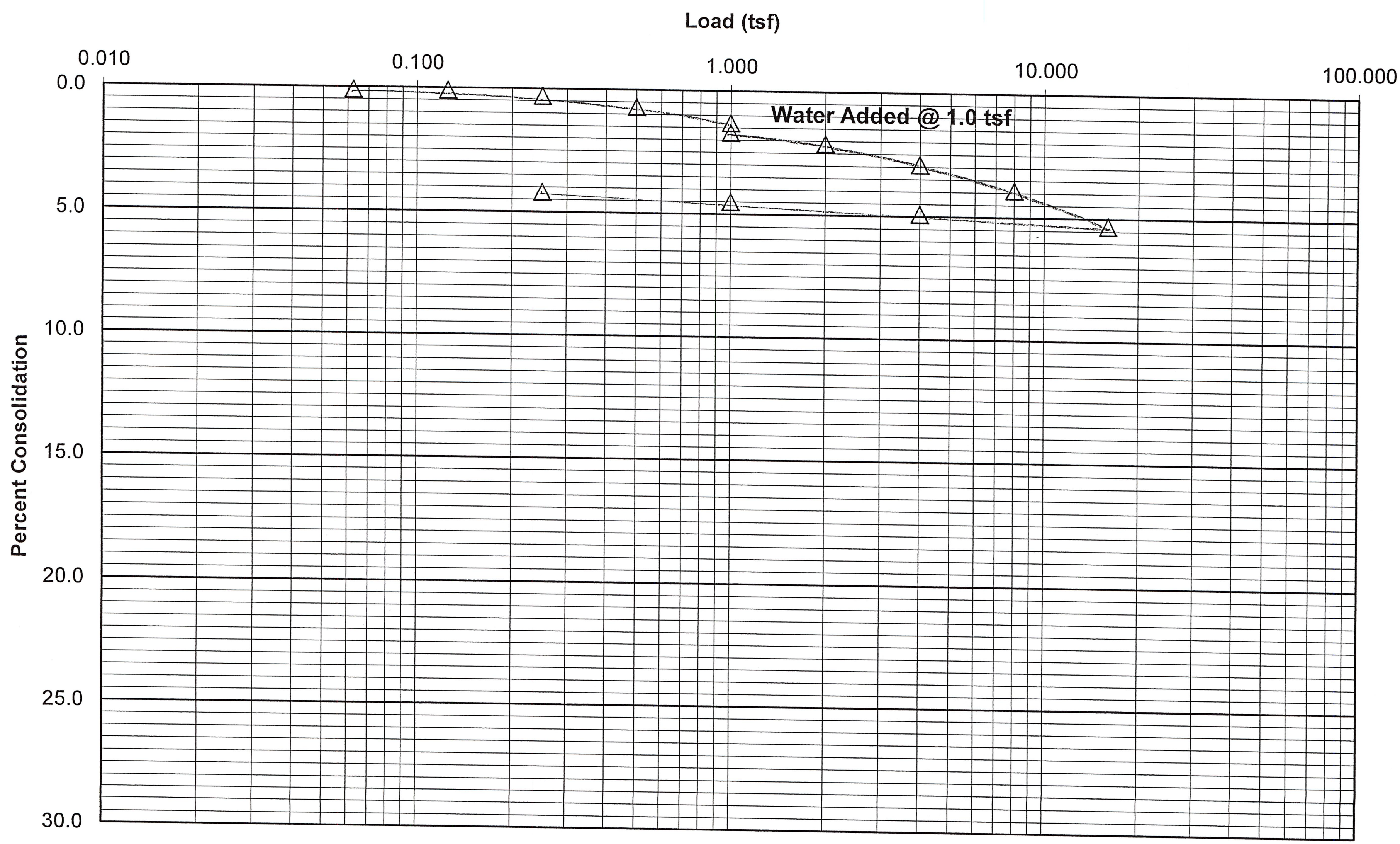
Date of Test: 9/21

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 0.9 After: 15.8

Sample(in.)
Height: 1.00 Diameter: 2.36



B-3 @ 7.5'
Light gray brown very fine to coarse SAND.

Consolidation Diagram

C7648.4

Plate C-4

Ravello Holdings
W.O.: 7648

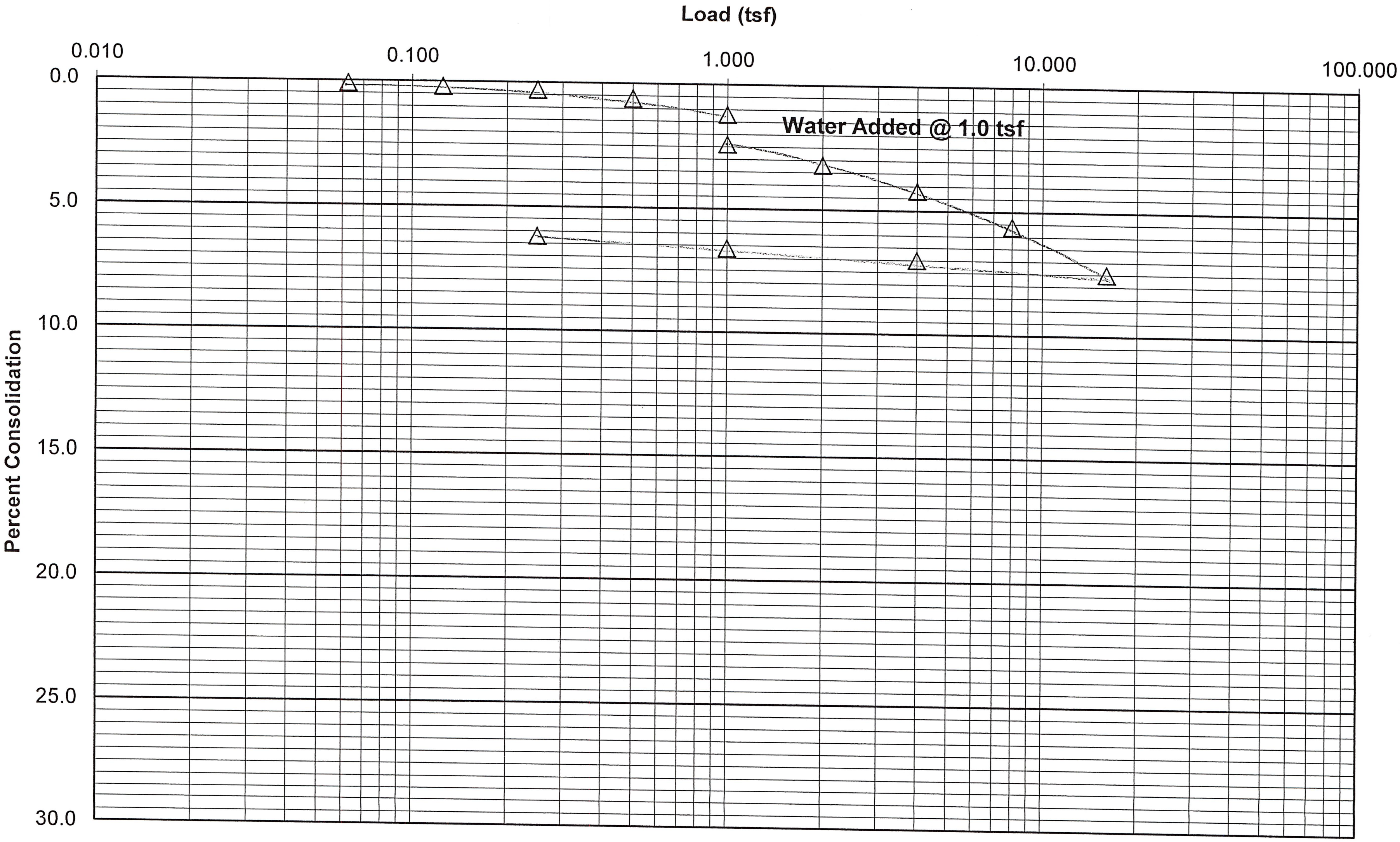
Date of Test: 9/21

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 2.4 After: 16.3

Sample(in.)
Height: 1.00 Diameter: 2.36



B-3 @ 10.0'
Brown silty very fine to coarse SAND.

Consolidation Diagram

C7648.5

Plate C-5

Ravello Holdings
W.O.: 7648

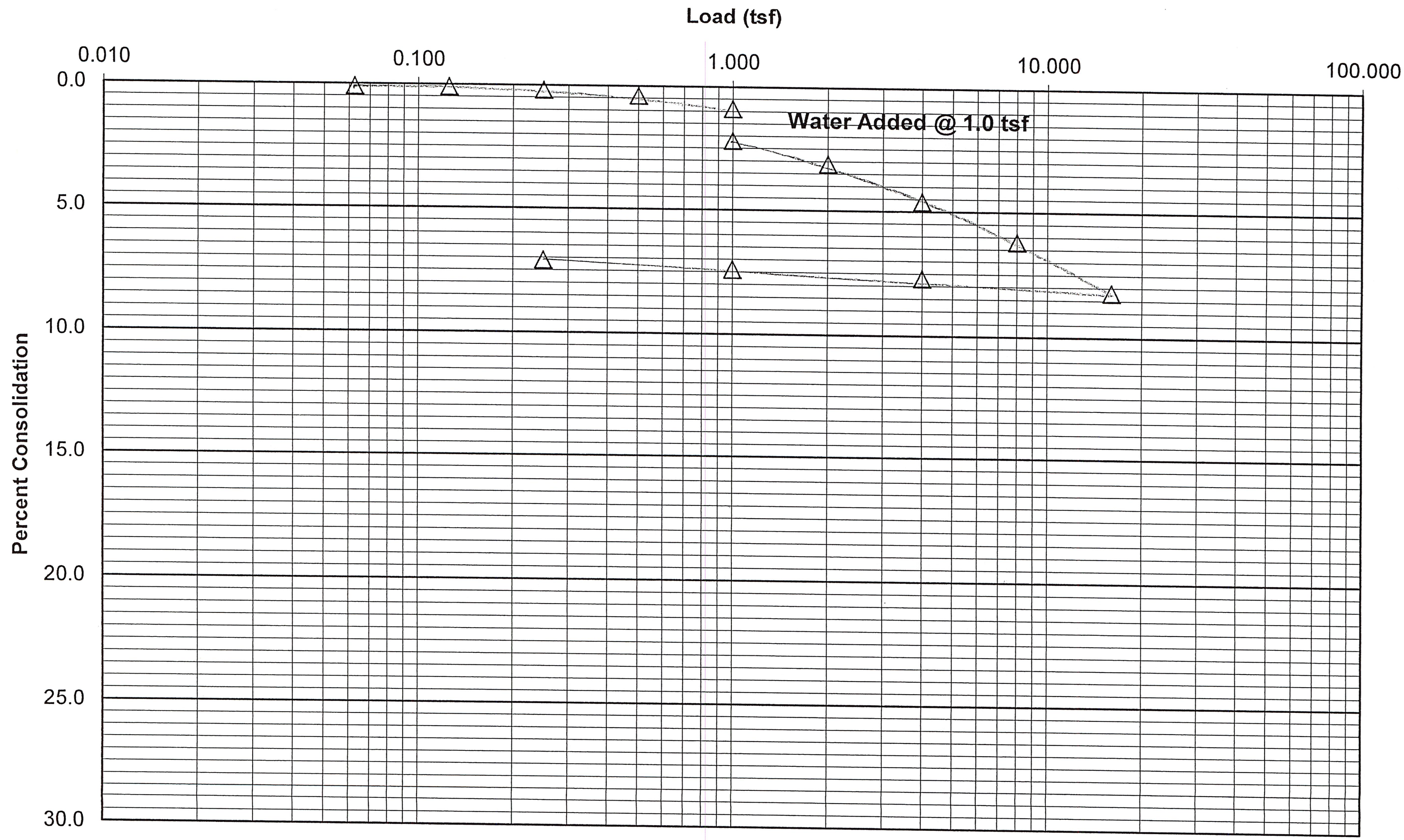
Date of Test: 9/21

GeoSoils Consultants, Inc.

Geotechnical Engineering * Engineering Geology

Moisture(%)
Before: 1.2 After: 11.1

Sample(in.)
Height: 1.00 Diameter: 2.36



B-3 @ 25.0'
Light gray brown very fine to coarse SAND with rock fragments.

Consolidation Diagram

C7648.6

Plate C-6

Ravello Holdings
W.O.: 7648

Date of Test: 9/21

Sample: **B-1 @ 0-5.0'**

GeoSoils Consultants, Inc.

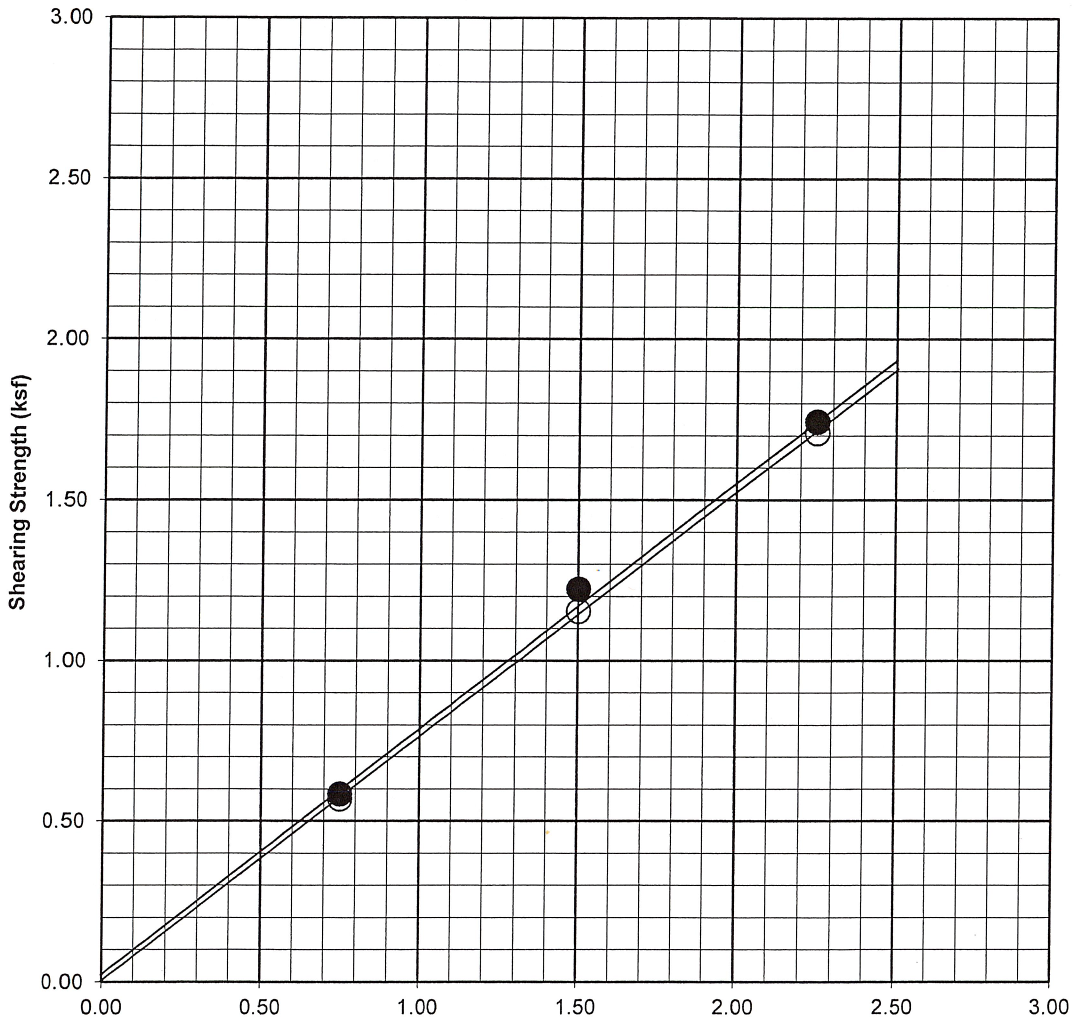
Geotechnical Engineering * Engineering Geology

PLATE SH-1

Shear Test Diagram

Peak
C(psf): **20** Phi (degrees): **37.0**

Reshear
C(psf): **0** Phi (degrees): **37.0**



Normal Pressure (ksf)
Direct Shear, Peak / Reshear Speed: .005 in./min.

● Peak Values ○ Reshear Values

Sample **Remolded** to 90% Relative Density, saturated.
Remolded Dry Density = 111.6 PCF

Gray brown slightly silty vf-c SAND.

MAX: 124.0 PCF: 9.5%

16.9% Saturated Moisture Content

7648.1

HDR

Table 1 - Laboratory Tests on Soil Samples

GeoSoils Consultants, Inc.
Ravello Holdings
Your #7648, HDR Lab #21-0807LAB
8-Sep-21

Sample ID			
			B-1 @ 0-5'
Resistivity		**Units**	
as-received		ohm-cm	124,000
minimum		ohm-cm	10,800
pH			7.6
Electrical Conductivity		mS/cm	0.07
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	53
magnesium	Mg^{2+}	mg/kg	4.9
sodium	Na^{1+}	mg/kg	8.4
potassium	K^{1+}	mg/kg	21
ammonium	NH_4^{1+}	mg/kg	ND
Anions			
carbonate	CO_3^{2-}	mg/kg	30
bicarbonate	HCO_3^{1-}	mg/kg	110
fluoride	F^{1-}	mg/kg	3.6
chloride	Cl^{1-}	mg/kg	7.5
sulfate	SO_4^{2-}	mg/kg	11
nitrate	NO_3^{1-}	mg/kg	14
phosphate	PO_4^{3-}	mg/kg	4.4
Other Tests			
sulfide	S^{2-}	qual	na
Redox		mV	na

Minimum resistivity and pH per CTM 643, Chloride per CTM 422, Sulfate per CTM 417

Electrical conductivity in millisiemens/cm and chemical analyses were made on a 1:5 soil-to-water extract.

mg/kg = milligrams per kilogram (parts per million) of dry soil.

Redox = oxidation-reduction potential in millivolts

ND = not detected

na = not analyzed

Plate L-1

431 West Baseline Road · Claremont, CA 91711
Phone: 909.962.5485 · Fax: 909.626.3316

Appendix F

Noise and Vibration Study

Tentative Tract Map 83359 Project

Noise and Vibration Study

prepared for

Maison's Palmdale Boulevard 150, LLC
Kevin Harbison
2007 Cedar Avenue
Manhattan Beach, California 90266
Contact: Kevin Harbison

prepared by

Rincon Consultants, Inc.
250 East 1st Street, Suite 1400
Los Angeles, California 90012

September 2023

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
rinconconsultants.com

Tentative Tract Map 83359 Project

Noise and Vibration Study

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September 2023

RINCON CONSULTANTS, INC.
Environmental Scientists | Planners | Engineers
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Tables

Figures

Appendices

1 Project Description and Impact Summary

1.1 Introduction

This study analyzes the potential noise and vibration impacts of the proposed Tentative Tract Map (TTM) 83359 (project) in the City of Palmdale, Los Angeles County, California. Rincon Consultants, Inc. (Rincon) prepared this study under contract to Maison's Palmdale Boulevard 150, LLC. The purpose of this study is to analyze the project's noise and vibration impacts related to both temporary construction activity and long-term operation of the project. Table 1 provides a summary of project impacts.

Table 1 Summary of Impacts

Issue	Impact	Applicable Recommendations
Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less than significant impact (Construction) Less than significant impact (Operation)	None None
Would the project result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	Less than significant impact (Construction) Less than significant impact (Operation)	None
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?	No Impact	None
Would the project conflict with land use compatibility guidelines for noise?	May conflict with interior noise standards	NOI-1 (On-site Noise Barrier)

1.2 Project Summary

Project Location

The project site is located immediately adjacent to, and south of, East Palmdale Boulevard between 55th Street and 50th Street East at APN: 3023-002-184. The project site is zoned Single Family Residential (R-1-7,000) with a land use designation of Single Family Residential (SFR-3). Figure 1 shows the regional location of the site, and Figure 2 shows the project site in the existing neighborhood context.

Project Description

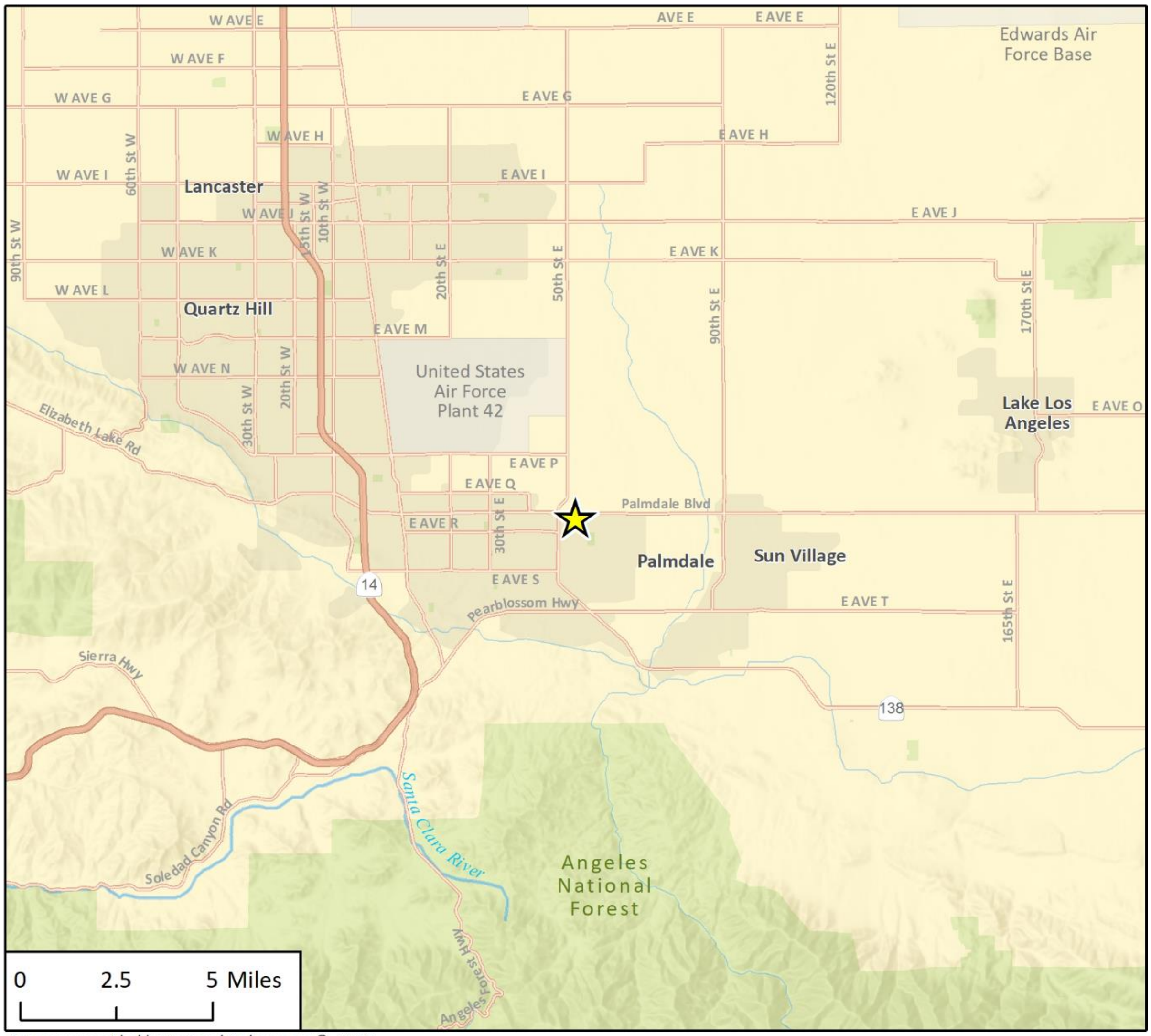
The proposed project would facilitate the development of up to 191 units of single story, single-family homes consisting of three-bedroom housing units, two-bedroom Accessory Dwelling Units and one-bedroom Junior Accessory Dwelling Units that would be offered for rent as a 100% affordable project to those qualifying at 30% to 80% Area Mean Income (AMI) for Los Angeles County. The project would also include a recreation center and community amenities on a total of

66 lots. The community would be an all-electric community and each residential unit would be constructed with rooftop solar, energy efficient appliances, and installation of all infrastructure improvements as conditioned by the City of Palmdale with approval of Tentative Tract Map (TTM) 83359. Within each lot, primary homes, accessory dwelling units (ADU), and junior ADUs would be separated by six-foot-tall vinyl fences and would be linked together by a network of walking paths and trails. The entire residential development would be enclosed by a six-foot-tall decorative perimeter block wall, except where existing and newly constructed streets would occur. Figure 3 shows the project site plan.

Indoor community amenities include a community building with a tenant lounge, office spaces, and a fitness center. Outdoor amenities include a pool, spa, grill area, pocket community park, children’s play area, and additional community open spaces. Additionally, a community trail network is planned to link the neighborhood and provide for additional open spaces and parks for the community to utilize. Monumentation signage for the community would be installed along Palmdale Boulevard.

Streets that would be constructed within the project site and would link the community to East Palmdale Boulevard to the north as well as the existing residential projects to both the east and west of the project. All public right-of-way would be constructed to the width shown on the TTM and would include road, sidewalks, and curbs and gutters. ADA curb ramps, appropriate street signage, fire hydrants, and streetlights would also be installed for each street both inside and outside of the development.

Figure 1 Regional Location



Basemap provided by Esri and its licensors © 2022.

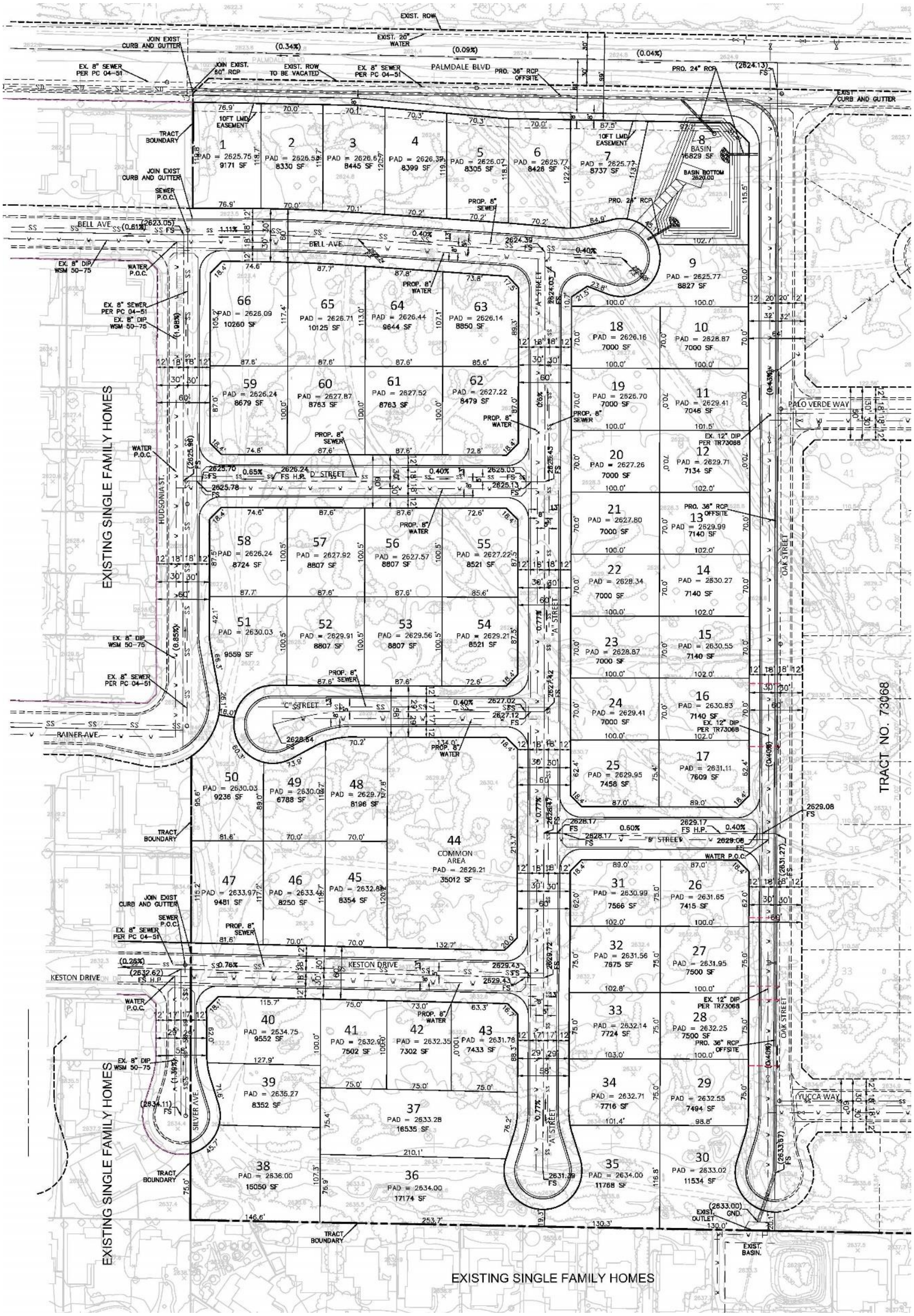
☆ Project Location

N

Figure 2 Project Location

Imagery provided by Microsoft Bing and its licensors © 2022.

Figure 3 Site Plan



2 Background

2.1 Overview of Sound Measurement

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (California Department of Transportation [Caltrans] 2020a).

Human Perception of Sound

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response. Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; dividing the energy in half would result in a 3 dB decrease (Caltrans 2020a).

Human perception of noise has no simple correlation with sound energy: the perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease (i.e., twice the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (half) as loud (10.5 times the sound energy) (Caltrans 2020a).

Sound Propagation and Shielding

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in the noise level as the distance from the source increases. The manner by which noise reduces with distance depends on factors such as the type of sources (e.g., point or line), the path the sound will travel, site conditions, and obstructions.

Sound levels are described as either a “sound power level” or a “sound pressure level,” which are two distinct characteristics of sound. Both share the same unit of measurement, the dB. However, sound power (expressed as L_{pw}) is the energy converted into sound by the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers, such as an eardrum or microphone, which is the sound pressure level. Sound measurement instruments only measure sound pressure, and noise level limits are typically expressed as sound pressure levels.

Noise levels from a point source (e.g., construction, industrial machinery, air conditioning units) typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance. Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2020a). Noise levels may also be reduced by intervening structures; the amount of attenuation provided by this “shielding” depends on the size of the object and the frequencies of the noise levels. Natural terrain features, such as hills and dense woods, and man-made features, such as buildings and walls, can significantly alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5-dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2011). Structures can substantially reduce exposure to noise as well. The FHWA's guidance indicates that modern building construction generally provides an exterior-to-interior noise level reduction of 10 dBA with open windows and an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows (FHWA 2011).

Descriptors

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important factors of project noise impact. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. The noise descriptors used for this study are the equivalent noise level (L_{eq}), Day-Night Average Level (DNL; may also be symbolized as L_{dn}), and the community noise equivalent level (CNEL; may also be symbolized as L_{den}).

L_{eq} is one of the most frequently used noise metrics; it considers both duration and sound power level. The L_{eq} is defined as the single steady-state A-weighted sound level equal to the average sound energy over a time period. When no time period is specified, a 1-hour period is assumed. The L_{max} is the highest noise level within the sampling period, and the L_{min} is the lowest noise level within the measuring period. Normal conversational levels are in the 60 to 65-dBA L_{eq} range; ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (Federal Transit Administration [FTA] 2018).

Noise that occurs at night tends to be more disturbing than that occurring during the day. Community noise is usually measured using Day-Night Average Level (L_{dn}), which is the 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime hours (10:00 p.m. to 7:00 a.m.). Community noise can also be measured using Community Noise Equivalent Level (CNEL or L_{DEN}), which is the 24-hour average noise level with a +5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a +10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. (Caltrans 2020a).[1] The relationship between the peak-hour L_{eq} value and the L_{dn}/CNEL depends on the distribution of noise during the day, evening, and night; however noise levels described by L_{dn} and CNEL usually differ by 1 dBA or less. Quiet suburban areas typically have CNEL noise levels in the range of 40 to 50 CNEL, while areas near arterial streets are in the 50 to 60+ CNEL range (FTA 2018).

2.2 Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of Hz. The frequency of a vibrating object describes how rapidly it oscillates. The normal frequency range of most groundborne vibration that can be felt by the human body starts from a low frequency of less than 1 Hz and goes to a high of about 200 Hz (Crocker 2007).

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings, such as from nearby construction activities, may cause windows, items on shelves, and pictures on walls to rattle. Vibration of building

[1] Because DNL and CNEL are typically used to assess human exposure to noise, the use of A-weighted sound pressure level (dBA) is implicit. Therefore, when expressing noise levels in terms of DNL or CNEL, the dBA unit is not included.

components can also take the form of an audible low-frequency rumbling noise, referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the vibration source (FTA 2018). Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and annoying to building occupants and vibration-sensitive land uses.

Vibration amplitudes are usually expressed in peak particle velocity (PPV), which is normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration and other construction activities because it is related to the stresses that are experienced by buildings (Caltrans 2020).

2.3 Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. In the City of Palmdale, noise sensitive land uses (also referred to as “sensitive receivers”) include residences, schools, libraries, hospitals/medical facilities, and assisted living facilities (City of Palmdale 2022).

Vibration-sensitive receivers, which are similar to noise-sensitive receivers, include residences and institutional uses, such as schools, churches, hospitals and libraries. Vibration-sensitive receivers also include buildings where vibrations may interfere with vibration-sensitive equipment that is affected by vibration levels that may be well below those associated with human annoyance (e.g., recording studies or medical facilities with sensitive equipment). As shown in Figure 2, the nearest sensitive receivers to the project site are the single-family homes adjacent to the project site to the south and west.

2.4 Project Noise Setting

The most common source of noise in the project site vicinity is vehicular traffic from East Palmdale Boulevard and 47th Street East. To characterize ambient sound levels at and near the project site, three 15-minute sound level measurements and one 24-hour sound level measurement were conducted on Wednesday, September 21, 2022. Short-Term Noise Measurement 1 (ST-1) was taken at the northern edge of the project site to capture noise levels from East Palmdale Boulevard. ST-2 was taken at the southwestern edge of the project site near the adjacent single-family residences. ST-3 was conducted at the center of the project site. Table 2 and Table 3 summarize the results of the noise measurements and Table 4 shows the recorded traffic volumes. Noise measurement locations are shown in Figure 4Table 2. Detailed sound level measurement data are included in Appendix A.

Table 2 Project Site Vicinity Sound Level Monitoring Results- Short-Term

Measurement Location		Sample Times	Approximate Distance to Primary Noise Source	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)
ST-1	Northern Boundary of Project Site	10:13 – 10:28 a.m.	50 feet to centerline of East Palmdale Boulevard	66.2	47.6	79.0
ST-2	Southwestern Boundary of Project Site	9:49 – 10:04 a.m.	1,200 feet to centerline of East Palmdale Boulevard	42.0	36.9	55.9
ST-3	Center of Project Site	9:26 – 9:41 a.m.	650 feet to centerline of East Palmdale Boulevard	44.3	38.9	52.7

L_{eq} = average noise level equivalent; dBA = A-weighted decibel; L_{min} = minimum instantaneous noise level; L_{max} = maximum instantaneous noise level

Detailed sound level measurement data are included in Appendix A.

Table 3 Project Site Vicinity Noise Monitoring Results – Long Term

Sample Time	dBA L_{eq}	Sample Time	dBA L_{eq}
24-hour Measurement – Center of Project Site, 500 Feet from Palmdale Boulevard – September 21-22, 2022			
10:59 a.m.	49.7	10:59 p.m.	42.1
11:59 a.m.	48.1	11:59 p.m.	48.3
12:59 p.m.	48.4	12:59 a.m.	40.3
1:59 p.m.	50.6	1:59 a.m.	39.0
2:59 p.m.	49.3	2:59 a.m.	41.6
3:59 p.m.	51.5	3:59 a.m.	45.0
4:59 p.m.	47.8	4:59 a.m.	55.1
5:59 p.m.	49.9	5:59 a.m.	50.4
6:59 p.m.	53.3	6:59 a.m.	51.5
7:59 p.m.	49.5	7:59 a.m.	50.9
8:59 p.m.	46.5	8:59 a.m.	50.1
9:59 p.m.	48.9	9:59 a.m.	41.2
24-hour Noise Level (CNEL)			**56.0**

L_{eq} = average noise level equivalent; dBA = A-weighted decibel; CNEL = Community Noise Equivalent Level

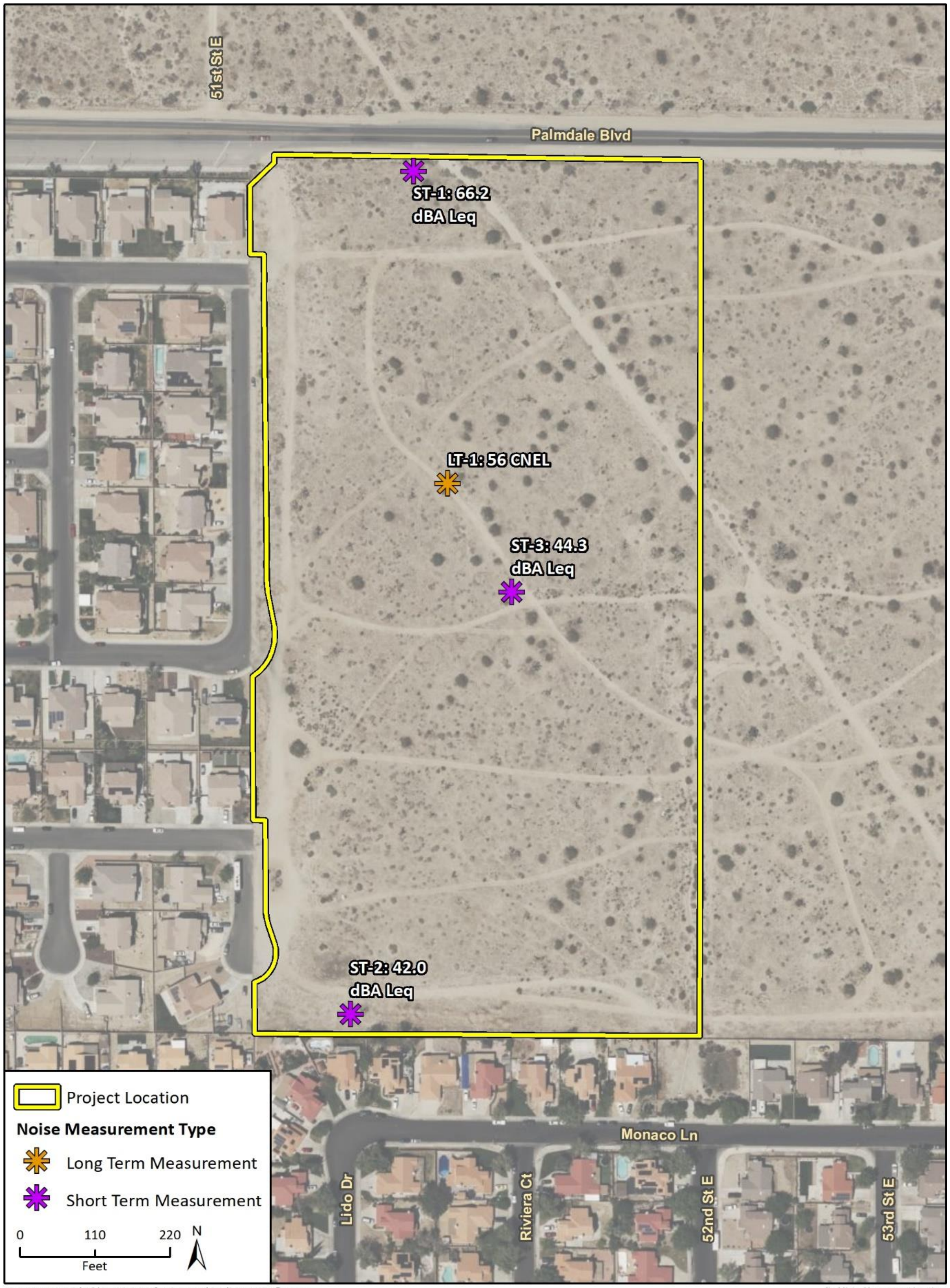
Detailed sound level measurement data are included in Appendix A.

Table 4 Sound Level Monitoring Traffic Counts

Measurement	Roadway	Traffic	Autos	Medium Trucks	Heavy Trucks
ST-1	East Palmdale Boulevard	15-minute count	202	3	3
		One-hour Equivalent	808	12	12
Percent			**97%**	**1.5%**	**1.5%**

Detailed sound level measurement data are included in Appendix A.

Figure 4 Noise Measurement Locations



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2.5 Regulatory Setting

Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual

There are no federal regulations directly applicable to the proposed project. However, the FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction in their *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018). For residential uses, the daytime noise threshold is 80 dBA L_{eq} for an 8-hour period. In addition, the FTA recommends a vibration limit of 0.2 inches per second (in/sec) peak particle velocity (PPV) for potential building architectural damage at residential buildings and 0.3 in/sec PPV at commercial buildings.

Sections 5 and 6 of manual addresses the federal guidelines used to evaluate a project for potential vibration impacts. The vibration impact analysis is a multi-step process used for determining vibration analysis level, determining vibration impact criteria, and evaluating vibration impact. FTA guidelines state that the threshold of perception for humans is approximately 65 vibration decibels (VdB). A vibration level of 85 VdB can result in strong annoyance, and a vibration level of 100 VdB is the threshold of potential damage (FTA 2018). Construction activity can result in varying degrees of ground vibration depending on the equipment and methods employed, and older and more fragile buildings must receive special consideration. These guidelines are advisory and should be used to assess the impacts of ground borne vibrations created from transit and construction sources.

California Building Code

California Code of Regulations Title 24, Building Standards Administrative Code, Part 2, and the California Building Code codify the state noise insulation standards. These noise standards apply to new construction in California to control interior noise levels as they are affected by exterior noise sources. The regulations specify that interior noise levels for residential and school land uses should not exceed 45 CNEL.

City of Palmdale General Plan

The State of California requires each City and County to adopt a Noise Element as part of its General Plan. Such Noise Elements must contain a Land Use/ Noise Compatibility Matrix. The objective of noise compatibility guidelines is to provide the community with a means of judging the noise environment that it deems to be generally acceptable. A recommended (but not mandatory) matrix is presented in the "Guidelines for the Preparation and Content of Noise Elements of the General Plan" (Department of Health Services 2003). The City of Palmdale Land Use/Noise Compatibility Matrix in the 2022 General Plan Noise Element is based on, and is similar to the California Land Use/Noise Compatibility Matrix. The matrix is used to determine whether a proposed new use would be compatible with the ambient noise environment in which it is proposed as well as whether or not the proposed new use would create noise compatibility conflicts with established uses. The compatibility table, shown in Figure 5, illustrates the ranges of community noise exposure in terms of what is "normally acceptable," "conditionally acceptable," "normally unacceptable," and "clearly unacceptable."

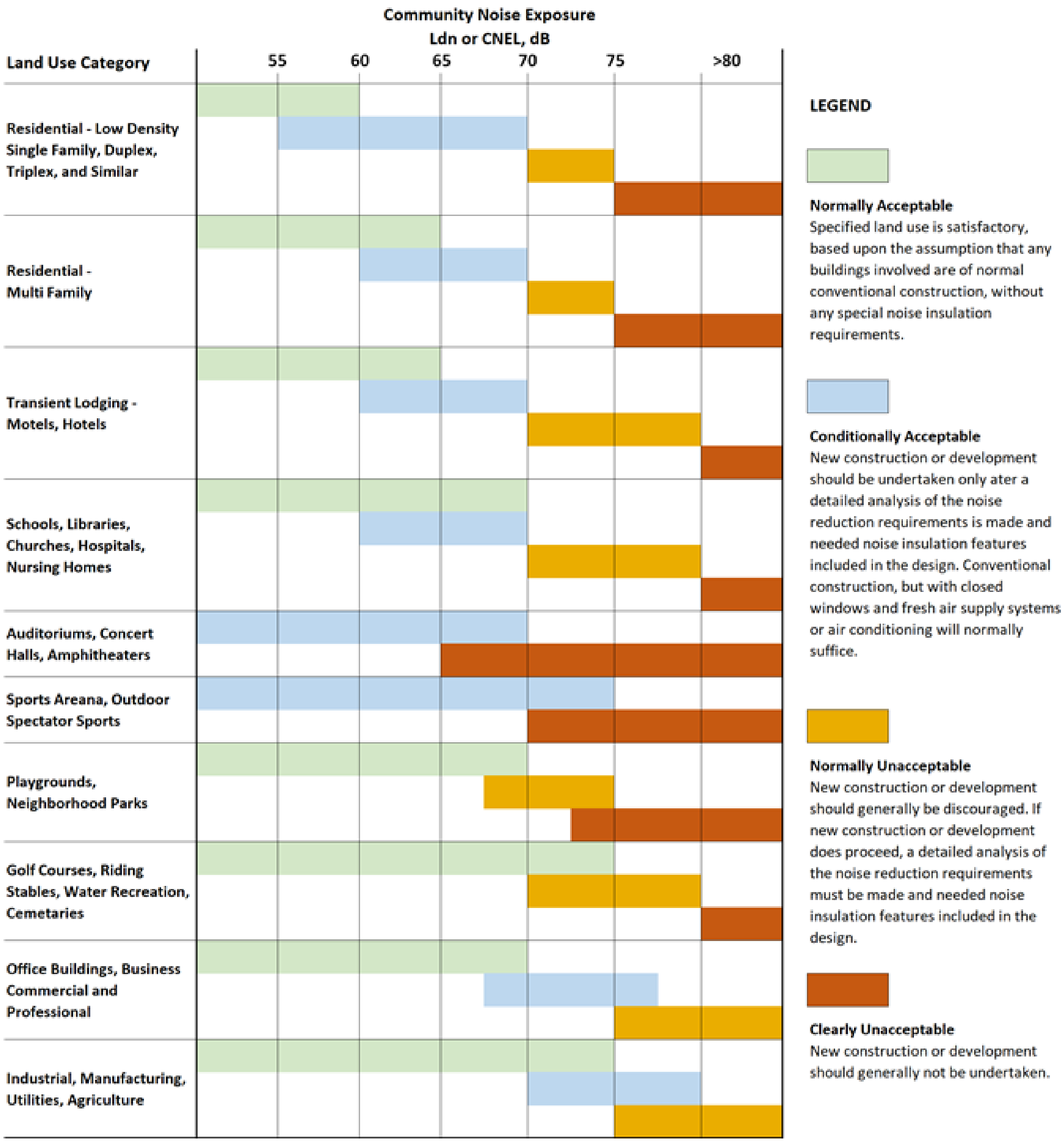
Denotation of a land use as "normally acceptable" implies that the highest noise level in that exposure level is the maximum desirable for existing or conventional construction that does not incorporate any special acoustical treatment. In general, evaluation of land use that falls into the "normally acceptable," "conditionally acceptable," or "normally unacceptable" noise environments should analyze other potential factors that would affect the noise environment. These include consideration of the types of noise source, the sensitivity of the noise receiver, the noise reduction likely to be provided by structures, and the degree to which the noise source may interfere with speech, sleep, or to other activities characteristic of the land use. Generally, the City's Land Use/Noise Compatibility Matrix is used as a guide to define where placement of certain land uses is considered acceptable. The Noise Element of the City's current General Plan also contains policies to maintain an acceptable noise environment in the City. Goals and policies from the proposed Plan relating to noise are listed in the impact analysis discussions in Section 4, *Impact Analysis*.

Palmdale Municipal Code

The City also implements and enforces noise control through the Palmdale Municipal Code (PMC). PMC Chapter 9.18, *Disturbing, Excessive, Loud, or Offensive Noise*, sets both daytime and nighttime sound level limits for residential and commercial zones; prohibits any person or property owner in the City from creating 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.

PMC Chapter 8.28, *Building Construction Hours of Operation and Noise Control,* prohibits any person or property owner in the City to 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.

Figure 5 Palmdale General Plan Noise Level Guidance



Source: City of Palmdale 2022

3 Methodology

3.1 Construction Noise

Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (FHWA 2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, construction noise levels were estimated at noise sensitive receivers near the project site. RCNM provides reference noise levels for standard construction equipment, with an attenuation rate of 6 dBA per doubling of distance for stationary equipment.

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FHWA 2018). Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some have high-impact noise levels.

Construction activity would result in temporary noise in the project site vicinity, exposing surrounding nearby receivers to increased noise levels. Construction noise would typically be higher during the heavier periods of initial construction (i.e., site preparation and grading) and would be lower during the later construction phases (i.e., building construction and paving). Typical heavy construction equipment during project grading could include dozers, loaders, graders, and dump trucks. It is assumed that diesel engines would power all construction equipment. Construction equipment would not all operate at the same time or location. In addition, construction equipment would not be in constant use during the 8-hour operating day.

Project construction would occur nearest to the single-family residences within the southern and western portion of the project site. Over the course of a typical construction day, construction equipment would be located as close as 15 feet to the properties but would typically be located at an average distance farther away due to the nature of construction and the lot size of the project. For example, during a typical construction day when performing construction near these residences, the equipment may operate across a horizontal distance (15 to several hundred feet) from a nearby noise receiver. Therefore, it is assumed that over the course of a typical construction day the construction equipment would operate at an average distance of 100 feet from the single-family residences to the west and south.

Construction noise is typically loudest during activities that involve excavation and soil movement, such as site preparation and grading. A potential construction scenario includes a dozer, front end loader and a dump truck during grading to excavate and move soil. At a distance of 100 feet, a dozer, front end loader and a dump truck would generate a noise level of 74.4 dBA L_{eq} (RCNM calculations are included in Appendix B).

3.2 Groundborne Vibration

The project does not include any substantial vibration sources associated with operation. Thus, construction activities have the greatest potential to generate ground-borne vibration affecting nearby receivers, especially during grading and excavation of the project site. Table 5 shows vibration levels of anticipated grading and excavation equipment used during construction. The greatest vibratory source during construction in the project vicinity would be a large bulldozer. Neither blasting nor pile driving would be required for construction of the project.

Table 5 Vibration Levels Measured during Construction Activities

Equipment	PPV at 25 ft. (in/sec)
Large Bulldozer	0.089
Loaded Trucks	0.076
Small Bulldozer	0.003

Source: FTA 2018

3.3 Operational Noise Sources

On-site Noise Sources

The main noise source associated with a residential development are heating, ventilation, and air conditioning (HVAC) units). The unit used in this analysis is a Carrier 38HDR060 split-system, which is a typical HVAC unit used on single-family residential sites and has a sound power level of 72 dBA (see Appendix C for manufacturer's specifications). HVAC equipment for single-family residences is typically located at ground-level, on the side or backyard portions of a house. The closest future residential lots to nearby receivers would occur on the southern edge of the project site.

3.4 Traffic Noise

The proposed project would generate additional traffic on area roadways, which would increase traffic noise levels in the area. The project's off-site traffic noise impacts are analyzed based on data from the Traffic Signal Warrant Study prepared for the project (General Technologies and Solutions 2023). The expected project traffic volumes were forecasted using the Institute of Transportation Engineers, Trip Generation Manual, 11th Edition, 2021. The overall increase in traffic noise was estimated using the "Phase 1 Build-out" data from the Traffic Signal Warrant Study.

3.5 Significance Thresholds

To determine whether a project would have a significant noise impact, Appendix G of the California Environmental Quality Act (CEQA) Guidelines requires consideration of whether a project would result in:

1. 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
2. Generation of excessive groundborne vibration or groundborne noise levels

3. 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, expose people residing or working in the project area to excessive noise levels

Construction Noise

Pursuant to Chapter 8.28 of the PMC, noise generated by construction activities is not prohibited if it occurs on Monday through Saturday, between the hours of 6:30 a.m. to 8:00 p.m. In addition, the FTA-recommended criterion of 80 dBA L_{eq} for residential daytime receivers is used as a significance threshold for nearby residences.

On-site Operational Noise

The City of Palmdale has not established operational noise standards. Therefore, operational noise standards based upon U.S. Environmental Protection Agency (USEPA) are provided for this analysis. Based upon available sleep criteria data, an interior nighttime level of 35 dBA is considered acceptable (USEPA 1974). Assuming a 15 dBA reduction with windows open, an exterior noise level of 50 dBA L_{eq} would be required to maintain an acceptable interior noise environment of 35 dBA.

Off-site Traffic Noise

Off-site project noise (i.e., roadway noise) would result in a significant impact if the project would increase traffic noise levels by 3 dBA, which would be a perceptible increase in traffic noise.

Vibration

The project would result in the generation of excessive groundborne vibration or groundborne noise levels if vibration levels exceed 0.2 in/sec PPV at residential structures or 0.3 in/sec PPV at commercial structures.

Land Use Compatibility

The City has adopted noise guidelines that provide both interior and exterior noise limits for noise compatibility. The proposed project would include single-family residential buildings, which are identified as a noise-sensitive land use. The conditionally acceptable noise level standard for outdoor living areas of new noise-sensitive land uses is 70 dBA CNEL. Outdoor living areas generally include backyards of single-family residences and individual patios or common outdoor activity areas. The maximum noise exposure for indoor living areas in new noise-sensitive land uses is 45 dBA CNEL.

However, as a result of the Supreme Court decision regarding the assessment of the environment's impacts on projects (*California Building Industry Association (CBIA) v. Bay Area Air Quality Management District (BAAQMD)*, 62 Cal. 4th 369 (No. S 213478) issued December 17, 2015), it is generally no longer the purview of the CEQA process to evaluate the impact of existing environmental conditions on any given project. As a result, while the noise from existing sources (e.g., adjacent roadways) is taken into account as part of the baseline condition, the direct effects of exterior noise from nearby noise sources relative to land use compatibility of a proposed project is typically no longer a required topic for impact evaluation under CEQA. Generally, no determination of significance is required except for certain school projects, projects affected by airport noise, and projects that would exacerbate existing conditions (i.e., projects that would have a significant operational impact).

4 Impact Analysis

4.1 Issue 1

Issue:	Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Project construction would occur nearest to the single-family residences located west and south of the project site. It is conservatively assumed that over the course of a typical construction day the construction equipment would operate 100 feet from the nearest sensitive receiver. At a distance of 100 feet, a loader, front end loader and dump truck would generate a noise level of 74.4 dBA L_{eq} (RCNM calculations are included in Appendix B). Therefore, construction noise levels would not exceed the FTA's daytime residential threshold of 80 dBA L_{eq}, and impacts would be less than significant.

Operation

HVAC Units

Each residence would have at least one ground-level HVAC equipment. Given estimated setbacks, HVAC equipment could be within 20 feet of existing residences. At a distance of 20 feet, an HVAC unit would generate noise levels of 48 dBA, which would not exceed an exterior noise level of 50 dBA L_{eq} at nearby residences that would result in an exceedance of an acceptable interior noise environment of 35 dBA. In addition, future fencing between properties may provide additional noise attenuation. Therefore, operational noise impacts associated with HVAC equipment would be less than significant.

Additional on-site noise sources such as landscape maintenance, low-speed traffic on internal roadways, conversations, open space activities, and trash hauling also would be typical of noise generated by neighboring land uses and would not substantially contribute to overall ambient noise levels. Therefore, on-site operations would have a less than significant impact on noise-sensitive receivers.

Off-site Traffic Noise

The overall increase in traffic noise from the project was estimated using observed ADT data and estimated project trips from the Traffic Signal Warrant Study prepared by General Technologies and Solutions as shown in Table 6. As shown in Table 6, ADT would increase by approximately 9 percent over existing conditions under the project. A 9 percent increase in traffic on a roadway would equate to an increase of 0.4 dBA. Therefore, the project would not double the existing mobile noise source and would not increase noise levels by 3 dBA, which is considered a barely perceptible noise increase. Therefore, off-site traffic noise impacts would be less than significant.

Table 6 Daily Vehicle Trip Summary

Palmdale Boulevard	Residential Trips
Existing Conditions	16,745[1]
Existing Plus Project Conditions	18,205
Change in Trips	**+1,460**
Percent Change in Vehicle Trips (%)	**9%**

[1] Existing condition traffic counts are observed traffic counts on Palmdale Avenue as presented in the Traffic Signal Warrant Study (General Technologies and Solutions 2023). For the noise analysis, all project trips were conservatively added to this observed value.

4.2 Issue 2

Issue: Would the project result in generation of excessive groundborne vibration or ground-borne noise levels?

Construction activities known to generate excessive ground-borne vibration, such as pile driving, would not be conducted to construct the project. Based on FTA recommendations, limiting vibration levels to below 0.2 in/sec PPV at residential structures would prevent architectural damage regardless of building construction type. The greatest anticipated source of vibration during project construction activities would be from a dozer, which may be used within 15 feet of the nearest off-site sensitive receivers to the to the west and south. A dozer would create approximately 0.089 in/sec PPV at a distance of 25 feet (FTA 2018). This would equal a vibration level of approximately 0.16 in/sec PPV at a distance of 15 feet.[2] This would be lower than the 0.2 in/sec PPV threshold. Therefore, temporary vibration impacts associated with the dozer (and other potential equipment) would be less than significant.

Operation of the project would not include any substantial vibration sources. Therefore, operational vibration impacts would be less than significant.

4.3 Issue 3

Issue: 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 airport nearest to the project site, Palmdale Regional Airport, is located approximately 3.8 miles to the northwest. The project would not be located within the 65 CNEL noise contour of the Palmdale Regional Airport (City of Palmdale 2022). Therefore, no substantial noise exposure from airport noise would occur to construction workers, users, or employees of the project, and no impacts would occur.

[2] PPVEquipment = PPVRef $(25/D)^n$ (in/sec), PPVRef = reference PPV at 25 feet, D = distance ,and n = 1.1

4.4 Issue 4

Issue:	Would the project be subjected to noise levels in excess of the City's land use compatibility guidelines for noise?

The normally acceptable noise level for the exterior use areas single-family residences in Palmdale is 60 CNEL. A long-term measurement was completed at the project site to estimate the noise exposure from the future residences, as shown in Table 3. The measurement captured a noise level of 56 CNEL, approximately 450 feet south of the Palmdale Boulevard centerline. With this measurement and distance, noise levels would exceed 60 CNEL within 175 feet of Palmdale Boulevard, which covers Lots 1 through 7. In addition, these lots likely have their backyard facing the roadway. Therefore, without a barrier between Lots 1 through 7 and Palmdale Boulevard, the project may be inconsistent with Palmdale noise compatibility standards.

Standard construction techniques for wood-frame construction buildings required under the California Building Code typically achieve a minimum 25-dBA reduction from exterior sources at interior locations when the windows are in a closed position. Therefore, if building façade noise levels exceeded 70 CNEL for the residences, interior noise levels for the project would potentially exceed the interior noise standard of 45 CNEL. The edge of Lots 1 through 7 are approximately 50 feet from the Palmdale Boulevard centerline, which would result in potential building noise exposures of 65 CNEL per the long-term measurement in Table 3. With a 25 dBA reduction, this would not exceed the 45 CNEL interior noise standard, and the project would be consistent with interior noise standards.

Recommendations

NOI-1 On-Site Noise Barriers

Exterior noise levels at exterior use areas for the proposed residences on Lots 1 through 7 shall be reduced to not exceed the City's noise compatibility standard for single-family residences of 60 CNEL. Noise reduction could be accomplished through a 6-foot-high sound wall along the northern perimeter of the affected lots.

The sound attenuation fence or wall must be solid. It can be constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, as long as there are no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one-inch total thickness or have a density of at least 3.5 pounds per SF. Where architectural or aesthetic factors allow, glass or clear plastic ⅜ of an inch thick or thicker may be used on the upper portion, if it is desirable to preserve a view. Sheet metal of 18 gauge (minimum) may be used, if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Any door(s) or gate(s) must be designed with overlapping closures on the bottom and sides and meet the minimum specifications of the wall materials described above. The gate(s) may be of one-inch thick or better wood, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated doorjambs.

Consistency After Implementation of Recommendations

Exterior noise levels at the project residences would be reduced by at least 5 dBA with a sound wall described in Recommendation NOI-1, which would reduce traffic noise levels at exterior areas to 60 CNEL or lower. Therefore, the project would be compatible with City noise compatibility standards with implementation of Recommendation NOI-1.

5 Conclusion

The project would generate both temporary construction-related noise and long-term noise associated with operation of the project. The project's noise exposure from construction would not exceed the FTA's noise threshold of 80 dBA. Project construction would occur on weekdays between the hours of 6:30 a.m. and 8:00 p.m. pursuant to PMC Chapter 8.28.

The project's stationary noise sources (HVAC units) would not exceed EPA standards at the nearest sensitive receiver. Therefore, stationary noise impacts would be less than significant.

Project-generated traffic would generate an increase of up to approximately 0.6 dBA at adjacent roadways. This is below the threshold of 3 dBA; therefore, the off-site traffic noise increase would be less than significant.

The project would generate groundborne vibration during construction, but vibration would not exceed the applicable thresholds at the closest residential structures adjacent to the south and west. Therefore, construction-related vibration impacts would be less than significant.

The project site is outside the noise contour for the nearest airport, Palmdale Regional Airport. Therefore, the project would not result in impacts from airport noise.

Lots 1 through 7 of the project may be exposed to exterior noise from Palmdale Boulevard that exceeds the City's exterior noise compatibility limits. With installation of a 6-foot block wall along the northern perimeter, noise levels would be consistent with City standards.

6 References

California Department of Transportation (Caltrans). 2020a. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. (CT-HWANP-RT-13-069.25.2) September. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/traffic-noise-protocol-april-2020-a11y.pdf

______. 2020b. *Transportation and Construction Vibration Guidance Manual*. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

Federal Highway Administration (FHWA). 2006. *FHWA Highway Construction Noise Handbook*. (FHWAHEP-06-015; DOT-VNTSC-FHWA-06-02). Available at: http://www.fhwa.dot.gov/environment/construction_noise/handbook. Accessed November 2018.

______. 2011. Highway Traffic Noise: Analysis and Abatement Guidance (FHWA-HEP-10-025). https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment*. November. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

General Technologies and Solutions. 2023. Traffic Signal Warrant Study for the intersection of E Palmdale Blvd and the proposed access road for the Palmdale Two residential development. July 6.

Institute of Transportation Engineers (ITE). 2021. Trip Generation Manual, 11th Edition. Volume 1: Desk Reference.

Palmdale, City of. 2022. Palmdale 2045 General Plan: Noise Element. Available at: https://static1.squarespace.com/static/5c7dc93065a707492aca3e47/t/63531218d0f5ef314c6c849a/1666388512134/PalmdaleGPU_Ch16_10322.pdf. Accessed October 2022.

United States Environmental Protection Agency. 1974. Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety. Report No. 550/9-74-004 March 1974. Available at: https://www.rosemonteis.us/documents/usepa-1974. Accessed September 2022.

Appendix A

Noise Measurement Data

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Freq Weight : A
Time Weight : SLOW
Level Range : 30-90
Max dB : 79.0 - 2022/09/21 10:21:03
Level Range : 30-90
SEL : 95.7
Leq : 66.2

No.s	Date Time	(dB)				
1	2022/09/21 10:13:13	68.2	68.7	74.5	65.4	66.1
6	2022/09/21 10:13:28	64.1	66.1	66.0	66.8	66.2
11	2022/09/21 10:13:43	63.2	63.5	64.8	65.4	65.6
16	2022/09/21 10:13:58	61.5	63.4	65.5	58.1	52.8
21	2022/09/21 10:14:13	50.8	58.9	59.6	55.6	56.9
26	2022/09/21 10:14:28	65.5	63.9	60.5	64.0	63.9
31	2022/09/21 10:14:43	68.7	69.4	66.5	68.8	69.8
36	2022/09/21 10:14:58	64.7	67.2	63.8	67.2	66.5
41	2022/09/21 10:15:13	61.5	61.7	63.0	67.1	62.0
46	2022/09/21 10:15:28	61.4	60.3	63.5	65.6	67.1
51	2022/09/21 10:15:43	63.4	58.2	64.7	63.2	61.3
56	2022/09/21 10:15:58	59.0	57.2	66.1	69.4	62.5
61	2022/09/21 10:16:13	55.9	61.8	66.7	64.7	62.1
66	2022/09/21 10:16:28	68.8	69.7	61.2	55.9	69.6
71	2022/09/21 10:16:43	67.0	64.4	64.9	68.7	66.6
76	2022/09/21 10:16:58	62.5	65.3	66.7	67.5	66.3
81	2022/09/21 10:17:13	69.7	69.1	71.7	72.3	69.4
86	2022/09/21 10:17:28	66.8	68.5	72.1	70.8	64.8
91	2022/09/21 10:17:43	63.3	69.4	66.7	69.2	64.4
96	2022/09/21 10:17:58	59.5	57.2	60.3	67.8	64.8
101	2022/09/21 10:18:13	65.3	70.9	60.3	62.0	70.4
106	2022/09/21 10:18:28	70.8	62.0	54.8	66.4	64.3
111	2022/09/21 10:18:43	63.5	66.3	68.7	59.1	55.3
116	2022/09/21 10:18:58	53.6	70.9	71.2	65.5	66.6
121	2022/09/21 10:19:13	66.2	64.2	72.8	65.7	62.7
126	2022/09/21 10:19:28	63.4	63.9	61.4	58.8	56.3
131	2022/09/21 10:19:43	59.1	66.4	61.2	67.2	68.6
136	2022/09/21 10:19:58	69.7	61.1	55.6	52.6	61.0
141	2022/09/21 10:20:13	60.5	65.9	63.0	63.7	58.9
146	2022/09/21 10:20:28	54.3	51.7	50.5	51.3	64.8
151	2022/09/21 10:20:43	75.9	71.2	65.2	62.6	59.9
156	2022/09/21 10:20:58	66.0	77.8	70.4	68.9	62.9
161	2022/09/21 10:21:13	64.0	67.3	64.5	64.0	64.9
166	2022/09/21 10:21:28	65.5	66.6	59.0	54.1	49.3
171	2022/09/21 10:21:43	47.9	50.5	51.4	58.2	61.6
176	2022/09/21 10:21:58	52.8	53.6	51.2	52.6	65.4
181	2022/09/21 10:22:13	69.5	69.1	69.7	64.2	65.5
186	2022/09/21 10:22:28	64.8	64.0	64.6	62.2	56.1
191	2022/09/21 10:22:43	52.1	49.3	50.4	62.9	64.5
196	2022/09/21 10:22:58	68.0	57.8	50.7	52.1	65.1
201	2022/09/21 10:23:13	66.1	59.2	66.6	61.7	66.5
206	2022/09/21 10:23:28	71.2	71.5	66.9	62.0	64.0
211	2022/09/21 10:23:43	65.8	70.1	72.2	72.2	72.0
216	2022/09/21 10:23:58	63.3	55.5	51.3	49.6	48.9
221	2022/09/21 10:24:13	50.6	48.9	64.7	60.7	58.0
226	2022/09/21 10:24:28	65.5	65.4	68.8	66.8	65.1
231	2022/09/21 10:24:43	69.5	69.0	65.5	61.1	59.8
236	2022/09/21 10:24:58	57.4	58.6	66.2	67.6	59.5
241	2022/09/21 10:25:13	62.3	64.9	68.9	73.0	71.2
246	2022/09/21 10:25:28	68.6	62.3	65.4	66.5	65.4
251	2022/09/21 10:25:43	62.9	59.4	65.8	66.6	73.3
256	2022/09/21 10:25:58	69.6	67.8	66.2	64.8	66.8
261	2022/09/21 10:26:13	68.4	68.4	66.6	65.6	70.1
266	2022/09/21 10:26:28	67.0	66.7	62.9	58.8	58.1
271	2022/09/21 10:26:43	64.8	68.8	60.8	54.2	52.7
276	2022/09/21 10:26:58	52.9	63.8	66.6	65.1	58.8
281	2022/09/21 10:27:13	58.4	66.4	60.6	63.8	64.7
286	2022/09/21 10:27:28	67.4	66.9	63.9	63.9	66.2
291	2022/09/21 10:27:43	67.9	68.6	63.3	62.7	64.8
296	2022/09/21 10:27:58	64.2	65.7	58.9	53.7	53.1

-
Freq Weight : A
-
Time Weight : SLOW
-
Level Range : 30-90
-
Max dB : 55.9 - 2022/09/21 09:50:10
-
Level Range : 30-90
-
SEL : 71.5
-
Leq : 42.0
-

No.s	Date Time	(dB)				
1	2022/09/21 09:49:43	45.0	44.5	44.6	43.0	44.9
6	2022/09/21 09:49:58	44.7	46.5	50.1	53.5	53.9
11	2022/09/21 09:50:13	52.0	51.4	48.7	51.7	45.7
16	2022/09/21 09:50:28	41.7	42.8	41.4	40.2	40.1
21	2022/09/21 09:50:43	40.2	40.2	41.3	39.3	39.5
26	2022/09/21 09:50:58	39.6	40.7	38.9	38.7	40.7
31	2022/09/21 09:51:13	41.6	42.7	41.2	43.8	41.3
36	2022/09/21 09:51:28	41.5	40.0	39.7	43.9	40.6
41	2022/09/21 09:51:43	40.3	39.1	39.6	39.8	39.2
46	2022/09/21 09:51:58	38.8	38.8	39.2	39.7	40.8
51	2022/09/21 09:52:13	39.7	39.1	38.5	38.7	39.1
56	2022/09/21 09:52:28	38.2	38.0	37.7	37.0	37.4
61	2022/09/21 09:52:43	37.0	37.8	37.8	46.0	43.1
66	2022/09/21 09:52:58	38.6	43.2	38.8	42.8	45.3
71	2022/09/21 09:53:13	40.6	41.4	41.5	42.1	41.7
76	2022/09/21 09:53:28	41.4	41.2	40.9	41.2	40.7
81	2022/09/21 09:53:43	40.0	40.8	40.0	39.3	41.7
86	2022/09/21 09:53:58	41.8	41.6	41.3	40.5	39.8
91	2022/09/21 09:54:13	40.0	40.7	40.3	41.8	41.3
96	2022/09/21 09:54:28	41.8	42.7	44.5	44.4	42.7
101	2022/09/21 09:54:43	42.0	41.1	40.2	41.1	41.5
106	2022/09/21 09:54:58	40.2	40.0	39.7	39.7	39.5
111	2022/09/21 09:55:13	40.4	41.0	41.5	40.4	40.6
116	2022/09/21 09:55:28	40.6	39.5	39.7	39.5	39.8
121	2022/09/21 09:55:43	41.0	41.7	40.5	39.9	39.6
126	2022/09/21 09:55:58	38.5	38.4	40.3	42.0	39.3
131	2022/09/21 09:56:13	39.2	39.2	38.7	38.2	37.8
136	2022/09/21 09:56:28	38.0	38.3	37.7	38.2	38.4
141	2022/09/21 09:56:43	39.1	39.6	38.8	38.8	40.1
146	2022/09/21 09:56:58	40.1	40.9	39.3	40.6	40.0
151	2022/09/21 09:57:13	39.2	38.6	38.5	38.5	38.4
156	2022/09/21 09:57:28	39.0	38.8	38.6	38.8	38.3
161	2022/09/21 09:57:43	38.6	41.2	40.7	39.0	39.0
166	2022/09/21 09:57:58	40.1	40.0	39.5	39.2	40.2
171	2022/09/21 09:58:13	39.6	39.5	39.5	39.5	39.3
176	2022/09/21 09:58:28	39.4	39.6	40.5	40.3	40.0
181	2022/09/21 09:58:43	38.7	39.4	38.5	40.3	40.5
186	2022/09/21 09:58:58	40.5	39.7	39.0	39.9	40.6
191	2022/09/21 09:59:13	40.2	41.5	39.9	40.9	40.9
196	2022/09/21 09:59:28	40.8	41.3	40.5	40.3	41.3
201	2022/09/21 09:59:43	41.3	41.1	41.3	41.8	42.1
206	2022/09/21 09:59:58	41.4	41.0	40.8	39.5	39.1
211	2022/09/21 10:00:13	39.9	39.1	38.6	39.6	40.6
216	2022/09/21 10:00:28	39.8	39.4	40.0	39.7	42.6
221	2022/09/21 10:00:43	40.0	41.3	41.3	41.9	40.9
226	2022/09/21 10:00:58	40.5	41.4	40.3	40.7	41.5
231	2022/09/21 10:01:13	40.1	40.3	41.1	40.8	42.3
236	2022/09/21 10:01:28	41.5	41.8	40.4	40.4	41.9
241	2022/09/21 10:01:43	41.6	41.0	40.1	41.5	43.6
246	2022/09/21 10:01:58	41.0	40.4	39.7	39.9	39.5
251	2022/09/21 10:02:13	41.4	41.1	41.1	41.9	43.0
256	2022/09/21 10:02:28	42.8	41.7	41.3	41.4	40.8
261	2022/09/21 10:02:43	39.9	39.1	39.4	40.0	39.8
266	2022/09/21 10:02:58	40.5	40.2	40.7	42.2	41.3
271	2022/09/21 10:03:13	40.7	41.0	40.5	41.5	40.6
276	2022/09/21 10:03:28	39.5	40.1	39.3	39.1	39.7
281	2022/09/21 10:03:43	41.3	44.7	46.8	42.4	44.7
286	2022/09/21 10:03:58	42.8	42.9	45.1	44.6	42.8
291	2022/09/21 10:04:13	42.2	42.8	42.0	42.1	44.0
296	2022/09/21 10:04:28	44.1	45.2	42.8	42.9	42.1

-
Freq Weight : A
-
Time Weight : SLOW
-
Level Range : 30-90
-
Max dB : 52.7 - 2022/09/21 09:37:45
-
Level Range : 30-90
-
SEL : 73.8
-
Leq : 44.3
-

No.s	Date Time	(dB)				
1	2022/09/21 09:26:13	43.8	43.8	44.1	43.0	43.2
6	2022/09/21 09:26:28	42.5	45.1	47.4	43.7	43.0
11	2022/09/21 09:26:43	41.6	42.4	40.7	39.6	41.6
16	2022/09/21 09:26:58	43.2	40.9	40.3	39.7	39.8
21	2022/09/21 09:27:13	40.1	40.6	39.3	39.2	40.7
26	2022/09/21 09:27:28	41.7	41.0	41.3	41.5	42.1
31	2022/09/21 09:27:43	45.6	47.2	44.7	44.3	43.6
36	2022/09/21 09:27:58	43.2	41.4	41.4	41.2	41.3
41	2022/09/21 09:28:13	43.3	45.9	45.0	44.6	42.8
46	2022/09/21 09:28:28	40.9	40.9	40.6	42.1	42.2
51	2022/09/21 09:28:43	44.4	49.1	50.7	50.0	47.6
56	2022/09/21 09:28:58	44.7	41.4	41.8	41.9	41.7
61	2022/09/21 09:29:13	40.7	41.1	42.2	41.9	41.1
66	2022/09/21 09:29:28	45.4	43.0	43.0	42.2	44.0
71	2022/09/21 09:29:43	41.3	42.6	40.5	40.4	39.4
76	2022/09/21 09:29:58	39.0	41.0	38.9	42.0	40.5
81	2022/09/21 09:30:13	40.1	41.7	41.2	41.4	40.9
86	2022/09/21 09:30:28	43.0	42.7	42.6	42.7	42.8
91	2022/09/21 09:30:43	44.0	43.5	45.5	45.9	45.7
96	2022/09/21 09:30:58	43.7	42.4	42.5	43.0	45.0
101	2022/09/21 09:31:13	44.7	45.6	45.0	44.0	44.7
106	2022/09/21 09:31:28	44.4	43.3	45.7	44.5	41.9
111	2022/09/21 09:31:43	41.4	41.9	41.4	41.3	41.6
116	2022/09/21 09:31:58	41.3	42.9	43.9	42.6	43.1
121	2022/09/21 09:32:13	42.6	43.6	45.8	46.0	45.1
126	2022/09/21 09:32:28	42.9	42.5	41.1	40.1	40.1
131	2022/09/21 09:32:43	40.8	41.1	42.2	42.0	41.0
136	2022/09/21 09:32:58	41.6	43.3	42.5	43.3	42.2
141	2022/09/21 09:33:13	43.8	41.3	42.6	42.2	43.2
146	2022/09/21 09:33:28	45.5	45.4	44.8	43.5	43.5
151	2022/09/21 09:33:43	42.7	42.2	42.8	43.8	44.4
156	2022/09/21 09:33:58	44.2	46.2	46.3	43.9	45.4
161	2022/09/21 09:34:13	46.2	46.7	46.0	45.3	46.3
166	2022/09/21 09:34:28	46.2	47.5	46.2	44.6	43.8
171	2022/09/21 09:34:43	42.7	42.6	42.9	42.5	42.7
176	2022/09/21 09:34:58	42.0	42.5	43.4	43.5	45.3
181	2022/09/21 09:35:13	45.8	46.6	47.4	44.0	43.3
186	2022/09/21 09:35:28	43.6	44.0	45.7	43.7	45.3
191	2022/09/21 09:35:43	43.5	43.1	43.3	42.4	43.0
196	2022/09/21 09:35:58	43.5	44.3	43.7	43.7	43.2
201	2022/09/21 09:36:13	45.7	46.1	45.0	44.2	42.4
206	2022/09/21 09:36:28	42.4	42.7	41.4	41.4	42.6
211	2022/09/21 09:36:43	41.8	41.9	42.6	42.5	44.5
216	2022/09/21 09:36:58	44.8	45.4	46.6	44.8	44.0
221	2022/09/21 09:37:13	43.7	42.8	43.1	42.8	42.6
226	2022/09/21 09:37:28	42.8	44.8	46.4	49.3	45.8
231	2022/09/21 09:37:43	50.1	44.8	45.7	44.5	44.3
236	2022/09/21 09:37:58	44.5	45.6	44.3	45.1	43.3
241	2022/09/21 09:38:13	44.2	44.2	43.5	44.4	45.4
246	2022/09/21 09:38:28	47.5	47.9	46.1	46.0	46.0
251	2022/09/21 09:38:43	44.8	44.3	44.2	43.6	43.6
256	2022/09/21 09:38:58	44.4	43.5	46.6	46.5	44.6
261	2022/09/21 09:39:13	44.2	44.8	47.0	45.1	44.2
266	2022/09/21 09:39:28	46.3	47.7	48.5	46.9	47.2
271	2022/09/21 09:39:43	47.4	46.6	46.0	45.6	46.3
276	2022/09/21 09:39:58	45.6	45.3	45.0	44.0	45.6
281	2022/09/21 09:40:13	45.0	44.4	44.7	46.0	45.7
286	2022/09/21 09:40:28	45.3	48.1	51.2	48.1	46.2
291	2022/09/21 09:40:43	46.7	45.6	46.8	48.4	47.2
296	2022/09/21 09:40:58	46.5	45.3	44.4	43.0	43.4

- Freq Weight : A
- Time Weight : SLOW
- Level Range : 30-90
- Max dB : 78.3 - 2022/09/22 10:24:09
- Level Range : 30-90
- SEL : 119.3
- Leq : 70.0
-

No.s	Date Time	(dB)				
1	2022/09/21 10:59:41	49.7	44.9	48.3	41.6	45.5
6	2022/09/21 11:19:41	45.4	51.3	44.0	49.8	50.0
11	2022/09/21 11:39:41	50.9	45.6	51.5	48.2	52.8
16	2022/09/21 11:59:41	48.1	44.0	56.5	52.5	49.7
21	2022/09/21 12:19:41	50.9	48.2	53.9	50.0	52.3
26	2022/09/21 12:39:41	54.6	48.7	53.3	47.4	49.8
31	2022/09/21 12:59:41	48.4	51.1	53.2	47.1	49.1
36	2022/09/21 13:19:41	46.0	47.1	46.2	48.6	50.9
41	2022/09/21 13:39:41	48.2	50.9	47.1	49.9	47.6
46	2022/09/21 13:59:41	50.6	49.1	47.5	49.0	46.0
51	2022/09/21 14:19:41	46.7	46.4	48.6	45.3	48.4
56	2022/09/21 14:39:41	47.5	52.0	47.7	56.0	47.5
61	2022/09/21 14:59:41	49.3	46.8	47.3	47.7	46.9
66	2022/09/21 15:19:41	49.9	48.2	54.9	50.5	51.3
71	2022/09/21 15:39:41	49.0	49.9	53.3	51.8	48.7
76	2022/09/21 15:59:41	51.5	51.1	51.6	52.5	52.6
81	2022/09/21 16:19:41	52.4	52.1	49.3	51.9	52.6
86	2022/09/21 16:39:41	49.8	48.8	48.8	48.0	51.0
91	2022/09/21 16:59:41	47.8	51.7	50.4	49.3	51.2
96	2022/09/21 17:19:41	47.6	50.2	51.3	53.4	49.4
101	2022/09/21 17:39:41	51.2	48.0	51.1	48.9	50.1
106	2022/09/21 17:59:41	49.9	51.4	51.6	51.3	49.5
111	2022/09/21 18:19:41	53.8	50.7	50.1	48.6	51.7
116	2022/09/21 18:39:41	50.8	52.2	49.8	46.3	51.1
121	2022/09/21 18:59:41	53.3	50.4	49.4	51.6	49.1
126	2022/09/21 19:19:41	51.0	53.7	51.1	50.9	47.7
131	2022/09/21 19:39:41	47.6	51.0	63.3	48.9	49.8
136	2022/09/21 19:59:41	49.5	48.8	47.5	49.0	44.1
141	2022/09/21 20:19:41	51.4	50.9	48.1	55.0	49.1
146	2022/09/21 20:39:41	53.1	49.4	50.5	50.2	46.7
151	2022/09/21 20:59:41	46.5	46.2	43.4	46.8	44.8
156	2022/09/21 21:19:41	43.2	44.9	47.9	48.6	48.7
161	2022/09/21 21:39:41	41.7	50.3	46.6	48.8	48.3
166	2022/09/21 21:59:41	48.9	48.2	48.0	45.6	44.8
171	2022/09/21 22:19:41	41.1	46.6	46.4	46.8	44.4
176	2022/09/21 22:39:41	42.3	42.9	41.8	40.9	56.0
181	2022/09/21 22:59:41	42.1	42.0	40.7	42.3	41.8
186	2022/09/21 23:19:41	41.2	43.5	41.3	43.5	43.2
191	2022/09/21 23:39:41	44.0	40.4	40.7	41.4	42.1
196	2022/09/21 23:59:41	48.3	43.4	41.0	40.6	40.3
201	2022/09/22 00:19:41	45.0	36.9	41.8	38.9	42.7
206	2022/09/22 00:39:41	40.1	43.8	41.0	40.4	39.0
211	2022/09/22 00:59:41	40.3	36.7	41.0	37.8	38.7
216	2022/09/22 01:19:41	47.4	37.2	39.2	42.1	35.1
221	2022/09/22 01:39:41	46.3	42.0	42.6	43.3	39.6
226	2022/09/22 01:59:41	39.0	43.7	44.1	44.1	44.9
231	2022/09/22 02:19:41	45.0	38.8	50.4	42.8	41.5
236	2022/09/22 02:39:41	42.9	44.4	46.1	48.3	43.6
241	2022/09/22 02:59:41	41.6	43.3	44.1	48.7	48.1
246	2022/09/22 03:19:41	40.7	42.2	46.8	43.3	47.6
251	2022/09/22 03:39:41	45.5	47.2	43.4	45.8	43.8
256	2022/09/22 03:59:41	45.0	47.7	46.2	44.1	47.5
261	2022/09/22 04:19:41	45.1	51.6	51.4	48.3	53.2
266	2022/09/22 04:39:41	57.8	57.7	51.3	48.6	55.8
271	2022/09/22 04:59:41	55.1	53.1	53.5	49.7	51.6
276	2022/09/22 05:19:41	49.8	47.7	56.5	47.1	54.4
281	2022/09/22 05:39:41	53.4	52.0	55.7	55.8	49.3
286	2022/09/22 05:59:41	50.4	51.2	50.1	54.0	54.6
291	2022/09/22 06:19:41	51.2	48.4	51.9	54.0	49.6
296	2022/09/22 06:39:41	53.5	50.9	52.9	50.8	52.9
301	2022/09/22 06:59:41	51.5	53.4	54.4	54.4	53.7
306	2022/09/22 07:19:41	50.5	54.4	52.0	49.2	50.7
311	2022/09/22 07:39:41	54.0	50.7	48.2	46.6	48.5
316	2022/09/22 07:59:41	50.9	48.3	50.4	51.0	48.9
321	2022/09/22 08:19:41	47.9	48.5	48.7	44.0	47.5
326	2022/09/22 08:39:41	47.4	51.1	50.0	46.4	48.0
331	2022/09/22 08:59:41	50.1	48.5	47.3	49.2	43.1
336	2022/09/22 09:19:41	42.7	49.9	44.9	45.4	40.9
341	2022/09/22 09:39:41	42.3	47.9	51.4	42.5	49.2
346	2022/09/22 09:59:41	41.2	43.5	48.9	43.9	39.7
351	2022/09/22 10:19:41	42.5	45.5	45.5	46.4	42.6
356	2022/09/22 10:39:41	43.6	44.0	41.8	48.7	51.7

Appendix B

RCNM Results

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/11/2022
Case Description: 22-13287 TTM 83359

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Single-Family Residences South	Residential	80.0	80.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	100.0	0.0
Dump Truck	No	40		76.5	100.0	0.0
Front End Loader	No	40		79.1	100.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	75.6	71.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	70.4	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	73.1	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	75.6	74.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Single-Family Residences West	Residential	80.0	80.0	45.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	100.0	0.0
Dump Truck	No	40		76.5	100.0	0.0
Front End Loader	No	40		79.1	100.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	75.6	71.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	70.4	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	73.1	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	75.6	74.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix C

Sample HVAC Specifications

38HDR
Performance™ Series Air Conditioner with Puron® Refrigerant 1−1/2 to 5 Nominal Tons

Carrier
Turn to the Experts.℠

Product Data

Carrier's Air Conditioners with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 38HDR has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows you to make a responsible decision in the protection of the earth's ozone layer.

As an Energy Star® Partner, Carrier Corporation has determined that this product meets the Energy Star® guidelines for energy efficiency. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

NOTE: Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory (www.ahridirectory.org) for the most up-to-date ratings information.

INDUSTRY LEADING FEATURES / BENEFITS

Energy Efficiency

- 13 - 15 SEER/10.9 - 12.5 EER

Sound

- Levels as low as 68 dBA

Design Features

- New aesthetics
- Small footprint, same as old model and "stackable"
- WeatherArmor™ cabinet
  - — All steel cabinet construction
  - — Baked on powder paint
  - — Mesh coil guard

Reliability, Quality and Toughness

- Scroll compressor
- Crankcase Heater standard on sizes 030-060
- Factory-supplied filter drier
- High pressure switch
- Low pressure switch
- Line lengths up to 250' (76.2 m)
- Low ambient operation (down to -20°F/-28.9°C) with low ambient accessories.

MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12	13
N	N	A	A	A/N	N	N	N	A/N	A/N	A/N	N	N
3	8	H	D	R	0	1	8	A	0	0	3	0
Product Series		HDR = Horizontal Discharge Condensing Unit			Cooling Capacity			Variations	Open	Open	Voltage	Minor Series
38=AC/HP		Major Model			1,000 Btuh Nominal			A=Standard	0=Not Defined	0=Not Defined	3=208/230–1 5=208/230–3 6=460/3	0, 1, 2...

ISO 9001:2000

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow all manufacturing refrigerant charging and air flow instructions. **Failure to confirm proper charge and air flow may reduce energy efficiency and shorten equipment life.**

PHYSICAL DATA

UNIT 38HDR	018	024	030	036	048	060
NOMINAL CAPACITY (Tons)	1.5	2.0	2.50	3.0	4.0	5.0
OPERATING WEIGHT lb (kg)	155 (70.3)	180 (81.6)	200 (90.7)	218 (98.9)	284 (128.8)	294 (133.4)
REFRIGERANT TYPE	R–410A					
METERING DEVICE	TXV					
CHARGE lb (kg)	6.3 (2.86)	6.0 (2.73)	8.7 (3.95)	8.7 (3.95)	11.5 (5.23)	12.0 (5.45)
COMPRESSOR						
Type	Scroll					
Oil Charge (POE –oz)	25.0	25.0	25.0	25.0	42.0	42.0
Crankcase Heater (watts)	—	—	40	40	40	40
OUTDOOR FAN						
Rpm/Cfm	840/1720	840/1720	850/3900	850/3900	850/3900	850/3900
Diameter in. (mm)	18 (457)	18 (457)	24 (610)	24 (610)	24 (610)	24 (610)
No. Blades	3	3	3	3	3	3
Motor hp (w)	1/8 (93)	1/8 (93)	1/4 (187)	1/4 (187)	1/4 (187)	1/4 (187)
OUTDOOR COIL						
Face Area (sq ft)	5.8	7.3	12.1	12.1	14.1	14.1
No. Rows	2	2	2	2	2	2
FPI	20	20	20	20	20	20
HIGH PRESSURE SWITCH						
Cut–In (psig) Cutout (psig)	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10
LOW PRESSURE SWITCH						
Cut–In (psig) Cutout (psig)	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5
REFRIGERANT LINES						
Connection Type	Sweat					
Max. Liquid Line* (in.) OD	3/8	3/8	3/8	3/8	3/8	3/8
Rated Vapor Line† (in.) OD	5/8	5/8	3/4	3/4	7/8	1–1/8**
CONTROLS						
Control Voltage‡	24 vac					
System Voltage	208/230 v	208/230 v	208/230 v	208/230 v, Single and 3 Phase, 460 v, 3 Phase		
FINISH	Gray					

* See *Liquid Line Sizing For Cooling Only Systems with Puron Refrigerant* tables.

† Units are rated with 25 ft (7.6 m) of lineset length. See *Vapor Line Sizing and Cooling Capacity Loss* table when using other sizes and lengths of lineset.

‡ 24 v and a minimum of 40 va is provided in the fan coil unit.

** Vapor connection size is 7/8 inch.

FPI – Fins Per Inch

POE – Polyol Ester

REFRIGERANT PIPING LENGTH LIMITATIONS

Liquid Line Sizing and Maximum Total Equivalent Lengths† for Cooling Only Systems with Puron® Refrigerant:

The maximum allowable length of a residential split system depends on the liquid line diameter and vertical separation between indoor and outdoor units.

See Table below for liquid line sizing and maximum lengths :

Maximum Total Equivalent Length
Outdoor Unit BELOW Indoor Unit

Size	Liquid Line Connection	Liquid Line Diam. w/ TXV	AC with Puron Refrigerant Maximum Total Equivalent Length†: Outdoor unit BELOW Indoor Vertical Separation ft (m)								
			0–5 (0–1.5)	6–10 (1.8–3.0)	11–20 (3.4–6.1)	21–30 (6.4–9.1)	31–40 (9.4–12.2)	41–50 (12.5–15.2)	51–60 (15.5–18.3)	61–70 (18.6–21.3)	71–80 (21.6–24.4)
018 AC with Puron	3/8	1/4	150	150	125	100	100	75	––	––	––
		5/16	250*	250*	250*	250*	250*	250*	250*	225*	150
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
024 AC with Puron	3/8	1/4	75	75	75	50	50	––	––	––	––
		5/16	250*	250*	250*	250*	250*	225*	175	125	100
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
030 AC with Puron	3/8	1/4	30	––	––	––	––	––	––	––	––
		5/16	175	225*	200	175	125	100	75	––	––
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	175	150	150	100	100	100	75	––	––
		3//8	250*	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	230	160	––
060 AC with Puron	3/8	3/8	250*	250*	250*	225*	190	150	110	––	––

*** Maximum actual length not to exceed 200 ft (61 m)**
† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.
–– = outside acceptable range

Maximum Total Equivalent Length
Outdoor Unit ABOVE Indoor Unit

Size	Liquid Line Connection	Liquid Line Diam. w/ TXV	AC with Puron Refrigerant Maximum Total Equivalent Length†: Outdoor unit ABOVE Indoor Vertical Separation ft (m)							
			25 (7.6)	26–50 (7.9–15.2)	51–75 (15.5–22.9)	76–100 (23.2–30.5)	101–125 (30.8–38.1)	126–150 (38.4–45.7)	151–175 (46.0–53.3)	176–200 (53.6–61.0)
018 AC with Puron	3/8	1/4	175	250*	250*	250*	250*	250*	250*	250*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
024 AC with Puron	3/8	1/4	100	125	175	200	225*	250*	250*	250*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
030 AC with Puron	3/8	1/4	30	––	––	––	––	––	––	––
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	225*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*
060 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*

*** Maximum actual length not to exceed 200 ft (61 m)**
† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.
–– = outside acceptable range

REFRIGERANT CHARGE ADJUSTMENTS

Liquid Line Size	Puron Charge oz/ft (g/m)
3/8	0.60 (17.74) (Factory charge for lineset = 9 oz / 266.16 g)
5/16	0.40 (11.83)
1/4	0.27 (7.98)

Units are factory charged for 15 ft (4.6 m) of 3/8" liquid line. The factory charge for 3/8" lineset 9 oz (266.16 g). When using other length or diameter liquid lines, charge adjustments are required per the chart above.

Charging Formula:

[(Lineset oz/ft x total length) – (factory charge for lineset)] = charge adjustment

Example 1: System has 15 ft of line set using existing 1/4" liquid line. What charge adjustment is required?

Formula: (.27 oz/ft x 15ft) – (9 oz) = (-4.95) oz.

Net result is to remove 4.95 oz of refrigerant from the system

Example 2: System has 45 ft of existing 5/16" liquid line. What is the charge adjustment?

Formula: (.40 oz/ft. x 45ft) – (9 oz.) = 9 oz.

Net result is to add 9 oz of refrigerant to the system

LONG LINE APPLICATIONS

An application is considered Long Line, when the refrigerant level in the system requires the use of accessories to maintain acceptable refrigerant management for systems reliability. See Accessory Usage Guideline table for required accessories. Defining a system as long line depends on the liquid line diameter, actual length of the tubing, and vertical separation between the indoor and outdoor units.

For Air Conditioner systems, the chart below shows when an application is considered Long Line.

AC WITH PURON® REFRIGERANT LONG LINE DESCRIPTION ft (m)
Beyond these lengths, long line accessories are required

Liquid Line Size	Units On Same Level	Outdoor Below Indoor	Outdoor Above Indoor
1/4	No accessories needed within allowed lengths	No accessories needed within allowed lengths	175 (53.3)
5/16	120 (36.6)	50 (15.2) vertical or 120 (36.6) total	120 (36.6)
3/8	80 (24.4)	35 (10.7) vertical or 80 24.4) total	80 (24.4)

Note: See Long Line Guideline for details

VAPOR LINE SIZING AND COOLING CAPACITY LOSS

Acceptable vapor line diameters provide adequate oil return to the compressor while avoiding excessive capacity loss. The suction line diameters shown in the chart below are acceptable for AC systems with Puron refrigerant:

Vapor Line Sizing and Cooling Capacity Losses — Puron® Refrigerant 1-Stage Air Conditioner Applications

Unit Nominal Size (Btuh)	Maximum Liquid Line Diameters (In. OD)	Vapor Line Diameters (In. OD)	Cooling Capacity Loss (%) Total Equivalent Line Length ft. (m)								
			26–50 (7.9–15.2)	51–80 (15.5–24.4)	81–100 (24.7–30.5)	101–125 (30.8–38.1)	126–150 (38.4–45.7)	151–175 (46.0–53.3)	176–200 (53.6–61.0)	201–225 (61.3–68.6)	226–250 (68.9–76.2)
018 1 Stage AC with Puron	3/8	1/2	1	2	3	5	6	7	8	9	11
		5/8	0	1	1	1	2	2	2	3	3
		3/4	0	0	0	0	1	1	1	1	1
024 1 Stage AC with Puron	3/8	5/8	0	1	2	2	3	3	4	5	5
		3/4	0	0	1	1	1	1	1	2	2
		7/8	0	0	0	0	0	1	1	1	1
030 1 Stage AC with Puron	3/8	5/8	1	2	3	3	4	5	6	7	8
		3/4	0	0	1	1	1	2	2	2	3
		7/8	0	0	0	0	1	1	1	1	1
036 1 Stage AC with Puron	3/8	5/8	1	2	4	5	6	8	9	10	12
		3/4	0	1	1	2	2	3	3	4	4
		7/8	0	0	0	1	1	1	1	2	2
048 1 Stage AC with Puron	3/8	3/4	0	1	2	3	4	5	5	6	7
		7/8	0	0	1	1	2	2	2	3	3
		1 1/8	0	0	0	0	0	0	0	1	1
060 1 Stage AC with Puron	3/8	3/4	1	2	4	5	6	7	9	10	11
		7/8	0	1	2	2	3	4	4	5	5
		1 1/8	0	0	0	1	1	1	1	1	1

Applications in this area may be long line and may have height restrictions. See the *Residential Piping and Long Line Guideline*.

ACCESSORY THERMOSTATS

THERMOSTAT / SUBBASE PKG.	DESCRIPTION
TP−PRH01−A	Programmable Thermidistat
TP−NRH01−A	Non−programmable Thermidistat
TP−PAC01	Performance Series Programmable AC Stat
TP−NAC01	Performance Series Non−programmable AC Stat
TSTATCCSEN01−B	Outdoor Air Temperature Sensor
TSTATXXBBP01	Backplate for Builder's Thermostat
TSTATXXNBP01	Backplate for Non−Programmable Thermostat
TSTATXXPBP01	Backplate for Programmable Thermostat
TSTATXXCNV10	Thermostat Conversion Kit (4 to 5 wires) − 10 Pack

ACCESSORIES

KIT NUMBER	KIT NAME	018	024	030	036	048	060
KAACH1401AAA	Crankcase Heater	X	X				
Standard	Crankcase Heater			S	S	S	S
KAAFT0101AAA	Evaporator Freeze Stat	X	X	X	X	X	X
KAATD0101TDR	Time Delay Relay	X	X	X	X	X	X
KAAWS0101AAA	Winter Start Kit (for low ambient)	X	X	X	X	X	X
53DS−900−−−086	Low Ambient Control (Puron)	X	X	X	X	X	X
53DS−900−−−070	Wind Baffle	X					
53DS−900−−−087	Wind Baffle		X				
53DS−900−−−071	Wind Baffle			X	X		
53DS−900−−−088	Wind Baffle					X	X
53DS−900−−−075	Stacking Kit	X	X				
53DS−900−−−076	Stacking Kit			X	X	X	X
53DS−900−−−077	Wall Mounting Kit	X	X				
53DS−900−−−078	Wall Mounting Kit			X	X	X	X

X = Accessory, S = Standard

38HDR

ACCESSORY USAGE GUIDELINE

ACCESSORY	REQUIRED FOR LOW–AMBIENT COOLING APPLICATIONS (Below 55°F/12.8°C)	REQUIRED FOR LONG LINE APPLICATIONS* (Over 80 ft. / 24.4 m)	REQUIRED FOR SEA COAST APPLICATIONS (Within 2 miles / 3.2 km)
Compressor Start Assist Capacitor and Relay	Yes	Yes	No
Crankcase Heater	Yes	Yes	No
Evaporator Freeze Thermostat	Yes	No	No
Hard Shutoff TXV	Yes	Yes	Yes
Liquid Line Solenoid Valve	No	See Longline Application Guideline	No
Low–ambient Control	Yes	No	No
Winter Start Control	Yes	No	No

* For tubing line sets between 80 and 200 ft. (24.38 and 60.96 m) and/or 35 ft. (10.7 m) vertical differential, refer to Residential Piping and Longline Guideline.

Accessory Description and Usage (Listed Alphabetically)

1. Crankcase Heater

An electric resistance heater which mounts to the base of the compressor to keep the lubricant warm during off cycles. Improves compressor lubrication on restart and minimizes the chance of liquid slugging.

Usage Guideline:

Required in low ambient cooling applications.

Required in long line applications.

Suggested in all commercial applications.

2. Evaporator Freeze Thermostat

An SPST temperature–actuated switch that stops unit operation when evaporator reaches freeze–up conditions.

Usage Guideline:

Required when low ambient kit has been added.

3. Low-Ambient Control

A fan–speed control device activated by a temperature sensor, designed to control condenser fan motor speed in response to the saturated, condensing temperature during operation in cooling mode only. For outdoor temperatures down to –20°F (–28.9°C), it maintains condensing temperature at 100°F ±10°F (37.8°C ± 5.5°C).

Usage Guideline:

A Low Ambient Controller must be used when cooling operation is used at outdoor temperatures below 55°F (12.8°C).

Suggested for all commercial applications.

4. Outdoor Air Temperature Sensor

Designed for use with Carrier Thermostats listed in this publication. This device enables the thermostat to display the outdoor temperature. This device also

is required to enable special thermostat features such as auxiliary heat lock out.

Usage Guideline:

Suggested for all Carrier thermostats listed in this publication.

5. Thermostatic Expansion Valve (TXV)

A modulating flow–control valve which meters refrigerant liquid flow rate into the evaporator in response to the superheat of the refrigerant gas leaving the evaporator.

Kit includes valve, adapter tubes, and external equalizer tube. Hard shut off types are available.

NOTE: When using a hard shut off TXV with single phase reciprocating compressors, a Compressor Start Assist Capacitor and Relay is required.

Usage Guideline:

Accessory required to meet ARI rating and system reliability, where indoor not equipped.

Hard shut off TXV or LLS required in air conditioner long line applications.

Required for use on all zoning systems.

6. Time–Delay Relay

An SPST delay relay which briefly continues operation of indoor blower motor to provide additional cooling after the compressor cycles off.

NOTE: Most indoor unit controls include this feature. For those that do not, use the guideline below.

Usage Guideline:

Accessory required to meet ARI rating, where indoor not equipped.

7. Winter Start Control

This control is designed to alleviate nuisance opening of the low–pressure switch by bypassing it for the first 3 minutes of operation.

ELECTRICAL DATA

38HDR UNIT SIZE	V−PH−Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/CKT BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018−31	208/230−1−60	187	253	9.0	48.0	0.8	0.125	0.09	12.1	20
024−32	208/230−1−60	187	253	13.5	58.3	0.8	0.125	0.09	17.7	25
030−31	208/230−1−60	187	253	14.1	73.0	1.5	0.250	0.19	19.1	30
036−31	208/230−1−60	187	253	14.1	77.0	1.5	0.250	0.19	19.1	30
	208/230−3−60	187	253	9.2	71.0	1.5	0.250	0.19	13.0	20
	460−3−60	414	506	5.6	38.0	0.8	0.250	0.19	7.9	10
048−32	208/230−1−60	187	253	19.9	109.0	1.5	0.250	0.19	26.4	40
	208/230−3−60	187	253	13.1	83.1	1.5	0.250	0.19	17.9	25
	460−3−60	414	506	6.1	41.0	0.8	0.250	0.19	8.4	15
060−32	208/230−1−60	187	253	26.4	134.0	1.5	0.250	0.19	34.5	60
	208/230−3−60	187	253	16.0	110.0	1.5	0.250	0.19	21.5	30
	460−3−60	414	506	7.8	52.0	0.8	0.250	0.19	10.6	15

* Permissible limits of the voltage range at which the unit will operate satisfactorily

FLA – Full Load Amps
HACR – Heating, Air Conditioning, Refrigeration
LRA – Locked Rotor Amps
NEC – National Electrical Code
RLA – Rated Load Amps (compressor)

NOTE: Control circuit is 24−V on all units and requires external power source. Copper wire must be used from service disconnect to unit. All motors/compressors contain internal overload protection.

Complies with 2007 requirements of ASHRAE Standards 90.1

38HDR

A-WEIGHTED SOUND POWER (dBA)

Unit Size	Standard Rating (dBA)	Typical Octave Band Spectrum (dBA) (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018−31	68	52.0	57.5	60.5	63.5	60.5	57.5	46.5
024−32	69	57.5	61.5	63.0	61.0	60.0	56.0	45.0
030−31	72	56.5	63.0	65.0	66.0	64.0	62.5	57.0
036−31	72	65.0	61.5	63.5	65.0	64.5	61.0	54.5
048−32	72	58.5	61.0	64.0	67.5	66.0	64.0	57.0
060−32	72	63.0	61.5	64.0	66.5	66.0	64.5	55.5

NOTE: Tested in accordance with ARI Standard 270−08 (not listed in AHRI).

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

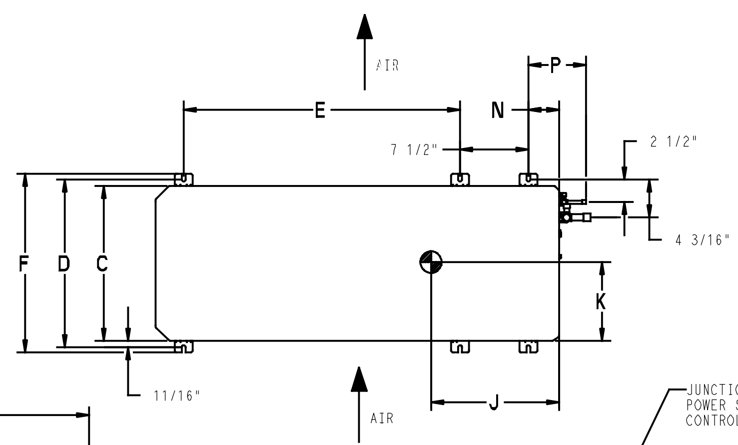
UNIT SIZE−VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018−31	12 (6.7)
024−32	12 (6.7)
030−31	12 (6.7)
036−31	12 (6.7)
048−32	12 (6.7)
060−32	12 (6.7)

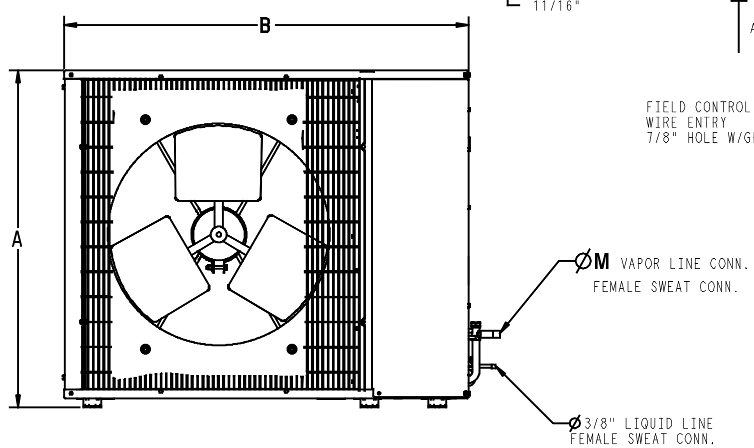
DIMENSIONS - ENGLISH

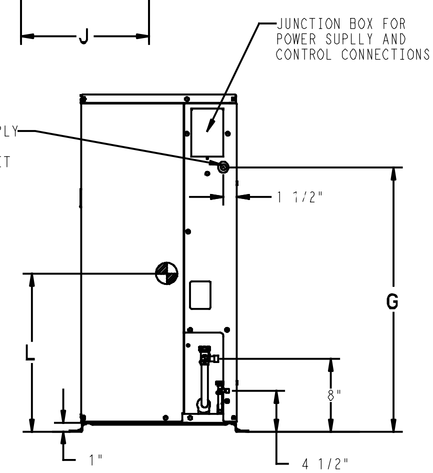
UNIT	SERIES	ELECTRICAL CHARACTERISTICS 208-230-1-60	230-1-60	208/230-3-60	460-3-60	A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(lbs)	SHIPPING WEIGHT(lbs)	SHIPPING DIMENSIONS (L x W x H)
38HDR018	1	X	O	O	O	25 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	17 1/8"	22"	13"	6 5/8"	11 1/4"	5/8"	2 15/16"	6"	155	171	42 9/10" X 18" X 28 1/10"
38HDR024	1,2	X	O	O	O	31 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	23 1/8"	28"	14"	6 3/4"	11 5/8"	5/8"	2 15/16"	6"	180	198	42 9/10" X 18" X 34 1/10"
38HDR030	1	X	O	O	O	37 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	200	223	50 1/2" X 20 1/2" X 40 2/10"
38HDR036	1	X	O	X	X	37 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	218	240	50 1/2" X 20 1/2" X 40 2/10"
38HDR048	1,2	X	O	X	X	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	35 3/16"	40 1/16"	14 1/2"	8 1/2"	18 7/8"	7/8"	3 7/16"	6 1/2"	284	309	50 1/2" X 20 1/2" X 46 2/10"
38HDR060	1,2	X	O	X	X	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	35 3/16"	40 1/16"	14 1/2"	8 1/2"	18 7/8"	7/8"	3 7/16"	6 1/2"	294	319	50 1/2" X 20 1/2" X 46 2/10"

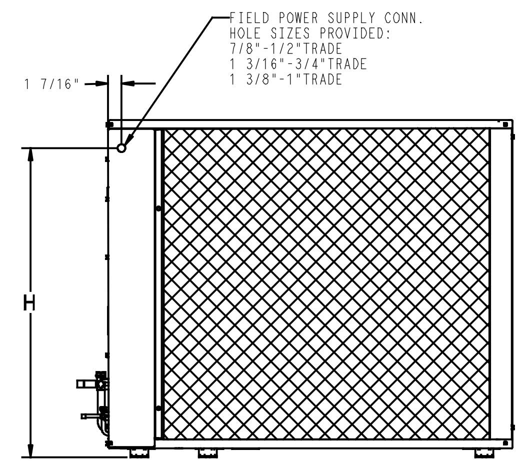
X = YES
O = NO

1. REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 6" MIN CLEARANCE ON COIL SIDE AND COIL END AND 36" MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 8" MIN CLEARANCE ON FAN SIDE AND COIL END AND 36" MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 55°F, MAX. 125°F.
3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
4. CENTER OF GRAVITY
5. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.









UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	23" X 42"
30,36,48,60	24" X 50"

COMBINATION RATINGS

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1085392	38HDR018−31	†CNPV*1814A**+TDR		17,000	11.0	13.0
1117974	38HDR018−31	40QAC024−−−3		18,000	11.5	13.0
1085396	38HDR018−31	CAP**1814A**	58CV(A,X)070−12	17,000	11.5	14.0
3015375	38HDR018−31	CAP**1814A**	58PH*045−08	17,000	11.5	14.0
1085394	38HDR018−31	CAP**1814A**+TDR		17,000	10.9	13.0
1085400	38HDR018−31	CAP**2414A**	58CV(A,X)070−12	17,400	11.5	14.0
3015376	38HDR018−31	CAP**2414A**	58PH*045−08	17,400	12.0	14.5
1085398	38HDR018−31	CAP**2414A**+TDR		17,400	11.0	13.0
1085456	38HDR018−31	CAP**2417A**	58CV(A,X)070−12	17,400	11.5	14.0
1085406	38HDR018−31	CAP**2417A**	58CV(A,X)090−16	17,400	11.5	14.0
3112072	38HDR018−31	CAP**2417A**	58MEB040−12	17,400	12.0	14.5
3112073	38HDR018−31	CAP**2417A**	58MEB060−12	17,400	12.0	14.5
1390388	38HDR018−31	CAP**2417A**	58MV(B,C)060−14	17,400	11.5	14.0
1085402	38HDR018−31	CAP**2417A**+TDR		17,400	11.0	13.0
1085432	38HDR018−31	CNPF*2418A**+TDR		17,400	11.0	13.0
1085428	38HDR018−31	CNPH*2417A**	58CV(A,X)070−12	17,400	11.5	14.0
1085430	38HDR018−31	CNPH*2417A**	58CV(A,X)090−16	17,400	11.5	14.0
3112076	38HDR018−31	CNPH*2417A**	58MEB040−12	17,400	12.0	14.5
3112077	38HDR018−31	CNPH*2417A**	58MEB060−12	17,400	12.0	14.5
1390392	38HDR018−31	CNPH*2417A**	58MV(B,C)060−14	17,400	11.5	14.0
1390396	38HDR018−31	CNPH*2417A**	58MV(B,C)080−14	17,400	11.5	14.0
3015379	38HDR018−31	CNPH*2417A**	58PH*045−08	17,400	12.0	14.5
1085420	38HDR018−31	CNPH*2417A**+TDR		17,400	11.0	13.0
1085408	38HDR018−31	CNPV*1814A**	58CV(A,X)070−12	17,000	11.5	14.0
3015377	38HDR018−31	CNPV*1814A**	58PH*045−08	17,000	11.5	14.0
1085412	38HDR018−31	CNPV*2414A**	58CV(A,X)070−12	17,400	11.5	14.0
3015378	38HDR018−31	CNPV*2414A**	58PH*045−08	17,400	12.0	14.5
1085410	38HDR018−31	CNPV*2414A**+TDR		17,400	11.0	13.0
1085458	38HDR018−31	CNPV*2417A**	58CV(A,X)070−12	17,400	11.5	14.0
1085418	38HDR018−31	CNPV*2417A**	58CV(A,X)090−16	17,400	11.5	14.0
3112074	38HDR018−31	CNPV*2417A**	58MEB040−12	17,400	12.0	14.5
3112075	38HDR018−31	CNPV*2417A**	58MEB060−12	17,400	12.0	14.5
1390390	38HDR018−31	CNPV*2417A**	58MV(B,C)060−14	17,400	11.5	14.0
1085414	38HDR018−31	CNPV*2417A**+TDR		17,400	11.0	13.0
1085442	38HDR018−31	CSPH*2412A**	58CV(A,X)070−12	17,400	11.5	14.0
1085444	38HDR018−31	CSPH*2412A**	58CV(A,X)090−16	17,400	11.5	14.0
3112078	38HDR018−31	CSPH*2412A**	58MEB040−12	17,400	12.0	14.5
3112079	38HDR018−31	CSPH*2412A**	58MEB060−12	17,400	12.0	14.5
1390394	38HDR018−31	CSPH*2412A**	58MV(B,C)060−14	17,400	11.5	14.0
1390398	38HDR018−31	CSPH*2412A**	58MV(B,C)080−14	17,400	11.5	14.0
3015380	38HDR018−31	CSPH*2412A**	58PH*045−08	17,400	12.0	14.5
1085434	38HDR018−31	CSPH*2412A**+TDR		17,400	11.0	13.0
1086232	38HDR018−31	FE4ANF002+UI		17,400	11.5	14.0
1085450	38HDR018−31	FF1ENP018		17,400	11.0	13.0
1085452	38HDR018−31	FF1ENP024		17,400	11.0	13.0
1085454	38HDR018−31	FV4BNF002		17,400	11.5	14.0
3404623	38HDR018−31	FV4CNF002		17,400	11.5	14.0
1085446	38HDR018−31	FX4CNF018		17,000	11.5	14.0
1085448	38HDR018−31	FX4CNF024		17,400	11.5	14.0
3465486	38HDR024−32	†CNPV*2414A**+TDR		23,400	11.0	13.0
3465806	38HDR024−32	40QAC024−3		22,800	11.5	13.0
3465488	38HDR024−32	CAP**2414A**	58CV(A,X)070−12	23,400	11.5	14.0
3465489	38HDR024−32	CAP**2414A**	58PH*045−08	23,400	11.5	14.0
3465487	38HDR024−32	CAP**2414A**+TDR		23,400	11.0	13.0
3465492	38HDR024−32	CAP**2417A**	58CV(A,X)090−16	23,400	11.5	14.0
3465493	38HDR024−32	CAP**2417A**	58MEB040−12	23,400	12.0	14.5
3465494	38HDR024−32	CAP**2417A**	58MEB060−12	23,400	12.0	14.5
3465495	38HDR024−32	CAP**2417A**	58MEB080−12	23,400	12.0	14.5
3465491	38HDR024−32	CAP**2417A**	58MV(B,C)060−14	23,400	11.5	14.0
3465490	38HDR024−32	CAP**2417A**+TDR		23,400	11.0	13.0
3465497	38HDR024−32	CAP**3014A**	58CV(A,X)070−12	23,400	11.5	14.0
3465498	38HDR024−32	CAP**3014A**	58PH*045−08	23,600	12.0	14.5
3465496	38HDR024−32	CAP**3014A**+TDR		23,600	11.0	13.0
3465501	38HDR024−32	CAP**3017A**	58CV(A,X)090−16	23,600	11.5	14.0
3465502	38HDR024−32	CAP**3017A**	58MEB040−12	23,600	12.0	14.5
3465503	38HDR024−32	CAP**3017A**	58MEB060−12	23,600	12.0	14.5
3465504	38HDR024−32	CAP**3017A**	58MEB080−12	23,600	12.0	14.5
3465500	38HDR024−32	CAP**3017A**	58MV(B,C)060−14	23,600	11.5	14.0
3465499	38HDR024−32	CAP**3017A**+TDR		23,600	11.0	13.0
3465554	38HDR024−32	CNPF*2418A**+TDR		23,400	11.0	13.0
3465529	38HDR024−32	CNPH*2417A**	58CV(A,X)070−12	23,400	11.5	14.0
3465530	38HDR024−32	CNPH*2417A**	58CV(A,X)090−16	23,400	11.5	14.0
3465531	38HDR024−32	CNPH*2417A**	58CV(A,X)110−20	23,400	11.5	14.0
3465532	38HDR024−32	CNPH*2417A**	58CV(A,X)135−22	23,400	11.5	14.0
3465533	38HDR024−32	CNPH*2417A**	58CV(A,X)155−22	23,400	11.5	14.0
3465535	38HDR024−32	CNPH*2417A**	58MEB040−12	23,400	12.0	14.5
3465536	38HDR024−32	CNPH*2417A**	58MEB060−12	23,400	12.0	14.5
3465537	38HDR024−32	CNPH*2417A**	58MEB080−12	23,400	12.0	14.5

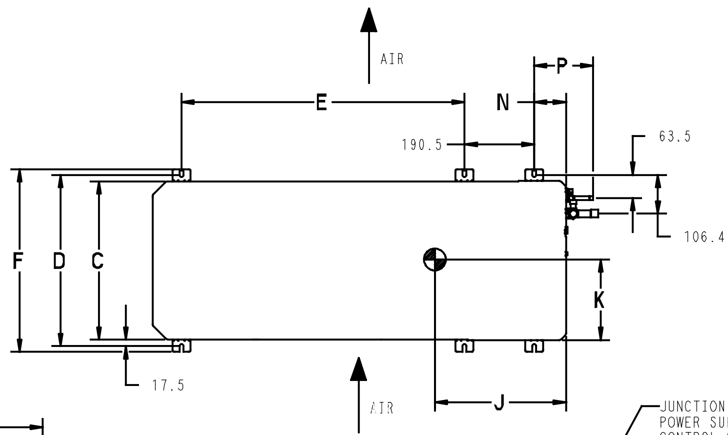
See notes on page 26

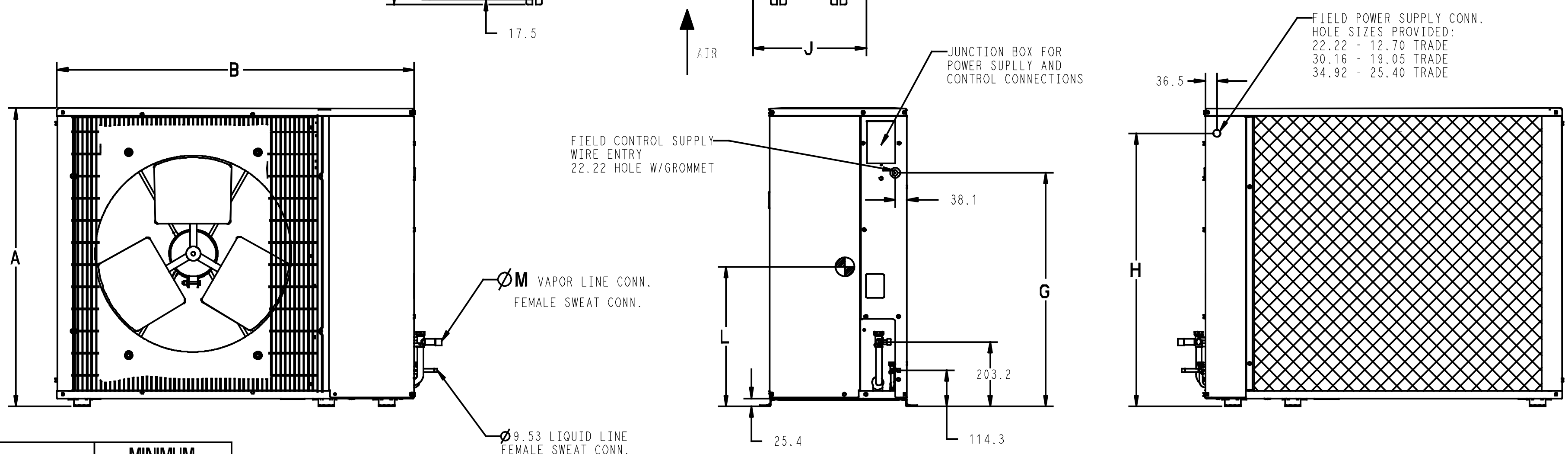
DIMENSIONS - SI

UNIT	SERIES	ELECTRICAL CHARACTERISTICS 208-230-1-60	230-1-60	208/230-3-60	460-3-60	A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(KG)	SHIPPING WEIGHT(KG)	SHIPPING DIMENSIONS (L x W x H)
38HDR018	1	X	O	O	O	638.2	938.2	369.9	406.4	595.3	436.6	435.0	558.8	330.2	168.3	285.8	15.9	74.6	152.4	70.4	77.7	1090.2 X 457.7 X 714.3
38HDR024	1,2	X	O	O	O	790.6	938.2	369.9	406.4	595.3	436.6	587.4	711.2	355.6	171.5	295.3	15.9	74.6	152.4	81.8	90.0	1090.2 X 457.7 X 866.7
38HDR030	1	X	O	O	O	944.6	1131.9	433.4	468.3	774.7	498.5	741.4	865.2	347.7	206.4	403.2	19.0	87.3	165.1	90.9	101.4	1282.7 X 520.7 X 1020.7
38HDR036	1	X	O	X	X	944.6	1131.9	433.4	468.3	774.7	498.5	741.4	865.2	347.7	206.4	403.2	19.0	87.3	165.1	99.0	109.0	1282.7 X 520.7 X 1020.7
38HDR048	1,2	X	O	X	X	1097.0	1131.9	433.4	468.3	774.7	498.5	893.8	1017.6	368.3	215.9	479.4	22.2	87.3	165.1	129.0	140.4	1282.7 X 520.7 X 1173.1
38HDR060	1,2	X	O	X	X	1097.0	1131.9	433.4	468.3	774.7	498.5	893.8	1017.6	368.3	215.9	479.4	22.2	87.3	165.1	133.6	145.0	1282.7 X 520.7 X 1173.1

X = YES
O = NO

1. REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 152.4 MIN CLEARANCE ON COIL SIDE AND COIL END AND 914.4 MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 203.2 MIN CLEARANCE ON FAN SIDE AND COIL END AND 914.4 MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 12.8°C, MAX. 51.7°C.
3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
4. CENTER OF GRAVITY
5. ALL DIMENSIONS ARE IN "MM" UNLESS NOTED.





UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	584.2 X 1066.8
30,36,48,60	609.6 X 1270.0

38HDR

COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465524	38HDR024−32	CNPH*2417A**	58MV(B,C)060−14	23,400	11.5	14.0
3465525	38HDR024−32	CNPH*2417A**	58MV(B,C)080−14	23,400	11.5	14.0
3465526	38HDR024−32	CNPH*2417A**	58MV(B,C)080−20	23,200	11.5	14.0
3465527	38HDR024−32	CNPH*2417A**	58MV(B,C)100−20	23,400	11.5	14.0
3465528	38HDR024−32	CNPH*2417A**	58MV(B,C)120−20	23,400	11.5	14.0
3465523	38HDR024−32	CNPH*2417A**	58MVB040−14	23,400	11.5	14.0
3465534	38HDR024−32	CNPH*2417A**	58PH*045−08	23,400	11.5	14.0
3465522	38HDR024−32	CNPH*2417A**+TDR		23,400	11.0	13.0
3465545	38HDR024−32	CNPH*3017A**	58CV(A,X)070−12	23,400	11.5	14.0
3465546	38HDR024−32	CNPH*3017A**	58CV(A,X)090−16	23,600	11.5	14.0
3465547	38HDR024−32	CNPH*3017A**	58CV(A,X)110−20	23,600	11.5	14.0
3465548	38HDR024−32	CNPH*3017A**	58CV(A,X)135−22	23,600	11.5	14.0
3465549	38HDR024−32	CNPH*3017A**	58CV(A,X)155−22	23,600	11.5	14.0
3465551	38HDR024−32	CNPH*3017A**	58MEB040−12	23,600	12.0	14.5
3465552	38HDR024−32	CNPH*3017A**	58MEB060−12	23,600	12.0	14.5
3465553	38HDR024−32	CNPH*3017A**	58MEB080−12	23,600	12.0	14.5
3465540	38HDR024−32	CNPH*3017A**	58MV(B,C)060−14	23,600	11.5	14.0
3465541	38HDR024−32	CNPH*3017A**	58MV(B,C)080−14	23,400	11.5	14.0
3465542	38HDR024−32	CNPH*3017A**	58MV(B,C)080−20	23,400	11.5	14.0
3465543	38HDR024−32	CNPH*3017A**	58MV(B,C)100−20	23,600	11.5	14.0
3465544	38HDR024−32	CNPH*3017A**	58MV(B,C)120−20	23,600	11.5	14.0
3465539	38HDR024−32	CNPH*3017A**	58MVB040−14	23,600	11.5	14.0
3465550	38HDR024−32	CNPH*3017A**	58PH*045−08	23,600	12.0	14.5
3465538	38HDR024−32	CNPH*3017A**+TDR		23,600	11.0	13.0
3465505	38HDR024−32	CNPV*2414A**	58CV(A,X)070−12	23,400	11.5	14.0
3465506	38HDR024−32	CNPV*2414A**	58PH*045−08	23,400	11.5	14.0
3465509	38HDR024−32	CNPV*2417A**	58CV(A,X)090−16	23,400	11.5	14.0
3465510	38HDR024−32	CNPV*2417A**	58MEB040−12	23,400	12.0	14.5
3465511	38HDR024−32	CNPV*2417A**	58MEB060−12	23,400	12.0	14.5
3465512	38HDR024−32	CNPV*2417A**	58MEB080−12	23,400	12.0	14.5
3465508	38HDR024−32	CNPV*2417A**	58MV(B,C)060−14	23,400	11.5	14.0
3465507	38HDR024−32	CNPV*2417A**+TDR		23,400	11.0	13.0
3465514	38HDR024−32	CNPV*3014A**	58CV(A,X)070−12	23,400	11.5	14.0
3465515	38HDR024−32	CNPV*3014A**	58PH*045−08	23,600	11.5	14.0
3465513	38HDR024−32	CNPV*3014A**+TDR		23,600	11.0	13.0
3465518	38HDR024−32	CNPV*3017A**	58CV(A,X)090−16	23,600	11.5	14.0
3465519	38HDR024−32	CNPV*3017A**	58MEB040−12	23,600	12.0	14.5
3465520	38HDR024−32	CNPV*3017A**	58MEB060−12	23,600	12.0	14.5
3465521	38HDR024−32	CNPV*3017A**	58MEB080−12	23,600	12.0	14.5
3465517	38HDR024−32	CNPV*3017A**	58MV(B,C)060−14	23,600	11.5	14.0
3465516	38HDR024−32	CNPV*3017A**+TDR		23,600	11.0	13.0
3465562	38HDR024−32	CSPH*2412A**	58CV(A,X)070−12	23,400	11.5	14.0
3465563	38HDR024−32	CSPH*2412A**	58CV(A,X)090−16	23,400	11.5	14.0
3465564	38HDR024−32	CSPH*2412A**	58CV(A,X)110−20	23,400	11.5	14.0
3465565	38HDR024−32	CSPH*2412A**	58CV(A,X)135−22	23,400	11.5	14.0
3465566	38HDR024−32	CSPH*2412A**	58CV(A,X)155−22	23,400	11.5	14.0
3465568	38HDR024−32	CSPH*2412A**	58MEB040−12	23,400	12.0	14.5
3465569	38HDR024−32	CSPH*2412A**	58MEB060−12	23,400	12.0	14.5
3465570	38HDR024−32	CSPH*2412A**	58MEB080−12	23,400	12.0	14.5
3465557	38HDR024−32	CSPH*2412A**	58MV(B,C)060−14	23,400	11.5	14.0
3465558	38HDR024−32	CSPH*2412A**	58MV(B,C)080−14	23,400	11.5	14.0
3465559	38HDR024−32	CSPH*2412A**	58MV(B,C)080−20	23,400	11.5	14.0
3465560	38HDR024−32	CSPH*2412A**	58MV(B,C)100−20	23,400	11.5	14.0
3465561	38HDR024−32	CSPH*2412A**	58MV(B,C)120−20	23,400	11.5	14.0
3465556	38HDR024−32	CSPH*2412A**	58MVB040−14	23,400	11.5	14.0
3465567	38HDR024−32	CSPH*2412A**	58PH*045−08	23,400	11.5	14.0
3465555	38HDR024−32	CSPH*2412A**+TDR		23,400	11.0	13.0
3465578	38HDR024−32	CSPH*3012A**	58CV(A,X)070−12	23,600	11.5	14.0
3465579	38HDR024−32	CSPH*3012A**	58CV(A,X)090−16	23,600	11.5	14.0
3465580	38HDR024−32	CSPH*3012A**	58CV(A,X)110−20	23,600	11.5	14.0
3465581	38HDR024−32	CSPH*3012A**	58CV(A,X)135−22	23,600	11.5	14.0
3465582	38HDR024−32	CSPH*3012A**	58CV(A,X)155−22	23,600	11.5	14.0
3465584	38HDR024−32	CSPH*3012A**	58MEB040−12	23,600	12.0	14.5
3465585	38HDR024−32	CSPH*3012A**	58MEB060−12	23,600	12.0	14.5
3465586	38HDR024−32	CSPH*3012A**	58MEB080−12	23,600	12.0	14.5
3465573	38HDR024−32	CSPH*3012A**	58MV(B,C)060−14	23,600	11.5	14.0
3465574	38HDR024−32	CSPH*3012A**	58MV(B,C)080−14	23,600	11.5	14.0
3465575	38HDR024−32	CSPH*3012A**	58MV(B,C)080−20	23,400	11.5	14.0
3465576	38HDR024−32	CSPH*3012A**	58MV(B,C)100−20	23,600	11.5	14.0
3465577	38HDR024−32	CSPH*3012A**	58MV(B,C)120−20	23,600	11.5	14.0
3465572	38HDR024−32	CSPH*3012A**	58MVB040−14	23,600	11.5	14.0
3465583	38HDR024−32	CSPH*3012A**	58PH*045−08	23,600	12.0	14.5
3465571	38HDR024−32	CSPH*3012A**+TDR		23,600	11.0	13.0
3465594	38HDR024−32	FE4AN(B,F)003+UI		23,800	12.0	14.5
3465592	38HDR024−32	FE4ANF002+UI		23,600	12.0	14.5
3465596	38HDR024−32	FE5ANB004+UI		24,000	12.0	14.5
3465597	38HDR024−32	FF1ENP024		22,800	11.0	13.0
3465606	38HDR024−32	FF1ENP025		23,400	11.5	14.0
3465600	38HDR024−32	FF1ENP030		23,000	11.0	13.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465608	38HDR024−32	FF1ENP031		23,600	11.5	14.0
3465609	38HDR024−32	FF1ENP037		23,800	11.5	14.0
3465603	38HDR024−32	FV4BN(B,F)003		23,800	12.0	14.5
3465601	38HDR024−32	FV4BNF002		23,600	12.0	14.5
3465613	38HDR024−32	FV4CN(B,F)003		23,800	12.0	14.5
3465611	38HDR024−32	FV4CNF002		23,600	12.0	14.5
3465589	38HDR024−32	FX4CNF024		23,400	11.5	14.0
3465590	38HDR024−32	FX4CNF030		23,800	11.5	14.0
3465587	38HDR024−32	FY4ANF024		23,200	11.0	13.0
3465588	38HDR024−32	FY4ANF030		23,600	11.0	13.0
1085620	38HDR030−31	†CNPV*3014A**+TDR		28,000	11.0	13.0
1117978	38HDR030−31	40QAC036−−−3		29,000	12.0	13.0
1085624	38HDR030−31	CAP**3014A**	58CV(A,X)070−12	28,000	11.5	14.0
1085622	38HDR030−31	CAP**3014A**+TDR		28,000	11.0	13.0
1085788	38HDR030−31	CAP**3017A**	58CV(A,X)070−12	28,000	11.5	14.0
1085630	38HDR030−31	CAP**3017A**	58CV(A,X)090−16	28,000	11.5	14.0
3112104	38HDR030−31	CAP**3017A**	58MEB040−12	28,000	12.0	14.5
3112105	38HDR030−31	CAP**3017A**	58MEB060−12	28,000	12.0	14.5
3112106	38HDR030−31	CAP**3017A**	58MEB080−12	28,000	12.0	14.5
3112107	38HDR030−31	CAP**3017A**	58MEB080−16	28,000	12.0	14.5
1390448	38HDR030−31	CAP**3017A**	58MV(B,C)060−14	28,000	11.5	14.0
3015389	38HDR030−31	CAP**3017A**	58PH*070−16	28,000	11.5	14.0
1085626	38HDR030−31	CAP**3017A**+TDR		28,000	11.0	13.0
1085634	38HDR030−31	CAP**3614A**	58CV(A,X)070−12	28,600	11.5	14.0
1085632	38HDR030−31	CAP**3614A**+TDR		28,600	11.0	13.0
1085790	38HDR030−31	CAP**3617A**	58CV(A,X)070−12	28,600	11.5	14.0
1085640	38HDR030−31	CAP**3617A**	58CV(A,X)090−16	28,600	11.5	14.0
3112108	38HDR030−31	CAP**3617A**	58MEB040−12	28,600	12.0	14.5
3112109	38HDR030−31	CAP**3617A**	58MEB060−12	28,600	12.0	14.5
3112110	38HDR030−31	CAP**3617A**	58MEB080−12	28,600	12.0	14.5
3112111	38HDR030−31	CAP**3617A**	58MEB080−16	28,600	12.0	14.5
1390450	38HDR030−31	CAP**3617A**	58MV(B,C)060−14	28,600	11.5	14.0
3015390	38HDR030−31	CAP**3617A**	58PH*070−16	28,600	12.0	14.5
1085636	38HDR030−31	CAP**3617A**+TDR		28,600	11.0	13.0
1085794	38HDR030−31	CAP**3621A**	58CV(A,X)090−16	28,600	11.5	14.0
1085650	38HDR030−31	CAP**3621A**	58CV(A,X)110−20	28,600	11.5	14.0
1390464	38HDR030−31	CAP**3621A**	58MV(B,C)060−14	28,600	11.5	14.0
1390468	38HDR030−31	CAP**3621A**	58MV(B,C)080−14	28,600	11.5	14.0
1390480	38HDR030−31	CAP**3621A**	58MV(B,C)080−20	28,600	11.5	14.0
1390492	38HDR030−31	CAP**3621A**	58MV(B,C)100−20	28,600	11.5	14.0
3015391	38HDR030−31	CAP**3621A**	58PH*090−16	28,600	12.0	14.5
1085642	38HDR030−31	CAP**3621A**+TDR		28,600	11.0	13.0
1085724	38HDR030−31	CNPF*3618A**+TDR		28,600	11.0	13.0
1085690	38HDR030−31	CNPH*3017A**	58CV(A,X)070−12	28,000	11.5	14.0
1085692	38HDR030−31	CNPH*3017A**	58CV(A,X)090−16	28,000	11.5	14.0
1085694	38HDR030−31	CNPH*3017A**	58CV(A,X)110−20	28,000	11.5	14.0
1085696	38HDR030−31	CNPH*3017A**	58CV(A,X)135−22	28,000	11.5	14.0
1085698	38HDR030−31	CNPH*3017A**	58CV(A,X)155−22	28,000	11.5	14.0
3112120	38HDR030−31	CNPH*3017A**	58MEB040−12	28,000	12.0	14.5
3112121	38HDR030−31	CNPH*3017A**	58MEB060−12	28,000	12.0	14.5
3112122	38HDR030−31	CNPH*3017A**	58MEB080−12	28,000	12.0	14.5
3112123	38HDR030−31	CNPH*3017A**	58MEB080−16	28,000	12.0	14.5
1390456	38HDR030−31	CNPH*3017A**	58MV(B,C)060−14	28,000	11.5	14.0
1390472	38HDR030−31	CNPH*3017A**	58MV(B,C)080−14	28,000	11.5	14.0
1390484	38HDR030−31	CNPH*3017A**	58MV(B,C)080−20	28,000	11.5	14.0
1390496	38HDR030−31	CNPH*3017A**	58MV(B,C)100−20	28,000	11.5	14.0
1390504	38HDR030−31	CNPH*3017A**	58MV(B,C)120−20	28,000	11.5	14.0
3015395	38HDR030−31	CNPH*3017A**	58PH*070−16	28,000	11.5	14.0
3015396	38HDR030−31	CNPH*3017A**	58PH*090−16	28,000	11.5	14.0
1085676	38HDR030−31	CNPH*3017A**+TDR		28,000	11.0	13.0
1085714	38HDR030−31	CNPH*3617A**	58CV(A,X)070−12	28,600	11.5	14.0
1085716	38HDR030−31	CNPH*3617A**	58CV(A,X)090−16	28,600	11.5	14.0
1085718	38HDR030−31	CNPH*3617A**	58CV(A,X)110−20	28,600	11.5	14.0
1085720	38HDR030−31	CNPH*3617A**	58CV(A,X)135−22	28,600	11.5	14.0
1085722	38HDR030−31	CNPH*3617A**	58CV(A,X)155−22	28,600	11.5	14.0
3112124	38HDR030−31	CNPH*3617A**	58MEB040−12	28,600	12.0	14.5
3112125	38HDR030−31	CNPH*3617A**	58MEB060−12	28,600	12.0	14.5
3112126	38HDR030−31	CNPH*3617A**	58MEB080−12	28,600	12.0	14.5
3112127	38HDR030−31	CNPH*3617A**	58MEB080−16	28,600	12.0	14.5
1390458	38HDR030−31	CNPH*3617A**	58MV(B,C)060−14	28,600	11.5	14.0
1390474	38HDR030−31	CNPH*3617A**	58MV(B,C)080−14	28,600	11.5	14.0
1390486	38HDR030−31	CNPH*3617A**	58MV(B,C)080−20	28,600	11.5	14.0
1390498	38HDR030−31	CNPH*3617A**	58MV(B,C)100−20	28,600	11.5	14.0
1390506	38HDR030−31	CNPH*3617A**	58MV(B,C)120−20	28,600	11.5	14.0
3015397	38HDR030−31	CNPH*3617A**	58PH*070−16	28,600	12.0	14.5
3015398	38HDR030−31	CNPH*3617A**	58PH*090−16	28,600	12.0	14.5
1085700	38HDR030−31	CNPH*3617A**+TDR		28,600	11.0	13.0
1085652	38HDR030−31	CNPV*3014A**	58CV(A,X)070−12	28,000	11.5	14.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1085796	38HDR030−31	CNPV*3017A**	58CV(A,X)070−12	28,000	11.5	14.0
1085658	38HDR030−31	CNPV*3017A**	58CV(A,X)090−16	28,000	11.5	14.0
3112112	38HDR030−31	CNPV*3017A**	58MEB040−12	28,000	12.0	14.5
3112113	38HDR030−31	CNPV*3017A**	58MEB060−12	28,000	12.0	14.5
3112114	38HDR030−31	CNPV*3017A**	58MEB080−12	28,000	12.0	14.5
3112115	38HDR030−31	CNPV*3017A**	58MEB080−16	28,000	12.0	14.5
1390452	38HDR030−31	CNPV*3017A**	58MV(B,C)060−14	28,000	11.5	14.0
3015392	38HDR030−31	CNPV*3017A**	58PH*070−16	28,000	11.5	14.0
1085654	38HDR030−31	CNPV*3017A**+TDR		28,000	11.0	13.0
1085798	38HDR030−31	CNPV*3617A**	58CV(A,X)070−12	28,600	11.5	14.0
1085664	38HDR030−31	CNPV*3617A**	58CV(A,X)090−16	28,600	11.5	14.0
3112116	38HDR030−31	CNPV*3617A**	58MEB040−12	28,600	12.0	14.5
3112117	38HDR030−31	CNPV*3617A**	58MEB060−12	28,600	12.0	14.5
3112118	38HDR030−31	CNPV*3617A**	58MEB080−12	28,600	12.0	14.5
3112119	38HDR030−31	CNPV*3617A**	58MEB080−16	28,600	12.0	14.5
1390454	38HDR030−31	CNPV*3617A**	58MV(B,C)060−14	28,600	11.5	14.0
3015393	38HDR030−31	CNPV*3617A**	58PH*070−16	28,600	12.0	14.5
1085660	38HDR030−31	CNPV*3617A**+TDR		28,600	11.0	13.0
1085802	38HDR030−31	CNPV*3621A**	58CV(A,X)090−16	28,600	11.5	14.0
1085674	38HDR030−31	CNPV*3621A**	58CV(A,X)110−20	28,600	11.5	14.0
1390466	38HDR030−31	CNPV*3621A**	58MV(B,C)060−14	28,600	11.5	14.0
1390470	38HDR030−31	CNPV*3621A**	58MV(B,C)080−14	28,600	11.5	14.0
1390482	38HDR030−31	CNPV*3621A**	58MV(B,C)080−20	28,600	11.5	14.0
1390494	38HDR030−31	CNPV*3621A**	58MV(B,C)100−20	28,600	11.5	14.0
3015394	38HDR030−31	CNPV*3621A**	58PH*090−16	28,600	12.0	14.5
1085666	38HDR030−31	CNPV*3621A**+TDR		28,600	11.0	13.0
1085740	38HDR030−31	CSPH*3012A**	58CV(A,X)070−12	28,000	11.5	14.0
1085742	38HDR030−31	CSPH*3012A**	58CV(A,X)090−16	28,000	11.5	14.0
1085744	38HDR030−31	CSPH*3012A**	58CV(A,X)110−20	28,000	11.5	14.0
1085746	38HDR030−31	CSPH*3012A**	58CV(A,X)135−22	28,000	11.5	14.0
1085748	38HDR030−31	CSPH*3012A**	58CV(A,X)155−22	28,000	11.5	14.0
3112128	38HDR030−31	CSPH*3012A**	58MEB040−12	28,000	12.0	14.5
3112129	38HDR030−31	CSPH*3012A**	58MEB060−12	28,000	12.0	14.5
3112130	38HDR030−31	CSPH*3012A**	58MEB080−12	28,000	12.0	14.5
3112131	38HDR030−31	CSPH*3012A**	58MEB080−16	28,000	12.0	14.5
1390460	38HDR030−31	CSPH*3012A**	58MV(B,C)060−14	28,000	11.5	14.0
1390476	38HDR030−31	CSPH*3012A**	58MV(B,C)080−14	28,000	11.5	14.0
1390488	38HDR030−31	CSPH*3012A**	58MV(B,C)080−20	28,000	11.5	14.0
1390500	38HDR030−31	CSPH*3012A**	58MV(B,C)100−20	28,000	11.5	14.0
1390508	38HDR030−31	CSPH*3012A**	58MV(B,C)120−20	28,000	11.5	14.0
3015399	38HDR030−31	CSPH*3012A**	58PH*070−16	28,000	11.5	14.0
3015400	38HDR030−31	CSPH*3012A**	58PH*090−16	28,000	11.5	14.0
1085726	38HDR030−31	CSPH*3012A**+TDR		28,000	11.0	13.0
1085764	38HDR030−31	CSPH*3612A**	58CV(A,X)070−12	28,600	11.5	14.0
1085766	38HDR030−31	CSPH*3612A**	58CV(A,X)090−16	28,600	11.5	14.0
1085768	38HDR030−31	CSPH*3612A**	58CV(A,X)110−20	28,600	11.5	14.0
1085770	38HDR030−31	CSPH*3612A**	58CV(A,X)135−22	28,600	11.5	14.0
1085772	38HDR030−31	CSPH*3612A**	58CV(A,X)155−22	28,600	11.5	14.0
3112132	38HDR030−31	CSPH*3612A**	58MEB040−12	28,600	12.0	14.5
3112133	38HDR030−31	CSPH*3612A**	58MEB060−12	28,600	12.0	14.5
3112134	38HDR030−31	CSPH*3612A**	58MEB080−12	28,600	12.0	14.5
3112135	38HDR030−31	CSPH*3612A**	58MEB080−16	28,600	12.0	14.5
1390462	38HDR030−31	CSPH*3612A**	58MV(B,C)060−14	28,600	11.5	14.0
1390478	38HDR030−31	CSPH*3612A**	58MV(B,C)080−14	28,600	11.5	14.0
1390490	38HDR030−31	CSPH*3612A**	58MV(B,C)080−20	28,600	11.5	14.0
1390502	38HDR030−31	CSPH*3612A**	58MV(B,C)100−20	28,600	11.5	14.0
1390510	38HDR030−31	CSPH*3612A**	58MV(B,C)120−20	28,600	11.5	14.0
3015401	38HDR030−31	CSPH*3612A**	58PH*070−16	28,600	12.0	14.5
3015402	38HDR030−31	CSPH*3612A**	58PH*090−16	28,600	12.0	14.5
1085750	38HDR030−31	CSPH*3612A**+TDR		28,600	11.0	13.0
1086240	38HDR030−31	FE4AN(B,F)003+UI		28,600	11.5	14.0
1086242	38HDR030−31	FE4AN(B,F)005+UI		29,000	12.5	15.0
1086238	38HDR030−31	FE4ANF002+UI		28,600	11.5	14.0
1085782	38HDR030−31	FF1ENP030		28,000	11.0	13.0
1085784	38HDR030−31	FF1ENP036		28,600	11.0	13.0
1085786	38HDR030−31	FV4BNF002		28,600	11.5	14.0
3404625	38HDR030−31	FV4CNF002		28,600	11.5	14.0
1085780	38HDR030−31	FX4CN(B,F)036		28,600	11.5	14.0
1085778	38HDR030−31	FX4CNF030		28,000	11.5	14.0
1085774	38HDR030−31	FY4ANF030		28,000	11.0	13.0
1085776	38HDR030−31	FY4ANF036		28,600	11.0	13.0
1085804	38HDR036−31	†CNPV*4221A**+TDR		33,400	11.0	13.0
1117980	38HDR036−31	40QAC036−−−3		33,000	11.4	13.0
1085808	38HDR036−31	CAP**3614A**	58CV(A,X)070−12	32,600	11.5	13.5
3015403	38HDR036−31	CAP**3614A**	58PH*045−08	33,000	11.5	14.0
1085806	38HDR036−31	CAP**3614A**+TDR		32,600	11.0	13.0
1085982	38HDR036−31	CAP**3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1085814	38HDR036−31	CAP**3617A**	58CV(A,X)090−16	33,000	11.5	14.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3112136	38HDR036−31	CAP**3617A**	58MEB040−12	33,000	12.0	14.5
3112137	38HDR036−31	CAP**3617A**	58MEB060−12	33,000	12.0	14.5
3112138	38HDR036−31	CAP**3617A**	58MEB080−12	33,000	12.0	14.5
3112139	38HDR036−31	CAP**3617A**	58MEB080−16	33,000	12.0	14.5
1390512	38HDR036−31	CAP**3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015404	38HDR036−31	CAP**3617A**	58PH*070−16	33,000	11.5	14.0
1085810	38HDR036−31	CAP**3617A**+TDR		33,000	11.0	13.0
1085986	38HDR036−31	CAP**3621A**	58CV(A,X)090−16	33,000	11.5	14.0
1085824	38HDR036−31	CAP**3621A**	58CV(A,X)110−20	33,000	11.5	14.0
3112140	38HDR036−31	CAP**3621A**	58MEB100−20	33,000	12.0	14.5
1390524	38HDR036−31	CAP**3621A**	58MV(B,C)060−14	33,000	11.5	14.0
1390532	38HDR036−31	CAP**3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390550	38HDR036−31	CAP**3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390568	38HDR036−31	CAP**3621A**	58MV(B,C)100−20	33,000	11.5	14.0
3015405	38HDR036−31	CAP**3621A**	58PH*090−16	33,000	12.0	14.5
3015406	38HDR036−31	CAP**3621A**	58PH*110−20	33,000	12.0	14.5
1085816	38HDR036−31	CAP**3621A**+TDR		33,000	11.0	13.0
1085990	38HDR036−31	CAP**4221A**	58CV(A,X)090−16	33,400	11.5	14.0
1085834	38HDR036−31	CAP**4221A**	58CV(A,X)110−20	33,400	11.5	14.0
3112141	38HDR036−31	CAP**4221A**	58MEB100−20	33,400	12.0	14.5
1390526	38HDR036−31	CAP**4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390534	38HDR036−31	CAP**4221A**	58MV(B,C)080−14	33,400	11.5	13.5
1390552	38HDR036−31	CAP**4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390570	38HDR036−31	CAP**4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015407	38HDR036−31	CAP**4221A**	58PH*090−16	33,400	12.0	14.5
3015408	38HDR036−31	CAP**4221A**	58PH*110−20	33,400	12.0	14.5
1085826	38HDR036−31	CAP**4221A**+TDR		33,400	11.0	13.0
1085998	38HDR036−31	CAP**4224A**	58CV(A,X)110−20	33,400	11.5	14.0
1085842	38HDR036−31	CAP**4224A**	58CV(A,X)135−22	33,400	11.5	14.0
1085844	38HDR036−31	CAP**4224A**	58CV(A,X)155−22	33,400	11.5	14.0
1390548	38HDR036−31	CAP**4224A**	58MV(B,C)080−14	33,400	11.5	14.0
1390566	38HDR036−31	CAP**4224A**	58MV(B,C)080−20	33,400	11.5	14.0
1390584	38HDR036−31	CAP**4224A**	58MV(B,C)100−20	33,400	11.5	14.0
1390586	38HDR036−31	CAP**4224A**	58MV(B,C)120−20	33,400	11.5	13.5
1085836	38HDR036−31	CAP**4224A**+TDR		33,400	11.0	13.0
1085918	38HDR036−31	CNPF*3618A**+TDR		33,000	11.0	13.0
1085884	38HDR036−31	CNPH*3617A**	58CV(A,X)070−12	33,000	11.5	13.5
1085886	38HDR036−31	CNPH*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
1085888	38HDR036−31	CNPH*3617A**	58CV(A,X)110−20	33,000	11.5	13.5
1085890	38HDR036−31	CNPH*3617A**	58CV(A,X)135−22	33,000	11.5	13.5
1085892	38HDR036−31	CNPH*3617A**	58CV(A,X)155−22	33,000	11.5	14.0
3112156	38HDR036−31	CNPH*3617A**	58MEB040−12	33,000	12.0	14.5
3112157	38HDR036−31	CNPH*3617A**	58MEB060−12	33,000	12.0	14.5
3112158	38HDR036−31	CNPH*3617A**	58MEB080−12	33,000	12.0	14.5
3112159	38HDR036−31	CNPH*3617A**	58MEB080−16	33,000	12.0	14.5
3112160	38HDR036−31	CNPH*3617A**	58MEB100−20	33,000	12.0	14.5
1390516	38HDR036−31	CNPH*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
1390540	38HDR036−31	CNPH*3617A**	58MV(B,C)080−14	33,000	11.5	13.5
1390558	38HDR036−31	CNPH*3617A**	58MV(B,C)080−20	33,000	11.5	13.5
1390576	38HDR036−31	CNPH*3617A**	58MV(B,C)100−20	33,000	11.5	13.5
1390588	38HDR036−31	CNPH*3617A**	58MV(B,C)120−20	33,000	11.5	13.5
3015414	38HDR036−31	CNPH*3617A**	58PH*045−08	33,000	11.5	14.0
3015415	38HDR036−31	CNPH*3617A**	58PH*070−16	33,000	11.5	14.0
3015416	38HDR036−31	CNPH*3617A**	58PH*090−16	33,000	12.0	14.5
3015417	38HDR036−31	CNPH*3617A**	58PH*110−20	33,000	12.0	14.5
1085870	38HDR036−31	CNPH*3617A**+TDR		33,000	11.0	13.0
1085908	38HDR036−31	CNPH*4221A**	58CV(A,X)070−12	33,400	11.5	14.0
1085910	38HDR036−31	CNPH*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1085912	38HDR036−31	CNPH*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
1085914	38HDR036−31	CNPH*4221A**	58CV(A,X)135−22	33,400	11.5	14.5
1085916	38HDR036−31	CNPH*4221A**	58CV(A,X)155−22	33,400	11.5	14.5
3112161	38HDR036−31	CNPH*4221A**	58MEB040−12	33,400	12.0	14.5
3112162	38HDR036−31	CNPH*4221A**	58MEB060−12	33,400	12.0	14.5
3112163	38HDR036−31	CNPH*4221A**	58MEB080−12	33,400	12.0	14.5
3112164	38HDR036−31	CNPH*4221A**	58MEB080−16	33,400	12.0	14.5
3112165	38HDR036−31	CNPH*4221A**	58MEB100−20	33,400	12.0	14.5
1390518	38HDR036−31	CNPH*4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390542	38HDR036−31	CNPH*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390560	38HDR036−31	CNPH*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390578	38HDR036−31	CNPH*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
1390590	38HDR036−31	CNPH*4221A**	58MV(B,C)120−20	33,400	11.5	14.5
3015418	38HDR036−31	CNPH*4221A**	58PH*045−08	33,400	11.5	14.0
3015419	38HDR036−31	CNPH*4221A**	58PH*070−16	33,400	11.5	14.0
3015420	38HDR036−31	CNPH*4221A**	58PH*090−16	33,400	12.0	14.5
3015421	38HDR036−31	CNPH*4221A**	58PH*110−20	33,400	12.0	14.5
1085894	38HDR036−31	CNPH*4221A**+TDR		33,400	11.0	13.0
1086000	38HDR036−31	CNPV*3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1085850	38HDR036−31	CNPV*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
3112142	38HDR036−31	CNPV*3617A**	58MEB040−12	33,000	12.0	14.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3112143	38HDR036−31	CNPV*3617A**	58MEB060−12	33,000	12.0	14.5
3112144	38HDR036−31	CNPV*3617A**	58MEB080−12	33,000	12.0	14.5
3112145	38HDR036−31	CNPV*3617A**	58MEB080−16	33,000	12.0	14.5
1390514	38HDR036−31	CNPV*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015409	38HDR036−31	CNPV*3617A**	58PH*070−16	33,000	11.5	14.0
1085846	38HDR036−31	CNPV*3617A**+TDR		33,000	11.0	13.0
1086004	38HDR036−31	CNPV*3621A**	58CV(A,X)090−16	33,000	11.5	14.5
1085860	38HDR036−31	CNPV*3621A**	58CV(A,X)110−20	33,000	11.5	13.5
3112146	38HDR036−31	CNPV*3621A**	58MEB100−20	33,000	12.0	14.5
1390528	38HDR036−31	CNPV*3621A**	58MV(B,C)060−14	33,000	11.5	14.5
1390536	38HDR036−31	CNPV*3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390554	38HDR036−31	CNPV*3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390572	38HDR036−31	CNPV*3621A**	58MV(B,C)100−20	33,000	11.5	13.5
3015410	38HDR036−31	CNPV*3621A**	58PH*090−16	33,000	12.0	14.5
3015411	38HDR036−31	CNPV*3621A**	58PH*110−20	33,000	12.0	14.5
1085852	38HDR036−31	CNPV*3621A**+TDR		33,000	11.0	13.0
3112149	38HDR036−31	CNPV*4217A**	58CV(A,X)090−16	33,400	12.0	14.5
3112151	38HDR036−31	CNPV*4217A**	58MEB040−12	33,400	12.0	14.5
3112152	38HDR036−31	CNPV*4217A**	58MEB060−12	33,400	12.0	14.5
3112153	38HDR036−31	CNPV*4217A**	58MEB080−12	33,400	12.0	14.5
3112154	38HDR036−31	CNPV*4217A**	58MEB080−16	33,400	12.0	14.5
3112148	38HDR036−31	CNPV*4217A**	58MV(B,C)060−14	33,400	12.0	14.5
3112150	38HDR036−31	CNPV*4217A**	58PH*070−16	33,400	12.0	14.5
3112147	38HDR036−31	CNPV*4217A**+TDR		33,400	11.0	13.0
1086008	38HDR036−31	CNPV*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1085868	38HDR036−31	CNPV*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
3112155	38HDR036−31	CNPV*4221A**	58MEB100−20	33,400	12.0	14.5
1390530	38HDR036−31	CNPV*4221A**	58MV(B,C)060−14	33,400	11.5	14.5
1390538	38HDR036−31	CNPV*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390556	38HDR036−31	CNPV*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390574	38HDR036−31	CNPV*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015412	38HDR036−31	CNPV*4221A**	58PH*090−16	33,400	12.0	14.5
3015413	38HDR036−31	CNPV*4221A**	58PH*110−20	33,400	12.0	14.5
1085934	38HDR036−31	CSPH*3612A**	58CV(A,X)070−12	33,000	11.5	14.0
1085936	38HDR036−31	CSPH*3612A**	58CV(A,X)090−16	33,000	11.5	14.5
1085938	38HDR036−31	CSPH*3612A**	58CV(A,X)110−20	33,000	11.5	14.5
1085940	38HDR036−31	CSPH*3612A**	58CV(A,X)135−22	33,000	11.5	14.5
1085942	38HDR036−31	CSPH*3612A**	58CV(A,X)155−22	33,000	11.5	14.5
3112166	38HDR036−31	CSPH*3612A**	58MEB040−12	33,000	12.0	14.5
3112167	38HDR036−31	CSPH*3612A**	58MEB060−12	33,000	12.0	14.5
3112168	38HDR036−31	CSPH*3612A**	58MEB080−12	33,000	12.0	14.5
3112169	38HDR036−31	CSPH*3612A**	58MEB080−16	33,000	12.0	14.5
3112170	38HDR036−31	CSPH*3612A**	58MEB100−20	33,000	12.0	14.5
1390520	38HDR036−31	CSPH*3612A**	58MV(B,C)060−14	33,000	11.5	14.5
1390544	38HDR036−31	CSPH*3612A**	58MV(B,C)080−14	33,000	11.5	14.0
1390562	38HDR036−31	CSPH*3612A**	58MV(B,C)080−20	33,000	11.5	14.0
1390580	38HDR036−31	CSPH*3612A**	58MV(B,C)100−20	33,000	11.5	14.5
1390592	38HDR036−31	CSPH*3612A**	58MV(B,C)120−20	33,000	11.5	14.5
3015422	38HDR036−31	CSPH*3612A**	58PH*045−08	33,000	11.5	14.0
3015423	38HDR036−31	CSPH*3612A**	58PH*070−16	33,000	11.5	14.0
3015424	38HDR036−31	CSPH*3612A**	58PH*090−16	33,000	12.0	14.5
3015425	38HDR036−31	CSPH*3612A**	58PH*110−20	33,000	12.0	14.5
1085920	38HDR036−31	CSPH*3612A**+TDR		33,000	11.0	13.0
1085958	38HDR036−31	CSPH*4212A**	58CV(A,X)070−12	33,400	11.5	14.0
1085960	38HDR036−31	CSPH*4212A**	58CV(A,X)090−16	33,400	11.5	14.5
1085962	38HDR036−31	CSPH*4212A**	58CV(A,X)110−20	33,400	11.5	14.5
1085964	38HDR036−31	CSPH*4212A**	58CV(A,X)135−22	33,400	11.5	14.5
1085966	38HDR036−31	CSPH*4212A**	58CV(A,X)155−22	33,400	11.5	14.5
3112171	38HDR036−31	CSPH*4212A**	58MEB040−12	33,400	12.0	14.5
3112172	38HDR036−31	CSPH*4212A**	58MEB060−12	33,400	12.0	14.5
3112173	38HDR036−31	CSPH*4212A**	58MEB080−12	33,400	12.0	14.5
3112174	38HDR036−31	CSPH*4212A**	58MEB080−16	33,400	12.0	14.5
3112175	38HDR036−31	CSPH*4212A**	58MEB100−20	33,400	12.0	14.5
1390522	38HDR036−31	CSPH*4212A**	58MV(B,C)060−14	33,400	11.5	14.0
1390546	38HDR036−31	CSPH*4212A**	58MV(B,C)080−14	33,400	11.5	14.0
1390564	38HDR036−31	CSPH*4212A**	58MV(B,C)080−20	33,400	11.5	14.0
1390582	38HDR036−31	CSPH*4212A**	58MV(B,C)100−20	33,400	11.5	14.0
1390594	38HDR036−31	CSPH*4212A**	58MV(B,C)120−20	33,400	11.5	14.0
3015426	38HDR036−31	CSPH*4212A**	58PH*045−08	33,400	11.5	14.0
3015427	38HDR036−31	CSPH*4212A**	58PH*070−16	33,400	11.5	14.0
3015428	38HDR036−31	CSPH*4212A**	58PH*090−16	33,400	12.0	14.5
3015429	38HDR036−31	CSPH*4212A**	58PH*110−20	33,400	12.0	14.5
1085944	38HDR036−31	CSPH*4212A**+TDR		33,400	11.0	13.0
1086246	38HDR036−31	FE4AN(B,F)003+UI		33,000	11.5	14.0
1086248	38HDR036−31	FE4AN(B,F)005+UI		33,400	12.5	15.0
1086250	38HDR036−31	FE4ANB006+UI		33,400	12.5	15.0
1086244	38HDR036−31	FE4ANF002+UI		33,000	11.5	13.5
1085976	38HDR036−31	FF1ENP036		33,000	11.0	13.0
1085980	38HDR036−31	FV4BNB006		33,400	12.5	15.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1085978	38HDR036−31	FV4BNF002		33,000	11.5	13.5
3404627	38HDR036−31	FV4CNB006		33,400	12.5	15.0
3404626	38HDR036−31	FV4CNF002		33,000	11.5	13.5
1085972	38HDR036−31	FX4CN(B,F)036		33,000	11.5	14.0
1085974	38HDR036−31	FX4CN(B,F)042		33,400	11.5	14.0
1085968	38HDR036−31	FY4ANF036		33,000	11.0	13.0
1085970	38HDR036−31	FY4ANF042		33,400	11.0	13.0
1117042	38HDR036−51	†CNPV*4221A**+TDR		33,400	11.0	13.0
1117982	38HDR036−51	40QAC036−−−3		33,000	11.4	13.0
1117046	38HDR036−51	CAP**3614A**	58CV(A,X)070−12	32,600	11.5	13.5
3015466	38HDR036−51	CAP**3614A**	58PH*045−08	33,000	11.5	14.0
1117044	38HDR036−51	CAP**3614A**+TDR		32,600	11.0	13.0
1117228	38HDR036−51	CAP**3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1117052	38HDR036−51	CAP**3617A**	58CV(A,X)090−16	33,000	11.5	14.0
3116284	38HDR036−51	CAP**3617A**	58MEB040−12	33,000	12.0	14.5
3116285	38HDR036−51	CAP**3617A**	58MEB060−12	33,000	12.0	14.5
3116286	38HDR036−51	CAP**3617A**	58MEB080−12	33,000	12.0	14.5
3116287	38HDR036−51	CAP**3617A**	58MEB080−16	33,000	12.0	14.5
1390596	38HDR036−51	CAP**3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015467	38HDR036−51	CAP**3617A**	58PH*070−16	33,000	11.5	14.0
1117048	38HDR036−51	CAP**3617A**+TDR		33,000	11.0	13.0
1117232	38HDR036−51	CAP**3621A**	58CV(A,X)090−16	33,000	11.5	14.0
1145786	38HDR036−51	CAP**3621A**	58CV(A,X)110−20	33,000	11.5	14.0
3116288	38HDR036−51	CAP**3621A**	58MEB100−20	33,000	12.0	14.5
1390602	38HDR036−51	CAP**3621A**	58MV(B,C)060−14	33,000	11.5	14.0
1390616	38HDR036−51	CAP**3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390634	38HDR036−51	CAP**3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390658	38HDR036−51	CAP**3621A**	58MV(B,C)100−20	33,000	11.5	14.0
3015468	38HDR036−51	CAP**3621A**	58PH*090−16	33,000	12.0	14.5
3015469	38HDR036−51	CAP**3621A**	58PH*110−20	33,000	12.0	14.5
1117054	38HDR036−51	CAP**3621A**+TDR		33,000	11.0	13.0
1117236	38HDR036−51	CAP**4221A**	58CV(A,X)090−16	33,400	11.5	14.0
1145796	38HDR036−51	CAP**4221A**	58CV(A,X)110−20	33,400	11.5	14.0
3116289	38HDR036−51	CAP**4221A**	58MEB100−20	33,400	12.0	14.5
1390604	38HDR036−51	CAP**4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390624	38HDR036−51	CAP**4221A**	58MV(B,C)080−14	33,400	11.5	13.5
1390642	38HDR036−51	CAP**4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390660	38HDR036−51	CAP**4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015470	38HDR036−51	CAP**4221A**	58PH*090−16	33,400	12.0	14.5
3015471	38HDR036−51	CAP**4221A**	58PH*110−20	33,400	12.0	14.5
1145788	38HDR036−51	CAP**4221A**+TDR		33,400	11.0	13.0
1117244	38HDR036−51	CAP**4224A**	58CV(A,X)110−20	33,400	11.5	14.0
1145804	38HDR036−51	CAP**4224A**	58CV(A,X)135−22	33,400	11.5	14.0
1145806	38HDR036−51	CAP**4224A**	58CV(A,X)155−22	33,400	11.5	14.0
1390622	38HDR036−51	CAP**4224A**	58MV(B,C)080−14	33,400	11.5	14.0
1390640	38HDR036−51	CAP**4224A**	58MV(B,C)080−20	33,400	11.5	14.0
1390656	38HDR036−51	CAP**4224A**	58MV(B,C)100−20	33,400	11.5	14.0
1390674	38HDR036−51	CAP**4224A**	58MV(B,C)120−20	33,400	11.5	13.5
1145798	38HDR036−51	CAP**4224A**+TDR		33,400	11.0	13.0
1117156	38HDR036−51	CNPF*3618A**+TDR		33,000	11.0	13.0
1145846	38HDR036−51	CNPH*3617A**	58CV(A,X)070−12	33,000	11.5	13.5
1145848	38HDR036−51	CNPH*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
1145850	38HDR036−51	CNPH*3617A**	58CV(A,X)110−20	33,000	11.5	13.5
1145852	38HDR036−51	CNPH*3617A**	58CV(A,X)135−22	33,000	11.5	13.5
1145854	38HDR036−51	CNPH*3617A**	58CV(A,X)155−22	33,000	11.5	14.0
3116304	38HDR036−51	CNPH*3617A**	58MEB040−12	33,000	12.0	14.5
3116305	38HDR036−51	CNPH*3617A**	58MEB060−12	33,000	12.0	14.5
3116306	38HDR036−51	CNPH*3617A**	58MEB080−12	33,000	12.0	14.5
3116307	38HDR036−51	CNPH*3617A**	58MEB080−16	33,000	12.0	14.5
3116308	38HDR036−51	CNPH*3617A**	58MEB100−20	33,000	12.0	14.5
1390612	38HDR036−51	CNPH*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
1390630	38HDR036−51	CNPH*3617A**	58MV(B,C)080−14	33,000	11.5	13.5
1390648	38HDR036−51	CNPH*3617A**	58MV(B,C)080−20	33,000	11.5	13.5
1390666	38HDR036−51	CNPH*3617A**	58MV(B,C)100−20	33,000	11.5	13.5
1390676	38HDR036−51	CNPH*3617A**	58MV(B,C)120−20	33,000	11.5	13.5
3015477	38HDR036−51	CNPH*3617A**	58PH*045−08	33,000	11.5	14.0
3015478	38HDR036−51	CNPH*3617A**	58PH*070−16	33,000	11.5	14.0
3015479	38HDR036−51	CNPH*3617A**	58PH*090−16	33,000	12.0	14.5
3015480	38HDR036−51	CNPH*3617A**	58PH*110−20	33,000	12.0	14.5
1145832	38HDR036−51	CNPH*3617A**+TDR		33,000	11.0	13.0
1145870	38HDR036−51	CNPH*4221A**	58CV(A,X)070−12	33,400	11.5	14.0
1145872	38HDR036−51	CNPH*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1145874	38HDR036−51	CNPH*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
1117152	38HDR036−51	CNPH*4221A**	58CV(A,X)135−22	33,400	11.5	14.5
1117154	38HDR036−51	CNPH*4221A**	58CV(A,X)155−22	33,400	11.5	14.5
3116309	38HDR036−51	CNPH*4221A**	58MEB040−12	33,400	12.0	14.5
3116310	38HDR036−51	CNPH*4221A**	58MEB060−12	33,400	12.0	14.5
3116311	38HDR036−51	CNPH*4221A**	58MEB080−12	33,400	12.0	14.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3116312	38HDR036−51	CNPH*4221A**	58MEB080−16	33,400	12.0	14.5
3116313	38HDR036−51	CNPH*4221A**	58MEB100−20	33,400	12.0	14.5
1390614	38HDR036−51	CNPH*4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390632	38HDR036−51	CNPH*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390650	38HDR036−51	CNPH*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390668	38HDR036−51	CNPH*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
1390678	38HDR036−51	CNPH*4221A**	58MV(B,C)120−20	33,400	11.5	14.5
3015481	38HDR036−51	CNPH*4221A**	58PH*045−08	33,400	11.5	14.0
3015482	38HDR036−51	CNPH*4221A**	58PH*070−16	33,400	11.5	14.0
3015483	38HDR036−51	CNPH*4221A**	58PH*090−16	33,400	12.0	14.5
3015484	38HDR036−51	CNPH*4221A**	58PH*110−20	33,400	12.0	14.5
1145856	38HDR036−51	CNPH*4221A**+TDR		33,400	11.0	13.0
1117246	38HDR036−51	CNPV*3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1145812	38HDR036−51	CNPV*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
3116290	38HDR036−51	CNPV*3617A**	58MEB040−12	33,000	12.0	14.5
3116291	38HDR036−51	CNPV*3617A**	58MEB060−12	33,000	12.0	14.5
3116292	38HDR036−51	CNPV*3617A**	58MEB080−12	33,000	12.0	14.5
3116293	38HDR036−51	CNPV*3617A**	58MEB080−16	33,000	12.0	14.5
1390610	38HDR036−51	CNPV*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015472	38HDR036−51	CNPV*3617A**	58PH*070−16	33,000	11.5	14.0
1145808	38HDR036−51	CNPV*3617A**+TDR		33,000	11.0	13.0
1117250	38HDR036−51	CNPV*3621A**	58CV(A,X)090−16	33,000	11.5	14.5
1145822	38HDR036−51	CNPV*3621A**	58CV(A,X)110−20	33,000	11.5	13.5
3116294	38HDR036−51	CNPV*3621A**	58MEB100−20	33,000	12.0	14.5
1390606	38HDR036−51	CNPV*3621A**	58MV(B,C)060−14	33,000	11.5	14.5
1390626	38HDR036−51	CNPV*3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390644	38HDR036−51	CNPV*3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390662	38HDR036−51	CNPV*3621A**	58MV(B,C)100−20	33,000	11.5	13.5
3015473	38HDR036−51	CNPV*3621A**	58PH*090−16	33,000	12.0	14.5
3015474	38HDR036−51	CNPV*3621A**	58PH*110−20	33,000	12.0	14.5
1145814	38HDR036−51	CNPV*3621A**+TDR		33,000	11.0	13.0
3116297	38HDR036−51	CNPV*4217A**	58CV(A,X)090−16	33,400	12.0	14.5
3116299	38HDR036−51	CNPV*4217A**	58MEB040−12	33,400	12.0	14.5
3116300	38HDR036−51	CNPV*4217A**	58MEB060−12	33,400	12.0	14.5
3116301	38HDR036−51	CNPV*4217A**	58MEB080−12	33,400	12.0	14.5
3116302	38HDR036−51	CNPV*4217A**	58MEB080−16	33,400	12.0	14.5
3116296	38HDR036−51	CNPV*4217A**	58MV(B,C)060−14	33,400	12.0	14.5
3116298	38HDR036−51	CNPV*4217A**	58PH*070−16	33,400	12.0	14.5
3116295	38HDR036−51	CNPV*4217A**+TDR		33,400	11.0	13.0
1117254	38HDR036−51	CNPV*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1145830	38HDR036−51	CNPV*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
3116303	38HDR036−51	CNPV*4221A**	58MEB100−20	33,400	12.0	14.5
1390608	38HDR036−51	CNPV*4221A**	58MV(B,C)060−14	33,400	11.5	14.5
1390628	38HDR036−51	CNPV*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390646	38HDR036−51	CNPV*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390664	38HDR036−51	CNPV*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015475	38HDR036−51	CNPV*4221A**	58PH*090−16	33,400	12.0	14.5
3015476	38HDR036−51	CNPV*4221A**	58PH*110−20	33,400	12.0	14.5
1117172	38HDR036−51	CSPH*3612A**	58CV(A,X)070−12	33,000	11.5	14.0
1117174	38HDR036−51	CSPH*3612A**	58CV(A,X)090−16	33,000	11.5	14.5
1117176	38HDR036−51	CSPH*3612A**	58CV(A,X)110−20	33,000	11.5	14.5
1117178	38HDR036−51	CSPH*3612A**	58CV(A,X)135−22	33,000	11.5	14.5
1117180	38HDR036−51	CSPH*3612A**	58CV(A,X)155−22	33,000	11.5	14.5
3116314	38HDR036−51	CSPH*3612A**	58MEB040−12	33,000	12.0	14.5
3116315	38HDR036−51	CSPH*3612A**	58MEB060−12	33,000	12.0	14.5
3116316	38HDR036−51	CSPH*3612A**	58MEB080−12	33,000	12.0	14.5
3116317	38HDR036−51	CSPH*3612A**	58MEB080−16	33,000	12.0	14.5
3116318	38HDR036−51	CSPH*3612A**	58MEB100−20	33,000	12.0	14.5
1390598	38HDR036−51	CSPH*3612A**	58MV(B,C)060−14	33,000	11.5	14.5
1390618	38HDR036−51	CSPH*3612A**	58MV(B,C)080−14	33,000	11.5	14.0
1390636	38HDR036−51	CSPH*3612A**	58MV(B,C)080−20	33,000	11.5	14.0
1390652	38HDR036−51	CSPH*3612A**	58MV(B,C)100−20	33,000	11.5	14.5
1390670	38HDR036−51	CSPH*3612A**	58MV(B,C)120−20	33,000	11.5	14.5
3015485	38HDR036−51	CSPH*3612A**	58PH*045−08	33,000	11.5	14.0
3015486	38HDR036−51	CSPH*3612A**	58PH*070−16	33,000	11.5	14.0
3015487	38HDR036−51	CSPH*3612A**	58PH*090−16	33,000	12.0	14.5
3015488	38HDR036−51	CSPH*3612A**	58PH*110−20	33,000	12.0	14.5
1117158	38HDR036−51	CSPH*3612A**+TDR		33,000	11.0	13.0
1117196	38HDR036−51	CSPH*4212A**	58CV(A,X)070−12	33,400	11.5	14.0
1117198	38HDR036−51	CSPH*4212A**	58CV(A,X)090−16	33,400	11.5	14.5
1117200	38HDR036−51	CSPH*4212A**	58CV(A,X)110−20	33,400	11.5	14.5
1117202	38HDR036−51	CSPH*4212A**	58CV(A,X)135−22	33,400	11.5	14.5
1117204	38HDR036−51	CSPH*4212A**	58CV(A,X)155−22	33,400	11.5	14.5
3116319	38HDR036−51	CSPH*4212A**	58MEB040−12	33,400	12.0	14.5
3116320	38HDR036−51	CSPH*4212A**	58MEB060−12	33,400	12.0	14.5
3116321	38HDR036−51	CSPH*4212A**	58MEB080−12	33,400	12.0	14.5
3116322	38HDR036−51	CSPH*4212A**	58MEB080−16	33,400	12.0	14.5
3116323	38HDR036−51	CSPH*4212A**	58MEB100−20	33,400	12.0	14.5
1390600	38HDR036−51	CSPH*4212A**	58MV(B,C)060−14	33,400	11.5	14.0

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ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1390620	38HDR036−51	CSPH*4212A**	58MV(B,C)080−14	33,400	11.5	14.0
1390638	38HDR036−51	CSPH*4212A**	58MV(B,C)080−20	33,400	11.5	14.0
1390654	38HDR036−51	CSPH*4212A**	58MV(B,C)100−20	33,400	11.5	14.0
1390672	38HDR036−51	CSPH*4212A**	58MV(B,C)120−20	33,400	11.5	14.0
3015489	38HDR036−51	CSPH*4212A**	58PH*045−08	33,400	11.5	14.0
3015490	38HDR036−51	CSPH*4212A**	58PH*070−16	33,400	11.5	14.0
3015491	38HDR036−51	CSPH*4212A**	58PH*090−16	33,400	12.0	14.5
3015492	38HDR036−51	CSPH*4212A**	58PH*110−20	33,400	12.0	14.5
1117182	38HDR036−51	CSPH*4212A**+TDR		33,400	11.0	13.0
1117216	38HDR036−51	FE4AN(B,F)003+UI		33,000	11.5	14.0
1117218	38HDR036−51	FE4AN(B,F)005+UI		33,400	12.5	15.0
1117220	38HDR036−51	FE4ANB006+UI		33,400	12.5	15.0
1117214	38HDR036−51	FE4ANF002+UI		33,000	11.5	13.5
1117222	38HDR036−51	FF1ENP036		33,000	11.0	13.0
1117226	38HDR036−51	FV4BNB006		33,400	12.5	15.0
1117224	38HDR036−51	FV4BNF002		33,000	11.5	13.5
3404631	38HDR036−51	FV4CNB006		33,400	12.5	15.0
3404630	38HDR036−51	FV4CNF002		33,000	11.5	13.5
1117210	38HDR036−51	FX4CN(B,F)036		33,000	11.5	14.0
1117212	38HDR036−51	FX4CN(B,F)042		33,400	11.5	14.0
1117206	38HDR036−51	FY4ANF036		33,000	11.0	13.0
1117208	38HDR036−51	FY4ANF042		33,400	11.0	13.0
1117484	38HDR036−61	†CNPV*4221A**+TDR		33,400	11.0	13.0
1117984	38HDR036−61	40QAC036−−−3		33,000	11.4	13.0
1117488	38HDR036−61	CAP**3614A**	58CV(A,X)070−12	32,600	11.5	13.5
3015493	38HDR036−61	CAP**3614A**	58PH*045−08	33,000	11.5	14.0
1117486	38HDR036−61	CAP**3614A**+TDR		32,600	11.0	13.0
1117670	38HDR036−61	CAP**3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1117494	38HDR036−61	CAP**3617A**	58CV(A,X)090−16	33,000	11.5	14.0
3116353	38HDR036−61	CAP**3617A**	58MEB040−12	33,000	12.0	14.5
3116354	38HDR036−61	CAP**3617A**	58MEB060−12	33,000	12.0	14.5
3116355	38HDR036−61	CAP**3617A**	58MEB080−12	33,000	12.0	14.5
3116356	38HDR036−61	CAP**3617A**	58MEB080−16	33,000	12.0	14.5
1390680	38HDR036−61	CAP**3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015494	38HDR036−61	CAP**3617A**	58PH*070−16	33,000	11.5	14.0
1117490	38HDR036−61	CAP**3617A**+TDR		33,000	11.0	13.0
1117674	38HDR036−61	CAP**3621A**	58CV(A,X)090−16	33,000	11.5	14.0
1117504	38HDR036−61	CAP**3621A**	58CV(A,X)110−20	33,000	11.5	14.0
3116357	38HDR036−61	CAP**3621A**	58MEB100−20	33,000	12.0	14.5
1390692	38HDR036−61	CAP**3621A**	58MV(B,C)060−14	33,000	11.5	14.0
1390700	38HDR036−61	CAP**3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390718	38HDR036−61	CAP**3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390736	38HDR036−61	CAP**3621A**	58MV(B,C)100−20	33,000	11.5	14.0
3015495	38HDR036−61	CAP**3621A**	58PH*090−16	33,000	12.0	14.5
3015496	38HDR036−61	CAP**3621A**	58PH*110−20	33,000	12.0	14.5
1117496	38HDR036−61	CAP**3621A**+TDR		33,000	11.0	13.0
1117678	38HDR036−61	CAP**4221A**	58CV(A,X)090−16	33,400	11.5	14.0
1117514	38HDR036−61	CAP**4221A**	58CV(A,X)110−20	33,400	11.5	14.0
3116358	38HDR036−61	CAP**4221A**	58MEB100−20	33,400	12.0	14.5
1390694	38HDR036−61	CAP**4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390702	38HDR036−61	CAP**4221A**	58MV(B,C)080−14	33,400	11.5	13.5
1390720	38HDR036−61	CAP**4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390738	38HDR036−61	CAP**4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015497	38HDR036−61	CAP**4221A**	58PH*090−16	33,400	12.0	14.5
3015498	38HDR036−61	CAP**4221A**	58PH*110−20	33,400	12.0	14.5
1117506	38HDR036−61	CAP**4221A**+TDR		33,400	11.0	13.0
1117686	38HDR036−61	CAP**4224A**	58CV(A,X)110−20	33,400	11.5	14.0
1117522	38HDR036−61	CAP**4224A**	58CV(A,X)135−22	33,400	11.5	14.0
1117524	38HDR036−61	CAP**4224A**	58CV(A,X)155−22	33,400	11.5	14.0
1390716	38HDR036−61	CAP**4224A**	58MV(B,C)080−14	33,400	11.5	14.0
1390734	38HDR036−61	CAP**4224A**	58MV(B,C)080−20	33,400	11.5	14.0
1390752	38HDR036−61	CAP**4224A**	58MV(B,C)100−20	33,400	11.5	14.0
1390754	38HDR036−61	CAP**4224A**	58MV(B,C)120−20	33,400	11.5	13.5
1117516	38HDR036−61	CAP**4224A**+TDR		33,400	11.0	13.0
1117598	38HDR036−61	CNPF*3618A**+TDR		33,000	11.0	13.0
1117564	38HDR036−61	CNPH*3617A**	58CV(A,X)070−12	33,000	11.5	13.5
1117566	38HDR036−61	CNPH*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
1117568	38HDR036−61	CNPH*3617A**	58CV(A,X)110−20	33,000	11.5	13.5
1117570	38HDR036−61	CNPH*3617A**	58CV(A,X)135−22	33,000	11.5	13.5
1117572	38HDR036−61	CNPH*3617A**	58CV(A,X)155−22	33,000	11.5	14.0
3116373	38HDR036−61	CNPH*3617A**	58MEB040−12	33,000	12.0	14.5
3116374	38HDR036−61	CNPH*3617A**	58MEB060−12	33,000	12.0	14.5
3116375	38HDR036−61	CNPH*3617A**	58MEB080−12	33,000	12.0	14.5
3116376	38HDR036−61	CNPH*3617A**	58MEB080−16	33,000	12.0	14.5
3116377	38HDR036−61	CNPH*3617A**	58MEB100−20	33,000	12.0	14.5
1390684	38HDR036−61	CNPH*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
1390708	38HDR036−61	CNPH*3617A**	58MV(B,C)080−14	33,000	11.5	13.5
1390726	38HDR036−61	CNPH*3617A**	58MV(B,C)080−20	33,000	11.5	13.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1390744	38HDR036−61	CNPH*3617A**	58MV(B,C)100−20	33,000	11.5	13.5
1390756	38HDR036−61	CNPH*3617A**	58MV(B,C)120−20	33,000	11.5	13.5
3015504	38HDR036−61	CNPH*3617A**	58PH*045−08	33,000	11.5	14.0
3015505	38HDR036−61	CNPH*3617A**	58PH*070−16	33,000	11.5	14.0
3015506	38HDR036−61	CNPH*3617A**	58PH*090−16	33,000	12.0	14.5
3015507	38HDR036−61	CNPH*3617A**	58PH*110−20	33,000	12.0	14.5
1117550	38HDR036−61	CNPH*3617A**+TDR		33,000	11.0	13.0
1117588	38HDR036−61	CNPH*4221A**	58CV(A,X)070−12	33,400	11.5	14.0
1117590	38HDR036−61	CNPH*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1117592	38HDR036−61	CNPH*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
1117594	38HDR036−61	CNPH*4221A**	58CV(A,X)135−22	33,400	11.5	14.5
1117596	38HDR036−61	CNPH*4221A**	58CV(A,X)155−22	33,400	11.5	14.5
3116378	38HDR036−61	CNPH*4221A**	58MEB040−12	33,400	12.0	14.5
3116379	38HDR036−61	CNPH*4221A**	58MEB060−12	33,400	12.0	14.5
3116380	38HDR036−61	CNPH*4221A**	58MEB080−12	33,400	12.0	14.5
3116381	38HDR036−61	CNPH*4221A**	58MEB080−16	33,400	12.0	14.5
3116382	38HDR036−61	CNPH*4221A**	58MEB100−20	33,400	12.0	14.5
1390686	38HDR036−61	CNPH*4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390710	38HDR036−61	CNPH*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390728	38HDR036−61	CNPH*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390746	38HDR036−61	CNPH*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
1390758	38HDR036−61	CNPH*4221A**	58MV(B,C)120−20	33,400	11.5	14.5
3015508	38HDR036−61	CNPH*4221A**	58PH*045−08	33,400	11.5	14.0
3015509	38HDR036−61	CNPH*4221A**	58PH*070−16	33,400	11.5	14.0
3015510	38HDR036−61	CNPH*4221A**	58PH*090−16	33,400	12.0	14.5
3015511	38HDR036−61	CNPH*4221A**	58PH*110−20	33,400	12.0	14.5
1117574	38HDR036−61	CNPH*4221A**+TDR		33,400	11.0	13.0
1117688	38HDR036−61	CNPV*3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1117530	38HDR036−61	CNPV*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
3116359	38HDR036−61	CNPV*3617A**	58MEB040−12	33,000	12.0	14.5
3116360	38HDR036−61	CNPV*3617A**	58MEB060−12	33,000	12.0	14.5
3116361	38HDR036−61	CNPV*3617A**	58MEB080−12	33,000	12.0	14.5
3116362	38HDR036−61	CNPV*3617A**	58MEB080−16	33,000	12.0	14.5
1390682	38HDR036−61	CNPV*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015499	38HDR036−61	CNPV*3617A**	58PH*070−16	33,000	11.5	14.0
1117526	38HDR036−61	CNPV*3617A**+TDR		33,000	11.0	13.0
1117692	38HDR036−61	CNPV*3621A**	58CV(A,X)090−16	33,000	11.5	14.5
1117540	38HDR036−61	CNPV*3621A**	58CV(A,X)110−20	33,000	11.5	13.5
3116363	38HDR036−61	CNPV*3621A**	58MEB100−20	33,000	12.0	14.5
1390696	38HDR036−61	CNPV*3621A**	58MV(B,C)060−14	33,000	11.5	14.5
1390704	38HDR036−61	CNPV*3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390722	38HDR036−61	CNPV*3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390740	38HDR036−61	CNPV*3621A**	58MV(B,C)100−20	33,000	11.5	13.5
3015500	38HDR036−61	CNPV*3621A**	58PH*090−16	33,000	12.0	14.5
3015501	38HDR036−61	CNPV*3621A**	58PH*110−20	33,000	12.0	14.5
1117532	38HDR036−61	CNPV*3621A**+TDR		33,000	11.0	13.0
3116366	38HDR036−61	CNPV*4217A**	58CV(A,X)090−16	33,400	12.0	14.5
3116368	38HDR036−61	CNPV*4217A**	58MEB040−12	33,400	12.0	14.5
3116369	38HDR036−61	CNPV*4217A**	58MEB060−12	33,400	12.0	14.5
3116370	38HDR036−61	CNPV*4217A**	58MEB080−12	33,400	12.0	14.5
3116371	38HDR036−61	CNPV*4217A**	58MEB080−16	33,400	12.0	14.5
3116365	38HDR036−61	CNPV*4217A**	58MV(B,C)060−14	33,400	12.0	14.5
3116367	38HDR036−61	CNPV*4217A**	58PH*070−16	33,400	12.0	14.5
3116364	38HDR036−61	CNPV*4217A**+TDR		33,400	11.0	13.0
1117696	38HDR036−61	CNPV*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1117548	38HDR036−61	CNPV*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
3116372	38HDR036−61	CNPV*4221A**	58MEB100−20	33,400	12.0	14.5
1390698	38HDR036−61	CNPV*4221A**	58MV(B,C)060−14	33,400	11.5	14.5
1390706	38HDR036−61	CNPV*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390724	38HDR036−61	CNPV*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390742	38HDR036−61	CNPV*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015502	38HDR036−61	CNPV*4221A**	58PH*090−16	33,400	12.0	14.5
3015503	38HDR036−61	CNPV*4221A**	58PH*110−20	33,400	12.0	14.5
1117614	38HDR036−61	CSPH*3612A**	58CV(A,X)070−12	33,000	11.5	14.0
1117616	38HDR036−61	CSPH*3612A**	58CV(A,X)090−16	33,000	11.5	14.5
1117618	38HDR036−61	CSPH*3612A**	58CV(A,X)110−20	33,000	11.5	14.5
1117620	38HDR036−61	CSPH*3612A**	58CV(A,X)135−22	33,000	11.5	14.5
1117622	38HDR036−61	CSPH*3612A**	58CV(A,X)155−22	33,000	11.5	14.5
3116383	38HDR036−61	CSPH*3612A**	58MEB040−12	33,000	12.0	14.5
3116384	38HDR036−61	CSPH*3612A**	58MEB060−12	33,000	12.0	14.5
3116385	38HDR036−61	CSPH*3612A**	58MEB080−12	33,000	12.0	14.5
3116386	38HDR036−61	CSPH*3612A**	58MEB080−16	33,000	12.0	14.5
3116387	38HDR036−61	CSPH*3612A**	58MEB100−20	33,000	12.0	14.5
1390688	38HDR036−61	CSPH*3612A**	58MV(B,C)060−14	33,000	11.5	14.5
1390712	38HDR036−61	CSPH*3612A**	58MV(B,C)080−14	33,000	11.5	14.0
1390730	38HDR036−61	CSPH*3612A**	58MV(B,C)080−20	33,000	11.5	14.0
1390748	38HDR036−61	CSPH*3612A**	58MV(B,C)100−20	33,000	11.5	14.5
1390760	38HDR036−61	CSPH*3612A**	58MV(B,C)120−20	33,000	11.5	14.5
3015512	38HDR036−61	CSPH*3612A**	58PH*045−08	33,000	11.5	14.0

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ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3015513	38HDR036−61	CSPH*3612A**	58PH*070−16	33,000	11.5	14.0
3015514	38HDR036−61	CSPH*3612A**	58PH*090−16	33,000	12.0	14.5
3015515	38HDR036−61	CSPH*3612A**	58PH*110−20	33,000	12.0	14.5
1117600	38HDR036−61	CSPH*3612A**+TDR		33,000	11.0	13.0
1117638	38HDR036−61	CSPH*4212A**	58CV(A,X)070−12	33,400	11.5	14.0
1117640	38HDR036−61	CSPH*4212A**	58CV(A,X)090−16	33,400	11.5	14.5
1117642	38HDR036−61	CSPH*4212A**	58CV(A,X)110−20	33,400	11.5	14.5
1117644	38HDR036−61	CSPH*4212A**	58CV(A,X)135−22	33,400	11.5	14.5
1117646	38HDR036−61	CSPH*4212A**	58CV(A,X)155−22	33,400	11.5	14.5
3116388	38HDR036−61	CSPH*4212A**	58MEB040−12	33,400	12.0	14.5
3116389	38HDR036−61	CSPH*4212A**	58MEB060−12	33,400	12.0	14.5
3116390	38HDR036−61	CSPH*4212A**	58MEB080−12	33,400	12.0	14.5
3116391	38HDR036−61	CSPH*4212A**	58MEB080−16	33,400	12.0	14.5
3116392	38HDR036−61	CSPH*4212A**	58MEB100−20	33,400	12.0	14.5
1390690	38HDR036−61	CSPH*4212A**	58MV(B,C)060−14	33,400	11.5	14.0
1390714	38HDR036−61	CSPH*4212A**	58MV(B,C)080−14	33,400	11.5	14.0
1390732	38HDR036−61	CSPH*4212A**	58MV(B,C)080−20	33,400	11.5	14.0
1390750	38HDR036−61	CSPH*4212A**	58MV(B,C)100−20	33,400	11.5	14.0
1390762	38HDR036−61	CSPH*4212A**	58MV(B,C)120−20	33,400	11.5	14.0
3015516	38HDR036−61	CSPH*4212A**	58PH*045−08	33,400	11.5	14.0
3015517	38HDR036−61	CSPH*4212A**	58PH*070−16	33,400	11.5	14.0
3015518	38HDR036−61	CSPH*4212A**	58PH*090−16	33,400	12.0	14.5
3015519	38HDR036−61	CSPH*4212A**	58PH*110−20	33,400	12.0	14.5
1117624	38HDR036−61	CSPH*4212A**+TDR		33,400	11.0	13.0
1117658	38HDR036−61	FE4AN(B,F)003+UI		33,000	11.5	14.0
1117660	38HDR036−61	FE4AN(B,F)005+UI		33,400	12.5	15.0
1117662	38HDR036−61	FE4ANB006+UI		33,400	12.5	15.0
1117656	38HDR036−61	FE4ANF002+UI		33,000	11.5	13.5
1117664	38HDR036−61	FF1ENP036		33,000	11.0	13.0
1117668	38HDR036−61	FV4BNB006		33,400	12.5	15.0
1117666	38HDR036−61	FV4BNF002		33,000	11.5	13.5
3404635	38HDR036−61	FV4CNB006		33,400	12.5	15.0
3404634	38HDR036−61	FV4CNF002		33,000	11.5	13.5
1117652	38HDR036−61	FX4CN(B,F)036		33,000	11.5	14.0
1117654	38HDR036−61	FX4CN(B,F)042		33,400	11.5	14.0
1117648	38HDR036−61	FY4ANF036		33,000	11.0	13.0
1117650	38HDR036−61	FY4ANF042		33,400	11.0	13.0
3465144	38HDR048−32	†CNPV*4821A**+TDR		47,000	11.0	13.0
3465807	38HDR048−32	40QAC048−3		45,500	11.5	13.0
3465146	38HDR048−32	CAP**4817A**	58CV(A,X)090−16	46,500	11.5	13.5
3465148	38HDR048−32	CAP**4817A**	58MEB080−16	46,500	11.5	14.0
3465147	38HDR048−32	CAP**4817A**	58PH*070−16	46,500	11.5	13.5
3465145	38HDR048−32	CAP**4817A**+TDR		46,500	11.0	13.0
3465152	38HDR048−32	CAP**4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465155	38HDR048−32	CAP**4821A**	58MEB100−20	46,500	11.5	14.0
3465150	38HDR048−32	CAP**4821A**	58MV(B,C)080−20	46,000	11.5	13.5
3465151	38HDR048−32	CAP**4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465153	38HDR048−32	CAP**4821A**	58PH*090−16	46,500	11.5	14.0
3465154	38HDR048−32	CAP**4821A**	58PH*110−20	46,500	11.5	14.0
3465149	38HDR048−32	CAP**4821A**+TDR		47,000	11.0	13.0
3465158	38HDR048−32	CAP**4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465159	38HDR048−32	CAP**4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465161	38HDR048−32	CAP**4824A**	58MEB120−20	46,500	11.5	14.0
3465157	38HDR048−32	CAP**4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465160	38HDR048−32	CAP**4824A**	58PH*135−20	46,500	11.5	14.0
3465156	38HDR048−32	CAP**4824A**+TDR		47,000	11.0	13.0
3465165	38HDR048−32	CAP**6021A**	58CV(A,X)110−20	47,000	11.5	13.5
3465168	38HDR048−32	CAP**6021A**	58MEB100−20	47,000	12.0	14.5
3465163	38HDR048−32	CAP**6021A**	58MV(B,C)080−20	47,000	11.5	13.5
3465164	38HDR048−32	CAP**6021A**	58MV(B,C)100−20	47,000	11.5	13.5
3465166	38HDR048−32	CAP**6021A**	58PH*090−16	47,000	12.0	14.5
3465167	38HDR048−32	CAP**6021A**	58PH*110−20	47,000	12.0	14.5
3465162	38HDR048−32	CAP**6021A**+TDR		47,500	11.0	13.0
3465171	38HDR048−32	CAP**6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465172	38HDR048−32	CAP**6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465174	38HDR048−32	CAP**6024A**	58MEB120−20	47,000	12.0	14.5
3465170	38HDR048−32	CAP**6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465173	38HDR048−32	CAP**6024A**	58PH*135−20	47,000	12.0	14.5
3465169	38HDR048−32	CAP**6024A**+TDR		47,500	11.0	13.0
3465221	38HDR048−32	CNPF*4818A**+TDR		46,000	11.0	13.0
3465197	38HDR048−32	CNPH*4821A**	58CV(A,X)090−16	46,500	11.5	13.5
3465198	38HDR048−32	CNPH*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465199	38HDR048−32	CNPH*4821A**	58CV(A,X)135−22	46,500	11.5	13.5
3465200	38HDR048−32	CNPH*4821A**	58CV(A,X)155−22	46,500	11.5	13.5
3465204	38HDR048−32	CNPH*4821A**	58MEB080−16	46,500	11.5	14.0
3465205	38HDR048−32	CNPH*4821A**	58MEB100−20	46,500	11.5	14.0
3465206	38HDR048−32	CNPH*4821A**	58MEB120−20	46,500	11.5	14.0
3465194	38HDR048−32	CNPH*4821A**	58MV(B,C)080−20	46,500	11.5	13.5

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ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465195	38HDR048−32	CNPH*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465196	38HDR048−32	CNPH*4821A**	58MV(B,C)120−20	46,500	11.5	13.5
3465201	38HDR048−32	CNPH*4821A**	58PH*090−16	46,500	11.5	13.5
3465202	38HDR048−32	CNPH*4821A**	58PH*110−20	46,500	11.5	13.5
3465203	38HDR048−32	CNPH*4821A**	58PH*135−20	46,500	11.5	13.5
3465193	38HDR048−32	CNPH*4821A**+TDR		47,000	11.0	13.0
3465211	38HDR048−32	CNPH*6024A**	58CV(A,X)090−16	47,000	11.5	13.5
3465212	38HDR048−32	CNPH*6024A**	58CV(A,X)110−20	47,000	11.5	13.5
3465213	38HDR048−32	CNPH*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465214	38HDR048−32	CNPH*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465218	38HDR048−32	CNPH*6024A**	58MEB080−16	47,000	11.5	14.0
3465219	38HDR048−32	CNPH*6024A**	58MEB100−20	47,000	12.0	14.5
3465220	38HDR048−32	CNPH*6024A**	58MEB120−20	47,000	12.0	14.5
3465208	38HDR048−32	CNPH*6024A**	58MV(B,C)080−20	47,000	11.5	13.5
3465209	38HDR048−32	CNPH*6024A**	58MV(B,C)100−20	47,000	11.5	13.5
3465210	38HDR048−32	CNPH*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465215	38HDR048−32	CNPH*6024A**	58PH*090−16	47,000	12.0	14.5
3465216	38HDR048−32	CNPH*6024A**	58PH*110−20	47,000	12.0	14.5
3465217	38HDR048−32	CNPH*6024A**	58PH*135−20	47,000	12.0	14.5
3465207	38HDR048−32	CNPH*6024A**+TDR		47,500	11.0	13.0
3465177	38HDR048−32	CNPV*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465180	38HDR048−32	CNPV*4821A**	58MEB100−20	46,500	11.5	13.5
3465175	38HDR048−32	CNPV*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465176	38HDR048−32	CNPV*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465178	38HDR048−32	CNPV*4821A**	58PH*090−16	46,500	11.5	14.0
3465179	38HDR048−32	CNPV*4821A**	58PH*110−20	46,500	11.5	14.0
3465183	38HDR048−32	CNPV*4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465184	38HDR048−32	CNPV*4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465186	38HDR048−32	CNPV*4824A**	58MEB120−20	46,500	11.5	14.0
3465182	38HDR048−32	CNPV*4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465185	38HDR048−32	CNPV*4824A**	58PH*135−20	46,500	11.5	14.0
3465181	38HDR048−32	CNPV*4824A**+TDR		47,000	11.0	13.0
3465189	38HDR048−32	CNPV*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465190	38HDR048−32	CNPV*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465192	38HDR048−32	CNPV*6024A**	58MEB120−20	47,000	12.0	14.5
3465188	38HDR048−32	CNPV*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465191	38HDR048−32	CNPV*6024A**	58PH*135−20	47,000	12.0	14.5
3465187	38HDR048−32	CNPV*6024A**+TDR		47,500	11.0	13.0
3465226	38HDR048−32	CSPH*4812A**	58CV(A,X)090−16	46,500	11.5	13.5
3465227	38HDR048−32	CSPH*4812A**	58CV(A,X)110−20	46,500	11.5	13.5
3465228	38HDR048−32	CSPH*4812A**	58CV(A,X)135−22	46,500	11.5	13.5
3465229	38HDR048−32	CSPH*4812A**	58CV(A,X)155−22	46,500	11.5	13.5
3465233	38HDR048−32	CSPH*4812A**	58MEB080−16	46,500	11.5	14.0
3465234	38HDR048−32	CSPH*4812A**	58MEB100−20	46,500	11.5	14.0
3465235	38HDR048−32	CSPH*4812A**	58MEB120−20	46,500	11.5	14.0
3465223	38HDR048−32	CSPH*4812A**	58MV(B,C)080−20	46,500	11.5	13.5
3465224	38HDR048−32	CSPH*4812A**	58MV(B,C)100−20	46,500	11.5	13.5
3465225	38HDR048−32	CSPH*4812A**	58MV(B,C)120−20	46,500	11.5	13.5
3465230	38HDR048−32	CSPH*4812A**	58PH*090−16	46,500	11.5	14.0
3465231	38HDR048−32	CSPH*4812A**	58PH*110−20	46,500	11.5	14.0
3465232	38HDR048−32	CSPH*4812A**	58PH*135−20	46,500	11.5	14.0
3465222	38HDR048−32	CSPH*4812A**+TDR		47,000	11.0	13.0
3465240	38HDR048−32	CSPH*6012A**	58CV(A,X)090−16	47,000	11.5	13.5
3465241	38HDR048−32	CSPH*6012A**	58CV(A,X)110−20	47,000	11.5	14.0
3465242	38HDR048−32	CSPH*6012A**	58CV(A,X)135−22	47,000	11.5	14.0
3465243	38HDR048−32	CSPH*6012A**	58CV(A,X)155−22	47,000	11.5	14.0
3465247	38HDR048−32	CSPH*6012A**	58MEB080−16	47,000	12.0	14.5
3465248	38HDR048−32	CSPH*6012A**	58MEB100−20	47,000	12.0	14.5
3465249	38HDR048−32	CSPH*6012A**	58MEB120−20	47,000	12.0	14.5
3465237	38HDR048−32	CSPH*6012A**	58MV(B,C)080−20	47,000	11.5	13.5
3465238	38HDR048−32	CSPH*6012A**	58MV(B,C)100−20	47,000	11.5	13.5
3465239	38HDR048−32	CSPH*6012A**	58MV(B,C)120−20	47,000	11.5	13.5
3465244	38HDR048−32	CSPH*6012A**	58PH*090−16	47,000	12.0	14.5
3465245	38HDR048−32	CSPH*6012A**	58PH*110−20	47,000	12.0	14.5
3465246	38HDR048−32	CSPH*6012A**	58PH*135−20	47,000	12.0	14.5
3465236	38HDR048−32	CSPH*6012A**+TDR		47,500	11.0	13.0
3465254	38HDR048−32	FE4AN(B,F)005+UI		47,000	11.5	13.5
3465255	38HDR048−32	FE4ANB006+UI		47,500	11.5	14.0
3465256	38HDR048−32	FV4BN(B,F)005		47,000	11.5	14.0
3465257	38HDR048−32	FV4BNB006		47,500	11.5	14.0
3465252	38HDR048−32	FX4CN(B,F)048		47,000	11.5	13.5
3465253	38HDR048−32	FX4CN(B,F)060		47,500	11.5	14.0
3465251	38HDR048−32	FY4ANB060		47,500	11.0	13.0
3465250	38HDR048−32	FY4ANF048		47,000	11.0	13.0
3465258	38HDR048−52	†CNPV*4821A**+TDR		47,000	11.0	13.0
3465808	38HDR048−52	40QAC048−3		45,500	11.5	13.0
3465260	38HDR048−52	CAP**4817A**	58CV(A,X)090−16	46,500	11.5	13.5
3465262	38HDR048−52	CAP**4817A**	58MEB080−16	46,500	11.5	14.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465261	38HDR048−52	CAP**4817A**	58PH*070−16	46,500	11.5	13.5
3465259	38HDR048−52	CAP**4817A**+TDR		46,500	11.0	13.0
3465266	38HDR048−52	CAP**4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465269	38HDR048−52	CAP**4821A**	58MEB100−20	46,500	11.5	14.0
3465264	38HDR048−52	CAP**4821A**	58MV(B,C)080−20	46,000	11.5	13.5
3465265	38HDR048−52	CAP**4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465267	38HDR048−52	CAP**4821A**	58PH*090−16	46,500	11.5	14.0
3465268	38HDR048−52	CAP**4821A**	58PH*110−20	46,500	11.5	14.0
3465263	38HDR048−52	CAP**4821A**+TDR		47,000	11.0	13.0
3465272	38HDR048−52	CAP**4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465273	38HDR048−52	CAP**4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465275	38HDR048−52	CAP**4824A**	58MEB120−20	46,500	11.5	14.0
3465271	38HDR048−52	CAP**4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465274	38HDR048−52	CAP**4824A**	58PH*135−20	46,500	11.5	14.0
3465270	38HDR048−52	CAP**4824A**+TDR		47,000	11.0	13.0
3465279	38HDR048−52	CAP**6021A**	58CV(A,X)110−20	47,000	11.5	13.5
3465282	38HDR048−52	CAP**6021A**	58MEB100−20	47,000	12.0	14.5
3465277	38HDR048−52	CAP**6021A**	58MV(B,C)080−20	47,000	11.5	13.5
3465278	38HDR048−52	CAP**6021A**	58MV(B,C)100−20	47,000	11.5	13.5
3465280	38HDR048−52	CAP**6021A**	58PH*090−16	47,000	12.0	14.5
3465281	38HDR048−52	CAP**6021A**	58PH*110−20	47,000	12.0	14.5
3465276	38HDR048−52	CAP**6021A**+TDR		47,500	11.0	13.0
3465285	38HDR048−52	CAP**6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465286	38HDR048−52	CAP**6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465288	38HDR048−52	CAP**6024A**	58MEB120−20	47,000	12.0	14.5
3465284	38HDR048−52	CAP**6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465287	38HDR048−52	CAP**6024A**	58PH*135−20	47,000	12.0	14.5
3465283	38HDR048−52	CAP**6024A**+TDR		47,500	11.0	13.0
3465335	38HDR048−52	CNPF*4818A**+TDR		46,000	11.0	13.0
3465311	38HDR048−52	CNPH*4821A**	58CV(A,X)090−16	46,500	11.5	13.5
3465312	38HDR048−52	CNPH*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465313	38HDR048−52	CNPH*4821A**	58CV(A,X)135−22	46,500	11.5	13.5
3465314	38HDR048−52	CNPH*4821A**	58CV(A,X)155−22	46,500	11.5	13.5
3465318	38HDR048−52	CNPH*4821A**	58MEB080−16	46,500	11.5	14.0
3465319	38HDR048−52	CNPH*4821A**	58MEB100−20	46,500	11.5	14.0
3465320	38HDR048−52	CNPH*4821A**	58MEB120−20	46,500	11.5	14.0
3465308	38HDR048−52	CNPH*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465309	38HDR048−52	CNPH*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465310	38HDR048−52	CNPH*4821A**	58MV(B,C)120−20	46,500	11.5	13.5
3465315	38HDR048−52	CNPH*4821A**	58PH*090−16	46,500	11.5	13.5
3465316	38HDR048−52	CNPH*4821A**	58PH*110−20	46,500	11.5	13.5
3465317	38HDR048−52	CNPH*4821A**	58PH*135−20	46,500	11.5	13.5
3465307	38HDR048−52	CNPH*4821A**+TDR		47,000	11.0	13.0
3465325	38HDR048−52	CNPH*6024A**	58CV(A,X)090−16	47,000	11.5	13.5
3465326	38HDR048−52	CNPH*6024A**	58CV(A,X)110−20	47,000	11.5	13.5
3465327	38HDR048−52	CNPH*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465328	38HDR048−52	CNPH*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465332	38HDR048−52	CNPH*6024A**	58MEB080−16	47,000	11.5	14.0
3465333	38HDR048−52	CNPH*6024A**	58MEB100−20	47,000	12.0	14.5
3465334	38HDR048−52	CNPH*6024A**	58MEB120−20	47,000	12.0	14.5
3465322	38HDR048−52	CNPH*6024A**	58MV(B,C)080−20	47,000	11.5	13.5
3465323	38HDR048−52	CNPH*6024A**	58MV(B,C)100−20	47,000	11.5	13.5
3465324	38HDR048−52	CNPH*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465329	38HDR048−52	CNPH*6024A**	58PH*090−16	47,000	12.0	14.5
3465330	38HDR048−52	CNPH*6024A**	58PH*110−20	47,000	12.0	14.5
3465331	38HDR048−52	CNPH*6024A**	58PH*135−20	47,000	12.0	14.5
3465321	38HDR048−52	CNPH*6024A**+TDR		47,500	11.0	13.0
3465291	38HDR048−52	CNPV*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465294	38HDR048−52	CNPV*4821A**	58MEB100−20	46,500	11.5	13.5
3465289	38HDR048−52	CNPV*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465290	38HDR048−52	CNPV*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465292	38HDR048−52	CNPV*4821A**	58PH*090−16	46,500	11.5	14.0
3465293	38HDR048−52	CNPV*4821A**	58PH*110−20	46,500	11.5	14.0
3465297	38HDR048−52	CNPV*4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465298	38HDR048−52	CNPV*4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465300	38HDR048−52	CNPV*4824A**	58MEB120−20	46,500	11.5	14.0
3465296	38HDR048−52	CNPV*4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465299	38HDR048−52	CNPV*4824A**	58PH*135−20	46,500	11.5	14.0
3465295	38HDR048−52	CNPV*4824A**+TDR		47,000	11.0	13.0
3465303	38HDR048−52	CNPV*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465304	38HDR048−52	CNPV*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465306	38HDR048−52	CNPV*6024A**	58MEB120−20	47,000	12.0	14.5
3465302	38HDR048−52	CNPV*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465305	38HDR048−52	CNPV*6024A**	58PH*135−20	47,000	12.0	14.5
3465301	38HDR048−52	CNPV*6024A**+TDR		47,500	11.0	13.0
3465340	38HDR048−52	CSPH*4812A**	58CV(A,X)090−16	46,500	11.5	13.5
3465341	38HDR048−52	CSPH*4812A**	58CV(A,X)110−20	46,500	11.5	13.5
3465342	38HDR048−52	CSPH*4812A**	58CV(A,X)135−22	46,500	11.5	13.5
3465343	38HDR048−52	CSPH*4812A**	58CV(A,X)155−22	46,500	11.5	13.5

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ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465347	38HDR048−52	CSPH*4812A**	58MEB080−16	46,500	11.5	14.0
3465348	38HDR048−52	CSPH*4812A**	58MEB100−20	46,500	11.5	14.0
3465349	38HDR048−52	CSPH*4812A**	58MEB120−20	46,500	11.5	14.0
3465337	38HDR048−52	CSPH*4812A**	58MV(B,C)080−20	46,500	11.5	13.5
3465338	38HDR048−52	CSPH*4812A**	58MV(B,C)100−20	46,500	11.5	13.5
3465339	38HDR048−52	CSPH*4812A**	58MV(B,C)120−20	46,500	11.5	13.5
3465344	38HDR048−52	CSPH*4812A**	58PH*090−16	46,500	11.5	14.0
3465345	38HDR048−52	CSPH*4812A**	58PH*110−20	46,500	11.5	14.0
3465346	38HDR048−52	CSPH*4812A**	58PH*135−20	46,500	11.5	14.0
3465336	38HDR048−52	CSPH*4812A**+TDR		47,000	11.0	13.0
3465354	38HDR048−52	CSPH*6012A**	58CV(A,X)090−16	47,000	11.5	13.5
3465355	38HDR048−52	CSPH*6012A**	58CV(A,X)110−20	47,000	11.5	14.0
3465356	38HDR048−52	CSPH*6012A**	58CV(A,X)135−22	47,000	11.5	14.0
3465357	38HDR048−52	CSPH*6012A**	58CV(A,X)155−22	47,000	11.5	14.0
3465361	38HDR048−52	CSPH*6012A**	58MEB080−16	47,000	12.0	14.5
3465362	38HDR048−52	CSPH*6012A**	58MEB100−20	47,000	12.0	14.5
3465363	38HDR048−52	CSPH*6012A**	58MEB120−20	47,000	12.0	14.5
3465351	38HDR048−52	CSPH*6012A**	58MV(B,C)080−20	47,000	11.5	13.5
3465352	38HDR048−52	CSPH*6012A**	58MV(B,C)100−20	47,000	11.5	13.5
3465353	38HDR048−52	CSPH*6012A**	58MV(B,C)120−20	47,000	11.5	13.5
3465358	38HDR048−52	CSPH*6012A**	58PH*090−16	47,000	12.0	14.5
3465359	38HDR048−52	CSPH*6012A**	58PH*110−20	47,000	12.0	14.5
3465360	38HDR048−52	CSPH*6012A**	58PH*135−20	47,000	12.0	14.5
3465350	38HDR048−52	CSPH*6012A**+TDR		47,500	11.0	13.0
3465368	38HDR048−52	FE4AN(B,F)005+UI		47,000	11.5	13.5
3465369	38HDR048−52	FE4ANB006+UI		47,500	11.5	14.0
3465370	38HDR048−52	FV4BN(B,F)005		47,000	11.5	14.0
3465371	38HDR048−52	FV4BNB006		47,500	11.5	14.0
3465366	38HDR048−52	FX4CN(B,F)048		47,000	11.5	13.5
3465367	38HDR048−52	FX4CN(B,F)060		47,500	11.5	14.0
3465365	38HDR048−52	FY4ANB060		47,500	11.0	13.0
3465364	38HDR048−52	FY4ANF048		47,000	11.0	13.0
3465372	38HDR048−62	†CNPV*4821A**+TDR		47,000	11.0	13.0
3465809	38HDR048−62	40QAC048−3		45,500	11.5	13.0
3465374	38HDR048−62	CAP**4817A**	58CV(A,X)090−16	46,500	11.5	13.5
3465376	38HDR048−62	CAP**4817A**	58MEB080−16	46,500	11.5	14.0
3465375	38HDR048−62	CAP**4817A**	58PH*070−16	46,500	11.5	13.5
3465373	38HDR048−62	CAP**4817A**+TDR		46,500	11.0	13.0
3465380	38HDR048−62	CAP**4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465383	38HDR048−62	CAP**4821A**	58MEB100−20	46,500	11.5	14.0
3465378	38HDR048−62	CAP**4821A**	58MV(B,C)080−20	46,000	11.5	13.5
3465379	38HDR048−62	CAP**4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465381	38HDR048−62	CAP**4821A**	58PH*090−16	46,500	11.5	14.0
3465382	38HDR048−62	CAP**4821A**	58PH*110−20	46,500	11.5	14.0
3465377	38HDR048−62	CAP**4821A**+TDR		47,000	11.0	13.0
3465386	38HDR048−62	CAP**4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465387	38HDR048−62	CAP**4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465389	38HDR048−62	CAP**4824A**	58MEB120−20	46,500	11.5	14.0
3465385	38HDR048−62	CAP**4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465388	38HDR048−62	CAP**4824A**	58PH*135−20	46,500	11.5	14.0
3465384	38HDR048−62	CAP**4824A**+TDR		47,000	11.0	13.0
3465393	38HDR048−62	CAP**6021A**	58CV(A,X)110−20	47,000	11.5	13.5
3465396	38HDR048−62	CAP**6021A**	58MEB100−20	47,000	12.0	14.5
3465391	38HDR048−62	CAP**6021A**	58MV(B,C)080−20	47,000	11.5	13.5
3465392	38HDR048−62	CAP**6021A**	58MV(B,C)100−20	47,000	11.5	13.5
3465394	38HDR048−62	CAP**6021A**	58PH*090−16	47,000	12.0	14.5
3465395	38HDR048−62	CAP**6021A**	58PH*110−20	47,000	12.0	14.5
3465390	38HDR048−62	CAP**6021A**+TDR		47,500	11.0	13.0
3465399	38HDR048−62	CAP**6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465400	38HDR048−62	CAP**6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465402	38HDR048−62	CAP**6024A**	58MEB120−20	47,000	12.0	14.5
3465398	38HDR048−62	CAP**6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465401	38HDR048−62	CAP**6024A**	58PH*135−20	47,000	12.0	14.5
3465397	38HDR048−62	CAP**6024A**+TDR		47,500	11.0	13.0
3465449	38HDR048−62	CNPF*4818A**+TDR		46,000	11.0	13.0
3465425	38HDR048−62	CNPH*4821A**	58CV(A,X)090−16	46,500	11.5	13.5
3465426	38HDR048−62	CNPH*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465427	38HDR048−62	CNPH*4821A**	58CV(A,X)135−22	46,500	11.5	13.5
3465428	38HDR048−62	CNPH*4821A**	58CV(A,X)155−22	46,500	11.5	13.5
3465432	38HDR048−62	CNPH*4821A**	58MEB080−16	46,500	11.5	14.0
3465433	38HDR048−62	CNPH*4821A**	58MEB100−20	46,500	11.5	14.0
3465434	38HDR048−62	CNPH*4821A**	58MEB120−20	46,500	11.5	14.0
3465422	38HDR048−62	CNPH*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465423	38HDR048−62	CNPH*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465424	38HDR048−62	CNPH*4821A**	58MV(B,C)120−20	46,500	11.5	13.5
3465429	38HDR048−62	CNPH*4821A**	58PH*090−16	46,500	11.5	13.5
3465430	38HDR048−62	CNPH*4821A**	58PH*110−20	46,500	11.5	13.5
3465431	38HDR048−62	CNPH*4821A**	58PH*135−20	46,500	11.5	13.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465421	38HDR048−62	CNPH*4821A**+TDR		47,000	11.0	13.0
3465439	38HDR048−62	CNPH*6024A**	58CV(A,X)090−16	47,000	11.5	13.5
3465440	38HDR048−62	CNPH*6024A**	58CV(A,X)110−20	47,000	11.5	13.5
3465441	38HDR048−62	CNPH*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465442	38HDR048−62	CNPH*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465446	38HDR048−62	CNPH*6024A**	58MEB080−16	47,000	11.5	14.0
3465447	38HDR048−62	CNPH*6024A**	58MEB100−20	47,000	12.0	14.5
3465448	38HDR048−62	CNPH*6024A**	58MEB120−20	47,000	12.0	14.5
3465436	38HDR048−62	CNPH*6024A**	58MV(B,C)080−20	47,000	11.5	13.5
3465437	38HDR048−62	CNPH*6024A**	58MV(B,C)100−20	47,000	11.5	13.5
3465438	38HDR048−62	CNPH*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465443	38HDR048−62	CNPH*6024A**	58PH*090−16	47,000	12.0	14.5
3465444	38HDR048−62	CNPH*6024A**	58PH*110−20	47,000	12.0	14.5
3465445	38HDR048−62	CNPH*6024A**	58PH*135−20	47,000	12.0	14.5
3465435	38HDR048−62	CNPH*6024A**+TDR		47,500	11.0	13.0
3465405	38HDR048−62	CNPV*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465408	38HDR048−62	CNPV*4821A**	58MEB100−20	46,500	11.5	13.5
3465403	38HDR048−62	CNPV*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465404	38HDR048−62	CNPV*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465406	38HDR048−62	CNPV*4821A**	58PH*090−16	46,500	11.5	14.0
3465407	38HDR048−62	CNPV*4821A**	58PH*110−20	46,500	11.5	14.0
3465411	38HDR048−62	CNPV*4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465412	38HDR048−62	CNPV*4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465414	38HDR048−62	CNPV*4824A**	58MEB120−20	46,500	11.5	14.0
3465410	38HDR048−62	CNPV*4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465413	38HDR048−62	CNPV*4824A**	58PH*135−20	46,500	11.5	14.0
3465409	38HDR048−62	CNPV*4824A**+TDR		47,000	11.0	13.0
3465417	38HDR048−62	CNPV*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465418	38HDR048−62	CNPV*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465420	38HDR048−62	CNPV*6024A**	58MEB120−20	47,000	12.0	14.5
3465416	38HDR048−62	CNPV*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465419	38HDR048−62	CNPV*6024A**	58PH*135−20	47,000	12.0	14.5
3465415	38HDR048−62	CNPV*6024A**+TDR		47,500	11.0	13.0
3465454	38HDR048−62	CSPH*4812A**	58CV(A,X)090−16	46,500	11.5	13.5
3465455	38HDR048−62	CSPH*4812A**	58CV(A,X)110−20	46,500	11.5	13.5
3465456	38HDR048−62	CSPH*4812A**	58CV(A,X)135−22	46,500	11.5	13.5
3465457	38HDR048−62	CSPH*4812A**	58CV(A,X)155−22	46,500	11.5	13.5
3465461	38HDR048−62	CSPH*4812A**	58MEB080−16	46,500	11.5	14.0
3465462	38HDR048−62	CSPH*4812A**	58MEB100−20	46,500	11.5	14.0
3465463	38HDR048−62	CSPH*4812A**	58MEB120−20	46,500	11.5	14.0
3465451	38HDR048−62	CSPH*4812A**	58MV(B,C)080−20	46,500	11.5	13.5
3465452	38HDR048−62	CSPH*4812A**	58MV(B,C)100−20	46,500	11.5	13.5
3465453	38HDR048−62	CSPH*4812A**	58MV(B,C)120−20	46,500	11.5	13.5
3465458	38HDR048−62	CSPH*4812A**	58PH*090−16	46,500	11.5	14.0
3465459	38HDR048−62	CSPH*4812A**	58PH*110−20	46,500	11.5	14.0
3465460	38HDR048−62	CSPH*4812A**	58PH*135−20	46,500	11.5	14.0
3465450	38HDR048−62	CSPH*4812A**+TDR		47,000	11.0	13.0
3465468	38HDR048−62	CSPH*6012A**	58CV(A,X)090−16	47,000	11.5	13.5
3465469	38HDR048−62	CSPH*6012A**	58CV(A,X)110−20	47,000	11.5	14.0
3465470	38HDR048−62	CSPH*6012A**	58CV(A,X)135−22	47,000	11.5	14.0
3465471	38HDR048−62	CSPH*6012A**	58CV(A,X)155−22	47,000	11.5	14.0
3465475	38HDR048−62	CSPH*6012A**	58MEB080−16	47,000	12.0	14.5
3465476	38HDR048−62	CSPH*6012A**	58MEB100−20	47,000	12.0	14.5
3465477	38HDR048−62	CSPH*6012A**	58MEB120−20	47,000	12.0	14.5
3465465	38HDR048−62	CSPH*6012A**	58MV(B,C)080−20	47,000	11.5	13.5
3465466	38HDR048−62	CSPH*6012A**	58MV(B,C)100−20	47,000	11.5	13.5
3465467	38HDR048−62	CSPH*6012A**	58MV(B,C)120−20	47,000	11.5	13.5
3465472	38HDR048−62	CSPH*6012A**	58PH*090−16	47,000	12.0	14.5
3465473	38HDR048−62	CSPH*6012A**	58PH*110−20	47,000	12.0	14.5
3465474	38HDR048−62	CSPH*6012A**	58PH*135−20	47,000	12.0	14.5
3465464	38HDR048−62	CSPH*6012A**+TDR		47,500	11.0	13.0
3465482	38HDR048−62	FE4AN(B,F)005+UI		47,000	11.5	13.5
3465483	38HDR048−62	FE4ANB006+UI		47,500	11.5	14.0
3465484	38HDR048−62	FV4BN(B,F)005		47,000	11.5	14.0
3465485	38HDR048−62	FV4BNB006		47,500	11.5	14.0
3465480	38HDR048−62	FX4CN(B,F)048		47,000	11.5	13.5
3465481	38HDR048−62	FX4CN(B,F)060		47,500	11.5	14.0
3465479	38HDR048−62	FY4ANB060		47,500	11.0	13.0
3465478	38HDR048−62	FY4ANF048		47,000	11.0	13.0
3465024	38HDR060−32	†CNPV*6024A**+TDR		57,000	11.0	13.0
3465810	38HDR060−32	40QAC060−3		56,000	11.0	13.0
3465026	38HDR060−32	CAP**6021A**	58CV(A,X)110−20	56,000	11.0	13.2
3465029	38HDR060−32	CAP**6021A**	58MEB100−20	56,000	11.0	13.5
3465027	38HDR060−32	CAP**6021A**	58PH*090−16	56,000	11.0	13.2
3465028	38HDR060−32	CAP**6021A**	58PH*110−20	56,000	11.0	13.5
3465025	38HDR060−32	CAP**6021A**+TDR		57,000	11.0	13.0
3465031	38HDR060−32	CAP**6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465032	38HDR060−32	CAP**6024A**	58CV(A,X)155−22	56,000	11.0	13.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465034	38HDR060−32	CAP**6024A**	58MEB120−20	56,000	11.0	13.5
3465033	38HDR060−32	CAP**6024A**	58PH*135−20	56,000	11.0	13.5
3465030	38HDR060−32	CAP**6024A**+TDR		57,000	11.0	13.0
3465040	38HDR060−32	CNPH*6024A**	58CV(A,X)110−20	56,000	11.0	13.2
3465041	38HDR060−32	CNPH*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465042	38HDR060−32	CNPH*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465046	38HDR060−32	CNPH*6024A**	58MEB080−16	56,000	11.0	13.2
3465047	38HDR060−32	CNPH*6024A**	58MEB100−20	56,000	11.0	13.5
3465048	38HDR060−32	CNPH*6024A**	58MEB120−20	56,000	11.0	13.5
3465043	38HDR060−32	CNPH*6024A**	58PH*090−16	56,000	11.0	13.2
3465044	38HDR060−32	CNPH*6024A**	58PH*110−20	56,000	11.0	13.5
3465045	38HDR060−32	CNPH*6024A**	58PH*135−20	56,000	11.0	13.5
3465039	38HDR060−32	CNPH*6024A**+TDR		57,000	11.0	13.0
3465035	38HDR060−32	CNPV*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465036	38HDR060−32	CNPV*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465038	38HDR060−32	CNPV*6024A**	58MEB120−20	56,000	11.0	13.5
3465037	38HDR060−32	CNPV*6024A**	58PH*135−20	56,000	11.0	13.5
3465051	38HDR060−32	CSPH*6012A**	58CV(A,X)110−20	56,000	11.0	13.5
3465052	38HDR060−32	CSPH*6012A**	58CV(A,X)135−22	56,000	11.0	13.5
3465053	38HDR060−32	CSPH*6012A**	58CV(A,X)155−22	56,000	11.0	13.5
3465057	38HDR060−32	CSPH*6012A**	58MEB080−16	56,000	11.0	13.2
3465058	38HDR060−32	CSPH*6012A**	58MEB100−20	56,000	11.0	13.5
3465059	38HDR060−32	CSPH*6012A**	58MEB120−20	56,000	11.0	13.5
3465050	38HDR060−32	CSPH*6012A**	58MV(B,C)120−20	56,000	11.0	13.2
3465054	38HDR060−32	CSPH*6012A**	58PH*090−16	56,000	11.0	13.5
3465055	38HDR060−32	CSPH*6012A**	58PH*110−20	56,000	11.0	13.5
3465056	38HDR060−32	CSPH*6012A**	58PH*135−20	56,000	11.0	13.5
3465049	38HDR060−32	CSPH*6012A**+TDR		57,000	11.0	13.0
3465062	38HDR060−32	FE4ANB006+UI		57,500	11.0	13.5
3465063	38HDR060−32	FV4BNB006		57,500	11.0	13.5
3465061	38HDR060−32	FX4CN(B,F)060		57,500	11.0	13.5
3465060	38HDR060−32	FY4ANB060		57,000	11.0	13.0
3465064	38HDR060−52	†CNPV*6024A**+TDR		57,000	11.0	13.0
3465811	38HDR060−52	40QAC060−3		56,000	11.0	13.0
3465066	38HDR060−52	CAP**6021A**	58CV(A,X)110−20	56,000	11.0	13.2
3465069	38HDR060−52	CAP**6021A**	58MEB100−20	56,000	11.0	13.5
3465067	38HDR060−52	CAP**6021A**	58PH*090−16	56,000	11.0	13.2
3465068	38HDR060−52	CAP**6021A**	58PH*110−20	56,000	11.0	13.5
3465065	38HDR060−52	CAP**6021A**+TDR		57,000	11.0	13.0
3465071	38HDR060−52	CAP**6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465072	38HDR060−52	CAP**6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465074	38HDR060−52	CAP**6024A**	58MEB120−20	56,000	11.0	13.5
3465073	38HDR060−52	CAP**6024A**	58PH*135−20	56,000	11.0	13.5
3465070	38HDR060−52	CAP**6024A**+TDR		57,000	11.0	13.0
3465080	38HDR060−52	CNPH*6024A**	58CV(A,X)110−20	56,000	11.0	13.2
3465081	38HDR060−52	CNPH*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465082	38HDR060−52	CNPH*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465086	38HDR060−52	CNPH*6024A**	58MEB080−16	56,000	11.0	13.2
3465087	38HDR060−52	CNPH*6024A**	58MEB100−20	56,000	11.0	13.5
3465088	38HDR060−52	CNPH*6024A**	58MEB120−20	56,000	11.0	13.5
3465083	38HDR060−52	CNPH*6024A**	58PH*090−16	56,000	11.0	13.2
3465084	38HDR060−52	CNPH*6024A**	58PH*110−20	56,000	11.0	13.5
3465085	38HDR060−52	CNPH*6024A**	58PH*135−20	56,000	11.0	13.5
3465079	38HDR060−52	CNPH*6024A**+TDR		57,000	11.0	13.0
3465075	38HDR060−52	CNPV*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465076	38HDR060−52	CNPV*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465078	38HDR060−52	CNPV*6024A**	58MEB120−20	56,000	11.0	13.5
3465077	38HDR060−52	CNPV*6024A**	58PH*135−20	56,000	11.0	13.5
3465091	38HDR060−52	CSPH*6012A**	58CV(A,X)110−20	56,000	11.0	13.5
3465092	38HDR060−52	CSPH*6012A**	58CV(A,X)135−22	56,000	11.0	13.5
3465093	38HDR060−52	CSPH*6012A**	58CV(A,X)155−22	56,000	11.0	13.5
3465097	38HDR060−52	CSPH*6012A**	58MEB080−16	56,000	11.0	13.2
3465098	38HDR060−52	CSPH*6012A**	58MEB100−20	56,000	11.0	13.5
3465099	38HDR060−52	CSPH*6012A**	58MEB120−20	56,000	11.0	13.5
3465090	38HDR060−52	CSPH*6012A**	58MV(B,C)120−20	56,000	11.0	13.2
3465094	38HDR060−52	CSPH*6012A**	58PH*090−16	56,000	11.0	13.5
3465095	38HDR060−52	CSPH*6012A**	58PH*110−20	56,000	11.0	13.5
3465096	38HDR060−52	CSPH*6012A**	58PH*135−20	56,000	11.0	13.5
3465089	38HDR060−52	CSPH*6012A**+TDR		57,000	11.0	13.0
3465102	38HDR060−52	FE4ANB006+UI		57,500	11.0	13.5
3465103	38HDR060−52	FV4BNB006		57,500	11.0	13.5
3465101	38HDR060−52	FX4CN(B,F)060		57,500	11.0	13.5
3465100	38HDR060−52	FY4ANB060		57,000	11.0	13.0
3465104	38HDR060−62	†CNPV*6024A**+TDR		57,000	11.0	13.0
3465812	38HDR060−62	40QAC060−3		56,000	11.0	13.0
3465106	38HDR060−62	CAP**6021A**	58CV(A,X)110−20	56,000	11.0	13.2
3465109	38HDR060−62	CAP**6021A**	58MEB100−20	56,000	11.0	13.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465107	38HDR060−62	CAP**6021A**	58PH*090−16	56,000	11.0	13.2
3465108	38HDR060−62	CAP**6021A**	58PH*110−20	56,000	11.0	13.5
3465105	38HDR060−62	CAP**6021A**+TDR		57,000	11.0	13.0
3465111	38HDR060−62	CAP**6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465112	38HDR060−62	CAP**6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465114	38HDR060−62	CAP**6024A**	58MEB120−20	56,000	11.0	13.5
3465113	38HDR060−62	CAP**6024A**	58PH*135−20	56,000	11.0	13.5
3465110	38HDR060−62	CAP**6024A**+TDR		57,000	11.0	13.0
3465120	38HDR060−62	CNPH*6024A**	58CV(A,X)110−20	56,000	11.0	13.2
3465121	38HDR060−62	CNPH*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465122	38HDR060−62	CNPH*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465126	38HDR060−62	CNPH*6024A**	58MEB080−16	56,000	11.0	13.2
3465127	38HDR060−62	CNPH*6024A**	58MEB100−20	56,000	11.0	13.5
3465128	38HDR060−62	CNPH*6024A**	58MEB120−20	56,000	11.0	13.5
3465123	38HDR060−62	CNPH*6024A**	58PH*090−16	56,000	11.0	13.2
3465124	38HDR060−62	CNPH*6024A**	58PH*110−20	56,000	11.0	13.5
3465125	38HDR060−62	CNPH*6024A**	58PH*135−20	56,000	11.0	13.5
3465119	38HDR060−62	CNPH*6024A**+TDR		57,000	11.0	13.0
3465115	38HDR060−62	CNPV*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465116	38HDR060−62	CNPV*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465118	38HDR060−62	CNPV*6024A**	58MEB120−20	56,000	11.0	13.5
3465117	38HDR060−62	CNPV*6024A**	58PH*135−20	56,000	11.0	13.5
3465131	38HDR060−62	CSPH*6012A**	58CV(A,X)110−20	56,000	11.0	13.5
3465132	38HDR060−62	CSPH*6012A**	58CV(A,X)135−22	56,000	11.0	13.5
3465133	38HDR060−62	CSPH*6012A**	58CV(A,X)155−22	56,000	11.0	13.5
3465137	38HDR060−62	CSPH*6012A**	58MEB080−16	56,000	11.0	13.2
3465138	38HDR060−62	CSPH*6012A**	58MEB100−20	56,000	11.0	13.5
3465139	38HDR060−62	CSPH*6012A**	58MEB120−20	56,000	11.0	13.5
3465130	38HDR060−62	CSPH*6012A**	58MV(B,C)120−20	56,000	11.0	13.2
3465134	38HDR060−62	CSPH*6012A**	58PH*090−16	56,000	11.0	13.5
3465135	38HDR060−62	CSPH*6012A**	58PH*110−20	56,000	11.0	13.5
3465136	38HDR060−62	CSPH*6012A**	58PH*135−20	56,000	11.0	13.5
3465129	38HDR060−62	CSPH*6012A**+TDR		57,000	11.0	13.0
3465142	38HDR060−62	FE4ANB006+UI		57,500	11.0	13.5
3465143	38HDR060−62	FV4BNB006		57,500	11.0	13.5
3465141	38HDR060−62	FX4CN(B,F)060		57,500	11.0	13.5
3465140	38HDR060−62	FY4ANB060		57,000	11.0	13.0

† Tested combination

EER — Energy Efficiency Ratio

SEER — Seasonal Energy Efficiency Ratio

TDR — Time−Delay Relay. In most cases, only 1 method should be used to achieve TDR function. Using more than 1 method in a system may cause degradation in performance. Use either the accessory Time−Delay Relay KAATD0101TDR or a furnace equipped with TDR. Most Carrier furnaces are equipped with TDR.

TXV — Thermostatic Expansion Valve

NOTES:

1. Ratings are net values reflecting the effects of circulating fan motor heat. Supplemental electric heat is not included.
2. Tested outdoor/indoor combinations have been tested in accordance with DOE test procedures for central air conditioners. Ratings for other combinations are determined under DOE computer simulation procedures.
3. Determine actual CFM values obtainable for your system by referring to fan performance data in fan coil or furnace coil literature.
4. Do not apply with capillary tube coils as performance and reliability are significantly affected.

DETAILED COOLING CAPACITIES*

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR018 Outdoor Section With CNPV*1814A** Indoor Section																			
525	72 (22.2)	20.28	9.40	1.22	19.31	9.07	1.36	18.30	8.73	1.52	17.26	8.38	1.69	16.14	8.01	1.87	14.90	7.61	2.07
	67(19.4)	18.53	11.50	1.22	17.65	11.17	1.36	16.72	10.82	1.52	15.76	10.47	1.69	14.72	10.09	1.87	13.59	9.69	2.07
	62 (16.7)	16.93	13.58	1.23	16.13	13.24	1.37	15.29	12.89	1.52	14.43	12.52	1.69	13.57	13.57	1.87	12.71	12.71	2.07
	57 (13.9)	16.35	16.35	1.23	15.72	15.72	1.37	15.05	15.05	1.52	14.34	14.34	1.69	13.57	13.57	1.87	12.71	12.71	2.07
600	72(22.2)	20.65	9.87	1.25	19.63	9.53	1.39	18.59	9.18	1.54	17.50	8.83	1.71	16.34	8.46	1.90	15.05	8.05	2.10
	67(19.4)	18.90	12.25	1.25	17.97	11.91	1.39	17.00	11.56	1.55	16.00	11.20	1.72	14.93	10.82	1.90	13.75	10.41	2.10
	62 (16.7)	17.33	14.61	1.25	16.51	14.26	1.39	15.67	15.61	1.55	14.91	14.91	1.72	14.08	14.08	1.90	13.16	13.16	2.10
	57 (13.9)	17.07	17.07	1.25	16.39	16.39	1.39	15.67	15.67	1.55	14.91	14.91	1.72	14.08	14.08	1.90	13.16	13.16	2.10
675	72 (22.2)	20.91	10.30	1.27	19.86	9.96	1.41	18.78	9.61	1.57	17.67	9.26	1.74	16.47	8.88	1.93	15.15	8.46	2.13
	67 (19.4)	19.16	12.97	1.27	18.20	12.62	1.42	17.20	12.27	1.57	16.18	11.90	1.74	15.07	11.52	1.93	13.87	11.09	2.13
	62 (16.7)	17.70	17.52	1.28	16.94	16.94	1.42	16.17	16.17	1.57	15.37	15.37	1.74	14.49	14.49	1.93	13.52	13.52	2.13
	57(13.9)	17.67	17.67	1.28	16.94	16.94	1.42	16.17	16.17	1.57	15.37	15.37	1.74	14.49	14.49	1.93	13.52	13.52	2.13

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*1814A**	1.00	1.00	
40QAC(Q)024−3	1.06	1.01	
CAP**1814A**	1.00	1.01	
CAP**2414A**	1.02	1.02	
CAP**2417A**	1.02	1.02	
CNPF*2418A**	1.02	1.02	
CNPH*2417A**	1.02	1.02	
CNPV*2414A**	1.02	1.02	
CNPV*2417A**	1.02	1.02	
CSPH*2412A**	1.02	1.02	
FE4ANF002	1.02	0.98	
FF1ENP018	1.00	1.05	
FF1ENP024	1.02	1.07	
FV4BNF002	1.02	0.99	
FX4CNF018	1.00	0.96	
FX4CNF024	1.02	0.98	
FY4ANF018	1.00	1.05	
FY4ANF024	1.02	1.07	
CAP**1814A**	1.00	0.96	58CV(A,X)070−12
CAP**2414A**	1.02	0.98	58CV(A,X)070−12
CNPH*2417A**	1.02	0.98	58CV(A,X)070−12
CNPV*1814A**	0.10	0.10	58CV(A,X)070−12
CNPV*2414A**	1.02	0.98	58CV(A,X)070−12
CSPH*2412A**	1.02	0.98	58CV(A,X)070−12
CAP**2417A**	1.02	0.98	58CV(A,X)090−16
CNPH*2417A**	1.02	0.98	58CV(A,X)090−16
CNPV*2417A**	1.02	0.98	58CV(A,X)090−16
CSPH*2412A**	1.02	0.98	58CV(A,X)090−16
CAP**2417A**	1.02	0.94	58MEB040−12
CNPH*2417A**	1.02	0.94	58MEB040−12
CNPV*2417A**	1.02	0.94	58MEB040−12
CSPH*2412A**	1.02	0.94	58MEB040−12
CAP**2417A**	1.02	0.94	58MEB060−12
CNPH*2417A**	1.02	0.94	58MEB060−12
CNPV*2417A**	1.02	0.94	58MEB060−12
CSPH*2412A**	1.02	0.94	58MEB060−12
CAP**2417A**	1.02	0.98	58MV(B,C)060−14
CNPH*2417A**	1.02	0.98	58MV(B,C)060−14
CNPV*2417A**	1.02	0.98	58MV(B,C)060−14
CSPH*2412A**	1.02	0.98	58MV(B,C)060−14
CNPH*2417A**	1.02	0.98	58MV(B,C)080−14

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CSPH*2412A**	1.02	0.98	58MV(B,C)080−14
CNPH*2417A**	1.02	0.98	58MVB040−14
CSPH*2412A**	1.02	0.98	58MVB040−14
CAP**1814A**	0.10	0.10	58PH*045−08
CAP**2414A**	1.02	0.94	58PH*045−08
CNPH*2417A**	1.02	0.94	58PH*045−08
CNPV*1814A**	1.00	0.96	58PH*045−08
CNPV*2414A**	1.02	0.94	58PH*045−08
CSPH*2412A**	1.02	0.94	58PH*045−08

See notes on pg. 34

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR024 Outdoor Section With CNPV*2414A** Indoor Section																			
700	72 (22.2)	28.11	13.59	1.69	26.70	13.09	1.89	25.17	12.55	2.10	23.54	11.98	2.33	21.76	11.38	2.58	19.78	10.71	2.84
	67(19.4)	25.68	16.61	1.68	24.41	16.11	1.87	23.04	15.58	2.09	21.58	15.02	2.32	19.98	14.42	2.57	18.21	13.77	2.83
	62 (16.7)	23.47	19.61	1.67	22.34	19.11	1.86	21.13	18.58	2.08	19.86	18.01	2.31	18.57	18.57	2.55	17.23	17.23	2.82
	57 (13.9)	22.67	22.67	1.67	21.77	21.77	1.86	20.81	20.81	2.07	19.75	19.75	2.31	18.57	18.57	2.55	17.23	17.23	2.82
800	72(22.2)	28.62	14.25	1.73	27.14	13.73	1.93	25.53	13.18	2.14	23.83	12.61	2.37	21.98	11.99	2.62	19.92	11.32	2.88
	67(19.4)	26.18	17.67	1.72	24.84	17.16	1.91	23.40	16.61	2.13	21.88	16.05	2.36	20.22	15.43	2.61	18.38	14.76	2.87
	62 (16.7)	24.02	21.07	1.71	22.85	20.54	1.90	21.63	21.51	2.12	20.48	20.48	2.35	19.20	19.20	2.60	17.75	17.75	2.86
	57 (13.9)	23.64	23.64	1.71	22.68	22.68	1.90	21.62	21.62	2.12	20.48	20.48	2.35	19.20	19.20	2.60	17.75	17.75	2.86
900	72 (22.2)	28.99	14.87	1.77	27.45	14.34	1.96	25.78	13.78	2.18	24.03	13.20	2.41	22.12	12.57	2.66	20.00	11.89	2.92
	67 (19.4)	26.54	18.68	1.76	25.15	18.16	1.95	23.66	17.61	2.17	22.09	17.03	2.40	20.38	16.40	2.65	18.50	15.71	2.91
	62 (16.7)	24.51	22.41	1.75	23.41	23.41	1.94	22.28	22.28	2.16	21.06	21.06	2.39	19.70	19.70	2.64	18.15	18.15	2.91
	57(13.9)	24.45	24.45	1.75	23.41	23.41	1.94	22.28	22.28	2.16	21.06	21.06	2.39	19.70	19.70	2.64	18.15	18.15	2.91

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*2414A**	1.00	1.00	
40QAC024−3	0.97	0.93	
CAP**2414A**	1.00	1.00	
CAP**2417A**	1.00	1.00	
CAP**3014A**	1.01	1.01	
CAP**3017A**	1.01	1.01	
CNPF*2418A**	1.00	1.00	
CNPH*2417A**	1.00	1.00	
CNPH*3017A**	1.01	1.01	
CNPV*2417A**	1.00	1.00	
CNPV*3014A**	1.01	1.01	
CNPV*3017A**	1.01	1.01	
CSPH*2412A**	1.00	1.00	
CSPH*3012A**	1.01	1.01	
FE4AN(B,F)003	1.02	0.93	
FE4ANF002	1.01	0.92	
FE5ANB004	1.03	0.94	
FF1ENP024	0.97	0.97	
FF1ENP025	1.00	0.96	
FF1ENP030	0.98	0.98	
FF1ENP031	1.01	0.96	
FF1ENP037	1.02	0.97	
FV4BN(B,F)003	1.02	0.93	
FV4BNF002	1.01	0.92	
FV4CN(B,F)003	1.02	0.93	
FV4CNF002	1.01	0.92	
FX4CNF024	1.00	0.96	
FX4CNF030	1.02	0.97	
FY4ANF024	0.99	0.99	
FY4ANF030	1.01	1.01	
CAP**2414A**	1.00	0.96	58CV(A,X)070−12
CAP**3014A**	1.00	0.96	58CV(A,X)070−12
CNPH*2417A**	1.00	0.96	58CV(A,X)070−12
CNPH*3017A**	1.00	0.96	58CV(A,X)070−12
CNPV*2414A**	1.00	0.96	58CV(A,X)070−12
CNPV*3014A**	1.00	0.96	58CV(A,X)070−12
CSPH*2412A**	1.00	0.96	58CV(A,X)070−12
CSPH*3012A**	1.01	0.96	58CV(A,X)070−12
CAP**2417A**	1.00	0.96	58CV(A,X)090−16
CAP**3017A**	1.01	0.96	58CV(A,X)090−16
CNPH*2417A**	1.00	0.96	58CV(A,X)090−16
CNPH*3017A**	1.01	0.96	58CV(A,X)090−16

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPV*2417A**	1.00	0.96	58CV(A,X)090−16
CNPV*3017A**	1.01	0.96	58CV(A,X)090−16
CSPH*2412A**	1.00	0.96	58CV(A,X)090−16
CSPH*3012A**	1.01	0.96	58CV(A,X)090−16
CNPH*2417A**	1.00	0.96	58CV(A,X)110−20
CNPH*3017A**	1.01	0.96	58CV(A,X)110−20
CSPH*2412A**	1.00	0.96	58CV(A,X)110−20
CSPH*3012A**	1.01	0.96	58CV(A,X)110−20
CNPH*2417A**	1.00	0.96	58CV(A,X)135−22
CNPH*3017A**	1.01	0.96	58CV(A,X)135−22
CSPH*2412A**	1.00	0.96	58CV(A,X)135−22
CSPH*3012A**	1.01	0.96	58CV(A,X)135−22
CNPH*2417A**	1.00	0.96	58CV(A,X)155−22
CNPH*3017A**	1.01	0.96	58CV(A,X)155−22
CSPH*2412A**	1.00	0.96	58CV(A,X)155−22
CSPH*3012A**	1.01	0.96	58CV(A,X)155−22
CAP**2417A**	1.00	0.92	58MEB040−12
CAP**3017A**	1.01	0.92	58MEB040−12
CNPH*2417A**	1.00	0.92	58MEB040−12
CNPH*3017A**	1.01	0.92	58MEB040−12
CNPV*2417A**	1.00	0.92	58MEB040−12
CNPV*3017A**	1.01	0.92	58MEB040−12
CSPH*2412A**	1.00	0.92	58MEB040−12
CSPH*3012A**	1.01	0.92	58MEB040−12
CAP**2417A**	1.00	0.92	58MEB060−12
CAP**3017A**	1.01	0.92	58MEB060−12
CNPH*2417A**	1.00	0.92	58MEB060−12
CNPH*3017A**	1.01	0.92	58MEB060−12
CNPV*2417A**	1.00	0.92	58MEB060−12
CNPV*3017A**	1.01	0.92	58MEB060−12
CSPH*2412A**	1.00	0.92	58MEB060−12
CSPH*3012A**	1.01	0.92	58MEB060−12
CAP**2417A**	1.00	0.92	58MEB080−12
CAP**3017A**	1.01	0.92	58MEB080−12
CNPH*2417A**	1.00	0.92	58MEB080−12
CNPH*3017A**	1.01	0.92	58MEB080−12
CNPV*2417A**	1.00	0.92	58MEB080−12
CNPV*3017A**	1.01	0.92	58MEB080−12
CSPH*2412A**	1.00	0.92	58MEB080−12
CSPH*3012A**	1.01	0.92	58MEB080−12
CAP**2417A**	1.00	0.96	58MV(B,C)060−14
CAP**3017A**	1.01	0.96	58MV(B,C)060−14

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPH*2417A**	1.00	0.96	58MV(B,C)060−14
CNPH*3017A**	1.01	0.96	58MV(B,C)060−14
CNPV*2417A**	1.00	0.96	58MV(B,C)060−14
CNPV*3017A**	1.01	0.96	58MV(B,C)060−14
CSPH*2412A**	1.00	0.96	58MV(B,C)060−14
CSPH*3012A**	1.01	0.96	58MV(B,C)060−14
CNPH*2417A**	1.00	0.96	58MV(B,C)080−14
CNPH*3017A**	1.00	0.96	58MV(B,C)080−14
CSPH*2412A**	1.00	0.96	58MV(B,C)080−14
CSPH*3012A**	1.01	0.96	58MV(B,C)080−14
CNPH*2417A**	0.99	0.95	58MV(B,C)080−20
CNPH*3017A**	1.00	0.96	58MV(B,C)080−20
CSPH*2412A**	1.00	0.96	58MV(B,C)080−20
CSPH*3012A**	1.00	0.96	58MV(B,C)080−20
CNPH*2417A**	1.00	0.96	58MV(B,C)100−20
CNPH*3017A**	1.01	0.96	58MV(B,C)100−20
CSPH*2412A**	1.00	0.96	58MV(B,C)100−20
CSPH*3012A**	1.01	0.96	58MV(B,C)100−20
CNPH*2417A**	1.00	0.96	58MV(B,C)120−20
CNPH*3017A**	1.01	0.96	58MV(B,C)120−20
CSPH*2412A**	1.00	0.96	58MV(B,C)120−20
CSPH*3012A**	1.01	0.96	58MV(B,C)120−20
CNPH*2417A**	1.00	0.96	58MVB040−14
CNPH*3017A**	1.01	0.96	58MVB040−14
CSPH*2412A**	1.00	0.96	58MVB040−14
CSPH*3012A**	1.01	0.96	58MVB040−14
CAP**2414A**	1.00	0.96	58PH*045−08
CAP**3014A**	1.01	0.92	58PH*045−08
CNPH*2417A**	1.00	0.96	58PH*045−08
CNPH*3017A**	1.01	0.92	58PH*045−08
CNPV*2414A**	1.00	0.96	58PH*045−08
CNPV*3014A**	1.01	0.96	58PH*045−08
CSPH*2412A**	1.00	0.96	58PH*045−08
CSPH*3012A**	1.01	0.92	58PH*045−08

See notes on pg. 34

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR030 Outdoor Section With CNPV*3014A** Indoor Section																			
875	72 (22.2)	33.74	16.03	2.06	32.29	15.52	2.29	30.76	14.99	2.54	29.12	14.43	2.81	27.36	13.84	3.11	25.42	13.19	3.44
	67(19.4)	30.65	19.58	2.06	29.32	19.06	2.29	27.90	18.51	2.54	26.39	17.94	2.81	24.76	17.34	3.11	22.97	16.69	3.43
	62 (16.7)	28.07	23.01	2.07	26.73	22.59	2.29	25.47	22.03	2.54	24.10	21.45	2.81	22.76	22.72	3.11	21.45	21.45	3.43
	57 (13.9)	27.14	27.14	2.07	26.16	26.16	2.29	25.11	25.11	2.53	24.01	24.01	2.80	22.78	22.78	3.11	21.43	21.43	3.43
1000	72(22.2)	34.29	16.79	2.11	32.87	16.29	2.34	31.28	15.69	2.58	29.58	15.18	2.86	27.57	14.54	3.17	25.64	13.91	3.49
	67(19.4)	31.27	20.81	2.11	29.84	20.29	2.34	28.40	19.75	2.58	26.82	19.17	2.86	24.99	18.52	3.16	23.21	17.87	3.49
	62 (16.7)	28.72	24.92	2.11	27.38	24.26	2.34	26.11	26.11	2.58	24.94	24.94	2.85	23.54	23.54	3.16	22.22	22.22	3.48
	57 (13.9)	28.28	28.28	2.11	27.23	27.23	2.34	26.13	26.13	2.58	24.94	24.94	2.85	23.54	23.54	3.16	22.22	22.22	3.48
1125	72 (22.2)	34.76	17.52	2.16	33.30	17.00	2.39	31.65	16.46	2.63	29.90	15.89	2.91	28.03	15.27	3.21	25.95	14.60	3.53
	67 (19.4)	31.86	21.48	2.16	30.25	21.46	2.38	28.76	20.92	2.63	27.14	20.32	2.90	25.39	19.69	3.21	23.44	18.98	3.54
	62 (16.7)	29.27	29.04	2.16	28.12	28.12	2.38	26.98	26.98	2.63	25.71	25.71	2.90	24.35	24.35	3.20	22.84	22.84	3.53
	57(13.9)	29.23	29.23	2.16	28.13	28.13	2.38	26.99	26.99	2.63	25.71	25.71	2.90	24.23	24.23	3.21	22.85	22.85	3.53

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*3014A**	1.00	1.00	
CAP**3014A**	1.00	1.00	
CAP**3017A**	1.00	1.00	
CAP**3614A**	1.02	1.02	
CAP**3617A**	1.02	1.02	
CAP**3621A**	1.02	1.02	
CNPF*3618A**	1.02	1.02	
CNPH*3017A**	1.00	1.00	
CNPH*3617A**	1.02	1.02	
CNPV*3017A**	1.00	1.00	
CNPV*3617A**	1.02	1.02	
CNPV*3621A**	1.02	1.02	
CSPH*3012A**	1.00	1.00	
CSPH*3612A**	1.02	1.02	
40QAC(Q)036−3	1.04	1.06	
FE4AN(B,F)003	1.02	0.98	
FE4AN(B,F)005	1.04	0.91	
FE4ANF002	1.02	0.98	
FE5ANB004	1.00	0.88	
FF1ENP030	1.00	1.00	
FF1ENP036	1.02	1.02	
FV4BN(B,F)003	1.03	0.98	
FV4BN(B,F)005	1.04	0.99	
FV4BNF002	1.02	0.98	
FX4CN(B,F)036	1.02	0.98	
FX4CNF030	1.00	0.96	
FY4ANF030	1.00	1.00	
FY4ANF036	1.02	1.02	
CAP**3014A**	1.00	0.96	58CV(A,X)070−12
CAP**3614A**	1.02	0.98	58CV(A,X)070−12
CNPH*3017A**	1.00	0.96	58CV(A,X)070−12
CNPH*3617A**	1.02	0.98	58CV(A,X)070−12
CNPV*3014A**	1.02	0.98	58CV(A,X)070−12
CSPH*3012A**	1.00	0.96	58CV(A,X)070−12
CSPH*3612A**	1.02	0.98	58CV(A,X)070−12
CAP**3017A**	1.00	0.96	58CV(A,X)090−16
CAP**3617A**	1.02	0.98	58CV(A,X)090−16
CNPH*3017A**	1.00	0.96	58CV(A,X)090−16
CNPH*3617A**	1.02	0.98	58CV(A,X)090−16
CNPV*3017A**	1.00	0.96	58CV(A,X)090−16
CNPV*3617A**	1.02	0.98	58CV(A,X)090−16
CSPH*3012A**	1.00	0.96	58CV(A,X)090−16

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CSPH*3612A**	1.02	0.98	58CV(A,X)090−16
CAP**3621A**	1.02	0.98	58CV(A,X)110−20
CNPH*3017A**	1.00	0.96	58CV(A,X)110−20
CNPH*3617A**	1.02	0.98	58CV(A,X)110−20
CNPV*3621A**	1.02	0.98	58CV(A,X)110−20
CSPH*3012A**	1.00	0.96	58CV(A,X)110−20
CSPH*3612A**	1.02	0.98	58CV(A,X)110−20
CNPH*3017A**	1.00	0.96	58CV(A,X)135−22
CNPH*3617A**	1.02	0.98	58CV(A,X)135−22
CSPH*3012A**	1.00	0.96	58CV(A,X)135−22
CSPH*3612A**	1.02	0.98	58CV(A,X)135−22
CNPH*3017A**	1.00	0.96	58CV(A,X)155−22
CNPH*3617A**	1.02	0.98	58CV(A,X)155−22
CSPH*3012A**	1.00	0.96	58CV(A,X)155−22
CSPH*3612A**	1.02	0.98	58CV(A,X)155−22
CAP**3017A**	1.00	0.92	58MEB040−12
CAP**3617A**	1.02	0.94	58MEB040−12
CNPH*3017A**	1.00	0.92	58MEB040−12
CNPH*3617A**	1.02	0.94	58MEB040−12
CNPV*3017A**	1.00	0.92	58MEB040−12
CNPV*3617A**	1.02	0.94	58MEB040−12
CSPH*3012A**	1.00	0.92	58MEB040−12
CSPH*3612A**	1.02	0.94	58MEB040−12
CAP**3017A**	1.00	0.92	58MEB060−12
CAP**3617A**	1.02	0.94	58MEB060−12
CNPH*3017A**	1.00	0.92	58MEB060−12
CNPH*3617A**	1.02	0.94	58MEB060−12
CNPV*3017A**	1.00	0.92	58MEB060−12
CNPV*3617A**	1.02	0.94	58MEB060−12
CSPH*3012A**	1.00	0.92	58MEB060−12
CSPH*3612A**	1.02	0.94	58MEB060−12
CAP**3017A**	1.00	0.92	58MEB080−12
CAP**3617A**	1.02	0.94	58MEB080−12
CNPH*3017A**	1.00	0.92	58MEB080−12
CNPH*3617A**	1.02	0.94	58MEB080−12
CNPV*3017A**	1.00	0.92	58MEB080−12
CNPV*3617A**	1.02	0.94	58MEB080−12
CSPH*3012A**	1.00	0.92	58MEB080−12
CSPH*3612A**	1.02	0.94	58MEB080−12
CAP**3017A**	1.00	0.92	58MEB080−16
CAP**3617A**	1.02	0.94	58MEB080−16
CNPH*3017A**	1.00	0.92	58MEB080−16

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPH*3617A**	1.02	0.94	58MEB080−16
CNPV*3017A**	1.00	0.92	58MEB080−16
CNPV*3617A**	1.02	0.94	58MEB080−16
CSPH*3012A**	1.00	0.92	58MEB080−16
CSPH*3612A**	1.02	0.94	58MEB080−16
CAP**3017A**	1.00	0.96	58MV(B,C)060−14
CAP**3617A**	1.02	0.98	58MV(B,C)060−14
CNPH*3017A**	1.00	0.96	58MV(B,C)060−14
CNPH*3617A**	1.02	0.98	58MV(B,C)060−14
CNPV*3017A**	1.00	0.96	58MV(B,C)060−14
CNPV*3617A**	1.02	0.98	58MV(B,C)060−14
CSPH*3012A**	1.00	0.96	58MV(B,C)060−14
CSPH*3612A**	1.02	0.98	58MV(B,C)060−14
CAP**3621A**	1.02	0.98	58MV(B,C)080−14
CNPH*3017A**	1.00	0.96	58MV(B,C)080−14
CNPH*3617A**	1.02	0.98	58MV(B,C)080−14
CNPV*3621A**	1.02	0.98	58MV(B,C)080−14
CSPH*3012A**	1.00	0.96	58MV(B,C)080−14
CSPH*3612A**	1.02	0.98	58MV(B,C)080−14
CAP**3621A**	1.02	0.98	58MV(B,C)080−20
CNPH*3017A**	1.00	0.96	58MV(B,C)080−20
CNPH*3617A**	1.02	0.98	58MV(B,C)080−20
CNPV*3621A**	1.02	0.98	58MV(B,C)080−20
CSPH*3012A**	1.00	0.96	58MV(B,C)080−20
CSPH*3612A**	1.02	0.98	58MV(B,C)080−20
CAP**3621A**	1.02	0.98	58MV(B,C)100−20
CNPH*3017A**	1.00	0.96	58MV(B,C)100−20
CNPH*3617A**	1.02	0.98	58MV(B,C)100−20
CNPV*3621A**	1.02	0.98	58MV(B,C)100−20
CSPH*3012A**	1.00	0.96	58MV(B,C)100−20
CSPH*3612A**	1.02	0.98	58MV(B,C)100−20
CNPH*3017A**	1.00	0.96	58MV(B,C)120−20
CNPH*3617A**	1.02	0.98	58MV(B,C)120−20
CSPH*3012A**	1.00	0.96	58MV(B,C)120−20
CSPH*3612A**	1.02	0.98	58MV(B,C)120−20
CNPH*3617A**	1.02	0.98	58MVB040−14
CSPH*3012A**	1.00	0.96	58MVB040−14
CSPH*3612A**	1.02	0.98	58MVB040−14
CAP**3017A**	1.00	0.96	58PH*070−16
CAP**3617A**	1.02	0.94	58PH*070−16
CNPH*3017A**	1.00	0.96	58PH*070−16
CNPH*3617A**	1.02	0.94	58PH*070−16

DETAILED COOLING CAPACITIES* (CONT.)

38HDR030 Outdoor Section With CNPV*3014A Indoor Section**

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPV*3017A**	1.00	0.96	58PH*070–16
CNPV*3617A**	1.02	0.94	58PH*070–16
CSPH*3012A**	1.00	0.96	58PH*070–16
CSPH*3612A**	1.02	0.94	58PH*070–16
CAP**3621A**	1.02	0.94	58PH*090–16
CNPH*3017A**	1.00	0.96	58PH*090–16
CNPH*3617A**	1.02	0.94	58PH*090–16
CNPV*3621A**	1.02	0.94	58PH*090–16
CSPH*3012A**	1.00	0.96	58PH*090–16
CSPH*3612A**	1.02	0.94	58PH*090–16

See notes on pg. 34

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh† Total	Capacity MBtuh† Sens‡	Total System KW**	Capacity MBtuh† Total	Capacity MBtuh† Sens‡	Total System KW**	Capacity MBtuh† Total	Capacity MBtuh† Sens‡	Total System KW**	Capacity MBtuh† Total	Capacity MBtuh† Sens‡	Total System KW**	Capacity MBtuh† Total	Capacity MBtuh† Sens‡	Total System KW**	Capacity MBtuh† Total	Capacity MBtuh† Sens‡	Total System KW**
38HDR036 Outdoor Section With CNPV*4221A** Indoor Section																			
1050	72 (22.2)	39.85	18.85	2.42	38.03	18.23	2.68	36.08	17.58	2.98	33.99	16.89	3.30	31.72	16.14	3.65	29.20	15.33	4.03
	67(19.4)	36.33	23.19	2.42	34.67	22.57	2.68	32.91	21.91	2.98	31.02	21.23	3.30	28.99	20.49	3.65	26.73	19.69	4.04
	62 (16.7)	33.23	27.51	2.42	31.75	26.88	2.68	30.20	26.20	2.98	28.60	28.45	3.30	27.06	27.06	3.65	25.34	25.34	4.03
	57 (13.9)	32.46	32.46	2.42	31.26	31.26	2.68	29.98	29.98	2.98	28.59	28.59	3.30	27.06	27.06	3.65	25.34	25.34	4.03
1200	72(22.2)	40.51	19.77	2.48	38.61	19.14	2.74	36.57	18.47	3.04	34.40	17.77	3.36	32.04	17.01	3.71	29.42	16.18	4.09
	67(19.4)	36.97	24.67	2.48	35.23	24.04	2.74	33.40	23.38	3.04	31.45	22.68	3.36	29.33	21.93	3.71	27.00	21.10	4.09
	62 (16.7)	34.01	29.52	2.48	32.53	32.23	2.74	31.11	31.11	3.04	29.61	29.61	3.36	27.97	27.97	3.71	26.12	26.12	4.09
	57 (13.9)	33.78	33.78	2.48	32.49	32.49	2.74	31.11	31.11	3.04	29.62	29.62	3.36	27.97	27.97	3.71	26.12	26.12	4.09
1350	72 (22.2)	40.99	20.64	2.54	39.02	19.99	2.80	36.91	19.31	3.09	34.67	18.60	3.42	32.24	17.83	3.77	29.54	16.99	4.15
	67 (19.4)	37.43	26.09	2.54	35.65	25.45	2.80	33.76	24.78	3.10	31.75	24.06	3.42	29.58	23.29	3.77	27.20	22.42	4.15
	62 (16.7)	34.86	34.86	2.54	33.49	33.49	2.80	32.02	32.02	3.10	30.44	30.44	3.42	28.70	28.70	3.77	26.73	26.73	4.15
	57(13.9)	34.86	34.86	2.54	33.49	33.49	2.80	32.03	32.03	3.10	30.44	30.44	3.42	28.70	28.70	3.77	26.73	26.73	4.15

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*4221A**	1.00	1.00	
40QAC(Q)036−3	0.96	0.92	
CAP**3614A**	0.98	0.98	
CAP**3617A**	0.99	0.99	
CAP**3621A**	0.99	0.99	
CAP**4221A**	1.00	1.00	
CAP**4224A**	1.00	1.00	
CNPF*3618A**	0.99	0.99	
CNPH*3617A**	0.99	0.99	
CNPH*4221A**	1.00	1.00	
CNPV*3617A**	0.99	0.99	
CNPV*3621A**	0.99	0.99	
CNPV*4217A**	0.99	0.99	
CSPH*3612A**	0.99	0.99	
CSPH*4212A**	1.00	1.00	
FE4AN(B,F)003	0.99	0.95	
FE4AN(B,F)005	1.00	0.88	
FE4ANB006	1.00	0.88	
FE4ANF002	0.99	0.95	
FE5ANB004	1.04	0.91	
FF1ENP036	0.99	0.99	
FV4BN(B,F)003	0.99	0.91	
FV4BN(B,F)005	1.02	0.93	
FV4BNB006	1.00	0.88	
FV4BNF002	0.99	0.95	
FX4CN(B,F)036	0.99	0.95	
FX4CN(B,F)042	1.00	0.96	
FY4ANF036	0.99	0.99	
FY4ANF042	1.00	1.00	
CAP**3614A**	0.98	0.93	58CV(A,X)070−12
CNPH*3617A**	0.99	0.95	58CV(A,X)070−12
CNPH*4221A**	1.00	0.96	58CV(A,X)070−12
CSPH*3612A**	0.99	0.95	58CV(A,X)070−12
CSPH*4212A**	1.00	0.96	58CV(A,X)070−12
CAP**3617A**	0.99	0.95	58CV(A,X)090−16
CNPH*3617A**	0.99	0.95	58CV(A,X)090−16
CNPH*4221A**	1.00	0.96	58CV(A,X)090−16
CNPV*3617A**	0.99	0.95	58CV(A,X)090−16
CNPV*4217A**	1.00	0.92	58CV(A,X)090−16
CSPH*3612A**	0.99	0.95	58CV(A,X)090−16
CSPH*4212A**	1.00	0.96	58CV(A,X)090−16
CAP**3621A**	0.99	0.95	58CV(A,X)110−20

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CAP**4221A**	1.00	0.96	58CV(A,X)110−20
CNPH*3617A**	0.99	0.95	58CV(A,X)110−20
CNPH*4221A**	1.00	0.96	58CV(A,X)110−20
CNPV*3621A**	0.99	0.95	58CV(A,X)110−20
CNPV*4221A**	1.00	0.96	58CV(A,X)110−20
CSPH*3612A**	0.99	0.95	58CV(A,X)110−20
CSPH*4212A**	1.00	0.96	58CV(A,X)110−20
CAP**4224A**	1.00	0.96	58CV(A,X)135−22
CNPH*3617A**	0.99	0.95	58CV(A,X)135−22
CNPH*4221A**	1.00	0.96	58CV(A,X)135−22
CSPH*3612A**	0.99	0.95	58CV(A,X)135−22
CSPH*4212A**	1.00	0.96	58CV(A,X)135−22
CAP**4224A**	1.00	0.96	58CV(A,X)155−22
CNPH*3617A**	0.99	0.95	58CV(A,X)155−22
CNPH*4221A**	1.00	0.96	58CV(A,X)155−22
CSPH*3612A**	0.99	0.95	58CV(A,X)155−22
CSPH*4212A**	1.00	0.96	58CV(A,X)155−22
CAP**3617A**	0.99	0.91	58MEB040−12
CNPH*3617A**	0.99	0.91	58MEB040−12
CNPH*4221A**	1.00	0.92	58MEB040−12
CNPV*3617A**	0.10	0.09	58MEB040−12
CNPV*4217A**	1.00	0.92	58MEB040−12
CSPH*3612A**	0.99	0.91	58MEB040−12
CSPH*4212A**	1.00	0.92	58MEB040−12
CAP**3617A**	0.99	0.91	58MEB060−12
CNPH*3617A**	0.99	0.91	58MEB060−12
CNPH*4221A**	1.02	0.93	58MEB060−12
CNPV*3617A**	0.99	0.91	58MEB060−12
CNPV*4217A**	1.00	0.92	58MEB060−12
CSPH*3612A**	0.99	0.91	58MEB060−12
CSPH*4212A**	1.00	0.92	58MEB060−12
CAP**3617A**	0.99	0.91	58MEB080−12
CNPH*3617A**	0.99	0.91	58MEB080−12
CNPH*4221A**	1.00	0.92	58MEB080−12
CNPV*3617A**	0.99	0.91	58MEB080−12
CNPV*4217A**	1.00	0.92	58MEB080−12
CSPH*3612A**	0.99	0.91	58MEB080−12
CSPH*4212A**	1.00	0.92	58MEB080−12
CAP**3617A**	0.99	0.91	58MEB080−16
CNPH*3617A**	0.99	0.91	58MEB080−16
CNPH*4221A**	1.00	0.92	58MEB080−16
CNPV*3617A**	0.99	0.91	58MEB080−16

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPV*4217A**	1.00	0.92	58MEB080−16
CSPH*3612A**	0.99	0.91	58MEB080−16
CSPH*4212A**	1.00	0.92	58MEB080−16
CAP**3621A**	0.99	0.91	58MEB100−20
CAP**4221A**	1.00	0.92	58MEB100−20
CNPH*3617A**	0.99	0.91	58MEB100−20
CNPH*4221A**	1.00	0.92	58MEB100−20
CNPV*3621A**	0.99	0.91	58MEB100−20
CNPV*4221A**	1.00	0.92	58MEB100−20
CSPH*3612A**	0.99	0.91	58MEB100−20
CSPH*4212A**	1.00	0.92	58MEB100−20
CAP**3617A**	0.99	0.95	58MV(B,C)060−14
CNPH*3617A**	0.99	0.95	58MV(B,C)060−14
CNPH*4221A**	1.00	0.96	58MV(B,C)060−14
CNPV*3617A**	0.99	0.95	58MV(B,C)060−14
CNPV*4217A**	1.00	0.92	58MV(B,C)060−14
CSPH*3612A**	0.99	0.95	58MV(B,C)060−14
CSPH*4212A**	1.00	0.96	58MV(B,C)060−14
CAP**3621A**	0.99	0.95	58MV(B,C)080−14
CAP**4221A**	1.00	0.96	58MV(B,C)080−14
CNPH*3617A**	0.99	0.95	58MV(B,C)080−14
CNPH*4221A**	1.00	0.96	58MV(B,C)080−14
CNPV*3621A**	0.99	0.95	58MV(B,C)080−14
CNPV*4221A**	1.00	0.96	58MV(B,C)080−14
CSPH*3612A**	0.99	0.95	58MV(B,C)080−14
CSPH*4212A**	1.00	0.96	58MV(B,C)080−14
CAP**3621A**	0.99	0.95	58MV(B,C)080−20
CAP**4221A**	1.00	0.96	58MV(B,C)080−20
CNPH*3617A**	0.99	0.95	58MV(B,C)080−20
CNPH*4221A**	1.00	0.96	58MV(B,C)080−20
CNPV*3621A**	0.99	0.95	58MV(B,C)080−20
CNPV*4221A**	1.00	0.96	58MV(B,C)080−20
CSPH*3612A**	0.99	0.95	58MV(B,C)080−20
CSPH*4212A**	1.00	0.96	58MV(B,C)080−20
CAP**3621A**	0.99	0.95	58MV(B,C)100−20
CAP**4221A**	1.00	0.96	58MV(B,C)100−20
CNPH*3617A**	0.99	0.95	58MV(B,C)100−20
CNPH*4221A**	1.00	0.96	58MV(B,C)100−20
CNPV*3621A**	0.99	0.95	58MV(B,C)100−20
CNPV*4221A**	1.00	0.96	58MV(B,C)100−20
CSPH*3612A**	0.99	0.95	58MV(B,C)100−20
CSPH*4212A**	1.00	0.96	58MV(B,C)100−20

DETAILED COOLING CAPACITIES* (CONT.)

38HDR036 Outdoor Section With CNPV*4221A** Indoor Section

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CAP**4224A**	1.00	0.96	58MV(B,C)120-20
CNPH*3617A**	0.99	0.95	58MV(B,C)120-20
CNPH*4221A**	1.00	0.96	58MV(B,C)120-20
CSPH*3612A**	0.99	0.95	58MV(B,C)120-20
CSPH*4212A**	1.00	0.96	58MV(B,C)120-20
CAP**4224A**	1.00	0.96	58MVB040-14
CNPH*3617A**	0.99	0.95	58MVB040-14
CNPH*4221A**	1.00	0.96	58MVB040-14
CSPH*3612A**	0.99	0.95	58MVB040-14
CSPH*4212A**	1.00	0.96	58MVB040-14
CAP**3614A**	0.99	0.95	58PH*045-08
CNPH*3617A**	0.99	0.95	58PH*045-08
CNPH*4221A**	1.00	0.96	58PH*045-08
CSPH*3612A**	0.99	0.95	58PH*045-08
CSPH*4212A**	1.00	0.96	58PH*045-08
CAP**3617A**	0.99	0.95	58PH*070-16
CNPH*3617A**	0.99	0.95	58PH*070-16
CNPH*4221A**	1.00	0.96	58PH*070-16
CNPV*3617A**	0.99	0.95	58PH*070-16
CNPV*4217A**	1.00	0.92	58PH*070-16
CSPH*3612A**	0.99	0.95	58PH*070-16
CSPH*4212A**	1.00	0.96	58PH*070-16
CAP**3621A**	0.99	0.91	58PH*090-16
CAP**4221A**	1.00	0.92	58PH*090-16
CNPH*3617A**	0.99	0.91	58PH*090-16
CNPH*4221A**	1.00	0.92	58PH*090-16
CNPV*3621A**	0.99	0.91	58PH*090-16
CNPV*4221A**	1.00	0.92	58PH*090-16
CSPH*3612A**	0.99	0.91	58PH*090-16
CSPH*4212A**	1.00	0.92	58PH*090-16
CAP**3621A**	0.99	0.91	58PH*110-20
CAP**4221A**	1.02	0.93	58PH*110-20
CNPH*3617A**	0.99	0.91	58PH*110-20
CNPH*4221A**	1.02	0.93	58PH*110-20
CNPV*3621A**	0.99	0.91	58PH*110-20
CNPV*4221A**	1.00	0.92	58PH*110-20
CSPH*3612A**	0.99	0.91	58PH*110-20
CSPH*4212A**	1.00	0.92	58PH*110-20

See notes on pg. 34

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR048 Outdoor Section With CNPV*4821A** Indoor Section																			
1460	72 (22.2)	57.22	27.09	3.31	54.16	26.03	3.74	50.83	24.90	4.20	47.23	23.69	4.69	43.24	22.38	5.21	38.87	20.99	5.76
	67(19.4)	52.21	33.21	3.33	49.49	32.17	3.76	46.57	31.08	4.22	43.40	29.91	4.71	39.95	28.66	5.23	36.03	27.26	5.77
	62 (16.7)	47.74	39.31	3.35	45.37	38.29	3.78	42.88	37.19	4.23	40.25	39.91	4.72	37.64	37.64	5.23	34.63	34.63	5.78
	57 (13.9)	46.44	46.44	3.36	44.53	44.53	3.78	42.48	42.48	4.23	40.21	40.21	4.72	37.65	37.65	5.23	34.63	34.63	5.78
1650	72(22.2)	58.13	28.26	3.37	54.91	27.17	3.81	51.42	26.01	4.27	47.67	24.78	4.76	43.52	23.45	5.28	39.26	22.10	5.84
	67(19.4)	53.07	35.09	3.40	50.21	34.03	3.83	47.16	32.91	4.29	43.87	31.73	4.78	40.28	30.44	5.30	36.23	28.99	5.85
	62 (16.7)	48.75	41.89	3.42	46.32	40.79	3.85	43.85	43.85	4.30	41.42	41.42	4.79	38.64	38.64	5.31	35.37	35.37	5.85
	57 (13.9)	48.17	48.17	3.43	46.11	46.11	3.85	43.88	43.88	4.30	41.42	41.42	4.79	38.64	38.64	5.31	35.37	35.37	5.85
1850	72 (22.2)	58.83	29.41	3.45	55.48	28.31	3.88	51.86	27.12	4.35	47.97	25.87	4.84	43.73	24.52	5.36	39.89	23.26	5.92
	67 (19.4)	53.74	36.97	3.48	50.78	35.90	3.91	47.62	34.76	4.37	44.22	33.55	4.86	40.51	32.22	5.38	36.39	30.70	5.93
	62 (16.7)	49.74	44.35	3.50	47.48	47.48	3.92	45.09	45.09	4.38	42.44	42.44	4.87	39.46	39.46	5.38	35.96	35.96	5.93
	57(13.9)	49.69	49.69	3.50	47.49	47.49	3.92	45.09	45.09	4.38	42.45	42.45	4.87	39.46	39.46	5.38	35.97	35.97	5.93

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*4821A**	1.00	1.00	
40QAC048–3	0.97	0.93	
CAP**4817A**	0.99	0.99	
CAP**4821A**	1.00	1.00	
CAP**4824A**	1.00	1.00	
CAP**6021A**	1.01	1.01	
CAP**6024A**	1.01	1.01	
CNPF*4818A**	0.98	0.98	
CNPH*4821A**	1.00	1.00	
CNPH*6024A**	1.01	1.01	
CNPV*4824A**	1.00	1.00	
CNPV*6024A**	1.01	1.01	
CSPH*4812A**	1.00	1.00	
CSPH*6012A**	1.01	1.01	
FE4AN(B,F)005	1.00	0.96	
FE4ANB006	1.01	0.97	
FV4BN(B,F)005	1.00	0.96	
FV4BNB006	1.01	0.97	
FX4CN(B,F)048	1.00	0.96	
FX4CN(B,F)060	1.01	0.97	
FY4ANB060	1.01	1.01	
FY4ANF048	1.00	1.00	
CAP**4817A**	0.99	0.95	58CV(A,X)090–16
CNPH*4821A**	0.99	0.95	58CV(A,X)090–16
CNPH*6024A**	1.00	0.96	58CV(A,X)090–16
CSPH*4812A**	0.99	0.95	58CV(A,X)090–16
CSPH*6012A**	1.00	0.96	58CV(A,X)090–16
CAP**4821A**	0.99	0.95	58CV(A,X)110–20
CAP**6021A**	1.00	0.96	58CV(A,X)110–20
CNPH*4821A**	0.99	0.95	58CV(A,X)110–20
CNPH*6024A**	1.00	0.96	58CV(A,X)110–20
CNPV*4821A**	0.99	0.95	58CV(A,X)110–20
CSPH*4812A**	0.99	0.95	58CV(A,X)110–20
CSPH*6012A**	1.00	0.96	58CV(A,X)110–20
CAP**4824A**	0.99	0.95	58CV(A,X)135–22
CAP**6024A**	1.00	0.96	58CV(A,X)135–22
CNPH*4821A**	0.99	0.95	58CV(A,X)135–22
CNPH*6024A**	1.00	0.96	58CV(A,X)135–22
CNPV*4824A**	0.99	0.95	58CV(A,X)135–22
CNPV*6024A**	1.00	0.96	58CV(A,X)135–22
CSPH*4812A**	0.99	0.95	58CV(A,X)135–22
CSPH*6012A**	1.00	0.96	58CV(A,X)135–22

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CAP**4824A**	0.99	0.95	58CV(A,X)155–22
CAP**6024A**	1.00	0.96	58CV(A,X)155–22
CNPH*4821A**	0.99	0.95	58CV(A,X)155–22
CNPH*6024A**	1.00	0.96	58CV(A,X)155–22
CNPV*4824A**	0.99	0.95	58CV(A,X)155–22
CNPV*6024A**	1.00	0.96	58CV(A,X)155–22
CSPH*4812A**	0.99	0.95	58CV(A,X)155–22
CSPH*6012A**	1.00	0.96	58CV(A,X)155–22
CAP**4817A**	0.99	0.95	58MEB080–16
CNPH*4821A**	0.99	0.95	58MEB080–16
CNPH*6024A**	1.00	0.96	58MEB080–16
CSPH*4812A**	0.99	0.95	58MEB080–16
CSPH*6012A**	1.00	0.92	58MEB080–16
CAP**4821A**	0.99	0.95	58MEB100–20
CAP**6021A**	1.00	0.92	58MEB100–20
CNPH*4821A**	0.99	0.95	58MEB100–20
CNPH*6024A**	1.00	0.92	58MEB100–20
CNPV*4821A**	0.99	0.95	58MEB100–20
CSPH*4812A**	0.99	0.95	58MEB100–20
CSPH*6012A**	1.00	0.92	58MEB100–20
CAP**4824A**	0.99	0.95	58MEB120–20
CAP**6024A**	1.00	0.92	58MEB120–20
CNPH*4821A**	0.99	0.95	58MEB120–20
CNPH*6024A**	1.00	0.92	58MEB120–20
CNPV*4824A**	0.99	0.95	58MEB120–20
CNPV*6024A**	1.00	0.92	58MEB120–20
CSPH*4812A**	0.99	0.95	58MEB120–20
CSPH*6012A**	1.00	0.92	58MEB120–20
CAP**4821A**	0.98	0.94	58MV(B,C)080–20
CAP**6021A**	1.00	0.96	58MV(B,C)080–20
CNPH*4821A**	0.99	0.95	58MV(B,C)080–20
CNPH*6024A**	1.00	0.96	58MV(B,C)080–20
CNPV*4821A**	0.99	0.95	58MV(B,C)080–20
CSPH*4812A**	0.99	0.95	58MV(B,C)080–20
CSPH*6012A**	1.00	0.96	58MV(B,C)080–20
CAP**4821A**	0.99	0.95	58MV(B,C)100–20
CAP**6021A**	1.00	0.96	58MV(B,C)100–20
CNPH*4821A**	0.99	0.95	58MV(B,C)100–20
CNPH*6024A**	1.00	0.96	58MV(B,C)100–20
CNPV*4821A**	0.99	0.95	58MV(B,C)100–20
CSPH*4812A**	0.99	0.95	58MV(B,C)100–20
CSPH*6012A**	1.00	0.96	58MV(B,C)100–20

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CAP**4824A**	0.99	0.95	58MV(B,C)120–20
CAP**6024A**	1.00	0.96	58MV(B,C)120–20
CNPH*4821A**	0.99	0.95	58MV(B,C)120–20
CNPH*6024A**	1.00	0.96	58MV(B,C)120–20
CNPV*4824A**	0.99	0.95	58MV(B,C)120–20
CNPV*6024A**	1.00	0.96	58MV(B,C)120–20
CSPH*4812A**	0.99	0.95	58MV(B,C)120–20
CSPH*6012A**	1.00	0.96	58MV(B,C)120–20
CAP**4817A**	0.99	0.95	58PH*070–16
CAP**4821A**	0.99	0.95	58PH*090–16
CAP**6021A**	1.00	0.92	58PH*090–16
CNPH*4821A**	0.99	0.95	58PH*090–16
CNPH*6024A**	1.00	0.92	58PH*090–16
CNPV*4821A**	0.99	0.95	58PH*090–16
CSPH*4812A**	0.99	0.95	58PH*090–16
CSPH*6012A**	1.00	0.92	58PH*090–16
CAP**4821A**	0.99	0.95	58PH*110–20
CAP**6021A**	1.00	0.92	58PH*110–20
CNPH*4821A**	0.99	0.95	58PH*110–20
CNPH*6024A**	1.00	0.92	58PH*110–20
CNPV*4821A**	0.99	0.95	58PH*110–20
CSPH*4812A**	0.99	0.95	58PH*110–20
CSPH*6012A**	1.00	0.92	58PH*110–20
CAP**4824A**	0.99	0.95	58PH*135–20
CAP**6024A**	1.00	0.92	58PH*135–20
CNPH*4821A**	0.99	0.95	58PH*135–20
CNPH*6024A**	1.00	0.92	58PH*135–20
CNPV*4824A**	0.99	0.95	58PH*135–20
CNPV*6024A**	1.00	0.92	58PH*135–20
CSPH*4812A**	0.99	0.95	58PH*135–20
CSPH*6012A**	1.00	0.92	58PH*135–20

See notes on pg. 34

DETAILED COOLING CAPACITIES** (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR060 Outdoor Section With CNPV*6024A** Indoor Section																			
1750	72 (22.2)	68.88	33.36	4.20	65.13	32.05	4.64	60.97	30.62	5.12	56.47	29.10	5.64	51.66	27.52	6.20	46.31	25.80	6.80
	67(19.4)	63.28	41.18	4.15	59.98	39.91	4.59	56.34	38.52	5.08	52.38	37.05	5.60	48.00	35.44	6.17	43.23	33.69	6.77
	62 (16.7)	58.24	48.95	4.11	55.37	47.69	4.55	52.27	46.30	5.04	48.91	48.85	5.57	45.63	45.63	6.15	41.69	41.69	6.76
	57 (13.9)	56.77	56.77	4.09	54.45	54.45	4.54	51.86	51.86	5.03	48.95	48.95	5.57	45.63	45.63	6.15	41.69	41.69	6.76
2000	72(22.2)	69.89	34.93	4.31	65.94	33.59	4.75	61.58	32.12	5.23	56.96	30.59	5.74	52.01	29.02	6.31	47.30	27.45	6.92
	67(19.4)	64.28	43.75	4.26	60.81	42.45	4.70	57.00	41.04	5.18	52.88	39.53	5.71	48.32	37.86	6.27	43.82	36.17	6.88
	62 (16.7)	59.48	52.47	4.22	56.55	51.08	4.66	53.58	53.58	5.15	50.40	50.40	5.68	46.78	46.78	6.26	42.62	42.62	6.87
	57 (13.9)	58.96	58.96	4.21	56.42	56.42	4.66	53.58	53.58	5.15	50.40	50.40	5.68	46.78	46.78	6.26	42.60	42.60	6.87
2250	72 (22.2)	70.60	36.41	4.42	66.50	35.04	4.86	61.97	33.55	5.33	57.25	32.02	5.85	52.14	30.44	6.41	48.41	29.01	7.04
	67 (19.4)	65.01	46.21	4.37	61.41	44.89	4.81	57.46	43.44	5.29	53.20	41.88	5.81	48.56	40.17	6.37	44.28	38.42	6.99
	62 (16.7)	60.67	60.67	4.33	58.00	58.00	4.78	54.94	54.94	5.26	51.52	51.52	5.79	47.63	47.63	6.36	43.18	43.18	6.98
	57(13.9)	60.73	60.73	4.33	58.00	58.00	4.78	54.94	54.94	5.26	51.52	51.52	5.79	47.63	47.63	6.36	43.14	43.14	6.98

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*6024A**	1.00	1.00	
40QAC060−3	0.98	0.98	
CAP**6021A**	1.00	1.00	
CAP**6024A**	1.00	1.00	
CNPH*6024A**	1.00	1.00	
CSPH*6012A**	1.00	1.00	
FE4ANB006	1.01	1.01	
FV4BNB006	1.01	1.01	
FX4CN(B,F)060	1.01	1.01	
FY4ANB060	1.00	1.00	
CAP**6021A**	0.98	0.98	58CV(A,X)110−20
CNPH*6024A**	0.98	0.98	58CV(A,X)110−20
CSPH*6012A**	0.98	0.98	58CV(A,X)110−20
CAP**6024A**	0.98	0.98	58CV(A,X)135−22

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPH*6024A**	0.98	0.98	58CV(A,X)135−22
CNPV*6024A**	0.98	0.98	58CV(A,X)135−22
CSPH*6012A**	0.98	0.98	58CV(A,X)135−22
CAP**6024A**	0.98	0.98	58CV(A,X)155−22
CNPH*6024A**	0.98	0.98	58CV(A,X)155−22
CNPV*6024A**	0.98	0.98	58CV(A,X)155−22
CSPH*6012A**	0.98	0.98	58CV(A,X)155−22
CNPH*6024A**	0.98	0.98	58MEB080−16
CSPH*6012A**	0.98	0.98	58MEB080−16
CAP**6021A**	0.98	0.98	58MEB100−20
CNPH*6024A**	0.98	0.98	58MEB100−20
CSPH*6012A**	0.98	0.98	58MEB100−20
CAP**6024A**	0.98	0.98	58MEB120−20
CNPH*6024A**	0.98	0.98	58MEB120−20

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPV*6024A**	0.98	0.98	58MEB120−20
CSPH*6012A**	0.98	0.98	58MEB120−20
CSPH*6012A**	0.98	0.98	58MV(B,C)120−20
CAP**6021A**	0.98	0.98	58PH*090−16
CNPH*6024A**	0.98	0.98	58PH*090−16
CSPH*6012A**	0.98	0.98	58PH*090−16
CAP**6021A**	0.98	0.98	58PH*110−20
CNPH*6024A**	0.98	0.98	58PH*110−20
CSPH*6012A**	0.98	0.98	58PH*110−20
CAP**6024A**	0.98	0.98	58PH*135−20
CNPH*6024A**	0.98	0.98	58PH*135−20
CNPV*6024A**	0.98	0.98	58PH*135−20
CSPH*6012A**	0.98	0.98	58PH*135−20

NOTE: When the required data fall between the published data, interpolation may be performed. Extrapolation is not an acceptable practice.

* Detailed cooling capacities are based on indoor and outdoor unit at the same elevation per the latest edition of AHRI standard 210/240. If additional tubing length and/or indoor unit is located above outdoor unit, a slight variation in capacity may occur.

† Total and sensible capacities are net capacities. Blower motor heat has been subtracted.

‡ Sensible capacities shown are based on 80° F (27° C) entering air at the indoor coil. For sensible capacities at other than 80° F (27° C), deduct 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air for each degree below 80° F (27° C), or add 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air per degree above 80° F (27° C). When the required data fall between the published data, interpolation may be performed.

** Total system kW is total of indoor and outdoor unit kilowatts.

CONDENSER ONLY RATINGS*

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.8)	65 (18.3)	75 (23.9)	85 (29.4)	95 (35)	105 (40.6)	115 (46.1)	125 (51.7)
38HDR018–31									
30 (–1.6)	TCG	16.20	15.30	14.30	13.40	12.40	11.40	10.30	9.20
	SDT	67.40	77.00	86.50	96.00	105.50	114.90	124.40	133.70
	KW	0.86	0.98	1.11	1.26	1.42	1.59	1.77	1.96
35 (1.7)	TCG	17.90	16.90	15.90	14.80	13.80	12.70	11.60	10.40
	SDT	68.50	78.00	87.50	97.00	106.40	115.80	125.20	134.50
	KW	0.86	0.98	1.11	1.26	1.42	1.59	1.78	1.98
40 (4.4)	TCG	19.70	18.60	17.50	16.40	15.20	14.10	12.90	11.60
	SDT	69.70	79.10	88.60	98.00	107.40	116.80	126.10	135.30
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	1.99
45 (7.2)	TCG	21.60	20.40	19.20	18.00	16.80	15.50	14.20	12.80
	SDT	70.90	80.30	89.70	99.00	108.40	117.70	127.00	136.10
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	2.00
50 (10)	TCG	23.60	22.30	21.10	19.70	18.40	17.00	15.60	14.10
	SDT	72.20	81.50	90.80	100.10	109.40	118.60	127.80	136.90
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	2.00
55 (12.8)	TCG	25.70	24.30	22.90	21.50	20.00	18.60	17.00	15.40
	SDT	73.50	82.70	92.00	101.20	110.40	119.60	128.70	137.70
	KW	0.85	0.97	1.10	1.25	1.42	1.60	1.79	2.00
38HDR024–32									
30 (–1.6)	TCG	22.10	20.90	19.60	18.30	16.90	15.50	14.00	12.40
	SDT	69.00	78.50	88.00	97.40	106.80	116.10	125.30	134.50
	KW	1.08	1.24	1.41	1.60	1.80	2.02	2.25	2.48
35 (1.7)	TCG	24.30	23.00	21.70	20.30	18.80	17.20	15.60	13.80
	SDT	70.30	79.80	89.20	98.60	107.90	117.10	126.30	135.40
	KW	1.09	1.24	1.42	1.61	1.82	2.04	2.28	2.52
40 (4.4)	TCG	26.80	25.30	23.90	22.30	20.70	19.00	17.20	15.30
	SDT	71.70	81.10	90.50	99.80	109.10	118.20	127.30	136.30
	KW	1.10	1.26	1.43	1.62	1.83	2.06	2.30	2.55
45 (7.2)	TCG	29.40	27.80	26.20	24.50	22.70	20.90	18.90	16.70
	SDT	73.20	82.60	91.90	101.10	110.20	119.30	128.30	137.10
	KW	1.11	1.27	1.44	1.64	1.85	2.08	2.32	2.57
50 (10)	TCG	32.10	30.40	28.60	26.80	24.80	22.70	20.50	18.10
	SDT	74.80	84.10	93.30	102.40	111.50	120.40	129.20	137.90
	KW	1.12	1.28	1.46	1.65	1.86	2.09	2.33	2.59
55 (12.8)	TCG	35.00	33.10	31.20	29.10	26.90	24.60	22.20	19.50
	SDT	76.40	85.60	94.70	103.80	112.70	121.50	130.20	138.60
	KW	1.13	1.29	1.47	1.66	1.88	2.10	2.35	2.60
38HDR030–31									
30 (–1.6)	TCG	26.20	24.70	23.20	21.70	20.10	18.40	16.80	15.30
	SDT	72.00	82.30	92.90	103.80	115.00	126.90	139.00	148.90
	KW	1.30	1.48	1.69	1.92	2.19	2.50	2.84	3.12
35 (1.7)	TCG	28.80	27.30	25.70	24.10	22.40	20.60	18.90	17.40
	SDT	73.10	83.50	94.00	104.80	116.10	127.70	139.50	149.30
	KW	1.30	1.49	1.69	1.93	2.21	2.52	2.86	3.15
40 (4.4)	TCG	31.70	30.10	28.40	26.60	24.80	23.00	21.20	19.60
	SDT	74.30	84.70	95.20	105.90	117.10	128.60	140.00	149.70
	KW	1.31	1.49	1.70	1.94	2.22	2.53	2.87	3.18
45 (7.2)	TCG	34.80	33.10	31.20	29.40	27.40	25.50	23.60	21.90
	SDT	75.60	85.90	96.40	107.10	118.10	129.40	140.60	150.10
	KW	1.31	1.50	1.71	1.95	2.22	2.54	2.88	3.19
50 (10)	TCG	38.20	36.20	34.30	32.30	30.30	28.20	26.20	24.40
	SDT	76.90	87.20	97.60	108.20	119.20	130.30	141.10	150.50
	KW	1.32	1.50	1.71	1.95	2.23	2.55	2.89	3.20
55 (12.8)	TCG	41.70	39.70	37.60	35.50	33.30	31.10	29.00	27.10
	SDT	78.30	88.50	98.90	109.40	120.20	131.20	141.80	150.90
	KW	1.32	1.51	1.72	1.96	2.24	2.55	2.89	3.20
38HDR036–31									
30 (–1.6)	TCG	30.10	28.50	26.80	25.10	23.30	21.50	19.60	17.60
	SDT	70.90	80.80	90.90	101.00	111.20	121.60	132.30	143.30
	KW	1.50	1.71	1.94	2.20	2.50	2.83	3.19	3.58
35 (1.7)	TCG	33.20	31.50	29.70	27.80	25.90	24.00	21.90	19.90
	SDT	72.00	82.00	92.00	102.10	112.30	122.80	133.30	143.80
	KW	1.50	1.71	1.95	2.21	2.52	2.85	3.21	3.60
40 (4.4)	TCG	36.50	34.60	32.70	30.70	28.70	26.60	24.40	22.30
	SDT	73.30	83.20	93.20	103.20	113.40	123.60	134.10	144.50
	KW	1.51	1.72	1.95	2.22	2.52	2.85	3.23	3.63
45 (7.2)	TCG	40.10	38.10	36.00	33.80	31.70	29.40	27.10	24.80
	SDT	74.60	84.40	94.40	104.50	113.80	124.50	135.20	145.30
	KW	1.51	1.72	1.96	2.23	2.51	2.86	3.26	3.65
50 (10)	TCG	43.90	41.70	39.50	37.10	34.90	32.40	30.00	27.60
	SDT	75.90	85.80	95.70	105.90	115.50	125.90	136.20	146.00
	KW	1.52	1.73	1.97	2.24	2.54	2.89	3.27	3.66
55 (12.8)	TCG	48.00	45.70	43.30	40.70	38.30	35.70	33.10	30.50
	SDT	77.40	87.10	97.00	107.10	116.70	126.80	137.00	146.70
	KW	1.53	1.74	1.98	2.25	2.55	2.89	3.28	3.66

See notes on page 38

38HDR

CONDENSER ONLY RATINGS* CONTINUED

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.8)	65 (18.3)	75 (23.9)	85 (29.4)	95 (35)	105 (40.6)	115 (46.1)	125 (51.7)
38HDR048−32									
30 (−1.6)	TCG	48.40	45.50	42.50	39.50	36.20	32.90	30.60	28.10
	SDT	67.90	77.30	86.70	96.00	105.40	114.70	124.30	133.80
	KW	2.05	2.39	2.75	3.15	3.56	4.01	4.49	5.00
35 (1.7)	TCG	53.40	50.20	46.90	43.40	39.60	35.70	34.00	25.50
	SDT	69.10	78.40	87.80	97.00	106.20	115.40	125.10	133.00
	KW	2.02	2.37	2.74	3.14	3.56	4.01	4.51	4.99
40 (4.4)	TCG	58.70	55.10	51.40	47.50	43.10	38.30	33.00	27.10
	SDT	70.40	79.60	88.90	98.00	107.10	116.10	124.80	133.40
	KW	1.99	2.35	2.72	3.13	3.55	4.01	4.49	4.99
45 (7.2)	TCG	64.30	60.30	56.20	51.60	46.90	41.20	35.20	28.90
	SDT	71.80	80.90	90.00	99.10	108.10	116.80	125.40	133.80
	KW	1.96	2.32	2.70	3.11	3.54	4.00	4.48	4.99
50 (10)	TCG	70.30	65.80	61.10	55.80	50.40	44.20	37.30	34.60
	SDT	73.30	82.30	91.20	100.10	108.90	117.50	125.90	135.30
	KW	1.92	2.29	2.68	3.09	3.52	3.98	4.46	5.01
55 (12.8)	TCG	76.50	71.40	66.00	60.30	54.00	47.00	50.70	41.10
	SDT	74.80	83.60	92.50	101.20	109.80	118.20	129.40	137.00
	KW	1.88	2.25	2.64	3.06	3.49	3.95	4.57	5.05
38HDR060−32									
30 (−1.6)	TCG	59.30	55.30	50.90	46.20	40.40	37.90	33.80	30.30
	SDT	70.10	79.30	88.40	97.40	106.20	115.80	124.90	134.20
	KW	2.59	2.93	3.31	3.73	4.19	4.72	5.31	5.90
35 (1.7)	TCG	64.70	60.20	55.50	50.00	43.30	42.40	31.50	33.10
	SDT	71.40	80.50	89.50	98.40	106.90	116.90	124.20	134.90
	KW	2.62	2.97	3.34	3.76	4.21	4.76	5.25	5.93
40 (4.4)	TCG	69.90	65.30	60.10	53.80	55.90	47.40	31.70	35.60
	SDT	72.70	81.70	90.60	99.30	110.10	118.10	124.20	135.50
	KW	2.66	3.00	3.38	3.78	4.34	4.81	5.24	5.96
45 (7.2)	TCG	76.00	70.80	64.80	57.40	56.00	54.60	48.50	47.70
	SDT	74.10	83.00	91.80	100.20	110.00	119.90	128.60	138.80
	KW	2.71	3.04	3.40	3.80	4.32	4.89	5.43	6.08
50 (10)	TCG	82.20	76.70	69.30	70.90	61.80	58.60	30.50	52.10
	SDT	75.60	84.40	92.80	103.40	111.40	120.90	123.80	139.80
	KW	2.75	3.09	3.42	3.99	4.38	4.93	5.16	6.13
55 (12.8)	TCG	95.20	87.70	88.40	74.60	75.40	53.90	46.10	60.30
	SDT	78.80	87.10	97.50	104.30	114.70	119.50	127.70	141.70
	KW	2.85	3.13	3.74	3.95	4.56	4.78	5.33	6.25

* AHRI listing applies only to systems shown in Combination Ratings table.

KW – Outdoor Unit Kilowatts Only.

SDT – Saturated Temperature Leaving Compressor (°F)

SST – Saturated Temperature Entering Compressor (°F/°C)

TCG – Gross Cooling Capacity (1000 Btuh)

38HDR

GUIDE SPECIFICATIONS
GENERAL

System Description

Outdoor-mounted, air-cooled, split-system air conditioner unit suitable for ground or rooftop installation. Unit consists of a hermetic compressor, an air-cooled coil, propeller-type condenser fan, and a control box. Unit will discharge supply air horizontally as shown on contract drawings. Unit will be used in a refrigeration circuit to match up to a packaged fan coil or coil unit.

Quality Assurance

— Unit will be rated in accordance with the latest edition of ARI Standard 210.

— Unit will be certified for capacity and efficiency, and listed in the latest ARI directory.

— Unit construction will comply with latest edition of ANSI/ ASHRAE and with NEC.

— Unit will be constructed in accordance with UL standards and will carry the UL label of approval. Unit will have c-UL approval.

— Unit cabinet will be capable of withstanding Federal Test
Method Standard No. 141 (Method 6061) 500-hr salt spray test.

— Air-cooled condenser coils will be leak tested and pressure tested

— Unit constructed in ISO9001 approved facility.

Delivery, Storage, and Handling

— Unit will be shipped as single package only and is stored and handled per unit manufacturer's recommendations.

Warranty (for inclusion by specifying engineer)

— U.S. and Canada only.

PRODUCTS

Equipment

— Factory assembled, single piece, air-cooled air conditioner unit. Contained within the unit enclosure is all factory wiring, piping, controls, compressor, refrigerant charge Puron® (R-410A), and special features required prior to field start-up.

Unit Cabinet

— Unit cabinet will be constructed of galvanized steel, bonderized, and coated with a powder coat paint.

Fans

— Condenser fan will be direct-drive propeller type, discharging air horizontally.

— Condenser fan motors will be totally enclosed, 1-phase type with class B insulation and permanently lubricated bearings. Shafts will be corrosion resistant.

— Fan blades will be statically and dynamically balanced.

— Condenser fan openings will be equipped with coated steel wire safety guards.

Compressor

— Compressor will be hermetically sealed.

— Compressor will be mounted on rubber vibration isolators.

Condenser Coil

— Condenser coil will be air cooled.

— Coil will be constructed of aluminum fins mechanically bonded to copper tubes which are then cleaned, dehydrated, and sealed.

Refrigeration Components

— Refrigeration circuit components will include liquid-line front-seating shutoff valve with sweat connections, vapor-line front-seating shutoff valve with sweat connections, system charge of Puron® (R-410A) refrigerant, and compressor oil.

— Unit will be equipped with high-pressure switch, low pressure switch and filter drier for Puron refrigerant.

Operating Characteristics

— The capacity of the unit will meet or exceed _____ Btuh at a suction temperature of _____ °F/°C. The power consumption at full load will not exceed _____ kW.

— Combination of the unit and the evaporator or fan coil unit will have a total net cooling capacity of _____ Btuh or greater at conditions of _____ CFM entering air temperature at the evaporator at _____ °F/°C wet bulb and _____ °F/°C dry bulb, and air entering the unit at _____ °F/°C.

— The system will have a SEER of _____ Btuh/watt or greater at DOE conditions.

Electrical Requirements

— Nominal unit electrical characteristics will be _____ v, single phase, 60 hz. The unit will be capable of satisfactory operation within voltage limits of _____ v to _____ v.

— Nominal unit electrical characteristics will be _____ v, three phase, 60 hz. The unit will be capable of satisfactory operation within voltage limits of _____ v to _____ v.

— Unit electrical power will be single point connection.

— Control circuit will be 24v.

Special Features

— Refer to section of this literature identifying accessories and descriptions for specific features and available enhancements.

SYSTEM DESIGN SUMMARY

1. Intended for outdoor installation with free air inlet and outlet. Outdoor fan external static pressure available is less than 0.01-in. wc.
2. Minimum outdoor operating air temperature without low-ambient operation accessory is 55°F (12.8°C).
3. Maximum outdoor operating air temperature is 125°F (51.7°C).
4. For reliable operation, unit should be level in all horizontal planes.
5. For interconnecting refrigerant tube lengths greater than 80 ft (23.4 m) and/or 35 ft (10.7 m) vertical differential, consult Residential Piping and Longline Guideline and Service Manual available from equipment distributor.
6. If any refrigerant tubing is buried, provide a 6 in. (152.4 mm) vertical rise to the valve connections at the unit. Refrigerant tubing lengths up to 36 in. (914.4 mm) may be buried without further consideration. Do not bury refrigerant lines longer than 36 in. (914.4 mm).
7. Use only copper wire for electric connection at unit. Aluminum and clad aluminum are not acceptable for the type of connector provided.
8. Do not apply capillary tube indoor coils to these units.
9. Factory-supplied filter drier must be installed.

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Appendix G

Traffic Signal Warrant Study

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MEMORANDUM

Date:	July 6, 2023	**GTS:**	210806.07
To:	City of Palmdale		
From:	Rawad Hani, PE, TE		
Subject:	Traffic Signal Warrant Study for the intersection of E Palmdale Blvd and the proposed access road for the Palmdale Two residential development		

This memorandum presents the results of the Traffic Signal Warrant Study carried out by GTS for the intersection of East Palmdale Boulevard and the proposed access road for the Palmdale Two residential development.

As illustrated in the following sections, the analysis of all applicable Traffic Signal Warrants has shown that a traffic signal is not warranted for the initial phase of development (Scenario 1, with one 20-acre parcel developed), but is warranted for Scenario 2, in which both 20-acre parcels at the site are developed.

Introduction

As part of the traffic impact analysis scoping, the City of Palmdale requested GTS to complete a Traffic Control Device Warrant Analysis for the intersection of East Palmdale Boulevard and the proposed access road for the Palmdale Two residential development. GTS carried out an analysis per the California Manual of Uniform Traffic Control Devices (CA-MUTCD) guidelines in order to verify whether a traffic signal is justified and recommended based on meeting the standard guidelines.

Project Location

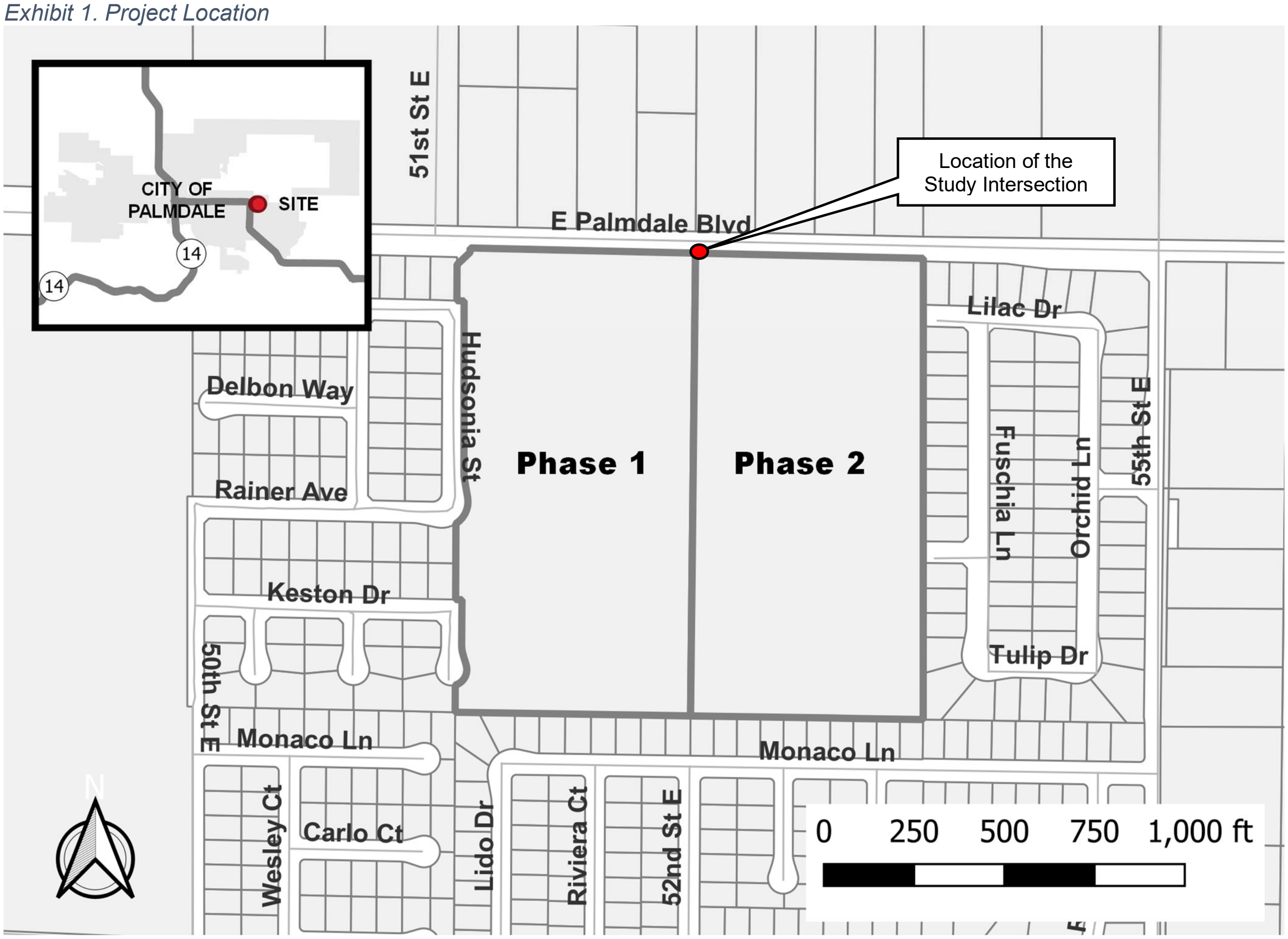
The Palmdale Two development project proposes to subdivide an approximately 20-acre parcel (currently vacant) into 66 lots for the purpose of constructing 64 single-family residences with 63 accessory dwelling units (ADUs) and 64 junior accessory dwelling units (JADUs), one detention basin, and one common amenities lot. The site is located directly south of East Palmdale Boulevard and east of Hudsonia Street in the City of Palmdale. It is bounded to the east by a vacant parcel, to the west and south by single-family residential development, and to the north by Palmdale Boulevard. The location is shown in Exhibit 1 and labeled “Phase 1”.

Subsequently, it is expected that the adjacent 20-acre parcel to the east of Phase 1 will also be developed with 72 single-family homes, 71 ADUs, and 27 JADUs. This parcel is also currently vacant. It is bounded to the west by vacant land (the Phase 1 site), to the east and south by single-family residential development, and to the north by Palmdale Boulevard. This location is labeled as “Phase 2” in Exhibit 1.

The proposed access road will serve both Phase 1 and Phase 2 once completed. Therefore, this Warrant Study analyzes two scenarios: (A) Phase 1 alone, and (B) Phase 1 and 2.

The subject intersection will be a “T” intersection with East Palmdale Boulevard running in the east-west direction and the access road for the proposed development intersecting perpendicularly on the south side of East Palmdale Boulevard.

Exhibit 1. Project Location



Existing Conditions

East Palmdale Boulevard has a street-width of approximately 22 feet and is classified as a minor arterial roadway. It has one travel lane in each direction (eastbound and westbound), separated by a double yellow centerline. Both sides of the roadway have unpaved shoulders and no curb, gutter, or sidewalk. The posted speed limit is 55 miles per hour. There is vacant land on the north side of the road and a mix of residential developments and large vacant parcels on the south side.

Exhibit 2 shows an aerial view of the existing site area and Exhibit 3 shows a street view looking along East Palmdale Boulevard next to the site.

Exhibit 2. Aerial View (Source: Nearmap)

Exhibit 3. Street View (Source: Google Maps Street View)

Project Trip Generation

The expected traffic volumes for the two scenarios were forecasted using the *Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition, 2021*.

Exhibit 4 shows the projected trip generation for Scenario A (Phase 1 alone). Exhibit 5 shows the projected trip generation for Scenario B (Phases 1 and 2).

Exhibit 6 shows the vehicle time of day distribution for Scenarios A and B based on the same ITE guide.

Exhibit 4. Scenario A (Phase 1 Build-out) Trip Generation

				AM Peak Hour			PM Peak Hour		
Land Use	**Land Use Code**	**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
Single-family Detached Housing[1]	LU 210	DU	9.430	0.195	0.555	0.750	0.634	0.356	0.990
Multifamily Housing (Low-Rise)[2]	LU 220	DU	6.740	0.113	0.357	0.470	0.353	0.217	0.570
Project Trip Generation									
Palmdale Single-Family Housing Trips	64	DU	604	12	36	48	41	23	63
ADUs	63	DU	425	7	23	30	22	14	36
JADUs	64	DU	431	7	23	30	23	14	36
Total Trip Generation			1,460	26	82	108	86	51	135

[1] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 11th Edition,* 2021. Land Use Code 210 - Single-family Detached Housing.

[2] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 11th Edition,* 2021. Land Use Code 221 - Multifamily Housing (Low-rise).

DU: Dwelling Units

Exhibit 5. Scenario B (Phase 1 and Phase 2 Build-out) Trip Generation

				AM Peak Hour			PM Peak Hour		
Land Use	**Land Use Code**	**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates									
Single-family Detached Housing[1]	LU 210	DU	9.430	0.195	0.555	0.750	0.634	0.356	0.990
Multifamily Housing (Low-Rise)[2]	LU 220	DU	6.740	0.113	0.357	0.470	0.353	0.217	0.570
Project Trip Generation									
Palmdale Single-Family Housing Trips	137	DU	1,282	27	75	102	86	48	135
ADUs	135	DU	903	15	48	63	47	29	76
JADUs	69	DU	613	10	33	43	32	20	52
Total Trip Generation			2,799	52	156	208	165	97	263

[1] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 11th Edition,* 2021. Land Use Code 210 - Single-family Detached Housing.

[2] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 11th Edition,* 2021. Land Use Code 221 - Multifamily Housing (Low-rise).

DU: Dwelling Units

Exhibit 6. Vehicle Time of Day Distribution on Project Access Road[1]

	Scenario A (Phase 1 Build-out)			Scenario B (Phase 1 and Phase 2 Build-out)		
Time[2]	Total	Entering	Exiting	Total	Entering	Exiting
12:00 - 1:00 AM	8	5	2	14	10	4
1:00 - 2:00 AM	5	3	2	9	5	3
2:00 - 3:00 AM	4	2	2	8	5	3
3:00 - 4:00 AM	4	2	2	8	4	4
4:00 - 5:00 AM	11	2	9	21	5	16
5:00 - 6:00 AM	21	4	17	39	7	32
6:00 - 7:00 AM	58	11	47	111	21	90
7:00 - 8:00 AM	95	18	76	182	36	146
8:00 - 9:00 AM	87	25	62	167	49	119
9:00 - 10:00 AM	61	22	38	117	43	74
10:00 - 11:00 AM	60	23	37	117	46	72
11:00 - 12:00 PM	68	33	36	132	64	69
12:00 - 1:00 PM	71	37	35	139	71	68
1:00 - 2:00 PM	73	35	37	141	69	72
2:00 - 3:00 PM	85	46	39	164	88	76
3:00 - 4:00 PM	97	56	42	188	108	80
4:00 - 5:00 PM	121	75	46	234	144	90
5:00 - 6:00 PM	133	79	54	255	150	104
6:00 - 7:00 PM	114	67	46	217	128	88
7:00 - 8:00 PM	86	53	33	163	100	63
8:00 - 9:00 PM	78	51	27	148	97	51
9:00 - 10:00 PM	58	39	19	109	74	36
10:00 - 11:00 PM	40	26	13	73	49	25
11:00 - 12:00 AM	22	14	8	42	27	15

[1] Source: Institute of Transportation Engineers, *Trip Generation, 11th Edition,* 2021

Traffic Signal Warrants Analysis

The traffic signal warrants analysis was carried out as per the guidelines set in the State of California Manual on Uniform Traffic Control Devices (CA-MUTCD) 2014 Edition Revision 6. The CA-MUTCD contains minimum guidelines regarding traffic volumes, collisions, speeds, pedestrian crossings, and other criteria in order to satisfy the requirements for the recommendation of a traffic signal. The traffic signal guidelines in Chapter 4C. Traffic Control Signal Needs Studies of the CA-MUTCD can be accessed at https://dot.ca.gov/programs/safety-programs/camutcd/camutcd-files.

As stated in these CA-MUTCD guidelines, an engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.
The investigation of the need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions, and the applicable factors contained in the following traffic signal warrants:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

If any, or a combination, of these warrants is met then a traffic signal should be considered. Yet, as also stated in the CA-MUTCD, “the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.” It should also be noted that if the warrant criteria in these guidelines are not met, the installation of an un-warranted traffic signal is typically not recommended as it may place the City in a position of potential liability.

The following pages present the analysis of each of the warrants for Scenario A and Scenario B. In order to evaluate traffic volume warrants, 24-hour Average Daily Traffic *(*ADT*)* machine counts were collected on East Palmdale Boulevard at the proposed intersection location on Wednesday, June 22, 2022. All traffic volume data collected for this intersection are included in Appendix A.

For the purposes of this analysis, it is assumed that the proposed development will be completed in 2025. Therefore, traffic volumes on East Palmdale Boulevard are increased by 1.5% per year (as agreed upon with the City) to account for expected future population growth and the accompanying growth in travel demand.

Scenario A. Phase 1 Build-out Traffic Signal Warrants

Warrant 1, Eight-Hour Vehicular Volume

Per the CA-MUTCD, the eight-hour vehicular volume warrant applies under two conditions:

- Condition A (Minimum Vehicular Volume): at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.
- Condition B (Interruption of Continuous Traffic): at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

For the intersection under consideration, Table 1 summarizes the vehicular volumes entering the intersection from E Palmdale Blvd (major street) and from the Project access road (minor street). As noted earlier the volumes were forecasted to 2025 conditions by using a 1.5% growth factor. Exhibit 7 shows that the minor street traffic is considerably less (approximately 4%) of the major street traffic.

Exhibit 7. Traffic Volumes Entering the Intersection (Phase 1 Build-out)

Street	Direction	ADT Volume[1]	Directional Split	Highest Hourly Volume
E Palmdale Blvd	Eastbound	9,089	52 %	886 veh. (5:00 to 6:00 PM)
	Westbound	8,421	48 %	617 veh. (7:00 to 8:00 AM)
Project Access Road	Northbound	730	50 %	76 veh. (7:00 to 8:00 AM)

[1] Year 2025 Average Daily Traffic Volumes

All traffic volume data were applied to the Traffic Signal Warrants Worksheet presented on the following page in Exhibit 8. The intersection traffic volume data do not meet the minimum volumes required for conditions A or B.

Therefore, Warrant 1 is not met.

Exhibit 8. Warrant 1 (CA-MUTCD) for Scenario A

DIST ____ CO ____ RTE ____ PM ____

COUNT DATE 6/22/2022
CALC AG DATE 10/31/2022
CHK . ____ DATE ____

Major St: E Palmdale Blvd
Minor St: Project Site - Scenario 1

Critical Approach Speed 55 mph
Critical Approach Speed ____ mph

Speed limit or critical speed on major street traffic > 40 mph.......... ☒ or
In built up area of isolated community of < 10,000 population.......... ☐ } **RURAL (R)**
☐ **URBAN (U)**

WARRANT 1 - Eight Hour Vehicular Volume **SATISFIED YES ☐ NO ☒**
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume
100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☒

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS) 1 U	1 R	2 or More U	2 or More R	6:00	7:00	8:00	14:00	15:00	16:00	17:00	18:00 Hour
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	641	850	839	1140	1178	1257	1326	1148
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	47	76	62	39	42	46	54	46

Condition B - Interruption of Continuous Traffic
100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☒

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS) 1 U	1 R	2 or More U	2 or More R	6:00	7:00	8:00	14:00	15:00	16:00	17:00	18:00 Hour
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	641	850	839	1140	1178	1257	1326	1148
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	47	76	62	39	42	46	54	46

Combination of Conditions A & B **SATISFIED YES ☐ NO ☒**

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☒
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Warrant 2, Four-Hour Vehicular Volume

This signal warrant is intended for intersections where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Per the CA-MUTCD, "the need for a traffic control signal shall be considered if an engineering study finds that, for each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) all fall above the applicable curve in Figure 4C-1 or Figure 4C-2 for the existing combination of approach lanes."

The analysis shown in Exhibit 9 illustrates that Warrant 2 is not met.

Warrant 3, Peak Hour

This warrant is intended for unusual cases of facilities that attract or discharge large numbers of vehicles over a short time. Per CA-MUTCD, a signal is warranted at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

This warrant requires the criteria in "either of the following two categories are met:

A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:
   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.

B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 or Figure 4C-4 for the existing combination of approach lanes."

No special facilities that attract or discharge large numbers of vehicles over a short time currently exist or are planned for the project area. Moreover, the analysis shown in Exhibit 10 illustrates that Warrant 3 is not met.

Exhibit 9. Warrant 2 (CA-MUTCD) for Scenario A

WARRANT 2 - Four Hour Vehicular Volume **SATISFIED* YES ☐ NO ☒**

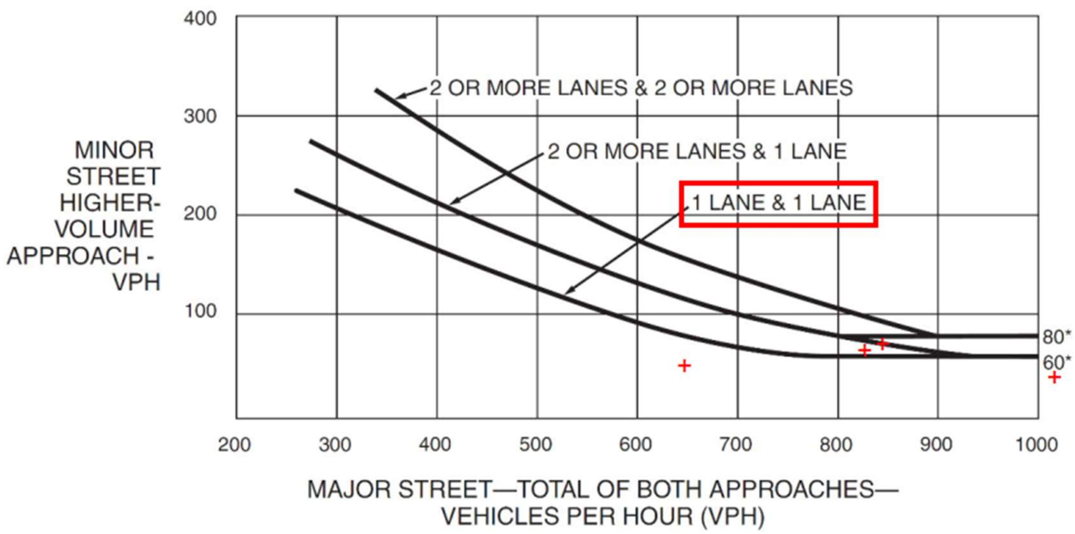
Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	6:00	7:00	8:00	17:00	Hour
Both Approaches - Major Street	X		641	850	839	1326	
Higher Approach - Minor Street	X		47	76	62	54	

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐	No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐	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.

Exhibit 10. Warrant 3 (CA-MUTCD) for Scenario A

WARRANT 3 - Peak Hour **SATISFIED YES ☐ NO ☒**
(Part A or Part B must be satisfied)

PART A **SATISFIED YES ☐ NO ☒**

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐ No ☒
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐ No ☐

PART B **SATISFIED YES ☐ NO ☒**

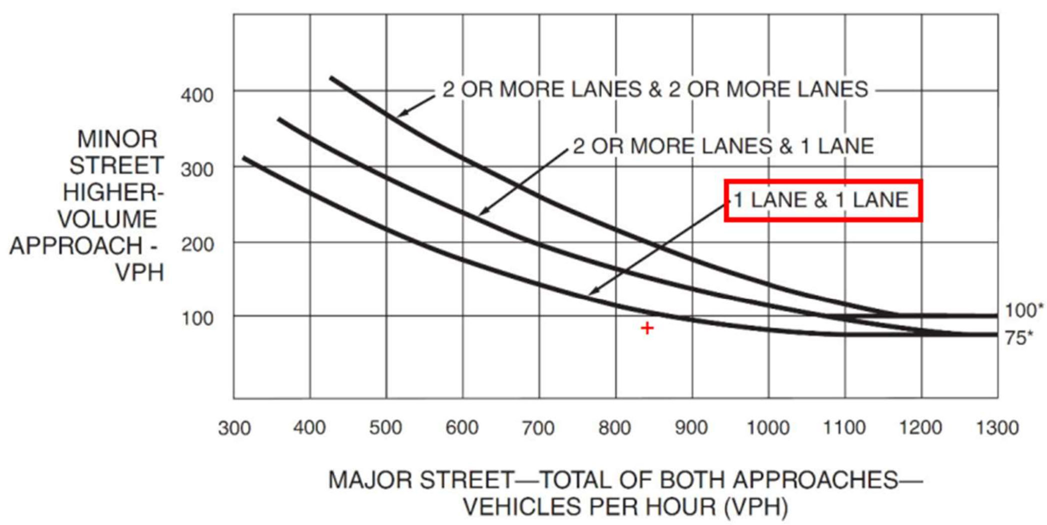
APPROACH LANES	One	2 or More	7:00 Hour
Both Approaches - Major Street	X		76
Higher Approach - Minor Street	X		850

The plotted point falls above the 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 ☒

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

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.

Warrant 4, Pedestrian Volume

This warrant addresses cases where pedestrians experience excessive delays in crossing the major street due to heavy traffic volumes on a major street.

Per CA-MUTCD, a signal “at an intersection or midblock crossing shall be considered if an engineering study finds that one of the following criteria is met:

A. For each of any 4 hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings) all fall above the curve in Figure 4C-5; or
B. For 1 hour (any four consecutive 15-minute periods) of an average day, the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings) falls above the curve in Figure 4C-7.”

There is currently very limited pedestrian activity in the project area. Even as the project site is developed, the area north of Palmdale Blvd across from the project is undeveloped. As such, Warrant 4 is not considered applicable.

Warrant 5, School Crossing

This warrant is intended to assist schoolchildren in crossing major streets.

Per CA-MUTCD, a signal shall be considered when “the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of schoolchildren at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the schoolchildren are using the crossing is less than the number of minutes in the same period (see Section 7A.03) and there are a minimum of 20 schoolchildren during the highest crossing hour.”

There are no school crossings in the intersection project area, Warrant 5 is not considered applicable.

Warrant 6, Coordinated Signal System

This warrant is intended to address cases where a signal is needed to ensure progressive movement (synchronization) in a coordinated signal system to maintain proper platooning of vehicles.

Warrant 6 is not applicable for the location at hand.

Warrant 7, Crash Experience

This warrant is intended at locations where a signal is being considered due to the severity and frequency of crashes.

Per the CA-MUTCD, one of the necessary conditions for this warrant is to have five or more “reported crashes, of types susceptible to correction by a traffic control signal that have occurred within a 12-month period”.

The Transportation Injury Mapping System (TIMS) was checked for the most recent 3-year period spanning from 2019 to 2021 and no collisions were recorded.

Therefore, Warrant 7 is not met.

Warrant 8, Roadway Network

Per the CA-MUTCD, installing a traffic signal at the intersection of two or more major routes “might be justified to encourage concentration and organization of traffic flow on a roadway network.”
Warrant 8 is not met as the project site location is not a major street.

Warrant 9, Intersection Near a Grade Crossing

This warrant is intended for use when the proximity of the intersection to an at-grade crossing is the main reason to install a traffic signal.
As there is no grade crossings near the studied intersection, Warrant 9 is not met.

Scenario B. Phase 1 and Phase 2 Build-out Traffic Signal Warrants

This scenario assumes that both Phase 1 and Phase 2 are built-out. Under this scenario the forecasted 2025 volumes at the subject intersection are illustrated in Exhibit 11.
The time-of-day distribution of traffic existing the project area (entering the study intersection) was presented earlier under Exhibit 6.

Exhibit 11. Traffic Volumes Entering the Intersection (Phase 1 Build-out)

Street	Direction	ADT Volume[1]	Directional Split	Highest Hourly Volume
E Palmdale Blvd	Eastbound	9,089	52 %	886 veh. (5:00 to 6:00 PM)
	Westbound	8,421	48 %	617 veh. (7:00 to 8:00 AM)
Project Access Road	Northbound	1,400	50 %	76 veh. (7:00 to 8:00 AM)

[1] Year 2025 Average Daily Traffic Volumes

Warrant 1, Eight-Hour Vehicular Volume

Scenario B (full build-out of Phase 1 and Phase 2) traffic volume data were applied to the Traffic Signal Warrants Worksheet presented on the following page in Exhibit 12.
While Condition A (Minimum Vehicle Volume) was not satisfied, Condition B (Interruption of Continuous Traffic) was met.
Therefore, Warrant 1 is met and the intersection would be warranted for installing a traffic signal.

Warrant 2, Four-Hour Vehicular Volume

The analysis shown in Exhibit 13 illustrates that Warrant 2 is also met under Scenario B.

Warrant 3, Peak Hour

As discussed previously, this warrant is intended for facilities that attract or discharge large numbers of vehicles over a short time. Although the traffic volumes do satisfy this warrant as shown in Exhibit 14, a signal would likely not be recommended based on this warrant alone.

Exhibit 12. Warrant 1 (CA-MUTCD) for Scenario B

COUNT DATE 6/22/2022
CALC AG DATE 7/13/2023
CHK . ________ DATE ________

_____ DIST _____ CO _____ RTE _____ PM

Major St: E Palmdale Blvd — Critical Approach Speed 55 mph
Minor St: Project Site - Scenario 2 — Critical Approach Speed ________ mph

Speed limit or critical speed on major street traffic > 40 mph........................ ☒ or
In built up area of isolated community of < 10,000 population...................... ☐ } **RURAL (R)**
☐ **URBAN (U)**

WARRANT 1 - Eight Hour Vehicular Volume **SATISFIED YES ☒ NO ☐**
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume
100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☒

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)											
	U	R	U	R								
APPROACH LANES	1		2 or More		6:00	7:00	8:00	14:00	15:00	16:00	17:00	18:00 Hour
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	641	850	839	1140	1178	1257	1326	1148
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	90	146	119	76	80	90	104	88

Condition B - Interruption of Continuous Traffic
100% SATISFIED YES ☒ NO ☐
80% SATISFIED YES ☐ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)											
	U	R	U	R								
APPROACH LANES	1		2 or More		6:00	7:00	8:00	14:00	15:00	16:00	17:00	18:00 Hour
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	641	850	839	1140	1178	1257	1326	1148
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	90	146	119	76	80	90	104	88

Combination of Conditions A & B **SATISFIED YES ☐ NO ☐**

REQUIREMENT	**CONDITION**	✓	**FULFILLED**
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☐
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Exhibit 13. Warrant 2 (CA-MUTCD) for Scenario B

WARRANT 2 - Four Hour Vehicular Volume **SATISFIED* YES ☒ NO ☐**

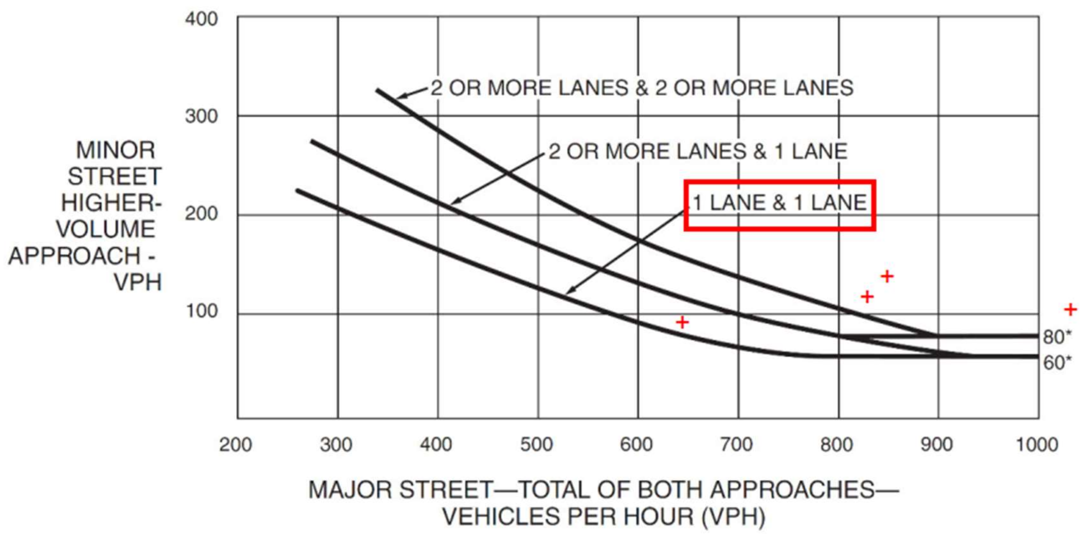
Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	6:00	7:00	8:00	17:00 Hour
Both Approaches - Major Street	X		641	850	839	1326
Higher Approach - Minor Street	X		90	146	119	104

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐	No ☐
<u>OR</u>, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☒	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.

Exhibit 14. Warrant 3 (CA-MUTCD) for Scenario B

WARRANT 3 - Peak Hour **SATISFIED YES ☒ NO ☐**
(Part A or Part B must be satisfied)

PART A **SATISFIED YES ☐ NO ☐**
(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐	No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐	No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐	No ☐

PART B **SATISFIED YES ☒ NO ☐**

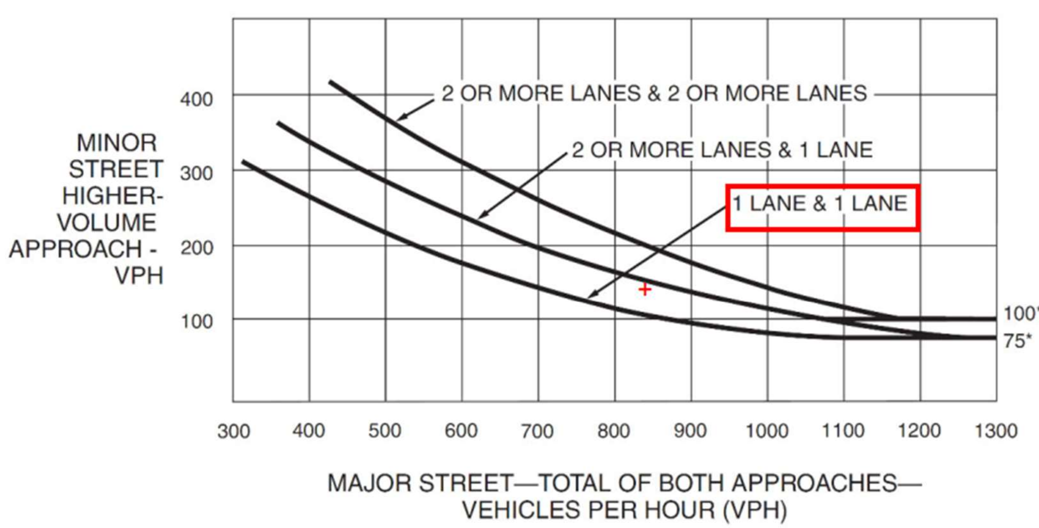
APPROACH LANES	One	2 or More	7:00 (Hour)
Both Approaches - Major Street	X		850
Higher Approach - Minor Street	X		146

The plotted point falls above the 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 ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

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.

Warrant 4, Pedestrian Volume

As noted in the previous section under Scenario A, there is currently very limited pedestrian activity in the project area which is yet to be developed. As such, Warrant 4 was not applicable.

Warrant 5, School Crossing

With no schools or school crossings in the intersection project area, Warrant 5 was not applicable.

Warrant 6, Coordinated Signal System

As presented in the previous section, Warrant 6 was not applicable for the location at hand.

Warrant 7, Crash Experience

Warrant 7 was not met, as no collisions were recorded in the most recent 3-year period.

Warrant 8, Roadway Network

As illustrated in the previous section, this warrant applies at the intersection of two or more major routes. As the project access and E Palmdale Blvd are not major routes, then Warrant 8 was not met.

Warrant 9, Intersection Near a Grade Crossing

As noted in the previous section, there are no grade crossings near the studied intersection. As such, Warrant 9 was not met.

Summary and Recommendations

The traffic signal warrants analysis was carried out for the intersection of East Palmdale Boulevard and the proposed access road for the Palmdale Two residential development in the City of Palmdale as per the guidelines set in the State of California Manual on Uniform Traffic Control Devices (CA-MUTCD) 2014 Edition Revision 6.

In order to justify and recommend the installation of traffic control signals, as shown above there are nine (9) CA-MUTCD Traffic Signal Warrants that should be analyzed. If any, or a combination, of these warrants is met then a traffic signal should be considered. Yet, as also stated in the CA-MUTCD, the "satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal." If the warrant criteria in these guidelines are not met, the installation of an un-warranted traffic signal is typically not recommended as it may place the City in a position of potential liability.

The analysis of all applicable Traffic Signal Warrants has shown that a traffic signal was not warranted for the initial phase of development (Scenario A, with one 20-acre parcel developed), but is warranted for Scenario B, in which both 20-acre parcels are developed.

Rawad Hani, PE, TE
July 14, 2023

Appendix A. Traffic Counts

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Palmdale
Palmdale Boulevard
B/ 51st Street - 55th Street
24 Hour Directional Volume Count

PDEPA5155
Site Code: 081-22597

Start	6/22/2022	Eastbound		Hour Totals		Westbound		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		27	136			17	126				
12:15		22	120			16	122				
12:30		31	134			14	125				
12:45		20	130	100	520	13	116	60	489	160	1009
01:00		11	125			10	121				
01:15		23	145			8	122				
01:30		18	149			8	101				
01:45		13	159	65	578	8	104	34	448	99	1026
02:00		14	144			13	122				
02:15		15	136			12	106				
02:30		13	152			9	125				
02:45		27	162	69	594	7	143	41	496	110	1090
03:00		17	138			14	104				
03:15		12	155			23	**121**				
03:30		17	151			38	**154**				
03:45		12	170	58	614	46	**134**	121	513	179	1127
04:00		6	194			37	**114**				
04:15		14	171			64	120				
04:30		22	183			100	128				
04:45		27	174	69	722	63	118	264	480	333	1202
05:00		35	**212**			80	86				
05:15		44	**212**			102	122				
05:30		33	**216**			116	118				
05:45		33	**207**	145	847	103	95	401	421	546	1268
06:00		46	195			92	94				
06:15		47	181			100	103				
06:30		37	155			110	112				
06:45		61	166	191	697	120	92	422	401	613	1098
07:00		49	174			105	78				
07:15		57	140			**118**	78				
07:30		67	129			**199**	85				
07:45		50	117	223	560	**168**	81	590	322	813	882
08:00		62	127			**133**	63				
08:15		70	116			118	72				
08:30		73	122			157	54				
08:45		64	103	269	468	125	53	533	242	802	710
09:00		73	118			109	52				
09:15		68	118			120	45				
09:30		66	89			138	43				
09:45		87	73	294	398	123	36	490	176	784	574
10:00		94	64			123	36				
10:15		90	59			116	21				
10:30		88	70			127	25				
10:45		**111**	51	383	244	105	25	471	107	854	351
11:00		**115**	44			106	22				
11:15		**117**	35			109	14				
11:30		**107**	30			112	14				
11:45		111	25	450	134	137	17	464	67	914	201
Total		2316	6376	2316	6376	3891	4162	3891	4162	6207	10538
Combined Total		8692		8692		8053		8053		16745	
AM Peak	-	10:45	-	-	-	07:15	-	-	-	-	-
Vol.	-	450	-	-	-	618	-	-	-	-	-
P.H.F.		0.962				0.776					
PM Peak	-	-	05:00	-	-	-	03:15	-	-	-	-
Vol.	-	-	847	-	-	-	523	-	-	-	-
P.H.F.			0.980				0.849				
Percentage		26.6%	73.4%			48.3%	51.7%				
ADT/AADT		ADT 16,745		AADT 16,745							

Appendix H

Vehicle Miles Traveled Analysis

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MEMORANDUM

Date:	July 6, 2023	**GTS:** 210806.06
To:	Kevin Harbison (Ravello Holdings)	
From:	Rawad Hani, GTS	
Subject:	Vehicle Miles Traveled (VMT) Analysis - Palmdale Residential Development Southeast corner of E. Palmdale Blvd and Hudsonia St (APN: 3023-002-184), Palmdale, CA	

This memorandum pertains to the vehicle miles traveled (VMT) screening analysis for the proposed residential development for the parcel APN: 3023-002-184 at southeast corner of E. Palmdale Blvd and Hudsonia St, in the City of Palmdale, Los Angeles County, CA (City). The project consists of 64 single family residences, 63 accessory dwelling units (ADUs) and 64 junior accessory dwelling units (JADUs) on an approximately 20 Acre site.

A VMT analysis has previously evaluated the project using 2016 Southern California Association of Governments' (SCAG) Regional Transportation Plan/Sustainable Communities Strategies (RTP/SCS) travel demand model.

As the project may be offered as an affordable development, this memorandum presents the VMT screening analysis for the 100% affordable scenario/option.

Background & Methodology

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled (VMT).

While the City is actively working on developing their own guidelines for VMT, at the time of the analysis the City is using the *Los Angeles County Public Works – Transportation Impact Analysis (TIA) Guidelines - dated July 23, 2020* as a guide in the VMT analysis of development projects.

VMT Screening Analysis

Pursuant to the above mentioned *Los Angeles County Public Works – Transportation Impact Analysis (TIA) Guidelines of July 23, 2020* (which in turn is in line with Senate Bill 743 Technical Guidance published by the State's Office of Planning and Research), certain residential projects that further the State's affordable housing goals are presumed to have less than significant impact on VMT if 100% of the units, excluding manager's units, are set aside for lower income households.

As such if the project is developed as 100% affordable, it is presumed to have less than significant impact on VMT, further analysis is not required, and a less than significant determination can be made.

Conclusion

Based on the screening criteria noted above, the 100% affordable project is presumed to have less than significant impact on VMT.