Initial Study/Mitigated Negative Declaration

Development of Tentative Tract Map 82364 Time Extension, Single-Family Residences

July 22, 2024

Prepared by:

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Prepared for: City of Palmdale
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Palmdale, California 93550

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

	Aesthetics		Hazards & Hazardous Materials		Public Services
	Agriculture Resources		Hydrology/Water Quality		Recreation
	Air Quality/GHG/Energy		Land Use/Planning		Transportation/Traffic
	Biological Resources		Mineral Resources		Utilities/Service Systems
	Cultural Resources		Noise		Mandatory Findings of Significance
	Geology/Soils		Population/Housing		

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

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

Date

Brenda Magaña
Planning Manager

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in its explanation following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e. g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation incorporated, or less than significant. "Potentially Significant Impact' is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section 17, "Earlier Analysis," may be cross-referenced).
5) Earlier analysis may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c) (3) (D). In this case, a brief discussion should identify the following:
   (a) Earlier Analysis Used. Identify and state where they are available for review.
   (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   (c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address the site-specific conditions for the project.
6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g. general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9) The explanation of each issue should identify:
   (a) The significance criteria or threshold, if any, used to evaluate each question; and
   (b) The mitigation measure identified, if any, to reduce the impact to less than significant.

Distribution List

Table of Contents

Environmental Checklist

1. PROJECT TITLE: Development of Tentative Tract Map 82364 Time Extension Single-Family Residences

2. LEAD AGENCY NAME AND ADDRESS:

   City of Palmdale
   Economic and Community Development Department
   Planning Division
   38250 Sierra Highway, Palmdale, California, 93550

3. CONTACT PERSON AND PHONE NUMBER:

   Brenda Magaña, Planning Manager, 661.267.5293

   Sarah Stachnik, Assistant Planner, 661.267.5207

4. PROJECT LOCATION: The 4.83-acre site is located south of the intersection of Avenue R-8 and 3rd Street East in Palmdale, California (APN: 3010-009-007) as depicted in Figures 1 and 2.

5. PROJECT SPONSOR'S NAME AND ADDRESS:

   Shawna Ricker
   661.952.7918
   shawna@duke-engineering.com
   Duke Engineering
   759 W. Lancaster Boulevard
   Lancaster, California 93534

6. GENERAL PLAN DESIGNATION (Figure 3): Single Family Residential 3 (SFR 3)

7. ZONING: Single Family Residential 3 (SFR 3)

8. DESCRIPTION OF PROJECT: The proposed project is a request to subdivide approximately five acres into 16 lots for the purpose of constructing 15 single-family lots, and one detention basin lot. Four existing structures will be demolished and 15 single-family residential homes and associated infrastructure will be constructed, including road improvements along Avenue R-8 and Avenue R-9. Vegetation will be removed and the entire site graded. Sidewalks, curbs, and utilities will be installed. Access into the property will be from Avenue R-9. There will be no outlet onto Avenue R-8. Specific details of the project are depicted on the site plan and grading plans (Appendix A and G):

   The project was originally approved by the City of Palmdale Planning Commission on March 20, 2020, prior to the listing of the western Joshua tree as a Candidate Species by the California Endangered Species Act (CESA) and adoption of the Western Joshua Tree Conservation Act. As the protection status of the western Joshua tree has changed, an initial study has been prepared.

9. SURROUNDING LAND USES AND SETTING: The project is proposed within the City of Palmdale on a site that is surrounded by residential development (Table 1). The site is bounded by East Avenue R-8 to the north, East Avenue R-9 to the south, with residential development on all sides. Photographs of the site and surrounding area are provided in Appendix B.

Table 1. Existing and Surrounding Land Use, Zoning, and General Plan Designations

	Land Use	Zoning	General Plan
Subject Site	Existing single-family residence and accessory structures	SFR3 (Single Family Residential 3)	SFR3 (Single Family Residential 3)
North	Existing single-family residences, across Avenue R-8	SFR3 (Single Family Residential 3)	SFR3 (Single Family Residential 3)
South	Existing single-family residences, across Avenue R-9	SFR3 (Single Family Residential 3)	SFR3 (Single Family Residential 3)
East	Existing single-family residences	SFR3 (Single Family Residential 3)	SFR3 (Single Family Residential 3)
West	Existing single-family residences	SFR3 (Single Family Residential 3)	SFR3 (Single Family Residential 3)

10. OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED (e.g., permits, financing approval, or participation agreement). Distribution of this document is appropriate, but not limited, to the following agencies:

    Lahontan Regional Water Quality Control Board
    Antelope Valley Air Quality Management District
    Los Angeles County Sanitation District 14
    Palmdale Water District
    California Department of Fish and Wildlife

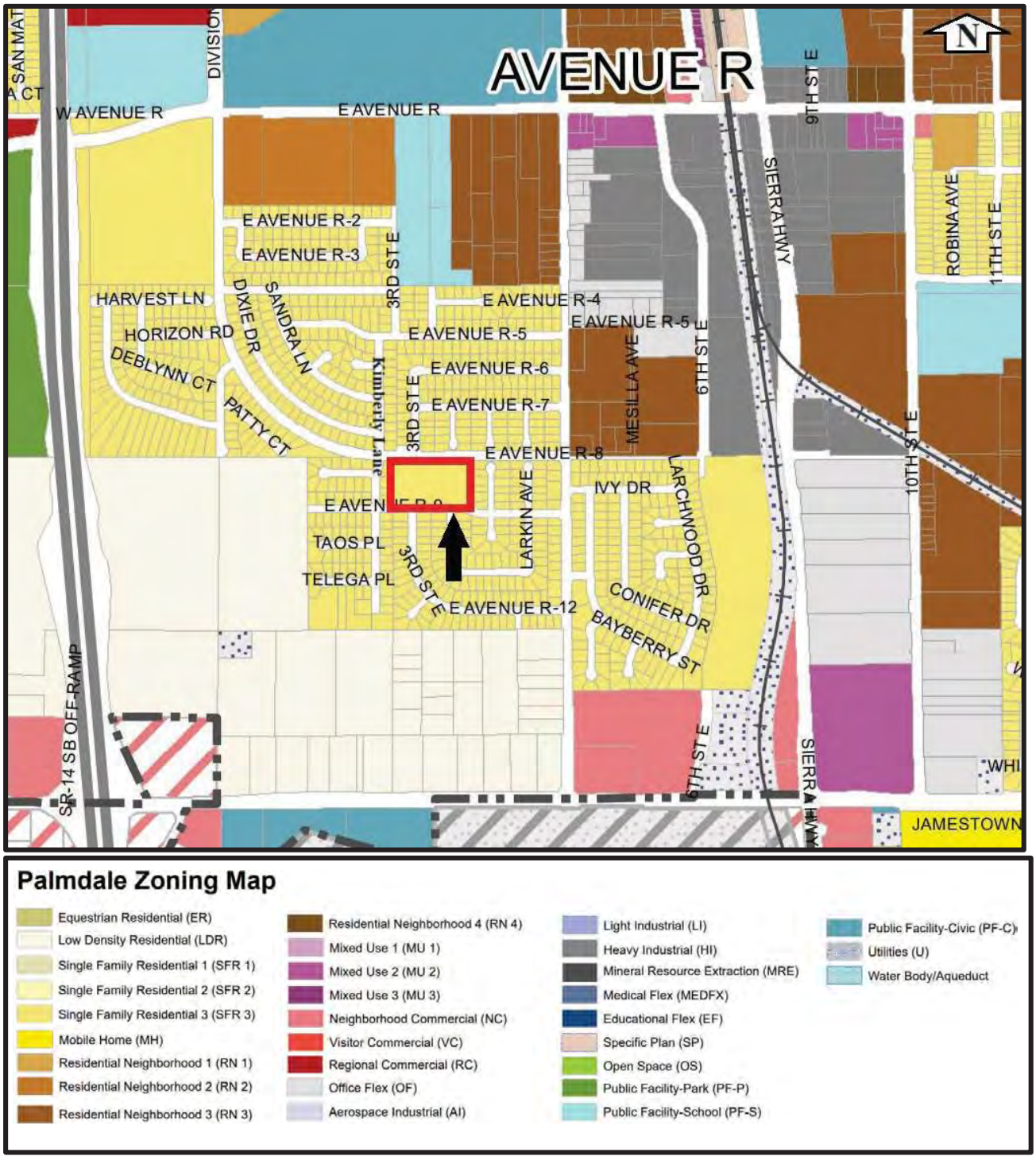
11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1?

    The City of Palmdale notified the Native American Heritage Commission and appropriate tribes. Their responses have been reviewed and incorporated into this document under Tribal Cultural Resources and the Mitigation, Monitoring, and Reporting Plan.

Figure 1. Vicinity Map

Approximate location of study area (red rectangle) as depicted on excerpts from USGS Quadrangles Palmdale, and Ritter Ridge, Calif., 7.5', 1975.

Figure 2. Aerial Photograph of Site and Surrounding Area (Google Earth 2022)



Palmdale Zoning Map

- Equestrian Residential (ER)
- Low Density Residential (LDR)
- Single Family Residential 1 (SFR 1)
- Single Family Residential 2 (SFR 2)
- Single Family Residential 3 (SFR 3)
- Mobile Home (MH)
- Residential Neighborhood 1 (RN 1)
- Residential Neighborhood 2 (RN 2)
- Residential Neighborhood 3 (RN 3)
- Residential Neighborhood 4 (RN 4)
- Mixed Use 1 (MU 1)
- Mixed Use 2 (MU 2)
- Mixed Use 3 (MU 3)
- Neighborhood Commercial (NC)
- Visitor Commercial (VC)
- Regional Commercial (RC)
- Office Flex (OF)
- Aerospace Industrial (AI)
- Light Industrial (LI)
- Heavy Industrial (HI)
- Mineral Resource Extraction (MRE)
- Medical Flex (MEDFX)
- Educational Flex (EF)
- Specific Plan (SP)
- Open Space (OS)
- Public Facility-Park (PF-P)
- Public Facility-School (PF-S)
- Public Facility-Civic (PF-C)
- Utilities (U)
- Water Body/Aqueduct

Excerpt of map and legend from Palmdale General Plan 2045. Black arrow, red rectangle, and Kimberly Lane designation were added to indicate project site location.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
1. **Aesthetics.** Would the project:				
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings? Would the project conflict with applicable zoning and other regulations governing scenic quality?				X
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X

Project Impacts and Mitigation Measures

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

No Impact. The project site is not located next to a state scenic highway and the area is not considered a scenic resource. The closest vista that could be considered "scenic" would be the Lamont Odett Vista Point overlooking Lake Palmdale from Highway 14. This overlook is approximately 2.5 miles from the project site. Furthermore, the proposed project is located in an area built out with residential development and would be subject to City review to ensure conformance with existing design regulations (project setbacks, height, scale, landscaping, etc.) and compatibility with surrounding land uses. Therefore, no impacts would occur.

Mitigation Measures: No mitigation measures are necessary.

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

No Impact. The project site is not located along a state scenic highway and does not contain any rock outcroppings, or historic buildings. While trees, including the western Joshua tree, are located on the project site, there are no scenic highways that abut the project area. Therefore, no impact would occur.

Mitigation Measures: No mitigation measures are necessary.

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 publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*

No impact. The visual character of the project site would be slightly altered from low-density residential development to single-family residential development, consistent with the zone of the property and existing adjacent development. Low numbers of western Joshua trees are present on site. Development of the site will remove all trees after submittal and approval of an Incidental Take Permit from the California Department of Fish and Wildlife. The presence of the western Joshua trees of the site do not substantially add to the visual character of the site. All western Joshua trees will be removed from the site in order to provide housing. The proposed development will be required to comply with PMC Chapter 17.37 for single-family residential development standards for aesthetically pleasing construction. The proposed project would not substantially degrade the existing visual character or quality of the site or its surroundings.

Mitigation Measures: No mitigation measures are necessary.

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

No impact. This project would create new sources of light, including outdoor house lights and street lighting, which will be compatible with the existing surrounding residential area. Additionally, the project will be required to comply with the lighting standards specified within PMC Chapter 17.86.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
2. **Agriculture Resources.** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
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))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
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?				X

Project Impacts and Mitigation Measures

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

No impact. This project site is not considered prime, unique, or farmland of statewide importance based on the Farmland Mapping and Monitoring Program (Department of Conservation 2023). The project site is zoned for single-family residential (SFR 3) and not considered agricultural (City of Palmdale 2022).

Mitigation Measures: No mitigation measures are necessary.

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

No impact. The project site is not zoned for agricultural use and is not under a Williamson Act contract (Rincon 2022).

Mitigation Measures: No mitigation measures are necessary.

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

No impact. There are no forests or timberland located within the City of Palmdale, therefore, no loss of forest land or the conversion of forest land to non-forest land would occur as a result of this project.

Mitigation Measures: No mitigation measures are necessary.

e) *Would the project involve other changes in the existing environment, which, due to their location or nature, could result in the conversion of Farmland to nonagricultural use or the conversion of forestland to non-forest use?*

No impact. There is no noted farmland nearby, and therefore, no conversion of farmland to non-agricultural use could occur. The project site and adjacent properties are zoned for single-family residential development.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
3. **Air Quality.** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
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?				X
c) Expose sensitive receptors to substantial pollutant concentrations?				X
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

Project Impacts and Mitigation Measures

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

Less than Significant Impact. The project site is located within the Antelope Valley Air Quality Management District (AVAQMD) and the Mojave Desert Air Basin (MDAB). Development and operation of this project will comply with all applicable district rules and regulations, and proposed control measures as required by the AVAQMD. By complying with these rules, regulations, and measures the project would not conflict with or obstruct implementation of the Air Quality Plan. This project is located within the SFR 3 zone which allows for single-family residential development. CalEEMod, Version 2020.4.0 was used to model potential air emissions (M.S. Hatch Consulting 2023, Appendix C). The estimated emissions of criteria pollutants and greenhouse gases from the construction and total operational emissions from the project are below the applicable thresholds (M.S. Hatch Consulting 2023).

Mitigation Measures: No mitigation measures are necessary.

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?*

No impact. The Antelope Valley is in an ozone and particulate matter nonattainment region (M.S. Hatch Consulting 2023). As specified within the air quality study, the project's estimated construction and total operational emissions are below the applicable AVAQMD thresholds of significance and will be required to comply with applicable AVAQMD requirements. As long as development and operations are able to follow those required measures, they cannot cause a cumulatively considerable increase in any criteria for which a region is in nonattainment (M.S. Hatch Consulting 2023). Dust controls are incorporated into the construction process and are monitored by the city and AVAQMD.

Mitigation Measures: No mitigation measures are necessary.

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

The proposed project is not considered one of the project types that the AVAQMD CEQA Guidelines require to be evaluated for potentially exposing sensitive receptors to substantial pollutant concentrations (M.S. Hatch Consulting 2023).

Mitigation Measures: No mitigation measures are necessary.

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

Less than Significant. The proposed project does not contain land uses that would typically be associated with significant odor emissions such as agricultural uses, landfills, and sewage treatment facilities. Typical construction odors would be temporary and are not expected to affect a substantial number of people.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
4. **Biological Resources.** Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?				X
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?				X
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?				X
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
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?				X

Project Impacts and Mitigation Measures

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 (CDFW) or U.S. Fish and Wildlife Service?*

Less than Significant with Mitigation. The biological report for this project site indicated that no sensitive wildlife species were observed or expected in the project site (Hagan 2023 [Appendix D]). The fate of Crotch's bumble bee has had elevated concern by some agencies lately. No Crotch's bumble bee observations have been documented since 1945 in Palmdale. This species is not considered present within the site. The biological report indicated no sensitive habitat was present within the site. The site has remnant creosote and sparse Western Joshua trees (WJTs), ornamental plantings, both shrubs and trees. Although the site does WJTs within the project there is no intact habitat. WJTs on-site are represented mostly by a few tight groupings (formerly considered clones). Those groupings would result in a different number of trees depending on how they are counted (under CESA or WJTCA). A census detailing the number and type of WJTs in support of an Incidental Take Permit will be accomplished prior to construction activities. Since it is unknown exactly when development will take place it is ill advised to accomplish a census at this time. There is no intact WJT habitat adjacent to the site, the site has low to no value to the overall population of WJTs. Loss of all the WJTs on this site would not constitute a significant impact. The western Joshua tree was listed as a candidate species for listing under the California Endangered Species Act in 2020. The Fish and Game Commission has not advanced the western Joshua tree to formal listing as of this date. The State of California, however, passed the Western Joshua Tree Conservation Act (WJTCA) in June 2023 providing full protection. The project will be required to follow CDFW requirements for handling of western Joshua trees on site. No other sensitive plant species were observed or are expected to be present within the project site; however, there is potential nesting habitat for migratory birds within the vegetation (WJTs, shrubs, ornamental plantings) and structures on site. Cover sites for burrowing owls were not observed within the study site and are not expected to occupy the project site due to the presence of free-roaming dogs.

With incorporation of **Mitigation Measure BIO-1 and BIO-2**, potentially significant impacts to western Joshua trees and migratory birds would be reduced to a less than significant level.

Mitigation Measures:

BIO-1: Because the project will result in "take" of western Joshua trees, coordination with the CDFW shall be undertaken by the project applicant and an Incidental Take Permit (ITP) will be obtained under the California Endangered Species Act (CESA) or the Western Joshua Tree Conservation Act (WJTCA) prior to any project activities. The project

applicant shall adhere to all conditions outlines in the ITP and provide compensatory mitigation required in the ITP to offset impacts. No take of western Joshua trees shall occur until the ITP has been issued to the applicant.

BIO-2: Project activities shall occur outside of the nesting season for birds and raptors, which generally runs from February 15 through September 15, and as early January 1 for some raptors. If project grading/construction activities are scheduled to occur during the nesting season a pre-construction nesting bird and raptor survey shall be conducted by a qualified biologist. The pre-construction survey shall occur within 7 days of Project activities throughout the entire Project site. If active bird nests are found, impacts to nests will be avoided by either delaying work or establishing initial buffer areas of a minimum of 50 feet (16 meter (m)) around active migratory passerine bird species nests and a minimum of 500 feet (160 m) around raptor nests. The project biologist will determine if the buffer areas should be increased or decreased based on the nesting bird response to disturbances.

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?*

No impact. As indicated in the biological resources assessment (Hagan 2023), there are no riparian habitats or sensitive natural communities present on the project site. The WJTs present on the site are a few isolated clones and individual trees which do not form a sensitive plant community.

Mitigation Measures: No mitigation measures are necessary.

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?*

No impact. There are no such features noted during the biological assessment of the site.

Mitigation Measures: No mitigation measures are necessary.

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 nesting sites?*

Less than Significant. There is no evidence of any movement corridors or nursery sites within this project area. This project will not interfere with the movement of fish or wildlife species, migratory corridors, or wildlife nursery sites. With the implementation **of BIO-2**, potentially significant impacts would be reduced to a less than significant level.

Mitigation Measures: No mitigation measures are necessary.

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

Less than Significant with Mitigation. The western Joshua trees are protected under state regulations and mitigation of impacts will be handled under CESA or the WJTCA. See BIO-1 above.

A native preservation plan in accordance with PMC Chapter 14.04 prior to issuance of a grading permit would not be required as the ITP will fulfill mitigation intent in the ordinance.

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?*

No impact. The project site is not located within or near lands that are governed by an adopted habitat conservation plan, natural community conservation plan, or other approved habitat conservation plan.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
5. **Cultural Resources.** Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?		X		
c) Disturb any human remains, including those interred outside of dedicated cemeteries?		X		

Project Impacts and Mitigation Measures

a-b) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to in §15064.5? Would the project cause a substantial adverse change in the significance of an archaeological resource as defined in Public Resources Code Section 21083.2 and 21084.1, and CEQA Guidelines Section 15064.5, respectively?

No impact. A Cultural Resources Report was completed for the project site. One historic period site was recorded (Site 683-1), which consists of a standing and occupied residence built in 1952 and various outbuildings; however, the site was evaluated as "not significant" (RT Factfinders 2023, Appendix F).

No Native American archaeological sites or artifacts have been identified on or immediately near the property (RT Factfinders 2023). No further cultural resource work is recommended; however, mitigation measures will be employed for any inadvertent discovery of buried artifacts (Appendix E). With the incorporation of **Mitigation Measure CUL-1**, impacts will be reduced to less than significant.

Mitigation Measures:

CUL-1: The project applicant shall retain a professional Tribal Monitor procured by the Fernandeño Tataviam Band of Mission Indians (FTBMI) and/or the Yuhaaviatam of San Manuel Nation (YSMN) to observe all ground-disturbing activities including, but not limited to, clearing, grubbing, grading, excavating, digging, trenching, plowing, drilling, tunneling, quarrying, leveling, driving posts, auguring, blasting, stripping topsoil or similar activity. Tribal Monitoring Services will continue until confirmation is received from the project applicant, in writing, that all scheduled activities pertaining to Tribal Monitoring are complete. If the Project's scheduled activities require the Tribal Monitor to leave the Project for a period of time and return, confirmation shall be submitted to the Tribe by Client, in writing, upon completion of each set of scheduled activities and

5 days' notice (if possible) shall be submitted to the Tribe by project applicant, in writing, prior to the start of each set of scheduled activities.

If cultural resources are encountered, the Tribal Monitor will have the authority to request that ground-disturbing activities cease within 60 feet of discovery and a qualified archaeologist meeting Secretary of Interior standards retained by the project applicant as well as the Tribal Monitor shall assess the find. The YSMN and the FTBMI shall be contacted, as detailed within TCR-1, regarding any pre- contact finds. They will be provided information after the archaeologist makes the initial assessment of the nature of the find, so as to provide Tribal input with regards to significance and treatment.

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

c) *Would the project disturb any Native American tribal cultural resources or human remains, including those interred outside of dedicated cemeteries?*

No impact. No indication of human remains was observed on the project site; however, **Mitigation Measure CUL-2** will be employed in the event resources or remains are discovered during construction.

Mitigation Measures:

CUL-2: If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.

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

Project Impacts and Mitigation Measures

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

Less than Significant Impact. There are no unusual project characteristics that would necessitate the use of construction equipment that would be less energy-efficient than at comparable construction sites in the region or state. Construction would be temporary and in compliance with AVAQMD regulations, Environmental Protection Agency (EPA) and California Air Resources Board (CARB) emissions standards. Residences will be constructed to comply with Title 24 Building Efficiency Standards.

Mitigation Measures: No mitigation measures are necessary.

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

No impact. This project will comply with applicable regulations and City of Palmdale General Plan policies to prevent wasteful, inefficient, or unnecessary consumption of energy resources during construction and operation. The project will construct and operate in a manner consistent with energy efficiency goals contained in the City of Palmdale Energy Action Plan. Construction and operation would comply with CALGreen and Title 24 of the California Energy Code requirements (City of Palmdale 2022, Rincon 2022).

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
7. **Geology and Soils.** Would the project:				
a) Directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist- Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42 ii) Strong seismic ground shaking? iii) Seismic-related ground failure, including liquefaction? iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?				X
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?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
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?				X
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

Project Impacts and Mitigation Measures

a) *i) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of injury, damage or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Map issued by the State Geologist for the area or based upon on other substantial evidence of a known fault?*

No impact. The project site is not located within the Alquist-Priolo special studies zone (Bruin Engineering 2023 [Appendix G]).

Mitigation Measures: No mitigation measures are necessary.

ii-iv) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of injury, damage or death involving strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides?

The project area is located in a region that is subject to seismic events. No known active faults have been mapped across the subject site and the potential hazards due to active fault ground rupture are considered minimal. According to current publications by the State of California, the project site is not located within the Alquist-Priolo special studies zone (Bruin Engineering 2023).

In view of the relatively firm silty sand and sandy silt encountered in the borings, relative densities, and depth to static groundwater (over 100 feet), the potential for on-site liquefaction or seismically induced dynamic settlement is considered to be negligible. Based on a review of the Seismic Hazards Map, the site is not located in an area requiring a liquefaction analysis (Bruin Engineering 2023).

As the site topography is relatively flat, hazards from landslides are considered negligible (Bruin Engineering 2023).

As a result of the potential seismic hazards associated with the region, specifications for earthwork and grading are identified in the geotechnical evaluation. Incorporation of these recommendations and compliance with the California Building Code would reduce seismic hazards to the residential development.

Mitigation Measures: No mitigation measures are necessary.

b-c) *Would the project result in substantial soil erosion or the loss of topsoil? 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?*

No impact. The current storm drainage sheet flows through the project site, which could cause erosion. Appropriate analysis, grading and drainage design, and site maintenance should minimize the potential sheet flow erosion (Bruin Engineering 2023). Due to

requirements in the Stormwater Pollution Prevention Plan (SWPP), which will be part of the construction, these actions will not result in substantial soil erosion or loss of topsoil.

Furthermore, the project would comply with the California Building Code and incorporate recommendations from the geotechnical and soils report into the development of the project.

Mitigation Measures: No mitigation measures are necessary.

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?*

No impact. The expansion index tests indicate that the site soils are considered to be "non-expansive" (Bruin Engineering 2023). Therefore, no substantial risks to life or property would be expected.

Mitigation Measures: No mitigation measures are necessary.

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?

No impact. During construction, portable toilet/wash station facilities will be used by on-site workers. Constructed residences will connect to the local sewer system. No septic tanks or alternative wastewater disposal systems are planned.

Mitigation Measures: No mitigation measures are necessary.

f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

Less than Significant Impact with Mitigation. There were no indication of any paleontological resources and no unique geologic features present or expected; however, in the event of encountering unknown paleontological resources, **Mitigation Measure GEO-1** is included to ensure impacts are reduced to a less than significant level.

Mitigation Measures:

GEO-1: In the event that paleontological resources are encountered all work shall stop at the discovery site. At that time, a qualified paleontological monitor shall be consulted to evaluate the find. Construction activities shall be temporarily redirected to another location on-site (minimum of 100 feet from the location of the find) so that the monitor can recover any specimens encountered during excavation. All fossils/specimens collected during this work shall be deposited in a City of Palmdale-approved museum repository for curation and storage.

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

Project Impacts and Mitigation Measures

a) Would the project generate greenhouse gas emissions, either directly or indirectly that may have a significant impact on the environment?

No impact. The estimated emissions of criteria pollutants and greenhouse gases from the construction and total operational emissions from the project were estimated using CalEEMod (Appendix C). The evaluation indicates that estimated emissions from the project are below the applicable AVAQMD thresholds of significance (M.S. Hatch Consulting 2023).

Mitigation Measures: No mitigation measures are necessary.

b) Would the project conflict with an applicable plan, policy, or regulation adoption for the purpose of reducing the emission of greenhouse gases?

No impact. The proposed project would not result in an increase of either population or emissions sources beyond what has been planned for in the City of Palmdale's General Plan. As the greenhouse gas emissions would be well below the applicable AVAQMD Significant Emissions Thresholds, no conflict would occur (M.S. Hatch Consulting 2023). The project will comply with energy-efficiency and green building standards as detailed within the California Building Standards Code and the City of Palmdale General Plan.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
9. **Hazards and Hazardous Materials.** Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X
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?				X
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
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 for people residing or working in the project area?				X
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?				X

Project Impacts and Mitigation Measures

a-b) Would the project create a significant hazard to the public or the environment through the routine transport, use, emission or disposal of hazardous materials and create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

No impact. During construction, common hazardous materials such as gas, diesel, oil, etc. used in construction equipment would be present. Long term, minor amounts of hazardous materials would be expected as household products such as bleach, pesticides, etc. Standard best management practices for transportation, storage, minor spills or leaks, will be used to ensure that this would not create a significant hazard to the public or environment.

Mitigation Measures: No mitigation measures are necessary.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No impact. The project site is not located within one-quarter mile of a school.

Mitigation Measures: No mitigation measures are necessary.

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

No impact. An search for a one-mile radius around the project site was completed (Figure 4). The search included records of a previous investigation of Ana Verde Elementary School, which concluded that no further action was required as no threats to human health, or the environment were present. As such, no hazardous materials sites were indicated within the study area.

Mitigation Measures: No mitigation measures are necessary.

e) Would the project be located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, result in a safety hazard or excessive noise for people residing or working in the project area?

No impact. This project site located approximately three miles southwest of the Palmdale Regional Airport/ US Plant 42 and is not located within an airport land use plan.

Mitigation Measures: No mitigation measures are necessary.

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

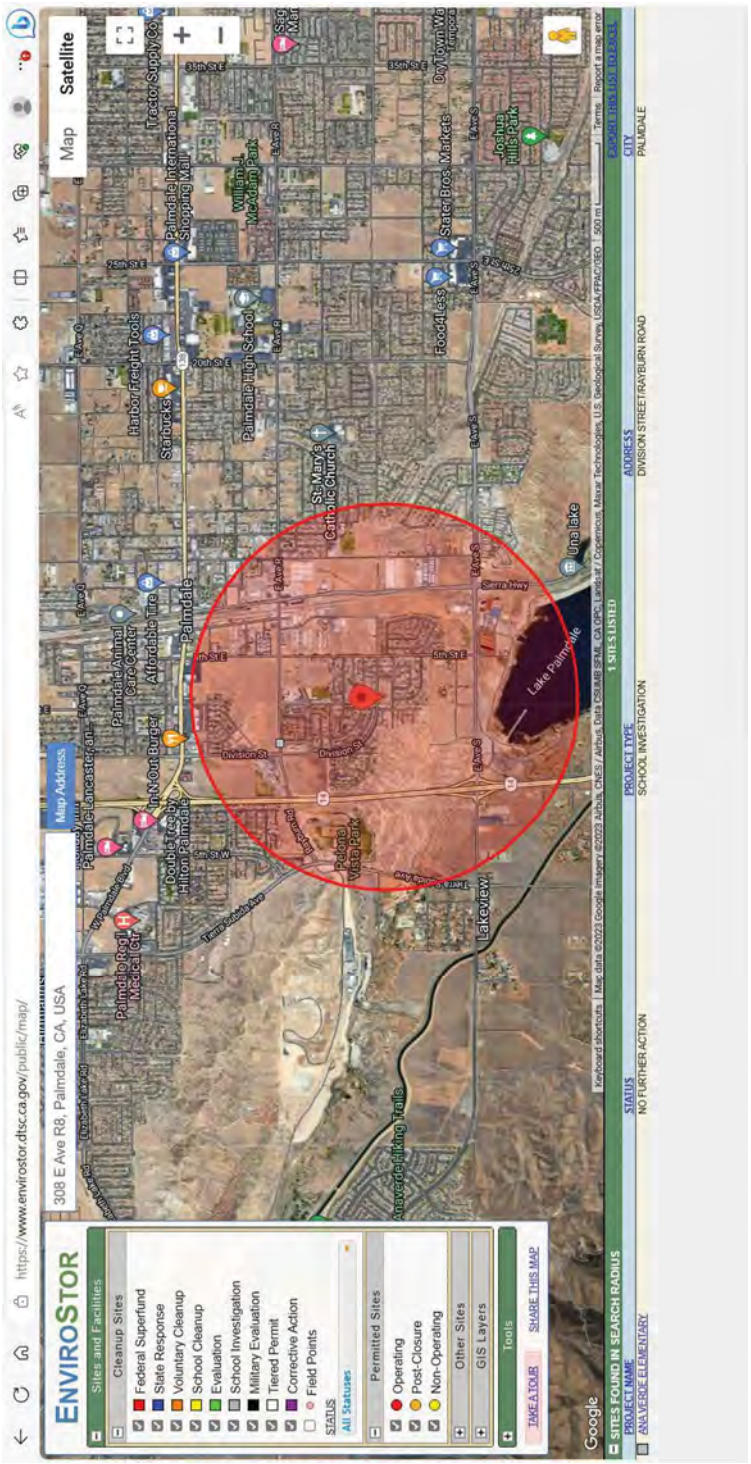


Figure 4. Map of EnviroStor search. The only feature listed within 1 mile of the project is noted at the bottom of map indicates a review of Ana Verde Elementary School with no further action.

No impact. Development of this project would not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Roads within the project would be constructed to allow emergency vehicle access to the residences. Construction vehicles would be parked within the project site avoiding obstacles to emergency vehicles on surrounding existing roads.

Mitigation Measures: No mitigation measures are necessary.

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

No impact. The project area is not located within a wildfire hazard zone (Palmdale 2022).

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
10. **Hydrology and Water Quality.** Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?				X
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?				X
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? impede or redirect flood flows?				X
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?				X
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?				X

Project Impacts and Mitigation Measures

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

No impact. The project will apply National Pollutant Discharge Elimination System (NPDES) best management practices to ensure water quality standards and waste discharge requirements are met. The required Stormwater Pollution Prevention Plan (SWPPP) further ensures no violations would occur.

Mitigation Measures: No mitigation measures are necessary.

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?

Due to the small size of this development, the water demand would not be enough to substantially deplete groundwater supplies or interfere with groundwater recharge. The project will be required to comply with City ordinances and regulations related to construction water use. The project will require a will serve letter from the Palmdale Water District prior to the recordation of the tentative map.

Mitigation Measures: No mitigation measures are necessary.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course or a stream or river or through the addition of impervious surfaces, in a manner that would: result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; 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 impede or redirect flood flows?

No impact. Best management practices as required by both NPDES and the SWPPP as overseen by Lahontan Water Quality Control Board ensures control of erosion and siltation during construction. A stormwater management basin will be located in the northeast corner of the site, as noted on the site plan (Appendix A) and within the hydrology study (Appendix H).

Mitigation Measures: No mitigation measures are necessary.

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

No impact.. The project site is not coastal, within a floodplain, or within high-risk flood area (Palmdale 2045).

Mitigation Measures: No mitigation measures are necessary.

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

The proposed project is being developed within an already evaluated area zoned for single-family residential. This development is small, normal construction, and normal operations consistent with the SFR 3 General Plan land use designation and zone (City of Palmdale 2022).

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
11. **Land Use and Planning.** Would the project:				
a) Physically divide an established community?				X
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?				X
c)				X

Project Impacts and Mitigation Measures

a) Would the project physically divide an established community?

No impact. The proposed subdivision of land for the construction of single-family residences is consistent with the adjacent land uses, the General Plan land use designation and zone of the property, and would not physically divide an established community.

Mitigation Measures: No mitigation measures are necessary.

b) Would the project conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No impact. The project site is zoned appropriately for the planned project and would not conflict with any applicable plans or regulations.

Mitigation Measures: No mitigation measures are necessary.

c) Would the project conflict with any applicable conservation plan or natural community conservation plan?

No impact. Currently, there are no habitat conservation or natural community conservation plans that cover this area.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
12. **Mineral Resources.** 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?				X
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?				X

Project Impacts and Mitigation Measures

a-b) 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 and result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No impact. The project site is not located within or near the Mineral Resources Extraction zone and development of the site would not result in the lossof known mineral resources. The nearest source of mineral resources of concern are located east of 62nd Street East (City of Palmdale 2022).

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
13. **Noise.** Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X
b) Generation of excessive groundborne vibration or groundborne noise levels?				X
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?				X

Project Impacts and Mitigation Measures

a-b) Would the project 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? Would the project cause generation of excessive groundborne vibration or groundborne noise levels?

No impact. Construction of the site would be required to follow established standards within the General Plan (City of Palmdale 2022, Rincon 2022). Construction noise would be considered within normal conventional standards for this type of development. Operation of the residential housing area is within the standards expected of a single-family development. A noise study was completed for the project by Christopher Jean and Associates, which addresses noise as it pertains to development of the residences (Appendix I).

Normal conventional construction noise would be expected during development of this project. Operations would be consistent with a single-family development and equipment operating that would not create groundborne vibration or groundborne noise levels.

Mitigation Measures: No mitigation measures are necessary.

c) *Would the project be 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. This site is not located in the vicinity of an airstrip or airport. The nearest airport, Palmdale Regional, is approximately three miles northeast of the project site.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
14. **Population and Housing.** Would the project:				
a) Induce substantial 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)?				X
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X
c)				X

Project Impacts and Mitigation Measures

a-c) *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)? Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*

No impact.

The proposed project is consistent with the General Plan land use designation and zone of the property and is surrounded on all sides by residential development. Due to the small size of the development, the project would not generate substantial population growth.

The project site has one house and three auxiliary structures, which would be demolished and an estimated 10 people who would be displaced due to development of this project site.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
15. **Public Services.** Would the project:				
Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:			X	
Fire Protection?			X	
Police Protection?			X	
Schools, parks, other public facilities?			X	

Project Impacts and Mitigation Measures

a) *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services; fire or police protection, schools, parks, other public facilities?*

Less than Significant. The proposed development is not expected to have a significant impact on existing public facilities. The applicant will pay appropriate impact fees to mitigate the impacts of the development.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
16. **Recreation.**				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	
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?				X

Project Impacts and Mitigation Measures

a,b) Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? Does the project include recreational facilities or require the construction of recreational facilities which might have an adverse physical effect on the environment?

Less than Significant.

There would be no need for expansion of existing recreational facilities to accommodate the development and no additional recreational facilities are proposed. Furthermore, the applicant shall pay appropriate impact fees to support the increased use of local parks by residents of the development.

Mitigation Measures: No mitigation measures are necessary.

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

Project Impacts and Mitigation Measures

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

Less than Significant. Single-family residences are permitted in the SFR 3 zone and the proposed development will not change or intensify the uses allowed within the zone. The development is not anticipated to change the forecasted traffic volumes in the surrounding area as the site was intended for the type and intensity of the proposed use at a density of 3.1 units an acre. Therefore, no significant impacts to traffic are anticipated. Additionally, a Trip Generation and Vehicle Miles Traveled (VMT) was completed for this project. The VMT analysis stated, “It is anticipated that the project will have a less-than-significant traffic impact, and no further analysis would be required” (Ruettgers & Schuler, 2023 [Appendix J]). A temporary but less than significant impact to the circulation pattern within the surrounding area would be expected from the ingress and egress of construction related vehicles and equipment. This could cause slight delays during workhour commutes.

Mitigation Measures: No mitigation measures are necessary.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1)?

No impact. With the planned street improvements, the number of cars noted in the trip

generation letter, and the approved zoning this project is not expected to conflict or be inconsistent with the CEQA Guidance.

Mitigation Measures: No mitigation measures are necessary.

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

No impact. Planned street improvements are being incorporated into the project to improve circulation along the project boundaries. The project will include the construction of two new roads to access the residences, which will be designed and constructed in accordance with city standards. Access will be provided from Avenue R-9, rather than Avenue R-8, a Connector, or secondary arterial street, which experiences higher traffic volume and speed. Sidewalks will also be constructed along the project frontages of Avenue R-8, Avenue R-9, and the two new streets, which will increase pedestrian safety.

Mitigation Measures: No mitigation measures are necessary.

d) *Would the project result in inadequate emergency access?*

No impact. The project designs will comply with applicable standards for emergency vehicle access.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
18. **Tribal Cultural Resources.** Would the project cause a substantial adverse change in the significance of a Tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:				
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)				X
b) A resource determined by the lead agency, in its discretion and is 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 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American Tribe.				X

Project Impacts and Mitigation Measures

a-b) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or 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) to Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

No impact. There are no resources present on this site listed in the California Register of Historical Resources or in a local register.

Mitigation Measures:

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

Trib-2: The Lead Agency and/or applicant shall, in good faith, consult with the FTBMI and YSMN on the disposition and treatment of any Tribal Cultural Resource encountered during all ground disturbing activities. Any and all archaeological/cultural documents created as a part of the project (isolate records, site records, survey reports, testing reports, etc.) shall be supplied to the applicant and Lead Agency for dissemination to YSMN and FTBMI. The Lead Agency and/or applicant shall, in good faith, consult with FTBMI throughout the life of the project.

Trib-3: Inadvertent discoveries of human remains and/or funerary object(s) are subject to California State Health and Safety Code Section 7050.5, and the subsequent disposition of those discoveries shall be decided by the Most Likely Descendant (MLD), as determined by the Native American Heritage Commission (NAHC), should those findings be determined as Native American in origin.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
19. **Utilities and Service Systems.**				
a) Require or result in the relocation or construction or 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?			X	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			X	
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?			X	
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impact the attainment of solid waste reduction goals?			X	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			X	

Project Impacts and Mitigation Measures

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

Less than Significant Impact. The proposed project would require utilities such as water, wastewater treatment, electrical and natural gas. No impediments are anticipated for

these services to be extended to the residences. The project is within the Palmdale Water District who would supply potable water to the residential development. Water would be provided to the project in accordance with the Palmdale Water District's rules and regulations. Impacts would be less than significant.

The project improvements propose connections to the existing eight-inch VCP Sewer Line located within Avenue R-8 and 4th Street East, approximately 140 feet east of the subject property line. The existing sewer analysis demonstrated that the existing sewer facilities are well below capacity and, therefore, have sufficient capacity to allow for additional development (City of Palmdale 2019). In addition, the project shall comply with city standards for stormwater management.

Mitigation Measures: No mitigation measures are necessary.

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?*

No impact. Adequate wastewater treatment capacity would be expected to support this small housing development (RJR Engineering 2019).

Mitigation Measures: No mitigation measures are necessary.

d-e) *Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impact the attainment of solid waste reduction goals? Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*

Less than Significant Impact. During site grubbing and clearance, green waste would be generated and disposed of in the local Class III landfill. Trash and debris generated during construction of the project would also be disposed of at a Class III landfill. The Antelope Valley Landfill is the closest landfill to the project site. Fees for disposing of green waste and non-hazardous waste will be paid by the project proponent. Once the project has been constructed, household trash will also be disposed of at the Antelope Valley Landfill. The anticipated waste generated is not expected to exceed the capacity of the local trash conveyors or the local landfill.

The project will comply with all federal, state, local management and reduction statutes/regulations for solid waste to include the National Emissions Standards for Hazardous Air Pollutants (NESHAP) as enforced through the AVAQMD for demolition of structures.

Mitigation Measures: No mitigation measures are necessary.

	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
20. **Mandatory Findings of Significance**				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				X
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)?				X
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?				X

The following are Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

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?*

No impact. There are no valuable habitats, plants, or wildlife within this project site and no examples of California history or prehistory. This site is currently developed over most of its area and the remaining is highly disturbed. No history, prehistory, or natural features exist within the site.

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)?*

No impact. No cumulatively considerable impacts are expected from this project. The project has a small footprint, and consistent with the impacts evaluated within the General Plan (City of Palmdale 2022, Rincon 2022). Furthermore, there are no known additional planned projects within the vicinity of the site.

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

No impact. The few individuals living on the property will be relocated. As noted in the individual elements of this checklist there are no significant impacts in any of the categories or unusual project characteristics that would cause substantial adverse effects on human beings.

References

Bruin Geotechnical Services, Inc. 2023. Geotechnical Engineering Report, Tentative Tract Map 82364, Los Angeles, California APN 3010-009-007. Bruin Geotechnical Services, Inc., 44732 Yucca Avenue, Lancaster, California, 93534. 27pp.

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RT Factfinders 2023. Cultural Resource Investigation for 5.1 Acres Between East Avenue R-8 and R-9, Palmdale, Los Angeles County, California. RT Factfinders, 4933 Cloudcroft Lane, Florence, Oregon, 97439. 24pp.

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)?

No impact. No cumulatively considerable impacts are expected from this project. The project has a small footprint, and consistent with the impacts evaluated within the General Plan (City of Palmdale 2022, Rincon 2022). Furthermore, there are no known additional planned projects within the vicinity of the site.

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

No impact. The few individuals living on the property will be relocated. As noted in the individual elements of this checklist there are no significant impacts in any of the categories or unusual project characteristics that would cause substantial adverse effects on human beings.

References

Bruin Geotechnical Services, Inc. 2023. Geotechnical Engineering Report, Tentative Tract Map 82364, Los Angeles, California APN 3010-009-007. Bruin Geotechnical Services, Inc., 44732 Yucca Avenue, Lancaster, California, 93534. 27pp.

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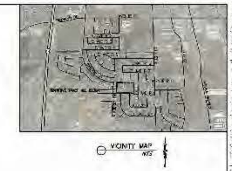
Rincon 2022. City of Palmdale 2045 General Plan Update Final Environmental Impact Report SCH# 2021060494. https://static1.squarespace.com/static/5c7dc93065a707492aca3e47/t/631fa8d1f119fa360cd7f0ee/1 521pp.

Ruettgers & Schuler. 2023. Trip Generation and Vehicle Miles Traveled (VMT) Analysis for TTM 82364 in Palmdale, CA. Ruettgers & Schuler, Civil Engineers, 1800 30th Street, Suite 260, Bakersfield, CA 93301. 2pp.

RT Factfinders 2023. Cultural Resource Investigation for 5.1 Acres Between East Avenue R-8 and R-9, Palmdale, Los Angeles County, California. RT Factfinders, 4933 Cloudcroft Lane, Florence, Oregon, 97439. 24pp.

Appendix A Site Plan

TENTATIVE TRACT NO. 82364
308 AVENUE R-8
CITY OF PALMDALE, STATE OF CALIFORNIA



LEGAL DESCRIPTION:

[illegible] QUARTER OF SECTION 35, TOWNSHIP 6 NORTH, RANGE 12 WEST, SAN BERNARDINO MERIDIAN, ACCORDING TO THE OFFICIAL PLAT OF SAID LAND DESCRIBED AS FOLLOWS:

[illegible] WEST ALONG NORTHERLY BOUNDARY AND THE NORTHERLY BOUNDARY OF TRACT 17370, AS SHOWN ON MAP FILED IN BOOK 531 PAGES 31 AND 32 OF SAID MAPS, A DISTANCE OF 360.38 FEET TO [illegible]

BASIS OF BEARING:

BASIS OF BEARINGS FOR THIS MAP IS N89°45'17"W ALONG THE CENTERLINE OF AVENUE R-8 AS SHOWN ON TRACT NO. 24125, AS RECORD IN BOOK 623, PAGES 33-37, LOS ANGELES COUNTY RECORDS.

GENERAL NOTES:

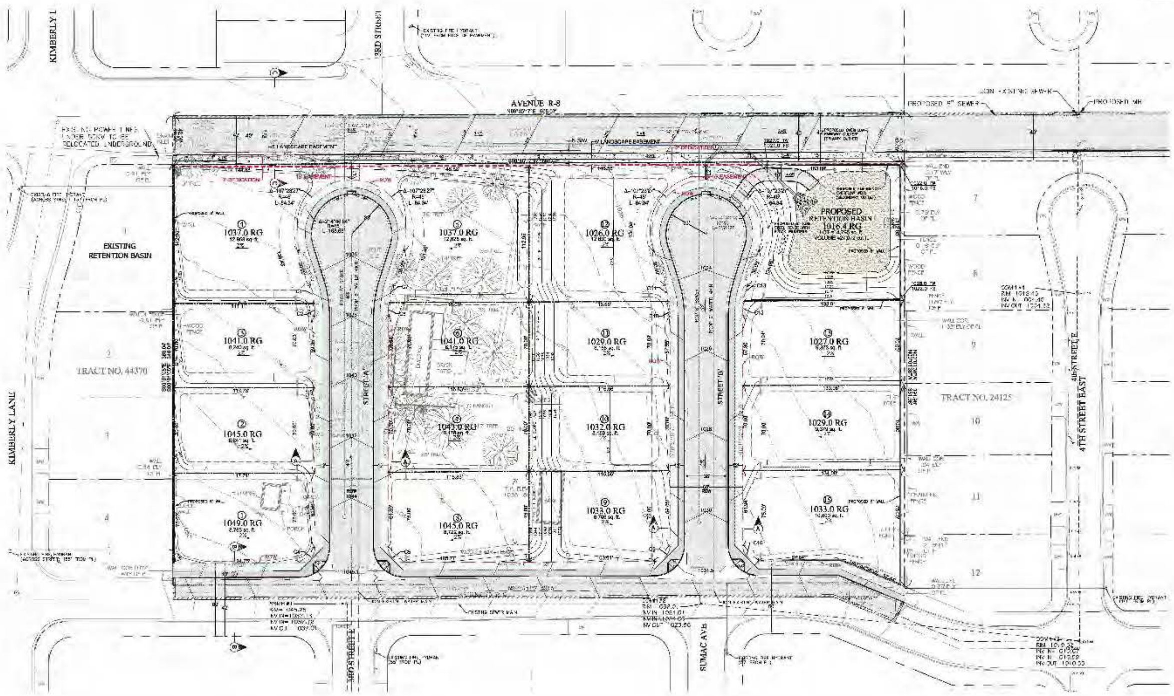
1. AREA: TOTAL SITE [illegible] ACRES
2. EXISTING LAND USE: EXISTING SINGLE FAMILY RESIDENCE
3. ZONE: EXISTING LAND USE: SFR-3; GENERAL PLAN USE: [illegible] 7,000
4. ASSESSOR'S PARCEL NUMBERS: [illegible]
5. PROPOSED DEVELOPMENT: 15 SINGLE FAMILY UNITS
6. RETENTION BASIN: VOLUME: 14,785 CU. FT.; CAPACITY: 18,234 CU. FT.
7. DEDICATIONS: (1) [illegible] DEDICATION TO THE CITY OF PALMDALE FOR RIGHT OF WAY AND UTILITY PURPOSES, SOUTHERN PORTION OF AVENUE R-8; (2) 18' DEDICATION TO THE CITY OF PALMDALE FOR RIGHT OF WAY AND UTILITY PURPOSES, NORTHERN PORTION OF AVENUE R-8
8. [illegible] OWNER: CARLOS & LOURDES RAMIREZ, [illegible], SUN VALLEY, CA 91352, (818) 425-4749
9. [illegible]: RJR ENGINEERING, 2310 PALMA DRIVE, SUITE 200, VENTURA, CA 93003, (805) 485-3935
10. SURVEYOR: CHRISTENSEN & PLOUFF, [illegible], VALENCIA, CA [illegible], (661) [illegible]

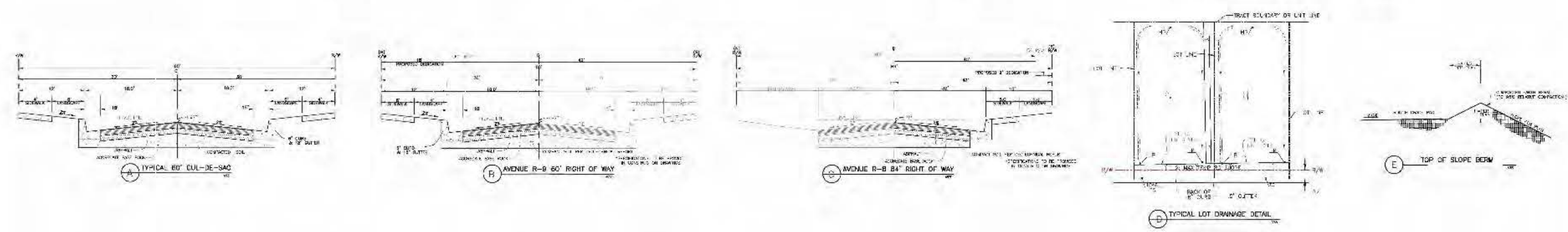
EARTHWORK VOLUMES

ROUGH GRADING QUANTITIES:
CUT: [illegible] C.Y. FILL: [illegible] C.Y. [illegible]

NET EXPORT: 328 C.Y.

LINE & CURVE DATA				
NUMBER	LENGTH	RADIUS	LINE DIRECTION	DELTA
L1	13.15'	–	N	–
L2	12.44'	–	N	–
C1	15.03'	87'	–	[illegible]
C2	[illegible]	87'	–	[illegible]
C3	26.41'	87'	–	17°23'24"
C4	20.30'	13'		[illegible]
C5	20.18'	13'	–	[illegible]
C6	[illegible]	87'	–	[illegible]
C7	15.03'	87'	–	[illegible]
C8	26.41'	87'	–	17°23'24"
C9	20.30'	13'	–	[illegible]
C10	13.46'	87'	–	[illegible]
C11	[illegible]	87'	–	[illegible]
C12	26.41'	87'	–	17°23'25"
C13	13.65'	87'	–	[illegible]
C14	26.41'	87'	–	17°23'25"
C15	13.35'	87'	–	[illegible]
C16	20.08'	13'	–	[illegible]





LEGEND:

GRAPHIC SCALE

1" = 30' (IN FEET)

PREPARED BY: RJR ENGINEERING GROUP

CHRISTENSEN & PLOUFF LAND SURVEYING

TENTATIVE TRACT NO. 82364

308 AVENUE R-8
IN THE CITY OF PALMDALE
COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

SHEET 1 OF 1

Appendix B. Photographs Depicting Project Site

Main house is located in front of parked covered car.

House within the site.

Auxiliary structures within the site.

Doves and backyard structures behind the house within the study site.

Auxiliary structures and vehicles parking area in site.

Representative photograph of another one of the structures within the site.

One area of storage within the site.

A Joshua tree clone near the house within the study site.

In background of photograph is view of the southeast boundary of the site from the central portion of the site.

In background of photograph is view of the east and northeast boundaries of the site from the north central portion of the site.

In the background of photograph is view of west boundary from inside northwest portion of site.

North of site (Google Earth Street View)

East of site (Google Earth Street View)

West of site (Google Earth Street View)

South of site (Google Earth Street View)

Appendix C Air Quality Study

Date: October 16, 2023
To: Ms. Patty de la Cruz, Duke Engineering
From: M. S. Hatch Consulting, LLC
Subject: Air Quality Study – TTM 82364, APN: 3010-009-007 Housing Development – Palmdale, CA

M. S. Hatch Consulting, LLC appreciates the opportunity to prepare the air quality study for the proposed construction and operation of the housing development shown on Tentative Tract Map (TTM) 82364, Assessor's Parcel Number (APN): 3010-009-007 for Duke Engineering (Duke). The project consists of 15 single-family homes and a retention basin on approximately 4.59 acres of land in the city of Palmdale. This air quality study includes the estimated criteria pollutant and greenhouse gas emissions from the construction and operation of the proposed project.

Executive Summary

Table 1 and Table 2 compare the estimated annual and daily emissions summaries from the construction and operation of the proposed project to the significant emission thresholds described in the Antelope Valley Air Quality Management District (AVAQMD) California Environmental Quality Act (CEQA) and Federal Conformity Guidelines, dated August 2016, included in Attachment A. The estimated emissions of criteria pollutants and greenhouse gases from the construction and total operational emissions from the project **are below the applicable thresholds**. Greenhouse gas emissions are presented in units of carbon dioxide equivalent (CO_2e). The proposed project is not considered one of the project types that the AVAQMD CEQA Guidelines require to be evaluated for potentially exposing sensitive receptors to substantial pollutant concentrations.[1] As such, hazardous air pollutants (HAP) emissions were not calculated, and the project was not evaluated for potential health risks to sensitive receptors.

Table 1. Annual Emissions Summary and Significance Thresholds

Emissions Source	Total Emissions (tons per year)						
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$	CO_2e (MT/year)
Year 1 Construction Emissions (2024)	0.11	1.02	1.13	< 0.01	0.10	0.06	195
Year 2 Construction Emissions (2025)	0.24	0.85	1.12	< 0.01	0.06	0.04	179
Total Operational Emissions	0.26	0.13	0.83	< 0.01	0.15	0.04	201
Significant Emissions Threshold	**25**	**25**	**100**	**25**	**15**	**12**	**100,000**

[1] Residences, schools, daycare centers, playgrounds and medical facilities are considered sensitive receptor land uses. The following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated using significance threshold criteria number 4 (refer to the significance threshold discussion): any industrial project within 1000 feet; a distribution center (40 or more trucks per day) within 1000 feet; a major transportation project (50,000 or more vehicles per day) within 1000 feet; a dry cleaner using perchloroethylene within 500 feet; or a gasoline dispensing facility within 300 feet.

Table 2. Daily Emissions Summary and Significance Thresholds

Emissions Source	Total Emissions (pounds per day)						
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$	CO_2e
Year 1 Construction Emissions (2024)	2.73	27.35	20.21	0.06	9.07	5.12	6,720
Year 2 Construction Emissions (2025)	17.79	14.09	19.12	0.03	0.94	0.65	3,338
Total Operational Emissions	1.54	0.88	5.64	0.01	0.90	0.27	1,326
Significant Emissions Threshold	**137**	**137**	**548**	**137**	**82**	**65**	**548,000**

ROG: Reactive Organic Compounds, used interchangeably with Volatile Organic Compounds (VOC); NO_X: oxides of nitrogen; CO: Carbon monoxide; SO_X: Oxides of sulfur; $PM_{2.5}$: particulate matter less than 2.5 micrometers in diameter; PM_{10}: particulate matter less than 10 micrometers in diameter; CO_2e: Carbon dioxide equivalent

Project Description

The proposed project includes the construction of 15 single-family homes and a retention basin on 4.59 acres of land. The project site is located east of Kimberly Lane between Avenue R-8 and Avenue R-9 in Palmdale, CA. The lot currently contains one single-family residence and several accessory structures, which will be demolished to accommodate the development. The site location is included in Figure 1 and the proposed site plan is included in Figure 2.

Figure 1. Regional Vicinity

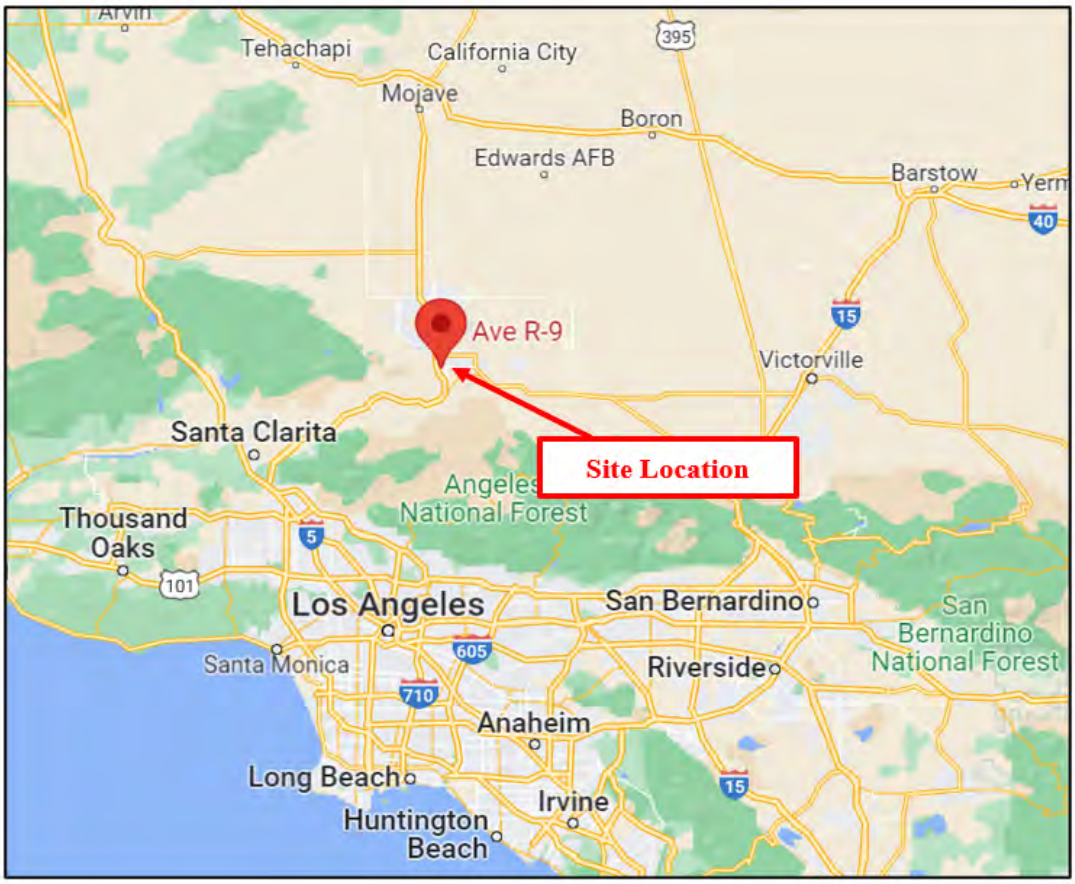
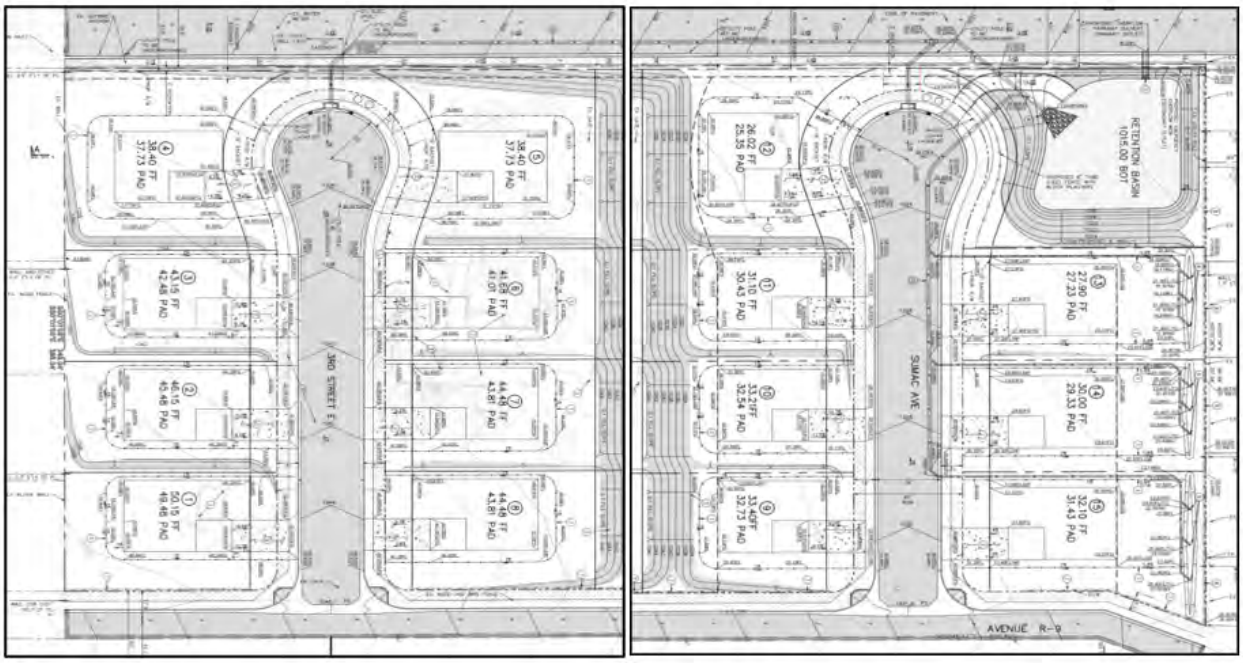


Figure 2. Site Plan – Proposed Housing Development - Palmdale, CA



Sources of Emissions

The emissions associated with the proposed project consist of construction and operational emissions from the development. Construction emissions are temporary and include emissions of criteria pollutants and greenhouse gases from construction activities during demolition, site preparation, grading, paving, building construction, and the application of architectural coatings. Operational emissions consist of area sources (i.e., re-applying architectural coatings, consumer products, and landscaping equipment), energy use (i.e., electricity and natural gas), mobile sources (e.g., commuting), solid waste disposal, and water and wastewater use (i.e., supplying and treating water and wastewater).

Emissions Estimates

Tables 3 and 4 present the annual and daily emissions summaries from the construction and operation of the proposed project, respectively. Emissions were estimated using CalEEMod Version 2020.4.0. The detailed emissions model outputs are included in Attachment B. This project is not considered one of the project types that the AVAQMD CEQA Guidelines require to be evaluated for potentially exposing sensitive receptors to substantial pollutant concentrations. As such, HAP emissions were not calculated, and the project was not evaluated for potential health risks to sensitive receptors.

Table 3. Annual Construction and Operational Emissions Summary

Emissions Source	Total Emissions (tons per year)						
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$	CO_2e (MT/year)
Construction Emissions							
Year 1 Construction Emissions (2024)	0.11	1.02	1.13	< 0.01	0.10	0.06	195
Year 2 Construction Emissions (2025)	0.24	0.85	1.12	< 0.01	0.06	0.04	179
Operational Emissions							
Area Sources	0.18	0.01	0.12	< 0.01	< 0.01	< 0.01	12
Energy	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	42
Mobile	0.07	0.10	0.71	< 0.01	0.15	0.04	133
Waste	N/A	N/A	N/A	N/A	0.00	0.00	9
Water	N/A	N/A	N/A	N/A	0.00	0.00	6
Total Operational Emissions	**0.26**	**0.13**	**0.83**	**< 0.01**	**0.15**	**0.04**	**201**
Significant Emissions Threshold	**25**	**25**	**100**	**25**	**15**	**12**	**100,000**

ROG: Reactive Organic Compounds, used interchangeably with Volatile Organic Compounds (VOC); NO_X: oxides of nitrogen; CO: Carbon monoxide; SO_X: Oxides of sulfur; $PM_{2.5}$: particulate matter less than 2.5 micrometers in diameter; PM_{10}: particulate matter less than 10 micrometers in diameter; CO_2e: Carbon dioxide equivalent; MT: metric ton

Table 4. Daily Construction and Operational Emissions Summary

Emissions Source	Total Emissions (pounds per day)						
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$	CO_2e
Construction Emissions							
Year 1 Construction Emissions (2024)	2.73	27.35	20.21	0.06	9.07	5.12	6,720
Year 2 Construction Emissions (2025)	17.79	14.09	19.12	0.03	0.94	0.65	3,338
Operational Emissions							
Area Sources	1.03	0.26	1.34	< 0.01	0.03	0.03	322
Energy	0.01	0.10	0.04	< 0.01	< 0.01	< 0.01	124
Mobile	0.50	0.52	4.26	< 0.01	0.87	0.24	880
Waste	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Operational Emissions	**1.54**	**0.88**	**5.64**	**0.01**	**0.90**	**0.27**	**1,326**
Significant Emissions Threshold	**137**	**137**	**548**	**137**	**82**	**65**	**548,000**

ROG: Reactive Organic Compounds, used interchangeably with Volatile Organic Compounds (VOC); NO_X: oxides of nitrogen; CO: Carbon monoxide; SO_X: Oxides of sulfur; $PM_{2.5}$: particulate matter less than 2.5 micrometers in diameter; PM_{10}: particulate matter less than 10 micrometers in diameter; CO_2e: Carbon dioxide equivalent

Emissions Calculation Methodology

The construction and operational emissions for this project were based on the following CalEEMod land use types: *Single Family Housing, City Park, Other Asphalt Surfaces,* and *Other Non-Asphalt Surfaces*. A discussion on the land use types that were used for the emissions modeling is included below.

CalEEMod Land Use Type: Single Family Housing

The *Single Family Housing* land use type was used to model the emissions associated with the 15 single family homes. The acreage for home lots (3.30 acres) and building square footage (40,500 square feet) were provided by Duke.

CalEEMod Land Use Type: City Park

The City Park land use type was used to model the emissions associated with the natural retention basin within the proposed project. The acreage (0.34 acres) was provided by Duke.

CalEEMod Land Use Type: Other Asphalt Surfaces

The *Other Asphalt Surfaces* land use type was used to model the emissions associated with new residential streets within the development. The total acreage (0.13 acres) was provided by Duke.

CalEEMod Land Use Type: Other Non-Asphalt Surfaces

The *Other Non-Asphalt Surfaces* land use type was used to model the emissions associated with large areas of concrete (e.g., sidewalks) within the housing development. The total acreage (0.82 acres) was provided by Duke.

Construction Emissions

Construction emissions were calculated using CalEEMod defaults and input provided by Duke. Duke reviewed and verified the list of construction equipment and the anticipated construction schedule.

Table 5 provides the anticipated construction schedule. Duke provided the proposed start date (7/1/2024) and end date (7/1/2025) for the project and indicated that work would be conducted five days per week. Based on the review of other developments being constructed, the schedule was adjusted to have the *Paving* phase conducted prior to the *Building Construction* phase. In addition, it was assumed that the *Architectural Coating* phase would overlap with the end of the *Building Construction* phase. Based on input from Duke, the default number of days were utilized for each phase except for the *Building Construction* phase, which was shortened to meet the provided end date of construction. According to Duke, the project will require the demolition of a home and accessory structures totaling 2,000 square feet.

Table 6 provides the anticipated number of equipment that will be used during each construction phase, the hours per day the equipment will be operated, and the horsepower of the equipment. The values in Table 6 are CalEEMod default values.

Based on input from Duke, this project will require 50 cubic yards of material import during the *Site Preparation* phase and 3,916 cubic yards of material import during the *Grading* phase; as such, the emissions for material haul trips were included in the construction emissions. For fugitive dust emissions, CalEEMod defaults do not include any control of fugitive dust from construction sites. AVAQMD Rule 403 requires that fugitive dust from any “active operation, open storage pile, or disturbed surface area” be controlled so that no

presence of dust remains visible beyond the property line. To meet this requirement, the standard operation is watering active sites three times per day. Although the addition of watering for dust control is listed as a mitigation measure in CalEEMod, within the AVAQMD this is a requirement, and is therefore included.

For architectural coating operations, VOC emissions were calculated based on the assumption that the coatings would be compliant with the VOC content limits of AVAQMD Rule 1113.[2]

Table 5. Construction Schedule

Construction Phase	Start Date	End Date	Days/week	Total Days
Demolition	7/1/2024	7/26/2024	5	20
Site Preparation	7/27/2024	8/2/2024	5	5
Grading	8/3/2024	8/14/2024	5	8
Paving	8/15/2024	9/9/2024	5	18
Building Construction	9/10/2024	7/1/2025	5	211
Architectural Coating	6/6/2025	7/1/2025	5	18

Table 6. Construction Equipment

Construction Phase	Equipment	Number of Equipment	Hours per day	Horsepower
Demolition	Concrete/Industrial Saws	1	8	81
	Excavators	3	8	158
	Rubber Tired Dozers	2	8	247
Site Preparation	Rubber Tired Dozers	3	8	247
	Tractors/Loaders/Backhoes	4	8	97
Grading	Excavators	1	8	158
	Graders	1	8	187
	Rubber Tired Dozers	1	8	247
	Tractors/Loaders/Backhoes	3	8	97
Paving	Cement and Mortar Mixers	2	6	9
	Pavers	1	8	130
	Paving Equipment	2	6	132
	Rollers	2	6	80
	Tractors/Loaders/Backhoes	1	8	97
Building Construction	Cranes	1	7	231
	Forklifts	3	8	89
	Generator Sets	1	8	84
	Tractors/Loaders/Backhoes	3	7	97
	Welders	1	8	46
Architectural Coating	Air Compressors	1	6	78

[2] For building coatings, assumed to be 90% flat paints (50 g/L) and 10% non-flat paints (100 g/L). For the road marking coatings, assumed to be compliant with the Traffic Marking Coating category (100 g/L). VOC limits based on AVAQMD Rule 1113.

Operational Emissions

Operational emissions consist of area sources (i.e., re-applying architectural coatings, consumer products, fireplaces, and landscaping equipment), energy use (i.e., electricity and natural gas), mobile sources (e.g., commuting), solid waste disposal, and water and wastewater use (i.e., supplying and treating water and wastewater).

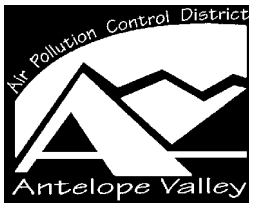
For area-source emissions, Duke indicated that woodstoves would not be installed and that every home would have a gas fireplace. For architectural coating operations (i.e., re-applying coatings), VOC emissions were calculated based on the assumption that the coatings would be compliant with the VOC content limits of AVAQMD Rule 1113.[3] For mobile source emissions, it was assumed that there would not be any external vehicle trips to the natural retention basin modeled under the *City Park* land use type. All other operational emission sources were calculated using CalEEMod default factors.

Findings

The estimated emissions of criteria pollutants and greenhouse gases from the construction and the total operational emissions **are below the applicable AVAQMD Significant Emissions Thresholds**; therefore, this project does not have a significant air quality impact on the environment. In addition, this project is not expected to expose sensitive receptors to substantial pollutant concentrations. Since the construction and operational emissions are below the significance thresholds, emissions mitigation measures are not required.

[3] For building coatings, assumed to be 90% flat paints (50 g/L) and 10% non-flat paints (100 g/L). For the road marking coatings, assumed to be compliant with the Traffic Marking Coating category (100 g/L). VOC limits based on AVAQMD Rule 1113.

ATTACHMENT A – Antelope Valley AQMD California Environmental Quality Act (CEQA) and Federal Conformity Guidelines



Antelope Valley AQMD

California Environmental Quality Act (CEQA)

and

Federal Conformity

Guidelines

August 2016

AVAQMD Planning, Rule-making and Grants Section
AVAQMD Air Monitoring Section

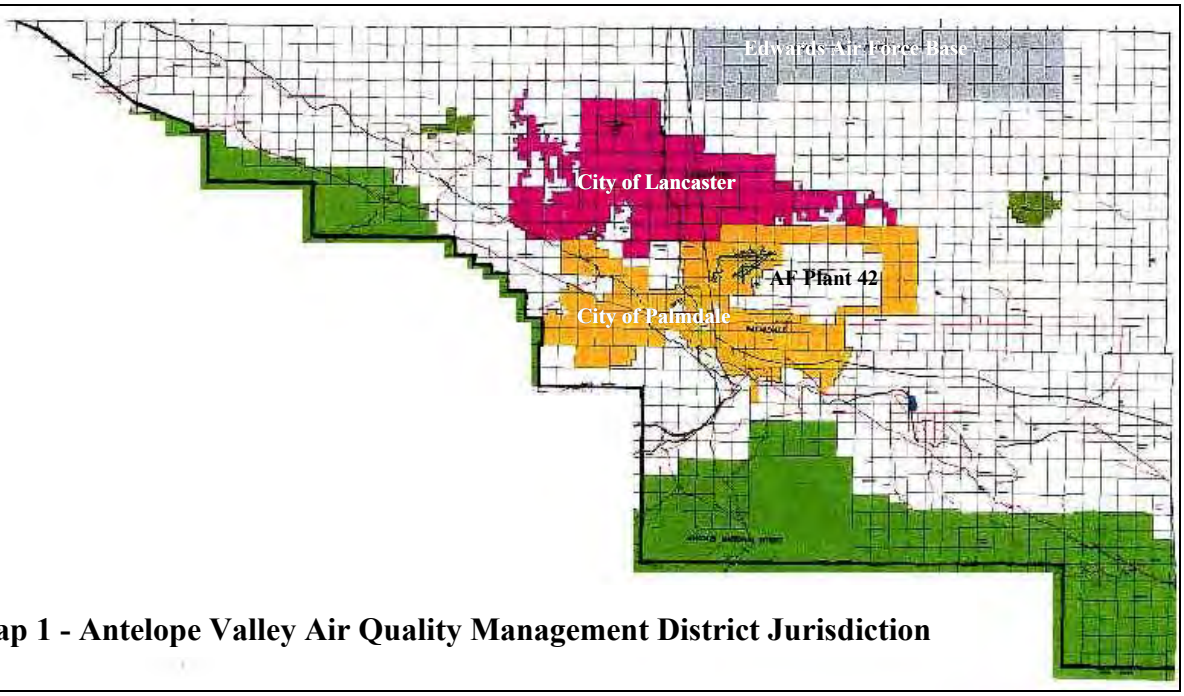
Table of Contents

Background

Under the California Environmental Quality Act (CEQA), the AVAQMD (District) is an expert commenting agency on air quality and related matters within its jurisdiction (or impacting on its jurisdiction). The District has dedicated resources to reviewing projects to ensure that they will not: (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any federal attainment plan. The District has adopted a federal attainment plan for ozone pursuant to the Federal Clean Air Act.

Purpose

These Guidelines are intended to assist persons preparing environmental analysis or review documents for any project within the jurisdiction of the District by providing background information and guidance on the preferred analysis approach.



Map 1 - Antelope Valley Air Quality Management District Jurisdiction

Jurisdiction

The District has jurisdiction over the northern, desert portion of Los Angeles County (please refer to Map 1). This region includes the incorporated cities of Lancaster and Palmdale, Air Force Plant 42, and the southern portion of Edwards Air Force Base. The Kern County-Los Angeles County boundary forms the northern boundary of the District; the San Bernardino-Los Angeles County boundary forms the eastern boundary of the District.

Non-attainment Designations and Classification Status

The United States Environmental Protection Agency and the California Air Resources Board have designated portions of the District non-attainment for a variety of pollutants, and some of those designations have an associated classification. Please refer to Table 1 for a chart of these designations and classifications.

Table 1 – AVAQMD Designations and Classifications

Ambient Air Quality Standard	**AVAQMD**
One-hour Ozone (Federal) – standard has been revoked, this is historical information only	Proposed attainment in 2014; historical classification Severe-17
Eight-hour Ozone (Federal 84 ppb (1997))	Subpart 2 Nonattainment; classified Severe-15
Eight-hour Ozone (Federal 75 ppb (2008))	Nonattainment, classified Severe-15
Eight-hour Ozone (Federal 70 ppb (2015))	Expected nonattainment; classification to be determined
Ozone (State)	Nonattainment; classified Extreme
PM_{10} 24-hour (Federal)	Unclassifiable/attainment
$PM_{2.5}$ Annual (Federal)	Unclassified/attainment
$PM_{2.5}$ 24-hour (Federal)	Unclassified/attainment
$PM_{2.5}$ (State)	Unclassified
PM_{10} (State)	Nonattainment
Carbon Monoxide (State and Federal)	Attainment
Nitrogen Dioxide (State and Federal)	Attainment/unclassified
Sulfur Dioxide (State and Federal)	Attainment/unclassified
Lead (State and Federal)	Attainment
Particulate Sulfate (State)	Unclassified
Hydrogen Sulfide (State)	Unclassified
Visibility Reducing Particles (State)	Unclassified

Attainment Plans

The District has adopted a single attainment plan for ozone. Please refer to Table 2 for information regarding this attainment plan.

Table 2 – AVAQMD Attainment Plans

Name of Plan	Date of Adoption	Standard(s) Targeted	Applicable Area	Pollutant(s) Targeted	Attainment Date*
AVAQMD 2004 Ozone Attainment Plan (State and Federal)	4/2004	Federal one hour ozone	Entire District	NO_x and VOC	2007
AVAQMD Federal 8-Hour Ozone Attainment Plan	5/20/2008	Federal eight hour ozone (84 ppb)	Entire District	NO_x and VOC	2019 (revised from 2021)

*Note: A historical attainment date given in an attainment plan does not necessarily mean that the affected area has been re-designated to attainment; please refer to Table 1.

Rules and Regulations

The District maintains a set of Rules and Regulations to improve air quality and maintain good air quality. Please contact the District to obtain a copy of the District rulebook, or visit www.avaqmd.ca.gov.

Recommended Environmental Setting Elements

Air Quality Data

The District gathers a variety of air quality data at the Lancaster monitoring site. Table 3 details the data available from the District for this site.

Table 3 - Available Air Quality Data

Site	Address	Pollutants	Dates
Lancaster	W. Ponderosa	O_3, NO_x, CO, PM_{10} (Hi-Vol and TEOM)	7/1/97 to 11/01
Lancaster	W. Ponderosa	$PM_{2.5}$	1/1/99 to 11/01
Lancaster	43301 Division St.	O_3, NO_x, CO, PM_{10} (hourly), $PM_{2.5}$	11/01 to present

Meteorological Data

A variety of meteorological data is available from the District for the Lancaster site. Table 4 contains a list of the data available for the Lancaster site.

Table 4 - Available Meteorological Data

Site	Address	Data	Dates
Lancaster	W. Ponderosa	Wind speed/direction, pressure, temperature, humidity	7/1/97 to 11/01
Lancaster	43301 Division St.	Wind speed/direction, pressure, temperature, humidity	11/01 to present

Topography and Climate Discussion

The District covers a western portion of the Mojave Desert Air Basin (MDAB). The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains which dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada mountains to the north; air masses pushed onshore in southern California by differential heating are channeled through the MDAB. The MDAB is separated from the southern California coastal and central California valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevadas in the north by the Tehachapi Pass (3,800 ft elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 ft).

During the summer the MDAB is generally influenced by a Pacific Subtropical High cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time the reach the desert. Most desert moisture arrives from infrequent warm, moist and unstable air masses from the south. MDAB annual average precipitation is presented in Table 5; the data displayed is 1981-2010 averages from the NOAA National Climate Data Center. The MDAB is classified as a dry-hot desert climate (BWh), with portions classified as dry-very hot desert (BWhh), to indicate at least three months have maximum average temperatures over 100.4° F.

Table 5 - MDAB Average Annual Precipitation

Site	County	District	Precipitation (inches)
Baker	San Bernardino	MDAQMD	4.48
Barstow Daggett Airport	San Bernardino	MDAQMD	4.06
Barstow	San Bernardino	MDAQMD	5.30
Blythe Airport	Riverside	MDAQMD	3.77
Desert Center 2 NNE	Riverside	SCAQMD	3.92
Eagle Mountain	Riverside	SCAQMD	4.10
Goldstone Echo Number 2	San Bernardino	MDAQMD	5.88
Joshua Tree	San Bernardino	MDAQMD	5.11
Lancaster Wm J Fox Field	Los Angeles	AVAQMD	7.38
Mitchell Caverns	San Bernardino	MDAQMD	11.50
Mojave	Kern	EKAPCD	6.67
Mountain Pass 1 SE	San Bernardino	MDAQMD	9.94
Needles Airport	San Bernardino	MDAQMD	4.62
Palmdale Airport	Los Angeles	AVAQMD	8.30
Palmdale	Los Angeles	AVAQMD	7.40

Site	County	District	Precipitation (inches)
Parker Reservoir	San Bernardino	MDAQMD	6.16
Pearblossom	Los Angeles	AVAQMD	6.73
Randsburg	Kern	EKAPCD	7.26
Trona	San Bernardino	MDAQMD	3.88
Twentynine Palms	San Bernardino	MDAQMD	4.46
Victorville Pump Plant	San Bernardino	MDAQMD	6.15
Wrightwood	Los Angeles	AVAQMD	22.61

Recommended Impacts Discussion Elements

Direct Impacts

Direct impacts are the result of the project itself (from its construction and operation), in the form of project activity and trips generated by the project. For example, in the case of a subdivision project, construction emissions (equipment exhaust, wind erosion, vehicle exhaust), housing use activity (natural gas consumption) and trips to and from the housing (vehicle exhaust, tire wear) represent direct impacts. In the case of a new mine project, construction emissions (equipment exhaust, wind erosion, vehicle exhaust), material handling (drilling, blasting, transfers, crushing, screening, bagging), operational emissions (wind erosion, vehicle travel, vehicle exhaust, tire wear), and employee/customer/delivery travel (vehicle exhaust, tire wear) represent direct impacts.

Indirect Impacts

Indirect impacts are the result of changes that would not occur without the project. In the case of a subdivision project, indirect impacts on the surrounding community can be generated in many ways: nearby construction of roadways (or roadway modifications) and other infrastructure to support the subdivision, construction and operation of new commercial/retail establishments, changes in traffic/circulation patterns that result in increased congestion/delays, etc. In the case of a new mine project, indirect impacts can be generated by nearby construction of infrastructure to support the mine, housing constructed and/or occupied by mine employees, changes in traffic/circulation patterns that result in increased congestion/delays, etc.

Cumulative Impacts

Cumulative impacts are similar to direct and indirect impacts of the project, which the project contributes to. In the case of a subdivision project, a given project has a cumulative impact with all other subdivision projects, from the standpoint of each type of impact (cumulative construction emissions, residential natural gas consumption, solvent use, transportation emissions, congestion, etc.). Similarly, a new mine project has a cumulative impact with all other mining projects, from the standpoint of each type of impact (cumulative construction emissions, diesel equipment emissions, blasting emissions, fugitive emissions, transportation, congestion, etc.).

Conformity Impacts

A project is non-conforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan. A project is conforming if it complies with all applicable District rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan). Conformity with growth forecasts can be established by demonstrating that the project is consistent with the land use plan that was used to generate the growth forecast. An example of a non-conforming project would be one that increases the gross number of dwelling units, increases the number of trips, and/or increases the overall vehicle miles traveled in an affected area (relative to the applicable land use plan).

Sensitive Receptor Land Uses

Residences, schools, daycare centers, playgrounds and medical facilities are considered sensitive receptor land uses. The following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated using significance threshold criteria number 4 (refer to the significance threshold discussion):

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

Recommended Substantiation Discussion Elements

For projects applying the emissions-based significance thresholds, project emissions quantification is required. In addition the environmental documentation must include support for the quantification methodology used, including emission factors, emission factors source, assumptions, and sample calculations where necessary. For projects using a calculation tool such as CalEEMod or URBEMIS, the support section must specify the inputs and settings used for the evaluation.

Significance Thresholds

Any project is significant if it triggers or exceeds the most appropriate evaluation criteria. The District will clarify upon request which threshold is most appropriate for a given project; in general, the emissions comparison (criteria number 1) is sufficient:

1. Generates total emissions (direct and indirect) in excess of the thresholds given in Table 6;
2. Generates a violation of any ambient air quality standard when added to the local background;
3. Does not conform with the applicable attainment or maintenance plan(s) [1];

[1] A project is deemed to not exceed this threshold, and hence not be significant, if it is consistent with the existing land use plan. Zoning changes, specific plans, general plan amendments and similar land use plan changes which do not increase dwelling unit density, do not increase vehicle trips, and do not increase vehicle miles traveled are also deemed to not exceed this threshold.

4. Exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 1.*

**Refer to the Sensitive Receptor Land Use discussion above*

A significant project must incorporate mitigation sufficient to reduce its impact to a level that is not significant. A project that cannot be mitigated to a level that is not significant must incorporate all feasible mitigation. Note that the emission thresholds are given as a daily value and an annual value, so that a multi-phased project (such as a project with a construction phase and a separate operational phase) with phases shorter than one year can be compared to the daily value.

Table 6 – Significant Emissions Thresholds

Criteria Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
Greenhouse Gases (CO2e)	100,000	548,000
Carbon Monoxide (CO)	100	548
Oxides of Nitrogen (NO_x)	25	137
Volatile Organic Compounds (VOC)	25	137
Oxides of Sulfur (SO_x)	25	137
Particulate Matter (PM_{10})	15	82
Particulate Matter ($PM_{2.5}$)	12	65
Hydrogen Sulfide (H_2S)	10	54
Lead (Pb)	0.6	3

District Contacts

If an address is not listed, please use the general address, to the attention of the listed individual.

AVAQMD General and Rulebook	Crystal Goree (661) 723-8070 x1 Mailing and Physical Address: 43301 Division St., Suite 206 Lancaster, CA 93535-4649
Planning and Rules	Tracy Walters (760) 245-1661 x6122
Air Quality and Meteorological Data	Orlando Salinas (760) 245-1661 x1810
CEQA and Conformity	Alan De Salvio (760) 245-1661 x6726
Permitting	Bret Banks (661) 723-8070 x2

Appendix A – Basic Definitions of Major Air Pollutants

Technical and/or legal definitions exist for many of these pollutants, depending on context. The following definitions are for general, introductory purposes only:

Carbon Dioxide (CO_2) – Common product of combustion. Not a criteria pollutant, but considered an important "greenhouse gas." Important on a national or global scale.

Carbon Monoxide (CO) – Common product of incomplete combustion. A criteria pollutant with state and federal standards. Not a primary photochemical reaction compound, but involved in photochemical reactions. Dissipates rapidly, and is therefore only important on a local scale near sources.

Criteria Pollutants – Those air pollutants specifically identified for control under the Federal Clean Air Act (currently six: carbon monoxide, nitrogen oxides, lead, sulfur oxides, ozone and particulates).

Lead (Pb) – A heavy metal, present in the environment mainly due to historical use in motor vehicle fuel. Primarily associated with lead smelting operations. A criteria pollutant with state and federal standards. Primarily of concern near sources.

Oxides of Nitrogen (NO_x) – Common product of combustion in the presence of nitrogen. Includes NO_2, which is a criteria pollutant with state and federal standards. Locally and regionally important due to its involvement in the photochemical formation of ozone.

Oxides of Sulfur (SO_x) – Common product of combustion in the presence of sulfur. Associated primarily with diesel and coal burning. Includes SO_2, a criteria pollutant with state and federal standards. Primarily of concern near sources.

Ozone (O_3) – A gas mainly produced by a photochemical reaction between reactive organic gases and oxides of nitrogen in the presence of sunlight (also produced by molecular oxygen in the presence of ultraviolet light or electrical discharge). A strong oxidant that is damaging at ground level but necessary at high altitude (in the stratosphere, where it absorbs dangerous ultraviolet light). Also considered an important greenhouse gas. A criteria pollutant with state and federal standards.

Particulate Matter (TSP or PM_{30}) – Solid or liquid matter suspended in the atmosphere, excluding water. Includes aerosols and droplets that form in the atmosphere. Locally and regionally important.

Reactive/Volatile Organic Compounds/Gases (ROG, VOC, NMOG, NMOC) – A portion of total organic compounds or gases, excludes methane, ethane and acetone (due to low photochemical reactivity). "ROG" is generally used by the California Air Resources Board, "VOC" is generally used by the United States Environmental Protection Agency, but all four terms are interchangeable for most uses. Regionally important due to its involvement in the photochemical reaction that produces ozone.

Respirable Particulate Matter (coarse or PM_{10}, and fine or $PM_{2.5}$) – That portion of particulate matter that tends to penetrate into the human lung. The subscript refers to aerodynamic diameter. Criteria pollutants with state and federal standards. Locally and regionally important.

Total Organic Compounds/Gases (TOC or TOG) – Compounds containing at least one atom of carbon, except carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and metallic carbonates. Primarily methane in the atmosphere, a "greenhouse gas."

ATTACHMENT B – CalEEMod Emissions Model Output

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA

Antelope Valley APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	15.00	Dwelling Unit	3.30	40,500.00	43
City Park	0.34	Acre	0.34	14,932.00	0
Other Asphalt Surfaces	0.13	Acre	0.13	5,662.80	0
Other Non-Asphalt Surfaces	0.82	Acre	0.82	35,719.20	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2025
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Information provided by client.

Construction Phase - An estimated start date of 07/01/2024 and end date of 07/01/2025 was provided by client. Since project is a housing development, assumed all paving was conducted prior to building construction. For architectural coating phase, assumed CalEEMod default number of days and assumed overlap with end of building construction phase.

Grading - Material import for site preparation and grading phases provided by client on data request form.

Demolition - Amount of material to be demolished provided by client on data request form.

Architectural Coating - VOC limits from AVAQMD Rule 1113. For the building, assumes 90% flat paint (50 g/L) and 10% non-flat (100 g/L). For parking lot coatings, assumed to be compliant with the Traffic Marking Coating category VOC limit of 100 g/L.

Vehicle Trips - All areas modeled as a City Park are within the development and no vehicle trips are expected.

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Woodstoves - Based on client input on the data request form no woodstoves will be installed and each home will have a gas fireplace.

Area Coating - VOC limits from AVAQMD Rule 1113. For the building, assumes 90% flat paint (50 g/L) and 10% non-flat (100 g/L). For parking lot coatings, assumed to be compliant with the Traffic Marking Coating category VOC limit of 100 g/L.

Construction Off-road Equipment Mitigation - Assumes that construction site will be watered 3 times per day to be in compliance with AVAQMD Rule 403.

Area Mitigation - -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	55.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	55.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	55.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	55.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	55
tblAreaCoating	Area_EF_Nonresidential_Interior	250	55
tblAreaCoating	Area_EF_Parking	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	55
tblAreaCoating	Area_EF_Residential_Interior	250	55
tblConstructionPhase	NumDays	230.00	211.00
tblConstructionPhase	PhaseEndDate	8/21/2025	7/1/2025
tblConstructionPhase	PhaseEndDate	7/2/2025	7/1/2025
tblConstructionPhase	PhaseEndDate	7/28/2025	9/9/2024
tblConstructionPhase	PhaseStartDate	7/29/2025	6/6/2025
tblConstructionPhase	PhaseStartDate	8/15/2024	9/10/2024
tblConstructionPhase	PhaseStartDate	7/3/2025	8/15/2024
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	8.25	15.00
tblFireplaces	NumberNoFireplace	1.50	0.00
tblFireplaces	NumberWood	5.25	0.00
tblGrading	MaterialImported	0.00	50.00
tblGrading	MaterialImported	0.00	3,916.00

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblLandUse	LandUseSquareFeet	27,000.00	40,500.00
tblLandUse	LandUseSquareFeet	14,810.40	14,932.00
tblLandUse	LotAcreage	4.87	3.30
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	48.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	33.00	0.00
tblVehicleTrips	DV_TP	28.00	0.00
tblVehicleTrips	PB_TP	6.00	0.00
tblVehicleTrips	PR_TP	66.00	0.00
tblVehicleTrips	ST_TR	1.96	0.00
tblVehicleTrips	SU_TR	2.19	0.00
tblVehicleTrips	WD_TR	0.78	0.00
tblWoodstoves	NumberCatalytic	0.75	0.00
tblWoodstoves	NumberNoncatalytic	0.75	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.1092	1.0156	1.1268	2.2000e-003	0.0990	0.0444	0.1433	0.0446	0.0414	0.0861	0.0000	192.9929	192.9929	0.0429	3.5600e-003	195.1253
2025	0.2416	0.8531	1.1234	2.0400e-003	0.0204	0.0350	0.0554	5.5200e-003	0.0329	0.0385	0.0000	177.6221	177.6221	0.0360	2.1600e-003	179.1678
Maximum	**0.2416**	**1.0156**	**1.1268**	**2.2000e-003**	**0.0990**	**0.0444**	**0.1433**	**0.0446**	**0.0414**	**0.0861**	**0.0000**	**192.9929**	**192.9929**	**0.0429**	**3.5600e-003**	**195.1253**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.1092	1.0156	1.1268	2.2000e-003	0.0510	0.0444	0.0953	0.0208	0.0414	0.0622	0.0000	192.9927	192.9927	0.0429	3.5600e-003	195.1251
2025	0.2416	0.8531	1.1234	2.0400e-003	0.0204	0.0350	0.0554	5.5200e-003	0.0329	0.0385	0.0000	177.6220	177.6220	0.0360	2.1600e-003	179.1676
Maximum	**0.2416**	**1.0156**	**1.1268**	**2.2000e-003**	**0.0510**	**0.0444**	**0.0953**	**0.0208**	**0.0414**	**0.0622**	**0.0000**	**192.9927**	**192.9927**	**0.0429**	**3.5600e-003**	**195.1251**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**40.22**	**0.00**	**24.16**	**47.60**	**0.00**	**19.18**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**7-1-2024**	**9-30-2024**	0.6046	0.6046
2	**10-1-2024**	**12-31-2024**	0.5099	0.5099
3	**1-1-2025**	**3-31-2025**	0.4637	0.4637
4	**4-1-2025**	**6-30-2025**	0.6243	0.6243
5	**7-1-2025**	**9-30-2025**	0.0114	0.0114
		Highest	0.6243	0.6243

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1800	0.0115	0.1156	7.0000e-005		1.4400e-003	1.4400e-003		1.4400e-003	1.4400e-003	0.0000	11.9967	11.9967	4.0000e-004	2.2000e-004	12.0713
Energy	2.0600e-003	0.0176	7.5000e-003	1.1000e-004		1.4200e-003	1.4200e-003		1.4200e-003	1.4200e-003	0.0000	41.3089	41.3089	2.1600e-003	5.9000e-004	41.5380
Mobile	0.0738	0.1002	0.7099	1.4100e-003	0.1501	1.1600e-003	0.1512	0.0402	1.0800e-003	0.0412	0.0000	130.5220	130.5220	9.1000e-003	6.5400e-003	132.6989
Waste						0.0000	0.0000		0.0000	0.0000	3.5848	0.0000	3.5848	0.2119	0.0000	8.8812
Water						0.0000	0.0000		0.0000	0.0000	0.3101	4.2690	4.5790	0.0322	8.0000e-004	5.6213
Total	**0.2559**	**0.1293**	**0.8330**	**1.5900e-003**	**0.1501**	**4.0200e-003**	**0.1541**	**0.0402**	**3.9400e-003**	**0.0441**	**3.8949**	**188.0966**	**191.9915**	**0.2557**	**8.1500e-003**	**200.8106**

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1800	0.0115	0.1156	7.0000e-005		1.4400e-003	1.4400e-003		1.4400e-003	1.4400e-003	0.0000	11.9967	11.9967	4.0000e-004	2.2000e-004	12.0713
Energy	2.0600e-003	0.0176	7.5000e-003	1.1000e-004		1.4200e-003	1.4200e-003		1.4200e-003	1.4200e-003	0.0000	41.3089	41.3089	2.1600e-003	5.9000e-004	41.5380
Mobile	0.0738	0.1002	0.7099	1.4100e-003	0.1501	1.1600e-003	0.1512	0.0402	1.0800e-003	0.0412	0.0000	130.5220	130.5220	9.1000e-003	6.5400e-003	132.6989
Waste						0.0000	0.0000		0.0000	0.0000	3.5848	0.0000	3.5848	0.2119	0.0000	8.8812
Water						0.0000	0.0000		0.0000	0.0000	0.3101	4.2690	4.5790	0.0322	8.0000e-004	5.6213
Total	**0.2559**	**0.1293**	**0.8330**	**1.5900e-003**	**0.1501**	**4.0200e-003**	**0.1541**	**0.0402**	**3.9400e-003**	**0.0441**	**3.8949**	**188.0966**	**191.9915**	**0.2557**	**8.1500e-003**	**200.8106**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	7/1/2024	7/26/2024	5	20	
2	Site Preparation	Site Preparation	7/27/2024	8/2/2024	5	5	
3	Grading	Grading	8/3/2024	8/14/2024	5	8	

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4	Building Construction	Building Construction	9/10/2024	7/1/2025	5	211	
5	Paving	Paving	8/15/2024	9/9/2024	5	18	
6	Architectural Coating	Architectural Coating	6/6/2025	7/1/2025	5	18	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 8

Acres of Paving: 0.95

Residential Indoor: 82,013; Residential Outdoor: 27,338; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 2,483 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37

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Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	6.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	29.00	11.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	9.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	490.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	6.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

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3.2 Demolition - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8000e-004	0.0000	9.8000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0224	0.2088	0.1971	3.9000e-004		9.6000e-003	9.6000e-003		8.9200e-003	8.9200e-003	0.0000	33.9961	33.9961	9.5100e-003	0.0000	34.2338
Total	**0.0224**	**0.2088**	**0.1971**	**3.9000e-004**	**9.8000e-004**	**9.6000e-003**	**0.0106**	**1.5000e-004**	**8.9200e-003**	**9.0700e-003**	**0.0000**	**33.9961**	**33.9961**	**9.5100e-003**	**0.0000**	**34.2338**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	5.4000e-004	1.4000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2362	0.2362	0.0000	4.0000e-005	0.2473
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	3.4000e-004	4.2500e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9648	0.9648	3.0000e-005	3.0000e-005	0.9746
Total	**4.4000e-004**	**8.8000e-004**	**4.3900e-003**	**1.0000e-005**	**1.2900e-003**	**1.0000e-005**	**1.3000e-003**	**3.4000e-004**	**1.0000e-005**	**3.5000e-004**	**0.0000**	**1.2009**	**1.2009**	**3.0000e-005**	**7.0000e-005**	**1.2219**

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3.2 Demolition - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.8000e-004	0.0000	3.8000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0224	0.2088	0.1971	3.9000e-004		9.6000e-003	9.6000e-003		8.9200e-003	8.9200e-003	0.0000	33.9960	33.9960	9.5100e-003	0.0000	34.2338
Total	**0.0224**	**0.2088**	**0.1971**	**3.9000e-004**	**3.8000e-004**	**9.6000e-003**	**9.9800e-003**	**6.0000e-005**	**8.9200e-003**	**8.9800e-003**	**0.0000**	**33.9960**	**33.9960**	**9.5100e-003**	**0.0000**	**34.2338**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	5.4000e-004	1.4000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2362	0.2362	0.0000	4.0000e-005	0.2473
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	3.4000e-004	4.2500e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9648	0.9648	3.0000e-005	3.0000e-005	0.9746
Total	**4.4000e-004**	**8.8000e-004**	**4.3900e-003**	**1.0000e-005**	**1.2900e-003**	**1.0000e-005**	**1.3000e-003**	**3.4000e-004**	**1.0000e-005**	**3.5000e-004**	**0.0000**	**1.2009**	**1.2009**	**3.0000e-005**	**7.0000e-005**	**1.2219**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0492	0.0000	0.0492	0.0253	0.0000	0.0253	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6500e-003	0.0679	0.0458	1.0000e-004		3.0700e-003	3.0700e-003		2.8300e-003	2.8300e-003	0.0000	8.3643	8.3643	2.7100e-003	0.0000	8.4319
Total	**6.6500e-003**	**0.0679**	**0.0458**	**1.0000e-004**	**0.0492**	**3.0700e-003**	**0.0522**	**0.0253**	**2.8300e-003**	**0.0281**	**0.0000**	**8.3643**	**8.3643**	**2.7100e-003**	**0.0000**	**8.4319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.6000e-004	9.0000e-005	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1574	0.1574	0.0000	2.0000e-005	0.1648
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	1.0000e-004	1.2700e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.2894	0.2894	1.0000e-005	1.0000e-005	0.2924
Total	**1.4000e-004**	**4.6000e-004**	**1.3600e-003**	**0.0000**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.4469**	**0.4469**	**1.0000e-005**	**3.0000e-005**	**0.4572**

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3.3 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0192	0.0000	0.0192	9.8500e-003	0.0000	9.8500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6500e-003	0.0679	0.0458	1.0000e-004		3.0700e-003	3.0700e-003		2.8300e-003	2.8300e-003	0.0000	8.3643	8.3643	2.7100e-003	0.0000	8.4319
Total	**6.6500e-003**	**0.0679**	**0.0458**	**1.0000e-004**	**0.0192**	**3.0700e-003**	**0.0222**	**9.8500e-003**	**2.8300e-003**	**0.0127**	**0.0000**	**8.3643**	**8.3643**	**2.7100e-003**	**0.0000**	**8.4319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	3.6000e-004	9.0000e-005	0.0000	5.0000e-005	0.0000	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1574	0.1574	0.0000	2.0000e-005	0.1648
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3000e-004	1.0000e-004	1.2700e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.2894	0.2894	1.0000e-005	1.0000e-005	0.2924
Total	**1.4000e-004**	**4.6000e-004**	**1.3600e-003**	**0.0000**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.4469**	**0.4469**	**1.0000e-005**	**3.0000e-005**	**0.4572**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0286	0.0000	0.0286	0.0137	0.0000	0.0137	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6500e-003	0.0681	0.0590	1.2000e-004		2.9000e-003	2.9000e-003		2.6700e-003	2.6700e-003	0.0000	10.4256	10.4256	3.3700e-003	0.0000	10.5099
Total	**6.6500e-003**	**0.0681**	**0.0590**	**1.2000e-004**	**0.0286**	**2.9000e-003**	**0.0315**	**0.0137**	**2.6700e-003**	**0.0164**	**0.0000**	**10.4256**	**10.4256**	**3.3700e-003**	**0.0000**	**10.5099**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.5000e-004	0.0295	7.5100e-003	1.3000e-004	4.2100e-003	1.9000e-004	4.4000e-003	1.1600e-003	1.8000e-004	1.3400e-003	0.0000	12.8568	12.8568	8.0000e-005	2.0200e-003	13.4612
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	1.4000e-004	1.7000e-003	0.0000	4.8000e-004	0.0000	4.9000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3859	0.3859	1.0000e-005	1.0000e-005	0.3899
Total	**7.2000e-004**	**0.0297**	**9.2100e-003**	**1.3000e-004**	**4.6900e-003**	**1.9000e-004**	**4.8900e-003**	**1.2900e-003**	**1.8000e-004**	**1.4700e-003**	**0.0000**	**13.2427**	**13.2427**	**9.0000e-005**	**2.0300e-003**	**13.8510**

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3.4 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0111	0.0000	0.0111	5.3600e-003	0.0000	5.3600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.6500e-003	0.0681	0.0590	1.2000e-004		2.9000e-003	2.9000e-003		2.6700e-003	2.6700e-003	0.0000	10.4256	10.4256	3.3700e-003	0.0000	10.5099
Total	**6.6500e-003**	**0.0681**	**0.0590**	**1.2000e-004**	**0.0111**	**2.9000e-003**	**0.0140**	**5.3600e-003**	**2.6700e-003**	**8.0300e-003**	**0.0000**	**10.4256**	**10.4256**	**3.3700e-003**	**0.0000**	**10.5099**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.5000e-004	0.0295	7.5100e-003	1.3000e-004	4.2100e-003	1.9000e-004	4.4000e-003	1.1600e-003	1.8000e-004	1.3400e-003	0.0000	12.8568	12.8568	8.0000e-005	2.0200e-003	13.4612
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7000e-004	1.4000e-004	1.7000e-003	0.0000	4.8000e-004	0.0000	4.9000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.3859	0.3859	1.0000e-005	1.0000e-005	0.3899
Total	**7.2000e-004**	**0.0297**	**9.2100e-003**	**1.3000e-004**	**4.6900e-003**	**1.9000e-004**	**4.8900e-003**	**1.2900e-003**	**1.8000e-004**	**1.4700e-003**	**0.0000**	**13.2427**	**13.2427**	**9.0000e-005**	**2.0300e-003**	**13.8510**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0596	0.5445	0.6548	1.0900e-003		0.0248	0.0248		0.0234	0.0234	0.0000	93.8989	93.8989	0.0222	0.0000	94.4540
Total	**0.0596**	**0.5445**	**0.6548**	**1.0900e-003**		**0.0248**	**0.0248**		**0.0234**	**0.0234**	**0.0000**	**93.8989**	**93.8989**	**0.0222**	**0.0000**	**94.4540**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-004	0.0177	6.8000e-003	8.0000e-005	2.9700e-003	9.0000e-005	3.0600e-003	8.6000e-004	8.0000e-005	9.4000e-004	0.0000	7.9634	7.9634	5.0000e-005	1.1500e-003	8.3067
Worker	3.3900e-003	2.6800e-003	0.0332	8.0000e-005	9.4600e-003	6.0000e-005	9.5100e-003	2.5100e-003	5.0000e-005	2.5600e-003	0.0000	7.5542	7.5542	2.6000e-004	2.4000e-004	7.6313
Total	**3.8900e-003**	**0.0204**	**0.0400**	**1.6000e-004**	**0.0124**	**1.5000e-004**	**0.0126**	**3.3700e-003**	**1.3000e-004**	**3.5000e-003**	**0.0000**	**15.5176**	**15.5176**	**3.1000e-004**	**1.3900e-003**	**15.9380**

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3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0596	0.5445	0.6548	1.0900e-003		0.0248	0.0248		0.0234	0.0234	0.0000	93.8988	93.8988	0.0222	0.0000	94.4539
Total	**0.0596**	**0.5445**	**0.6548**	**1.0900e-003**		**0.0248**	**0.0248**		**0.0234**	**0.0234**	**0.0000**	**93.8988**	**93.8988**	**0.0222**	**0.0000**	**94.4539**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-004	0.0177	6.8000e-003	8.0000e-005	2.9700e-003	9.0000e-005	3.0600e-003	8.6000e-004	8.0000e-005	9.4000e-004	0.0000	7.9634	7.9634	5.0000e-005	1.1500e-003	8.3067
Worker	3.3900e-003	2.6800e-003	0.0332	8.0000e-005	9.4600e-003	6.0000e-005	9.5100e-003	2.5100e-003	5.0000e-005	2.5600e-003	0.0000	7.5542	7.5542	2.6000e-004	2.4000e-004	7.6313
Total	**3.8900e-003**	**0.0204**	**0.0400**	**1.6000e-004**	**0.0124**	**1.5000e-004**	**0.0126**	**3.3700e-003**	**1.3000e-004**	**3.5000e-003**	**0.0000**	**15.5176**	**15.5176**	**3.1000e-004**	**1.3900e-003**	**15.9380**

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3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0889	0.8105	1.0455	1.7500e-003		0.0343	0.0343		0.0323	0.0323	0.0000	150.7476	150.7476	0.0354	0.0000	151.6336
Total	**0.0889**	**0.8105**	**1.0455**	**1.7500e-003**		**0.0343**	**0.0343**		**0.0323**	**0.0323**	**0.0000**	**150.7476**	**150.7476**	**0.0354**	**0.0000**	**151.6336**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.9000e-004	0.0283	0.0107	1.3000e-004	4.7700e-003	1.4000e-004	4.9100e-003	1.3800e-003	1.3000e-004	1.5100e-003	0.0000	12.5212	12.5212	7.0000e-005	1.8000e-003	13.0596
Worker	5.0600e-003	3.8500e-003	0.0494	1.3000e-004	0.0152	9.0000e-005	0.0153	4.0300e-003	8.0000e-005	4.1100e-003	0.0000	11.7197	11.7197	3.8000e-004	3.5000e-004	11.8345
Total	**5.8500e-003**	**0.0322**	**0.0601**	**2.6000e-004**	**0.0200**	**2.3000e-004**	**0.0202**	**5.4100e-003**	**2.1000e-004**	**5.6200e-003**	**0.0000**	**24.2408**	**24.2408**	**4.5000e-004**	**2.1500e-003**	**24.8941**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0889	0.8105	1.0455	1.7500e-003		0.0343	0.0343		0.0323	0.0323	0.0000	150.7475	150.7475	0.0354	0.0000	151.6334
Total	**0.0889**	**0.8105**	**1.0455**	**1.7500e-003**		**0.0343**	**0.0343**		**0.0323**	**0.0323**	**0.0000**	**150.7475**	**150.7475**	**0.0354**	**0.0000**	**151.6334**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.9000e-004	0.0283	0.0107	1.3000e-004	4.7700e-003	1.4000e-004	4.9100e-003	1.3800e-003	1.3000e-004	1.5100e-003	0.0000	12.5212	12.5212	7.0000e-005	1.8000e-003	13.0596
Worker	5.0600e-003	3.8500e-003	0.0494	1.3000e-004	0.0152	9.0000e-005	0.0153	4.0300e-003	8.0000e-005	4.1100e-003	0.0000	11.7197	11.7197	3.8000e-004	3.5000e-004	11.8345
Total	**5.8500e-003**	**0.0322**	**0.0601**	**2.6000e-004**	**0.0200**	**2.3000e-004**	**0.0202**	**5.4100e-003**	**2.1000e-004**	**5.6200e-003**	**0.0000**	**24.2408**	**24.2408**	**4.5000e-004**	**2.1500e-003**	**24.8941**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9300e-003	0.0745	0.1100	1.7000e-004		3.5900e-003	3.5900e-003		3.3200e-003	3.3200e-003	0.0000	14.7423	14.7423	4.6300e-003	0.0000	14.8581
Paving	1.7000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.1000e-003**	**0.0745**	**0.1100**	**1.7000e-004**		**3.5900e-003**	**3.5900e-003**		**3.3200e-003**	**3.3200e-003**	**0.0000**	**14.7423**	**14.7423**	**4.6300e-003**	**0.0000**	**14.8581**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	4.1000e-004	5.0900e-003	1.0000e-005	1.4500e-003	1.0000e-005	1.4600e-003	3.9000e-004	1.0000e-005	3.9000e-004	0.0000	1.1577	1.1577	4.0000e-005	4.0000e-005	1.1696
Total	**5.2000e-004**	**4.1000e-004**	**5.0900e-003**	**1.0000e-005**	**1.4500e-003**	**1.0000e-005**	**1.4600e-003**	**3.9000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1577**	**1.1577**	**4.0000e-005**	**4.0000e-005**	**1.1696**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.9300e-003	0.0745	0.1100	1.7000e-004		3.5900e-003	3.5900e-003		3.3200e-003	3.3200e-003	0.0000	14.7423	14.7423	4.6300e-003	0.0000	14.8581
Paving	1.7000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.1000e-003**	**0.0745**	**0.1100**	**1.7000e-004**		**3.5900e-003**	**3.5900e-003**		**3.3200e-003**	**3.3200e-003**	**0.0000**	**14.7423**	**14.7423**	**4.6300e-003**	**0.0000**	**14.8581**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	4.1000e-004	5.0900e-003	1.0000e-005	1.4500e-003	1.0000e-005	1.4600e-003	3.9000e-004	1.0000e-005	3.9000e-004	0.0000	1.1577	1.1577	4.0000e-005	4.0000e-005	1.1696
Total	**5.2000e-004**	**4.1000e-004**	**5.0900e-003**	**1.0000e-005**	**1.4500e-003**	**1.0000e-005**	**1.4600e-003**	**3.9000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1577**	**1.1577**	**4.0000e-005**	**4.0000e-005**	**1.1696**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1451					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5400e-003	0.0103	0.0163	3.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004	0.0000	2.2979	2.2979	1.3000e-004	0.0000	2.3011
Total	**0.1467**	**0.0103**	**0.0163**	**3.0000e-005**		**4.6000e-004**	**4.6000e-004**		**4.6000e-004**	**4.6000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.3000e-004**	**0.0000**	**2.3011**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.1000e-004	1.4200e-003	0.0000	4.3000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3357	0.3357	1.0000e-005	1.0000e-005	0.3390
Total	**1.4000e-004**	**1.1000e-004**	**1.4200e-003**	**0.0000**	**4.3000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3357**	**0.3357**	**1.0000e-005**	**1.0000e-005**	**0.3390**

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3.7 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1451					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5400e-003	0.0103	0.0163	3.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004	0.0000	2.2979	2.2979	1.3000e-004	0.0000	2.3011
Total	**0.1467**	**0.0103**	**0.0163**	**3.0000e-005**		**4.6000e-004**	**4.6000e-004**		**4.6000e-004**	**4.6000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.3000e-004**	**0.0000**	**2.3011**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.1000e-004	1.4200e-003	0.0000	4.3000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3357	0.3357	1.0000e-005	1.0000e-005	0.3390
Total	**1.4000e-004**	**1.1000e-004**	**1.4200e-003**	**0.0000**	**4.3000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3357**	**0.3357**	**1.0000e-005**	**1.0000e-005**	**0.3390**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0738	0.1002	0.7099	1.4100e-003	0.1501	1.1600e-003	0.1512	0.0402	1.0800e-003	0.0412	0.0000	130.5220	130.5220	9.1000e-003	6.5400e-003	132.6989
Unmitigated	0.0738	0.1002	0.7099	1.4100e-003	0.1501	1.1600e-003	0.1512	0.0402	1.0800e-003	0.0412	0.0000	130.5220	130.5220	9.1000e-003	6.5400e-003	132.6989

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Single Family Housing	141.60	143.10	128.25	397,353	397,353
Total	141.60	143.10	128.25	397,353	397,353

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.598468	0.051929	0.142496	0.115412	0.025941	0.007230	0.011936	0.009225	0.000692	0.000493	0.027552	0.002445	0.006180
Other Asphalt Surfaces	0.598468	0.051929	0.142496	0.115412	0.025941	0.007230	0.011936	0.009225	0.000692	0.000493	0.027552	0.002445	0.006180
Other Non-Asphalt Surfaces	0.598468	0.051929	0.142496	0.115412	0.025941	0.007230	0.011936	0.009225	0.000692	0.000493	0.027552	0.002445	0.006180
Single Family Housing	0.598468	0.051929	0.142496	0.115412	0.025941	0.007230	0.011936	0.009225	0.000692	0.000493	0.027552	0.002445	0.006180

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	20.9036	20.9036	1.7600e-003	2.1000e-004	21.0114
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	20.9036	20.9036	1.7600e-003	2.1000e-004	21.0114
NaturalGas Mitigated	2.0600e-003	0.0176	7.5000e-003	1.1000e-004		1.4200e-003	1.4200e-003		1.4200e-003	1.4200e-003	0.0000	20.4053	20.4053	3.9000e-004	3.7000e-004	20.5266
NaturalGas Unmitigated	2.0600e-003	0.0176	7.5000e-003	1.1000e-004		1.4200e-003	1.4200e-003		1.4200e-003	1.4200e-003	0.0000	20.4053	20.4053	3.9000e-004	3.7000e-004	20.5266

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	382381	2.0600e-003	0.0176	7.5000e-003	1.1000e-004		1.4200e-003	1.4200e-003		1.4200e-003	1.4200e-003	0.0000	20.4053	20.4053	3.9000e-004	3.7000e-004	20.5266
Total		**2.0600e-003**	**0.0176**	**7.5000e-003**	**1.1000e-004**		**1.4200e-003**	**1.4200e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**20.4053**	**20.4053**	**3.9000e-004**	**3.7000e-004**	**20.5266**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	382381	2.0600e-003	0.0176	7.5000e-003	1.1000e-004		1.4200e-003	1.4200e-003		1.4200e-003	1.4200e-003	0.0000	20.4053	20.4053	3.9000e-004	3.7000e-004	20.5266
Total		**2.0600e-003**	**0.0176**	**7.5000e-003**	**1.1000e-004**		**1.4200e-003**	**1.4200e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**20.4053**	**20.4053**	**3.9000e-004**	**3.7000e-004**	**20.5266**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	117869	20.9036	1.7600e-003	2.1000e-004	21.0114
Total		**20.9036**	**1.7600e-003**	**2.1000e-004**	**21.0114**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	117869	20.9036	1.7600e-003	2.1000e-004	21.0114
Total		**20.9036**	**1.7600e-003**	**2.1000e-004**	**21.0114**

6.0 Area Detail

6.1 Mitigation Measures Area

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1800	0.0115	0.1156	7.0000e-005		1.4400e-003	1.4400e-003		1.4400e-003	1.4400e-003	0.0000	11.9967	11.9967	4.0000e-004	2.2000e-004	12.0713
Unmitigated	0.1800	0.0115	0.1156	7.0000e-005		1.4400e-003	1.4400e-003		1.4400e-003	1.4400e-003	0.0000	11.9967	11.9967	4.0000e-004	2.2000e-004	12.0713

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0145					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1610					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.1900e-003	0.0102	4.3400e-003	7.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	11.8148	11.8148	2.3000e-004	2.2000e-004	11.8850
Landscaping	3.3400e-003	1.2800e-003	0.1113	1.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	0.1820	0.1820	1.7000e-004	0.0000	0.1863
Total	**0.1800**	**0.0115**	**0.1156**	**8.0000e-005**		**1.4400e-003**	**1.4400e-003**		**1.4400e-003**	**1.4400e-003**	**0.0000**	**11.9967**	**11.9967**	**4.0000e-004**	**2.2000e-004**	**12.0713**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0145					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1610					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	1.1900e-003	0.0102	4.3400e-003	7.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	11.8148	11.8148	2.3000e-004	2.2000e-004	11.8850
Landscaping	3.3400e-003	1.2800e-003	0.1113	1.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	0.1820	0.1820	1.7000e-004	0.0000	0.1863
Total	**0.1800**	**0.0115**	**0.1156**	**8.0000e-005**		**1.4400e-003**	**1.4400e-003**		**1.4400e-003**	**1.4400e-003**	**0.0000**	**11.9967**	**11.9967**	**4.0000e-004**	**2.2000e-004**	**12.0713**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	4.5790	0.0322	8.0000e-004	5.6213
Unmitigated	4.5790	0.0322	8.0000e-004	5.6213

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0.405104	0.7982	7.0000e-005	1.0000e-005	0.8023
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.97731 / 0.61613	3.7808	0.0321	7.9000e-004	4.8190
Total		**4.5790**	**0.0322**	**8.0000e-004**	**5.6213**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0.405104	0.7982	7.0000e-005	1.0000e-005	0.8023
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.97731 / 0.61613	3.7808	0.0321	7.9000e-004	4.8190
Total		**4.5790**	**0.0322**	**8.0000e-004**	**5.6213**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3.5848	0.2119	0.0000	8.8812
Unmitigated	3.5848	0.2119	0.0000	8.8812

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.03	6.0900e-003	3.6000e-004	0.0000	0.0151
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	17.63	3.5787	0.2115	0.0000	8.8662
Total		**3.5848**	**0.2119**	**0.0000**	**8.8812**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.03	6.0900e-003	3.6000e-004	0.0000	0.0151
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	17.63	3.5787	0.2115	0.0000	8.8662
Total		**3.5848**	**0.2119**	**0.0000**	**8.8812**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA

Antelope Valley APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	15.00	Dwelling Unit	3.30	40,500.00	43
City Park	0.34	Acre	0.34	14,932.00	0
Other Asphalt Surfaces	0.13	Acre	0.13	5,662.80	0
Other Non-Asphalt Surfaces	0.82	Acre	0.82	35,719.20	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2025
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Information provided by client.

Construction Phase - An estimated start date of 07/01/2024 and end date of 07/01/2025 was provided by client. Since project is a housing development, assumed all paving was conducted prior to building construction. For architectural coating phase, assumed CalEEMod default number of days and assumed overlap with end of building construction phase.

Grading - Material import for site preparation and grading phases provided by client on data request form.

Demolition - Amount of material to be demolished provided by client on data request form.

Architectural Coating - VOC limits from AVAQMD Rule 1113. For the building, assumes 90% flat paint (50 g/L) and 10% non-flat (100 g/L). For parking lot coatings, assumed to be compliant with the Traffic Marking Coating category VOC limit of 100 g/L.

Vehicle Trips - All areas modeled as a City Park are within the development and no vehicle trips are expected.

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Woodstoves - Based on client input on the data request form no woodstoves will be installed and each home will have a gas fireplace.

Area Coating - VOC limits from AVAQMD Rule 1113. For the building, assumes 90% flat paint (50 g/L) and 10% non-flat (100 g/L). For parking lot coatings, assumed to be compliant with the Traffic Marking Coating category VOC limit of 100 g/L.

Construction Off-road Equipment Mitigation - Assumes that construction site will be watered 3 times per day to be in compliance with AVAQMD Rule 403.

Area Mitigation - -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	55.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	55.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	55.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	55.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	55
tblAreaCoating	Area_EF_Nonresidential_Interior	250	55
tblAreaCoating	Area_EF_Parking	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	55
tblAreaCoating	Area_EF_Residential_Interior	250	55
tblConstructionPhase	NumDays	230.00	211.00
tblConstructionPhase	PhaseEndDate	8/21/2025	7/1/2025
tblConstructionPhase	PhaseEndDate	7/2/2025	7/1/2025
tblConstructionPhase	PhaseEndDate	7/28/2025	9/9/2024
tblConstructionPhase	PhaseStartDate	7/29/2025	6/6/2025
tblConstructionPhase	PhaseStartDate	8/15/2024	9/10/2024
tblConstructionPhase	PhaseStartDate	7/3/2025	8/15/2024
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	8.25	15.00
tblFireplaces	NumberNoFireplace	1.50	0.00
tblFireplaces	NumberWood	5.25	0.00
tblGrading	MaterialImported	0.00	50.00
tblGrading	MaterialImported	0.00	3,916.00

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblLandUse	LandUseSquareFeet	27,000.00	40,500.00
tblLandUse	LandUseSquareFeet	14,810.40	14,932.00
tblLandUse	LotAcreage	4.87	3.30
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	48.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	33.00	0.00
tblVehicleTrips	DV_TP	28.00	0.00
tblVehicleTrips	PB_TP	6.00	0.00
tblVehicleTrips	PR_TP	66.00	0.00
tblVehicleTrips	ST_TR	1.96	0.00
tblVehicleTrips	SU_TR	2.19	0.00
tblVehicleTrips	WD_TR	0.78	0.00
tblWoodstoves	NumberCatalytic	0.75	0.00
tblWoodstoves	NumberNoncatalytic	0.75	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	2.7254	27.3495	20.2129	0.0642	19.8270	1.2311	21.0582	10.1476	1.1327	11.2803	0.0000	6,529.3772	6,529.3772	1.1974	0.5597	6,720.0430
2025	17.7888	14.0927	19.1176	0.0345	0.3620	0.5828	0.9448	0.0977	0.5513	0.6490	0.0000	3,311.5431	3,311.5431	0.6249	0.0372	3,338.2582
Maximum	**17.7888**	**27.3495**	**20.2129**	**0.0642**	**19.8270**	**1.2311**	**21.0582**	**10.1476**	**1.1327**	**11.2803**	**0.0000**	**6,529.3772**	**6,529.3772**	**1.1974**	**0.5597**	**6,720.0430**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2024	2.7254	27.3495	20.2129	0.0642	7.8355	1.2311	9.0667	3.9850	1.1327	5.1177	0.0000	6,529.3772	6,529.3772	1.1974	0.5597	6,720.0430
2025	17.7888	14.0927	19.1176	0.0345	0.3620	0.5828	0.9448	0.0977	0.5513	0.6490	0.0000	3,311.5431	3,311.5431	0.6249	0.0372	3,338.2582
Maximum	**17.7888**	**27.3495**	**20.2129**	**0.0642**	**7.8355**	**1.2311**	**9.0667**	**3.9850**	**1.1327**	**5.1177**	**0.0000**	**6,529.3772**	**6,529.3772**	**1.1974**	**0.5597**	**6,720.0430**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	59.40	0.00	54.50	60.15	0.00	51.66	0.00	0.00	0.00	0.00	0.00	0.00

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0279	0.2631	1.3424	1.6500e-003		0.0270	0.0270		0.0270	0.0270	0.0000	319.8756	319.8756	8.2200e-003	5.8200e-003	321.8166
Energy	0.0113	0.0966	0.0411	6.2000e-004		7.8100e-003	7.8100e-003		7.8100e-003	7.8100e-003		123.2494	123.2494	2.3600e-003	2.2600e-003	123.9818
Mobile	0.4961	0.5159	4.2602	8.5200e-003	0.8600	6.5200e-003	0.8665	0.2298	6.0900e-003	0.2358		867.0463	867.0463	0.0538	0.0386	879.8975
Total	**1.5353**	**0.8755**	**5.6437**	**0.0108**	**0.8600**	**0.0413**	**0.9013**	**0.2298**	**0.0409**	**0.2706**	**0.0000**	**1,310.1713**	**1,310.1713**	**0.0644**	**0.0467**	**1,325.6959**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0279	0.2631	1.3424	1.6500e-003		0.0270	0.0270		0.0270	0.0270	0.0000	319.8756	319.8756	8.2200e-003	5.8200e-003	321.8166
Energy	0.0113	0.0966	0.0411	6.2000e-004		7.8100e-003	7.8100e-003		7.8100e-003	7.8100e-003		123.2494	123.2494	2.3600e-003	2.2600e-003	123.9818
Mobile	0.4961	0.5159	4.2602	8.5200e-003	0.8600	6.5200e-003	0.8665	0.2298	6.0900e-003	0.2358		867.0463	867.0463	0.0538	0.0386	879.8975
Total	**1.5353**	**0.8755**	**5.6437**	**0.0108**	**0.8600**	**0.0413**	**0.9013**	**0.2298**	**0.0409**	**0.2706**	**0.0000**	**1,310.1713**	**1,310.1713**	**0.0644**	**0.0467**	**1,325.6959**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	7/1/2024	7/26/2024	5	20	
2	Site Preparation	Site Preparation	7/27/2024	8/2/2024	5	5	
3	Grading	Grading	8/3/2024	8/14/2024	5	8	
4	Building Construction	Building Construction	9/10/2024	7/1/2025	5	211	
5	Paving	Paving	8/15/2024	9/9/2024	5	18	
6	Architectural Coating	Architectural Coating	6/6/2025	7/1/2025	5	18	

Acres of Grading (Site Preparation Phase): 7.5

Acres of Grading (Grading Phase): 8

Acres of Paving: 0.95

Residential Indoor: 82,013; Residential Outdoor: 27,338; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 2,483 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Grading	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	6.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	29.00	11.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	9.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	490.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	6.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0984	0.0000	0.0984	0.0149	0.0000	0.0149			0.0000			0.0000
Off-Road	2.2437	20.8781	19.7073	0.0388		0.9602	0.9602		0.8922	0.8922		3,747.4228	3,747.4228	1.0485		3,773.6345
Total	**2.2437**	**20.8781**	**19.7073**	**0.0388**	**0.0984**	**0.9602**	**1.0586**	**0.0149**	**0.8922**	**0.9071**		**3,747.4228**	**3,747.4228**	**1.0485**		**3,773.6345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.0500e-003	0.0512	0.0137	2.5000e-004	7.8700e-003	3.5000e-004	8.2200e-003	2.1600e-003	3.3000e-004	2.4900e-003		26.0107	26.0107	1.7000e-004	4.0900e-003	27.2334
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0515	0.0307	0.4919	1.1500e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0333		115.9730	115.9730	3.5200e-003	3.1100e-003	116.9864
Total	**0.0525**	**0.0819**	**0.5056**	**1.4000e-003**	**0.1311**	**1.0700e-003**	**0.1322**	**0.0348**	**9.9000e-004**	**0.0358**		**141.9838**	**141.9838**	**3.6900e-003**	**7.2000e-003**	**144.2198**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0384	0.0000	0.0384	5.8100e-003	0.0000	5.8100e-003			0.0000			0.0000
Off-Road	2.2437	20.8781	19.7073	0.0388		0.9602	0.9602		0.8922	0.8922	0.0000	3,747.4228	3,747.4228	1.0485		3,773.6345
Total	**2.2437**	**20.8781**	**19.7073**	**0.0388**	**0.0384**	**0.9602**	**0.9986**	**5.8100e-003**	**0.8922**	**0.8980**	**0.0000**	**3,747.4228**	**3,747.4228**	**1.0485**		**3,773.6345**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	1.0500e-003	0.0512	0.0137	2.5000e-004	7.8700e-003	3.5000e-004	8.2200e-003	2.1600e-003	3.3000e-004	2.4900e-003		26.0107	26.0107	1.7000e-004	4.0900e-003	27.2334
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0515	0.0307	0.4919	1.1500e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0333		115.9730	115.9730	3.5200e-003	3.1100e-003	116.9864
Total	**0.0525**	**0.0819**	**0.5056**	**1.4000e-003**	**0.1311**	**1.0700e-003**	**0.1322**	**0.0348**	**9.9000e-004**	**0.0358**		**141.9838**	**141.9838**	**3.6900e-003**	**7.2000e-003**	**144.2198**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.6581	0.0000	19.6581	10.1026	0.0000	10.1026			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310		3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**19.6581**	**1.2294**	**20.8875**	**10.1026**	**1.1310**	**11.2336**		**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.7900e-003	0.1366	0.0365	6.5000e-004	0.0210	9.3000e-004	0.0219	5.7600e-003	8.9000e-004	6.6500e-003		69.3620	69.3620	4.4000e-004	0.0109	72.6225
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0617	0.0368	0.5903	1.3800e-003	0.1479	8.6000e-004	0.1487	0.0392	7.9000e-004	0.0400		139.1677	139.1677	4.2200e-003	3.7300e-003	140.3837
Total	**0.0645**	**0.1735**	**0.6268**	**2.0300e-003**	**0.1689**	**1.7900e-003**	**0.1707**	**0.0450**	**1.6800e-003**	**0.0467**		**208.5296**	**208.5296**	**4.6600e-003**	**0.0146**	**213.0061**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.6667	0.0000	7.6667	3.9400	0.0000	3.9400			0.0000			0.0000
Off-Road	2.6609	27.1760	18.3356	0.0381		1.2294	1.2294		1.1310	1.1310	0.0000	3,688.0100	3,688.0100	1.1928		3,717.8294
Total	**2.6609**	**27.1760**	**18.3356**	**0.0381**	**7.6667**	**1.2294**	**8.8960**	**3.9400**	**1.1310**	**5.0710**	**0.0000**	**3,688.0100**	**3,688.0100**	**1.1928**		**3,717.8294**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.7900e-003	0.1366	0.0365	6.5000e-004	0.0210	9.3000e-004	0.0219	5.7600e-003	8.9000e-004	6.6500e-003		69.3620	69.3620	4.4000e-004	0.0109	72.6225
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0617	0.0368	0.5903	1.3800e-003	0.1479	8.6000e-004	0.1487	0.0392	7.9000e-004	0.0400		139.1677	139.1677	4.2200e-003	3.7300e-003	140.3837
Total	**0.0645**	**0.1735**	**0.6268**	**2.0300e-003**	**0.1689**	**1.7900e-003**	**0.1707**	**0.0450**	**1.6800e-003**	**0.0467**		**208.5296**	**208.5296**	**4.6600e-003**	**0.0146**	**213.0061**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1379	0.0000	7.1379	3.4331	0.0000	3.4331			0.0000			0.0000
Off-Road	1.6617	17.0310	14.7594	0.0297		0.7244	0.7244		0.6665	0.6665		2,873.0541	2,873.0541	0.9292		2,896.2842
Total	**1.6617**	**17.0310**	**14.7594**	**0.0297**	**7.1379**	**0.7244**	**7.8624**	**3.4331**	**0.6665**	**4.0996**		**2,873.0541**	**2,873.0541**	**0.9292**		**2,896.2842**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1425	6.9743	1.8606	0.0334	1.0719	0.0476	1.1194	0.2938	0.0455	0.3394		3,540.3501	3,540.3501	0.0227	0.5566	3,706.7725
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0515	0.0307	0.4919	1.1500e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0333		115.9730	115.9730	3.5200e-003	3.1100e-003	116.9864
Total	**0.1939**	**7.0050**	**2.3526**	**0.0345**	**1.1951**	**0.0483**	**1.2434**	**0.3265**	**0.0462**	**0.3727**		**3,656.3231**	**3,656.3231**	**0.0262**	**0.5597**	**3,823.7589**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7838	0.0000	2.7838	1.3389	0.0000	1.3389			0.0000			0.0000
Off-Road	1.6617	17.0310	14.7594	0.0297		0.7244	0.7244		0.6665	0.6665	0.0000	2,873.0541	2,873.0541	0.9292		2,896.2842
Total	**1.6617**	**17.0310**	**14.7594**	**0.0297**	**2.7838**	**0.7244**	**3.5082**	**1.3389**	**0.6665**	**2.0054**	**0.0000**	**2,873.0541**	**2,873.0541**	**0.9292**		**2,896.2842**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1425	6.9743	1.8606	0.0334	1.0719	0.0476	1.1194	0.2938	0.0455	0.3394		3,540.3501	3,540.3501	0.0227	0.5566	3,706.7725
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0515	0.0307	0.4919	1.1500e-003	0.1232	7.2000e-004	0.1239	0.0327	6.6000e-004	0.0333		115.9730	115.9730	3.5200e-003	3.1100e-003	116.9864
Total	**0.1939**	**7.0050**	**2.3526**	**0.0345**	**1.1951**	**0.0483**	**1.2434**	**0.3265**	**0.0462**	**0.3727**		**3,656.3231**	**3,656.3231**	**0.0262**	**0.5597**	**3,823.7589**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0129	0.4155	0.1657	2.0500e-003	0.0745	2.1500e-003	0.0767	0.0215	2.0600e-003	0.0235		216.4979	216.4979	1.2500e-003	0.0312	225.8209
Worker	0.0995	0.0593	0.9511	2.2200e-003	0.2382	1.3800e-003	0.2396	0.0632	1.2700e-003	0.0645		224.2145	224.2145	6.8000e-003	6.0000e-003	226.1737
Total	**0.1124**	**0.4749**	**1.1167**	**4.2700e-003**	**0.3128**	**3.5300e-003**	**0.3163**	**0.0846**	**3.3300e-003**	**0.0880**		**440.7125**	**440.7125**	**8.0500e-003**	**0.0372**	**451.9945**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0129	0.4155	0.1657	2.0500e-003	0.0745	2.1500e-003	0.0767	0.0215	2.0600e-003	0.0235		216.4979	216.4979	1.2500e-003	0.0312	225.8209
Worker	0.0995	0.0593	0.9511	2.2200e-003	0.2382	1.3800e-003	0.2396	0.0632	1.2700e-003	0.0645		224.2145	224.2145	6.8000e-003	6.0000e-003	226.1737
Total	**0.1124**	**0.4749**	**1.1167**	**4.2700e-003**	**0.3128**	**3.5300e-003**	**0.3163**	**0.0846**	**3.3300e-003**	**0.0880**		**440.7125**	**440.7125**	**8.0500e-003**	**0.0372**	**451.9945**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0127	0.4133	0.1630	2.0100e-003	0.0745	2.1400e-003	0.0767	0.0215	2.0500e-003	0.0235		212.0981	212.0981	1.2300e-003	0.0305	221.2104
Worker	0.0925	0.0532	0.8790	2.1400e-003	0.2382	1.3200e-003	0.2396	0.0632	1.2100e-003	0.0644		216.6901	216.6901	6.1400e-003	5.5900e-003	218.5091
Total	**0.1052**	**0.4665**	**1.0420**	**4.1500e-003**	**0.3128**	**3.4600e-003**	**0.3162**	**0.0846**	**3.2600e-003**	**0.0879**		**428.7882**	**428.7882**	**7.3700e-003**	**0.0361**	**439.7195**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0127	0.4133	0.1630	2.0100e-003	0.0745	2.1400e-003	0.0767	0.0215	2.0500e-003	0.0235		212.0981	212.0981	1.2300e-003	0.0305	221.2104
Worker	0.0925	0.0532	0.8790	2.1400e-003	0.2382	1.3200e-003	0.2396	0.0632	1.2100e-003	0.0644		216.6901	216.6901	6.1400e-003	5.5900e-003	218.5091
Total	**0.1052**	**0.4665**	**1.0420**	**4.1500e-003**	**0.3128**	**3.4600e-003**	**0.3162**	**0.0846**	**3.2600e-003**	**0.0879**		**428.7882**	**428.7882**	**7.3700e-003**	**0.0361**	**439.7195**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8814	8.2730	12.2210	0.0189		0.3987	0.3987		0.3685	0.3685		1,805.6205	1,805.6205	0.5673		1,819.8039
Paving	0.0189					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9003**	**8.2730**	**12.2210**	**0.0189**		**0.3987**	**0.3987**		**0.3685**	**0.3685**		**1,805.6205**	**1,805.6205**	**0.5673**		**1,819.8039**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0686	0.0409	0.6559	1.5300e-003	0.1643	9.5000e-004	0.1653	0.0436	8.8000e-004	0.0445		154.6307	154.6307	4.6900e-003	4.1400e-003	155.9818
Total	**0.0686**	**0.0409**	**0.6559**	**1.5300e-003**	**0.1643**	**9.5000e-004**	**0.1653**	**0.0436**	**8.8000e-004**	**0.0445**		**154.6307**	**154.6307**	**4.6900e-003**	**4.1400e-003**	**155.9818**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Paving - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8814	8.2730	12.2210	0.0189		0.3987	0.3987		0.3685	0.3685	0.0000	1,805.6205	1,805.6205	0.5673		1,819.8039
Paving	0.0189					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9003**	**8.2730**	**12.2210**	**0.0189**		**0.3987**	**0.3987**		**0.3685**	**0.3685**	**0.0000**	**1,805.6205**	**1,805.6205**	**0.5673**		**1,819.8039**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0686	0.0409	0.6559	1.5300e-003	0.1643	9.5000e-004	0.1653	0.0436	8.8000e-004	0.0445		154.6307	154.6307	4.6900e-003	4.1400e-003	155.9818
Total	**0.0686**	**0.0409**	**0.6559**	**1.5300e-003**	**0.1643**	**9.5000e-004**	**0.1653**	**0.0436**	**8.8000e-004**	**0.0445**		**154.6307**	**154.6307**	**4.6900e-003**	**4.1400e-003**	**155.9818**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.1262					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515		281.4481	281.4481	0.0154		281.8319
Total	**16.2971**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**		**281.4481**	**281.4481**	**0.0154**		**281.8319**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0191	0.0110	0.1819	4.4000e-004	0.0493	2.7000e-004	0.0496	0.0131	2.5000e-004	0.0133		44.8324	44.8324	1.2700e-003	1.1600e-003	45.2088
Total	**0.0191**	**0.0110**	**0.1819**	**4.4000e-004**	**0.0493**	**2.7000e-004**	**0.0496**	**0.0131**	**2.5000e-004**	**0.0133**		**44.8324**	**44.8324**	**1.2700e-003**	**1.1600e-003**	**45.2088**

3.7 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	16.1262					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1709	1.1455	1.8091	2.9700e-003		0.0515	0.0515		0.0515	0.0515	0.0000	281.4481	281.4481	0.0154		281.8319
Total	**16.2971**	**1.1455**	**1.8091**	**2.9700e-003**		**0.0515**	**0.0515**		**0.0515**	**0.0515**	**0.0000**	**281.4481**	**281.4481**	**0.0154**		**281.8319**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0191	0.0110	0.1819	4.4000e-004	0.0493	2.7000e-004	0.0496	0.0131	2.5000e-004	0.0133		44.8324	44.8324	1.2700e-003	1.1600e-003	45.2088
Total	**0.0191**	**0.0110**	**0.1819**	**4.4000e-004**	**0.0493**	**2.7000e-004**	**0.0496**	**0.0131**	**2.5000e-004**	**0.0133**		**44.8324**	**44.8324**	**1.2700e-003**	**1.1600e-003**	**45.2088**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4961	0.5159	4.2602	8.5200e-003	0.8600	6.5200e-003	0.8665	0.2298	6.0900e-003	0.2358		867.0463	867.0463	0.0538	0.0386	879.8975
Unmitigated	0.4961	0.5159	4.2602	8.5200e-003	0.8600	6.5200e-003	0.8665	0.2298	6.0900e-003	0.2358		867.0463	867.0463	0.0538	0.0386	879.8975

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Single Family Housing	141.60	143.10	128.25	397,353	397,353
Total	141.60	143.10	128.25	397,353	397,353

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.598468	0.051929	0.142496	0.115412	0.025941	0.007230	0.011936	0.009225	0.000692	0.000493	0.027552	0.002445	0.006180
Other Asphalt Surfaces	0.598468	0.051929	0.142496	0.115412	0.025941	0.007230	0.011936	0.009225	0.000692	0.000493	0.027552	0.002445	0.006180
Other Non-Asphalt Surfaces	0.598468	0.051929	0.142496	0.115412	0.025941	0.007230	0.011936	0.009225	0.000692	0.000493	0.027552	0.002445	0.006180
Single Family Housing	0.598468	0.051929	0.142496	0.115412	0.025941	0.007230	0.011936	0.009225	0.000692	0.000493	0.027552	0.002445	0.006180

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0113	0.0966	0.0411	6.2000e-004		7.8100e-003	7.8100e-003		7.8100e-003	7.8100e-003		123.2494	123.2494	2.3600e-003	2.2600e-003	123.9818
NaturalGas Unmitigated	0.0113	0.0966	0.0411	6.2000e-004		7.8100e-003	7.8100e-003		7.8100e-003	7.8100e-003		123.2494	123.2494	2.3600e-003	2.2600e-003	123.9818

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1047.62	0.0113	0.0966	0.0411	6.2000e-004		7.8100e-003	7.8100e-003		7.8100e-003	7.8100e-003		123.2494	123.2494	2.3600e-003	2.2600e-003	123.9818
Total		**0.0113**	**0.0966**	**0.0411**	**6.2000e-004**		**7.8100e-003**	**7.8100e-003**		**7.8100e-003**	**7.8100e-003**		**123.2494**	**123.2494**	**2.3600e-003**	**2.2600e-003**	**123.9818**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1.04762	0.0113	0.0966	0.0411	6.2000e-004		7.8100e-003	7.8100e-003		7.8100e-003	7.8100e-003		123.2494	123.2494	2.3600e-003	2.2600e-003	123.9818
Total		**0.0113**	**0.0966**	**0.0411**	**6.2000e-004**		**7.8100e-003**	**7.8100e-003**		**7.8100e-003**	**7.8100e-003**		**123.2494**	**123.2494**	**2.3600e-003**	**2.2600e-003**	**123.9818**

6.0 Area Detail

6.1 Mitigation Measures Area

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0279	0.2631	1.3424	1.6500e-003		0.0270	0.0270		0.0270	0.0270	0.0000	319.8756	319.8756	8.2200e-003	5.8200e-003	321.8166
Unmitigated	1.0279	0.2631	1.3424	1.6500e-003		0.0270	0.0270		0.0270	0.0270	0.0000	319.8756	319.8756	8.2200e-003	5.8200e-003	321.8166

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0795					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8821					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0291	0.2488	0.1059	1.5900e-003		0.0201	0.0201		0.0201	0.0201	0.0000	317.6471	317.6471	6.0900e-003	5.8200e-003	319.5347
Landscaping	0.0371	0.0142	1.2365	7.0000e-005		6.8600e-003	6.8600e-003		6.8600e-003	6.8600e-003		2.2286	2.2286	2.1300e-003		2.2819
Total	**1.0279**	**0.2631**	**1.3424**	**1.6600e-003**		**0.0270**	**0.0270**		**0.0270**	**0.0270**	**0.0000**	**319.8756**	**319.8756**	**8.2200e-003**	**5.8200e-003**	**321.8166**

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0795					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.8821					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0291	0.2488	0.1059	1.5900e-003		0.0201	0.0201		0.0201	0.0201	0.0000	317.6471	317.6471	6.0900e-003	5.8200e-003	319.5347
Landscaping	0.0371	0.0142	1.2365	7.0000e-005		6.8600e-003	6.8600e-003		6.8600e-003	6.8600e-003		2.2286	2.2286	2.1300e-003		2.2819
Total	**1.0279**	**0.2631**	**1.3424**	**1.6600e-003**		**0.0270**	**0.0270**		**0.0270**	**0.0270**	**0.0000**	**319.8756**	**319.8756**	**8.2200e-003**	**5.8200e-003**	**321.8166**

7.0 Water Detail

7.1 Mitigation Measures Water

Air Quality Study - TTM 82364, APN 3010-009-007 Housing Development, Palmdale, CA - Antelope Valley APCD Air District, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix D Biological Resource Assessment

Biological Resource Assessment of
APN 3010-009-007
Palmdale, California

October 27, 2023

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Biological Resource Assessment of APN 3010-009-007, Palmdale, California

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Abstract

Development has been proposed for APN 3010-009-007, Palmdale, California. The approximately 5 acre (2 hectare [ha])) study area was located east of Kimberly Lane and south of Avenue R-8, T6N, R12W, a portion of the N1/2 of the NW1/4 of the NE1/4 of the SW1/4 of Section 35, S.B.B.M. A vehicle transect was conducted on 21 October 2023 and a line transect survey was conducted on 26 October 2023 to inventory biological resources. The proposed project area was characteristic of a 1.5 acre (0.6 ha) disturbed creosote bush (*Larrea tridentata*) scrub habitat and 3.5 acre (1.4 ha) area of residential homes and associated buildings. A total of 34 plant species and 13 wildlife species or their sign were observed during the line transect survey. No desert tortoises (*Gopherus agassizii*) or their sign were observed during the field survey. The study site did not contain suitable habitat to support desert tortoises. No Mohave ground squirrels (*Xerospermophilus*) or their sign were observed during the field survey. The study site did not contain suitable habitat to support Mohave ground squirrels. No burrowing owls (*Athene cunicularia*) or their sign were observed during the field survey. No suitable habitat for burrowing owls was present. No Swainson's hawk (*Buteo swainsoni*) nests have been documented within 5 miles of the study area. The study area is not considered suitable foraging habitat for Swainson's hawks. Suitable nesting habitat for migratory birds is present within the study site. Joshua trees (*Yucca brevifolia*) were present within the study site. No desert cymopterus (*Cymopterus deserticola*), alkali mariposa lilies (*Calochortus striatus*), or Barstow woolly sunflowers (*Eriophyllum mohanense*) occur within the study area due to lack of suitable habitat. No other state or federally listed species are expected to occur within the proposed project area. No ephemeral washes or streams were present within the study site.

Recommended Protection Measures:

Joshua trees are protected under the Western Joshua Tree Conservation Act (WJTCA) and as a candidate plant species being considered for listing under the California Endangered Species Act (CESA). Compensation and mitigation for impacts to Joshua trees will be determined under the Incidental Take Permit process through either the WJTCA or under CESA.

If possible, removal of the vegetation and buildings will occur outside the nesting season for migratory birds. Nesting generally lasts from February to July but may extend beyond this time frame. If removal occurs during or close to the nesting season, a qualified biologist will survey all areas to be disturbed as close as possible but no more than one week prior to removal. If active bird nests are found, impacts to nests will be avoided by either delaying work or establishing initial buffer areas of a minimum of 50 feet (16 meter (m)) around active migratory passerine bird species nests and a minimum of 500 feet (160 m) around raptor nests. The project biologist will determine if the buffer areas should be increased or decreased based on the nesting bird response to disturbances.

Significance: This project is not expected to result in a significant adverse impact to biological resources.

Development has been proposed for APN 3010-009-007 (Figure 1). Development would include installation of access roads, parking, and utilities (water, sewer, electric, etc.). The entire project area would be graded prior to construction activities.

An assessment of biological resources is an integral part of environmental analyses (Gilbert and Dodds 1987). The purpose of this study was to provide an assessment of biological resources potentially occurring within or utilizing the proposed project area. Specific focus was on the presence/absence of rare, threatened and endangered species of plants and wildlife. Species of concern included the desert tortoise (*Gopherus agassizii*), Mohave ground squirrel (*Xerospermophilus mohavensis*), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), desert kit fox (*Vulpes macrotis)*, Joshua tree (*Yucca brevifolia*), desert cymopterus (*Cymopterus deserticola*), Barstow woolly sunflower (*Eriophyllum mohanense*), and alkali mariposa lily (*Calochortus striatus*).

Study Area

The approximately 5 acre (2 ha) study area was located east of Kimberly Lane and south of Avenue R-8, T6N, R12W, a portion of the N1/2 of the NW1/4 of the NE1/4 of the SW1/4 of Section 35, S.B.B.M. (Figures 2 and 3). Avenue R-8 formed the northern boundary of the study site. Single family housing was present north of Avenue R-8. The eastern boundary of the study site was formed by single family housing. Avenue R-9 formed the southern boundary. Single family housing was present south of Avenue R-9. Single family housing was present along the western boundary of the study site. The study site was enclosed by block walls and wire fencing.

Methods

A line transect survey was conducted to inventory plant and wildlife species occurring within the proposed project area (Cooperrider et al. 1986, Davis 1990). Line transects were walked in an east-west orientation through the remaining creosote habitat. Line transects were approximately 135 to 310 feet (41 to 94 m) long and were spaced approximately 50 feet (15 m) apart (U.S. Fish & Wildlife Service 2010). Vehicle transects were along the dirt roads encircling the multiple buildings within the study site and along the north and south perimeter of the site.

All observations of plant and animal species were recorded in field notes. Field guides were used to aid in the identification of plant and animal species (Arnett and Jacques 1981, Borror and White 1970, Burt and Grossenheider 1976, Gould 1981, Jaeger 1969, Knobel 1980, Robbins et al. 1983, Stark 2000). Observations were aided with the use of 10x42 binoculars. Observations of animal tracks, scat, and burrows were also utilized to determine the presence of wildlife species inhabiting the proposed project area (Cooperrider et al. 1986, Halfpenny 1986, Lowrey 2006, Murie 1974). The USGS topographic map, and Google Earth aerial photographs were reviewed. Representative photographs were taken of the study site (Figures 4 and 5).

Results

Vehicle transects were conducted on 21 October 2023. A total of 8 line transects were walked on 26 October 2023. Weather conditions consisted of warm temperatures (estimated 75 degrees F), 0% cloud cover and light winds. Sandy clay loam surface soil texture was present within the study area. No blue line streams were noted on the USGS topographic map within this study site. No ephemeral washes or streams were observed within the study site.

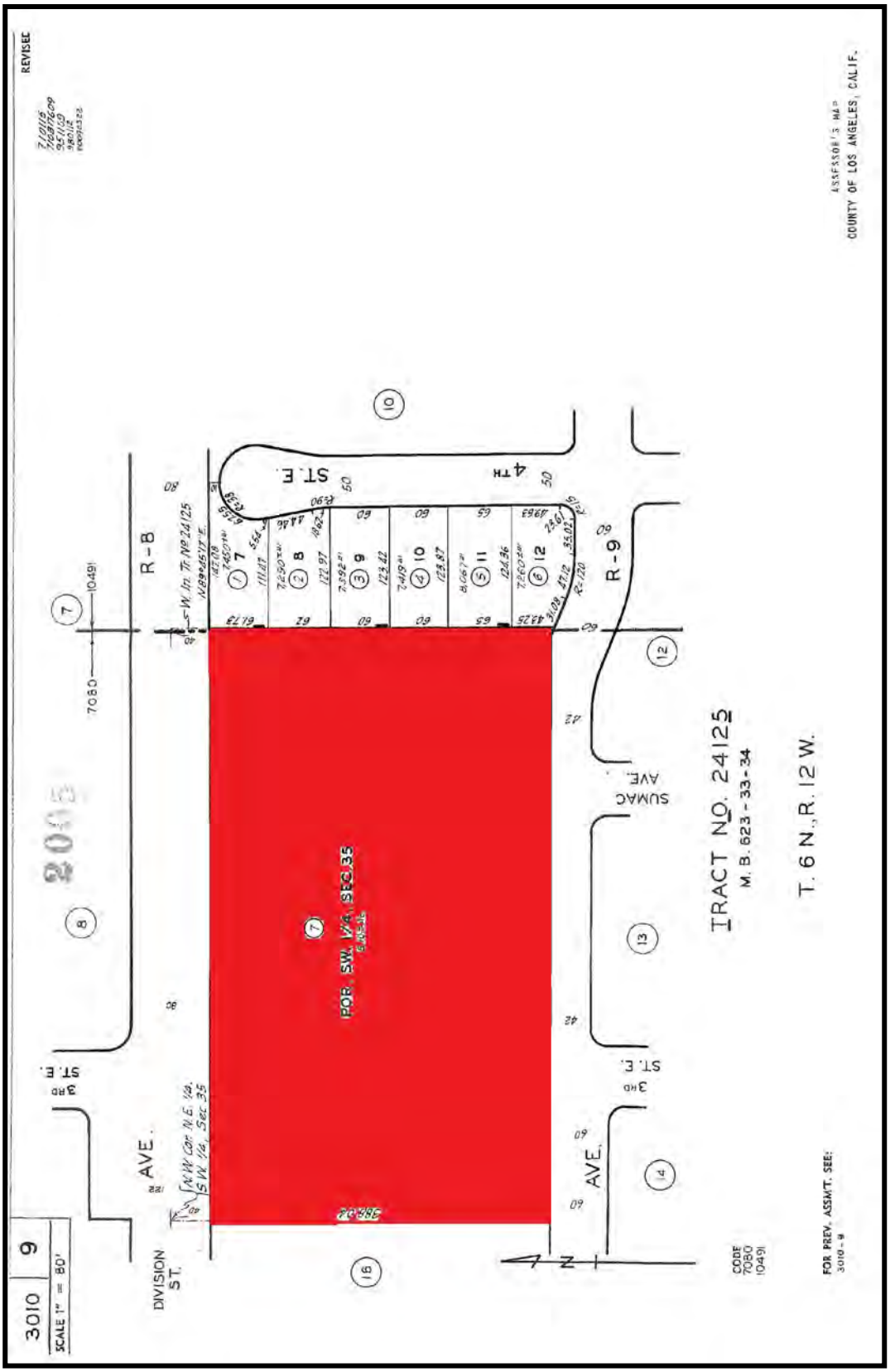

Figure 1. Location of proposed project site as depicted on APN map.

Figure 2. Approximate location of study area (red rectangle) as depicted on excerpts from U.S.G.S. Quadrangles Palmdale, and Ritter Ridge, Calif., 7.5', 1975.

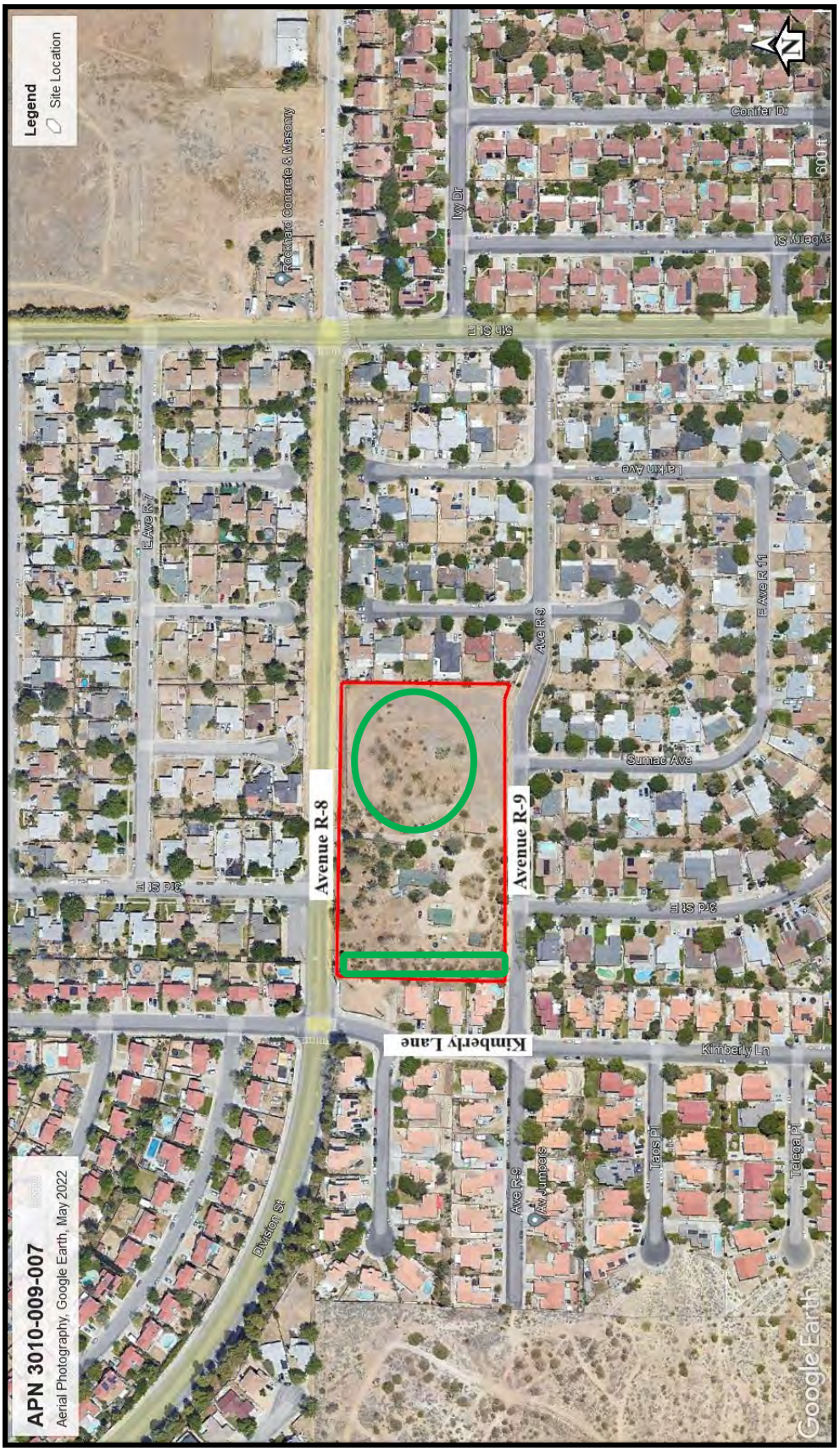

Figure 3. Approximate location of study area showing surrounding land use as depicted on excerpt from 2022 Google Earth Aerial Photography. Green outline depicts remaining 1.5 acre (0.6 has) of creosote habitat.

Figure 4. Representative photographs of remaining creosote bush scrub habitat.

Figure 5. Representative photographs of buildings and storage within study site.

The proposed project area was characteristic of a 1.5 acre (0.6 ha) disturbed creosote bush (*Larrea tridentata*) scrub habitat and 3.5 acre (1.4 ha) area of residential homes and associated buildings. A total of 34 plant species were observed during the line transect survey (Table 1). There were multiple ornamental species within the developed area which were not documented. Creosote bush scrub was the dominant perennial shrub species within the study site. Red-stemmed filaree (*Erodium cicutarium*) and non-native grasses (*Bromus* spp.) were the dominant annual plant species within the study site. Four Joshua tree groups were present within the study site. It was estimated greater than 50 individual Joshua trees were present within these four clones. No alkali mariposa lilies, Barstow woolly sunflowers, or desert cymopterus, or suitable habitat were observed within the study site.

A total of 13 wildlife species, or their sign were observed during the line transect survey (Table 2). No desert tortoises or their sign were observed during the field survey. No burrowing owls or their sign were observed during the field survey. The trees and buildings within the study site provided suitable nesting habitat for migratory birds. No bird nests were observed within the study site. No documented Swainson's hawk (*Buteo swainsoni*) nests have been observed within 5 miles of the study site (eBird 2023). No desert kit foxes or their sign were observed during the field survey. No suitable habitat for Mojave ground squirrels was present within the study site.

Household items, wood, construction debris were observed stored within the study site. Multiple cars and four main buildings along with associated structures were present within the study site. Dirt roads and vehicle tracks were observed within the study site. Individuals were living within the study site and were present during the survey. Four dogs (*Canis familiaris*) were observed roaming within the study site. Small scale farming was taking place within the study site.

Discussion

It is likely that most annual species were visible during the time the field survey was performed. Although not observed, several wildlife species would be expected to occur within the proposed project area (Table 3).

Human impacts are expected to increase as urban development continues to occur in the area. Most of the natural resources within this study site have already been irretrievably impacted. Burrowing animals within the proposed project area are not expected to survive construction activities. More mobile species, such as birds, are expected to survive. Birds may have less cover and foraging habitat available after site is further developed.

The desert tortoise is a state endangered and federally threatened listed species. The proposed project area was located within the geographic range of the desert tortoise. The proposed project site was not located in critical habitat designated for the Mojave population of the desert tortoise. Based on field observations, desert tortoises are not present within the study area. No protection measures are recommended for desert tortoises.

The Mohave ground squirrel is a state listed threatened species. The proposed project site was located within the geographic range of the Mohave ground squirrel. Habitat within the study site was not suitable for Mohave ground squirrels (CDFW 2019). Mohave ground squirrels are not present within the area. No protection measures are recommended for Mohave ground squirrels.

Table 1. List of plant species that were observed during the line transect survey of APN 3010-009-007, Palmdale, California.

Common Name	Scientific Name
Fruit trees	Family: Rosaceae
Cacti (ornamental)	Family: Cactaceae
Locust	Family: Leguminosae
Pine tree	*Pinus* sp.
Joshua tree	*Yucca brevifolia*
Creosote bush	*Larrea tridentata*
Peachthorn	*Lycium cooperi*
Mormon tea	*Ephedra nevadensis*
Rabbit brush	*Chrysothamnus nauseosis*
Australian saltbush	*Atriplex semibaccata*
Turkey mullein	*Eremocarpus setigerus*
Wishbone plant	*Mirabilis bigelovii*
Apricot mallow	*Sphaeralcea ambiqua*
Desert straw	*Stephanomeria pauciflora*
Fiddleneck	*Amsinckia tessellata*
Spotted buckwheat	*Eriogonum maculatum*
Cheeseweed (small mallow)	*Malva parviflora*
Rattlesnake weed	*Euphorbia albomarginata*
Prickly lettuce	*Lactuca seriola*
Annual burweed	*Franseria acanthicarpa*
Red stemmed filaree	*Erodium cicutarium*
Tumble mustard	*Sisymbrium altisissiimum*
Russian thistle	*Salsola iberica*
Puncture vine	*Tribulus terrestris*
Bermuda grass	*Cynodon dactylon*
Rumex	*Rumex* sp.
Foxtail barley	*Hordeum leporinum*
Schismus	*Schismus* sp.
Red brome	*Bromus rubens*
Ripgut grass	*Bromus diandrus*
Cheatgrass	*Bromus tectorum*
Squash	Family: Cucurbitaceae
Melon	Family: Cucurbitaceae
Corn	Family: Poaceae

Table 2. List of wildlife species, or their sign, that were observed during the line transect survey of APN 3010-009-007, Palmdale, California.

Common Name	Scientific Name
Rodents	Order: Rodentia
Domestic cat	*Felis catus*
Domestic dog	*Canis familiaris*
Goose	Family: Anatidae
Rock dove	*Columba livia*
Common raven	*Corvus corax*
Say's phoebe	*Sayornis saya*
White crowned sparrow	*Zonotrichia leucophrys*
Painted lady butterfly	*Vanessa cardui*
Darkling beetle	*Coelocnemis californicus*
Moth	Order: Lepidoptera
Grasshopper	Order: Orthoptera
Harvester ants	Order: Hymenoptera

Table 3. List of wildlife species that may occur within the study area, APN 3010-009-007, Palmdale, California.

Common Name	Scientific Name
Side blotched lizard	*Uta stansburiana*
House finch	*Carpodacus mexicanus*
Fly	Order: Diptera
Spider	Order: Araneida

Burrowing owls are considered a species of special concern by the CDFW. No burrowing owls or their sign were observed within the study site. No potential cover sites for burrowing owls were present within the study site. No protection measures are recommended for burrowing owls.

Many species of birds and their active nests are protected under the Migratory Bird Treaty Act. Trees and buildings within the study site provided potential nesting habitat for migratory birds. No Swainson's hawks have been documented nesting within 5 miles of the study site (eBird 2023). The study area is not considered suitable foraging habitat. No protection measures are recommended for Swainson's hawk.

Joshua trees are protected under both the WJTCA and as a candidate species for listing under CESA. Both regulations provide an avenue for protection and mitigation measures for WJT. The project proponent can choose under which law they will process an Incidental Take Permit (ITP) for the take and mitigation of WJTs.

No suitable habitat for desert cymopterus, alkali mariposa lily, or Barstow woolly sunflower was observed within the study site and no protection measures are recommended. No other state or federal listed species are expected to occur within the proposed project area (CDFW 2023a-b).

Landscape design should incorporate the use of native plants to the maximum extent feasible. Native plants that have food and cover value to wildlife should be used in landscape design (Adams and Dove 1989). Diversity of native plants should be maximized in landscape design (Adams and Dove 1989).

Recommended Protection Measures:

Joshua trees are protected under the Western Joshua Tree Conservation Act and concurrently being considered for listing under the California Endangered Species Act. Compensation and mitigation for impacts to Joshua trees will be determined under the Incidental Take Permit process through either the WJTCA or under CESA.

If possible, removal of the vegetation and buildings will occur outside the nesting season for migratory birds. Nesting generally lasts from February to July but may extend beyond this time frame. If removal will occur during or close to the nesting season, a qualified biologist will survey all areas to be disturbed as close as possible but no more than one week prior to removal. If active bird nests are found, impacts to nests will be avoided by either delaying work or establishing initial buffer areas of a minimum of 50 feet (16 m) around active migratory passerine bird species nests and a minimum of 500 feet (160 m) around raptor nests. The project biologist will determine if the buffer areas should be increased or decreased based on the nesting bird response to disturbances.

Significance: This project is not expected to result in a significant adverse impact to biological resources.

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Appendix E Mitigation, Monitoring, Reporting Plan

MITIGATION MEASURE	VERIFICATION RESPONSIBILITY	ACTION(S) REQUIRED	REQUIRED TIME OF COMPLIANCE	ACTION TAKEN	VERIFIED BY/DEPT.	FURTHER ACTION NEEDED
BIO-1	Planning Division / Building and Safety Division	Because the project will result in "take" or adverse impacts to western Joshua trees, consultation with the CDFW shall be undertaken and an Incidental Take Permit (ITP).) will be obtained under the California Endangered Species Act (CESA) or the Western Joshua Tree Conservation Act (WJTCA). During the consultation process compensatory mitigation will be required in the ITP to offset impacts. The ITP shall also specify minimization and avoidance measures and fully mitigate any impacts to western Joshua trees. No take of western Joshua trees shall occur until the ITP has been issued to the applicant.	Before ground disturbance activities			
BIO-2	Planning Division/ Building and Safety Division	If project grading/construction activities are scheduled to occur during the nesting season for breeding birds (February 15th through September 15th) a pre-construction nesting bird survey shall be conducted by a qualified biologist. If active bird nests are found, the applicants will avoid impacts to nests by either delaying work or establishing initial buffer areas of a minimum of 500 feet around active raptor nests and 50 feet around other active migratory bird species nests. The project biologist will determine if the buffer should be increased or decreased based on the nesting bird response to disturbances.	During ground disturbance activities			

CUL-1	Planning Division/ Building and Safety Division	The project applicant shall retain a professional Tribal Monitor procured by the Fernandeño Tataviam Band of Mission Indians to observe all ground-disturbing activities including, but not limited to, clearing, grubbing, grading, excavating, digging, trenching, plowing, drilling, tunneling, quarrying, leveling, driving posts, auguring, blasting, stripping topsoil or similar activity. Tribal Monitoring Services will continue until confirmation is received from the project applicant, in writing, that all scheduled activities pertaining to Tribal Monitoring are complete. If the Project's scheduled activities require the Tribal Monitor to leave the Project for a period of time and return, confirmation shall be submitted to the Tribe by Client, in writing, upon completion of each set of scheduled activities and 5 days' notice (if possible) shall be submitted to the Tribe by project applicant, in writing, prior to the start of each set of scheduled activities. If cultural resources are encountered, the Tribal Monitor will have the authority to request that ground-disturbing activities cease within 60 feet of discovery and a qualified archaeologist meeting Secretary of Interior standards retained by the project applicant as well as the Tribal Monitor shall assess the find. The Yuhaaviatam of San Manuel Nation Cultural Resources Department (YSMN) in addition to the Fernandeño Tataviam Band of Mission Indians (FTBMI) shall be contacted, as detailed within TCR-1, regarding any pre-contact finds. They will be provided information after the archaeologist makes the initial assessment of the nature of the find, so as to provide Tribal input with regards to significance and treatment. If significant pre-contact cultural resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, the archaeologist shall develop a Monitoring and Treatment Plan, the drafts of which shall be provided to both Tribes for review and comment, as detailed within TCR-1. The Tribal Monitor/archaeologist shall monitor the remainder of the project and implement the Plan accordingly.	During ground disturbance activities			
CUL-2	Planning Division/ Building and Safety Division	If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and that code enforced for the duration of the project.	During ground disturbance activities			

MITIGATION MEASURE	VERIFICATION RESPONSIBILITY	ACTION(S) REQUIRED	REQUIRED TIME OF COMPLIANCE	ACTION TAKEN	VERIFIED BY/DEPT.	FURTHER ACTION NEEDED
GEO-1	Planning Division / Building and Safety Division	In the event that paleontological resources are encountered all work shall stop at the discovery site. At that time, a qualified paleontological monitor shall be consulted to evaluate the find. Construction activities shall be temporarily redirected to another location on-site (minimum of 100 feet from the location of the find) so that the monitor can recover any specimens encountered during excavation. All fossils/specimens collected during this work shall be deposited in a City of Palmdale-approved museum repository for curation and storage.	Before ground disturbance activities			
TRIB-1	Planning Division/ Building and Safety Division	The Yuhaaviatam of San Manuel Nation Cultural Resources Management Department (YSMN) and the Fernandeño Tataviam Band of Mission Indians (FTBMI) shall be contacted, as detailed in CR-1, of any pre-contact cultural resources discovered during project implementation, and be provided information regarding the nature of the find, so as to provide Tribal input with regards to significance and treatment. Should the find be deemed significant, as defined by CEQA (as amended, 2015), a Cultural Resources Monitoring and Treatment Plan shall be created by the archaeologist, in coordination with YSMN and FTBMI, and all subsequent finds shall be subject to this Plan. This Plan shall allow for a monitor to be present that represents both Tribes for the remainder of the project.	During ground disturbance activities			
TRIB-2	Planning Division/ Building and Safety Division	The Lead Agency and/or applicant shall, in good faith, consult with the FTBMI and YSMN on the disposition and treatment of any Tribal Cultural Resource encountered during all ground disturbing activities. Any and all archaeological/cultural documents created as a part of the project (isolate records, site records, survey reports, testing reports, etc.) shall be supplied to the applicant and Lead Agency for dissemination to YSMN and FTBMI. The Lead Agency and/or applicant shall, in good faith, consult with FTBMI throughout the life of the project.	During ground disturbance activities			
TRIB-3	Planning Division/ Building and Safety Division	Trib-3: Inadvertent discoveries of human remains and/or funerary object(s) are subject to California State Health and Safety Code Section 7050.5, and the subsequent disposition of those discoveries shall be decided by the Most Likely Descendant (MLD), as determined by the Native American Heritage Commission (NAHC), should those findings be determined as Native American in origin.	During ground disturbance activities			

Appendix F Cultural Resource Study

RT FACTFINDERS
Cultural Resources

REPORT

PHASE I CULTURAL RESOURCE INVESTIGATION FOR 5.1 ACRES BETWEEN EAST AVENUES R-8 AND R-9 PALMDALE, LOS ANGELES COUNTY, CALIFORNIA

Prepared For:

Duke Engineering
759 West Lancaster Boulevard
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Prepared By:

Richard H. Norwood & Melinda Walton
Archaeologists

RTFactfinders
4933 Cloudcroft Lane
Florence, Oregon 97439
(541) 991-3505 / Mobile: (661) 265-5422

Job. No. 683

October 2023

Assessor's Parcel Number (APN) 3010-009-007

Performed under: Private contract
USGS Quadrangle: Palmdale, Calif. 7.5'
Area covered: 5.1 acres
Location: Township 6 North, Range 12 West, Section 35
Keywords: Antelope Valley, Palmdale

Table of Contents

SUMMARY

In accordance with the California Environmental Quality Act (CEQA) of 1970, as amended, and the requirements of the City of Palmdale, a phase I cultural resource investigation was completed for a 5.1-acre property in Palmdale, California. The property is located between East Avenue R-8 and East Avenue R-9. The property lies east of Kimberley Lane. The subject property is listed with the Los Angeles Tax Assessor as APN 3010-009-007 and encompasses a small portion of the southwest quarter of Section 35, Township 6 North, Range 12 West (SBBM).

The purpose of this study was to identify and record cultural resources within the subject property and recommend further measures as warranted. As a result of the investigation, no Native American period sites were identified on the property. One historic period site was recorded (Site 683-1). It consists of a standing and occupied residence built in 1952 and various outbuildings. The site was evaluated as "not significant." Since there are no significant resources on the property, no adverse impacts to significant cultural resources are anticipated as a result of future development. No further cultural resource work is recommended.

I. INTRODUCTION

In accordance with the California Environmental Quality Act (CEQA) of 1970, as amended, and the requirements of the City of Palmdale, a phase I cultural resource investigation was completed for a 5.1-acre property in Palmdale, California. The property is located between East Avenue R-8 and East Avenue R-9. The property lies east of Kimberley Lane. The subject property is listed with the Los Angeles Tax Assessor as APN 3010-009-007 and encompasses a small portion of the southwest quarter of Section 35, Township 6 North, Range 12 West SBBM (Figures 1, 2). (Figures 1, 2).

CEQA defines cultural resources as including archaeological sites, historic buildings, structures or objects, and properties of unique ethnic cultural value or religious/sacred uses. The City of Palmdale required this study because development would create a "substantial adverse change" to any significant cultural resources that might be present.

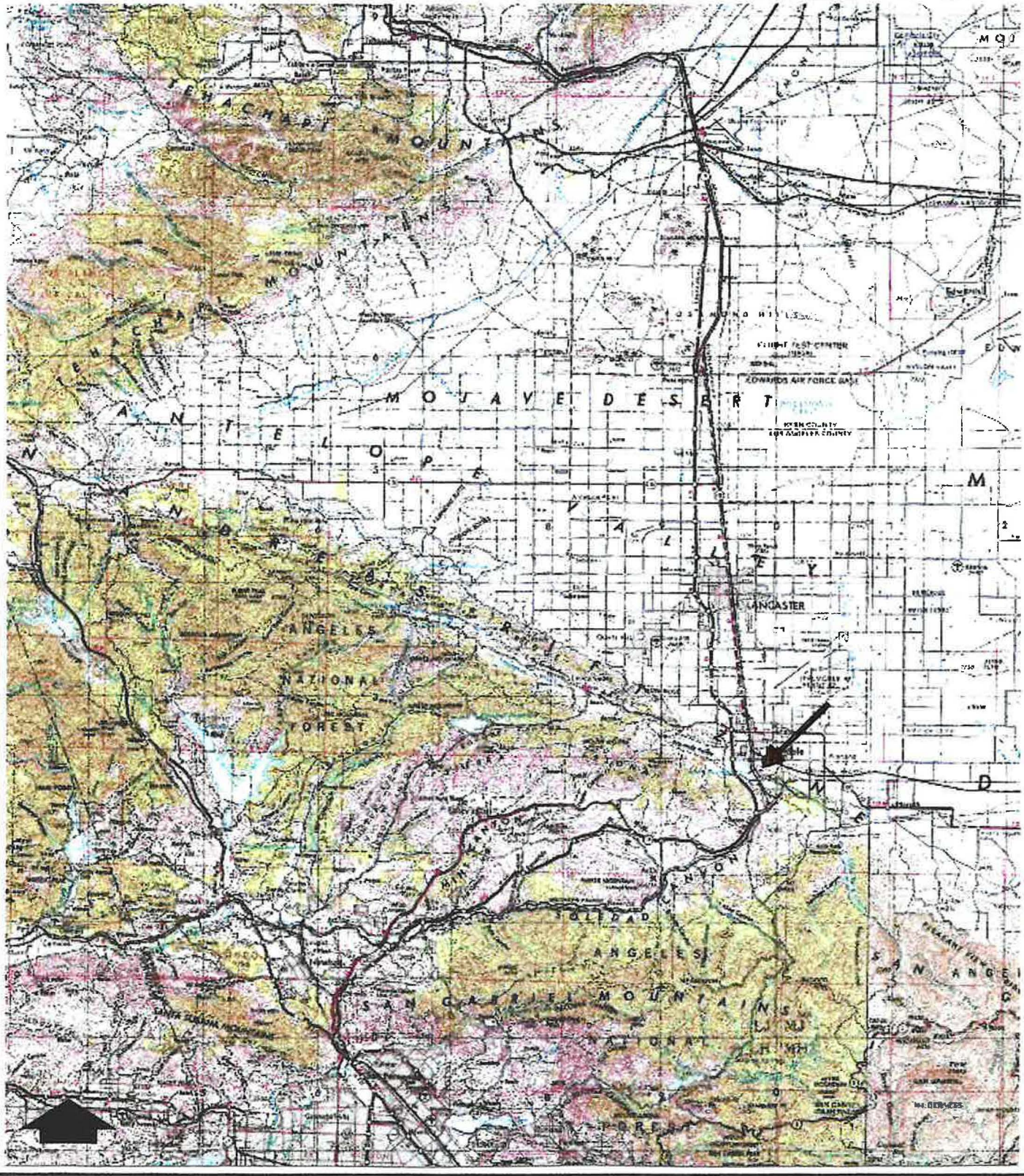
The purpose of the study was to identify and record cultural resources within the subject property and recommend further measures as warranted. The scope of the investigation included an on-foot inspection of the property, a review of literature and records, preparation and filing of record forms as specified by the Office of Historic Preservation guidelines, a search of the sacred lands file by the Native American Heritage Commission (NAHC), and preparation of a phase I report.

II. ENVIRONMENTAL SETTING

The property is situated at the margin of the foothills of the San Gabriel Mountains on the southern margin of the Antelope Valley. The Antelope Valley is a broad, flat V-shaped basin in the Western Mojave Desert. The Valley is bounded on the north by the Tehachapi Mountains and on the south by the San Gabriel Mountains and extends eastward to the Mojave River Valley. Low points in the Antelope Valley are Rogers and Rosamond Dry Lakes with elevations of approximately 2275' above mean sea level. The subject property lies south of Rosamond Dry Lake and its elevation is approximately 2760 feet above mean sea level.

The property is characterized as level land embedded in a previously developed area precluding any intact prehistoric period sites in the immediate area. There is an existing residence and outbuildings on the western portion of the property. Development to the north consists of homes built circa 1957. To the east there are homes built in the 1957-1965 period. To the south there are homes built circa 1969. Homes built circa 1987 lie to the west. All soil surfaces within the property have been previously affected by human activity including vegetation clearance and off road travel. The property perimeter is fenced. .

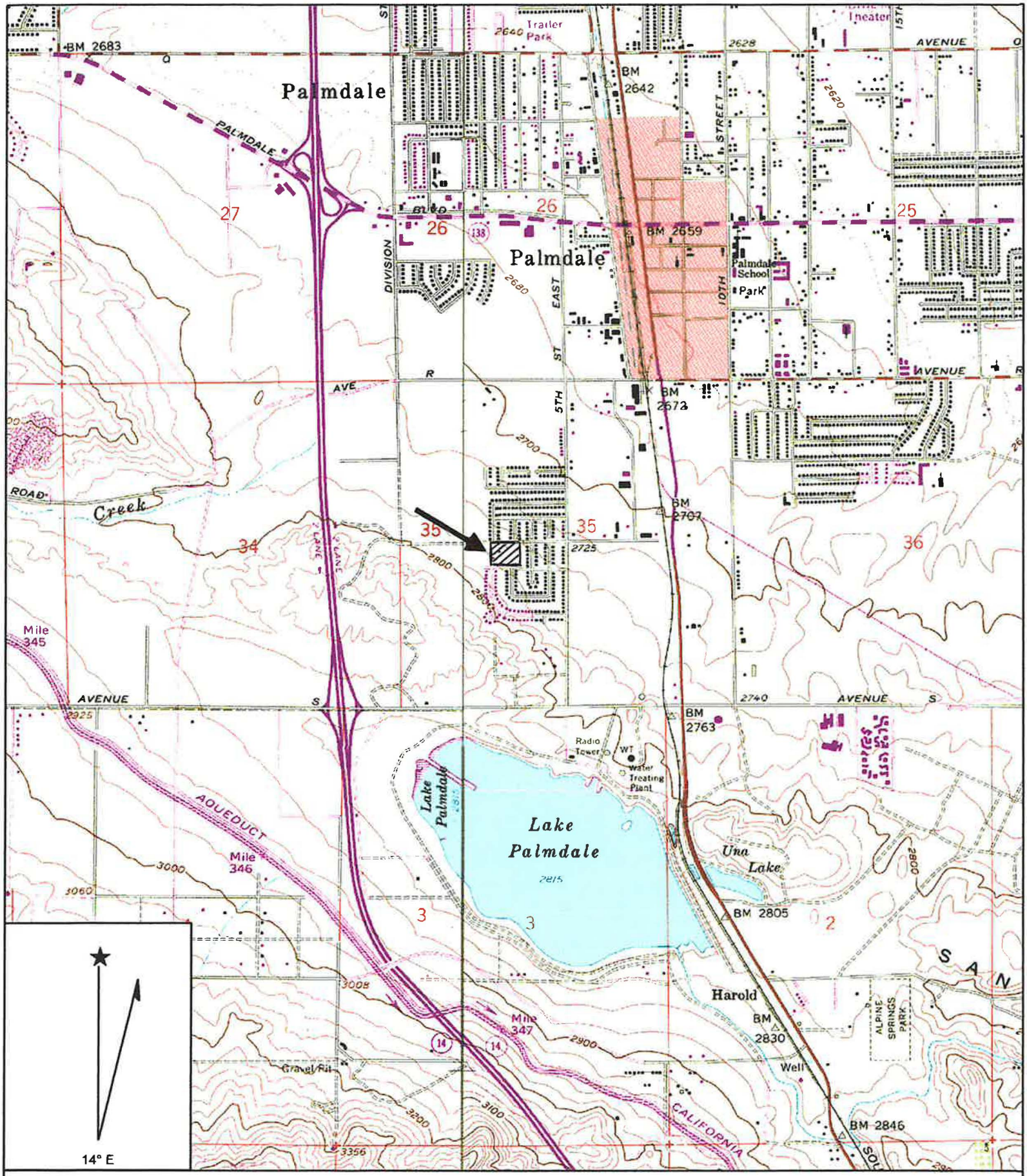
Soil on the property is predominantly fine grained, gravelly silt of quaternary age. Gravel contains some metamorphic rock such as schist and white quartz. There are no surface sources of water on, or immediately adjacent to, the property. No bedrock outcrops occur.



RT FACTFINDERS
Cultural Resources

Figure 1: Project location depicted on Palmdale, California USGS map of 01 July 1975 via Microsoft Terra Server

1" = about 7.5 miles



Name: PALMDALE
Date: 8/22/2023
Scale: 1 inch equals 2000 feet

Location: 11 0396968 E 3825186 N
Caption: Figure 2: Project location depicted on the Palmdale, Calif. 7.5' USGS map.

III. CULTURAL SETTING

The Antelope Valley likely has a prehistoric cultural history extending back over 10,000 years assuming it is like other Mojave Desert basins. Most of the prehistoric periods are known only in general outline. As would be expected, the later periods are the best known. General temporal and cultural sequences have been developed by a number of researchers for other areas of the Mojave Desert including Wallace (1962), Bettinger and Taylor (1974), Stickle and Weinman-Roberts (1980), Warren and Crabtree (1986), and Earle, et. al. (1997).

Local prehistoric cultural history can be classified into four periods: Early, Middle, Late and Post-Contact (Norwood 1987). These periods were created to recognize changes in environmental variables, technological and stylistic change, and/or settlement pattern changes. The ethnography of the Antelope Valley floor is poorly known. Various Native American groups including the Kitanemuk, Kawaiisu and Serrano/Vanyume may have been present in the area. These people were hunters and gatherers with an intimate knowledge of local floral and faunal resources and were able to obtain and prepare them for food and other products. The ethnography of the Valley is discussed by Kroeber (1925), Bean and Smith (1978), Blackburn and Bean (1978), Sutton (1980), Zigmond (1986) and Earle (1996).

The historical context of the region is discussed in several publications including those by Starr (1988); Morris (1977); and Earle, et. al. (1998); and Earle (1998). A series of publications by the Kern-Antelope Historical Society and the West Antelope Valley Historical Society contain historical essays and interviews that are valuable for understanding the development of local historical context.

Prior to the last part of the 19th century, the history of the Antelope Valley is characterized primarily by people's efforts to pass through it. Activity within the Valley was largely limited to cattle grazing, minor prospecting, and hunting expeditions. Historic development of the Valley really began after the 1876 establishment of the Southern Pacific Railroad linking Los Angeles with the San Joaquin Valley. The mid- 1880s brought the first actual land boom. This period saw establishment of a number of settlements in the Valley and many settlers began successful orchards and small farms. There was a great deal of speculation and a variety of questionable schemes were used to entice people into the Valley.

By the late 1800s the fortunes of the Valley were greatly altered by natural causes. In 1894, a 10-year drought began that devastated many settlers who had little practical knowledge or appreciation of the desert environment. These people lost crop after crop and eventually their homes and land. At the turn of the century, much of the Valley was considered worthless and the ownership of many parcels reverted to the state. A reduced population of die-hards remained, some of whom were blessed by high water tables and favorable and valuable agricultural soil. The history of the earlier periods of occupation are, as would be expected, less clear than later periods, because there was an exodus of people and records. There is still much to learn about the dynamics of local development prior to 1920-1925.

Worldwide during the same period many technological innovations were being introduced. In 1904, a gasoline engine was first used in the Valley to pump well water. By 1908-1914 there was an influx of people into the Valley due to the construction of the Los Angeles aqueduct. By 1904 improved conditions after the drought, improved irrigation techniques and increasing subsistence diversity enhanced the potential for economic success. The World War I period brought another influx of people as homesteading reached a peak of popularity and agricultural prices were relatively high.

In 1914, electricity was introduced to the Valley; and by 1917 the introduction of electric water pumps and improved dry farming techniques resulted in the substantial growth and success of agriculture. Increased prices for agricultural produce during World War I stimulated additional growth and agricultural expansion. Other economic endeavors, such as poultry ranching and, after 1919, moonshining, became important economic boosters. By the mid-1920s Palmdale and Lancaster had achieved the basic elements and social institutions and structure of a small American rural town. By the 1930s and 1940s aerospace development in the Antelope Valley accelerated with the coming of World War II. The construction and development of Edwards AFB and Plant 42 and associated influx of workers brought the need for housing. By the 1950s-60s period housing and commercial construction broadly expanded resulting in a setting that is familiar today.

IV. RECORD, MAP AND SACRED LANDS FILE SEARCH RESULTS

Record Search: A record search was requested from the South Central Coastal Information Center, CSUF for two nearby projects (Norwood 2017, 2023). A record search of the Native American Sacred Land file was also requested from the Native American Heritage Commission (Attachment 1). Research was performed by reviewing previous studies within the area, historic period maps, and early land records.

The record search shows no previous on-foot surveys of the subject property. The property lies within areas that were previously subject to overviews and record searches. There are eleven reports within a ½ mile that relate to the subject property search area. Nine cultural resources have been recorded within the record search area. Three of these are prehistoric period and six date to the historic period. None of these are adjacent or close to the subject property. A record search less than a mile to the northeast of the subject property showed over 50 historic period resources, primarily homes, that mostly date to the mid-20th century.

Map Search: Historic period maps were reviewed to identify any potential historic sites or features on the property. Findings are discussed below:

1911: The earliest regional map of Palmdale is Johnson's (1911) Water Supply map which shows structure and well locations throughout the Antelope Valley. Data for this map is based on a 1909 field survey. The scale of Johnson's map makes it difficult to identify plots precisely, however, Johnson's study provides a good overview of how development was occurring at the time.

Johnson's map shows no development within Section 35 other than the railroad and a dirt track that later became Sierra Highway. If structures had been present before this time, they had probably have been removed or demolished by 1909. At this time most of the settlement of Palmdale was located east of the railroad in Section 26 about a mile north of the subject property.

1915: The 1915 Lake Elizabeth 15' USGS quad map shows a similar degree of development as depicted on Johnson's 1911 map. There is one structure depicted in Section 35. It is located in the north central portion of the section. There are few structures in adjoining sections. Development remains fairly limited to Section 26 to the north.

1922: By 1920-1925, Palmdale had matured into a typical American small rural town characteristic of the period and the most concentrated settlement occurred in the present location of downtown Palmdale just east of the railroad tracks. Carpenter and Cosby's Soil Survey map (1926), based on a 1922 field survey, reflects the same basic array of structures and roads that are shown on the 1911 and 1915 maps. There is now one structure in the northeast corner of Section 35 and another at the east central boundary of Section 35. There are still no structures depicted on the subject property. Elsewhere in the Antelope Valley there was a surge of growth and homesteading during this time period.

1938: Walsh's 1938 real property map does not show the location or number of structures present, but it does show ownership. However, no ownership is shown for any of the parcels within Section 35, including the subject property. An arrow points to a location at the northeast corner of the section that is labeled "Pre Cooling Plant".

1958: This USGS map was photorevised in 1974. By 1958 there had been considerable growth in Palmdale, and there are numerous structures within the section. One structure is shown on the subject property. Other developments surround the property to the north, east and south.

The Bureau of Land Management General Land Office Records (GLO) were reviewed for all of Section 35. The subject property was originally granted to the Southern Pacific Railroad Company on 3/29/1876. They also held a large portion of the remaining lands in Section 35. The South Antelope Valley Irrigation District was granted certain other portions of Section 35 on 12/12/1900. Land later passed into private hands through railroad sales.

Native American sacred lands file search: Information regarding Native American Cultural Resources and/or Sacred sites was requested from the California Native American Heritage Commission (NAHC). Their records indicate that no Native American resources have been previously identified on or near the property (Attachment 1). They provided a list of contacts that the jurisdiction may contact for any further information or concerns. No Native American archaeological sites or artifacts have been identified on or immediately near the property.

V. SURVEY METHODS AND CONDITIONS

Field survey of the property was completed on September 24, 2023 by Melinda Walton representing RTFactfinders. Fieldwork required 2 person hours. The property was examined by walking a series of linear transects oriented north to south beginning at the northeast property corner. Spacing between transects did not exceed 5-7 meter intervals.

The property has a variety of native and introduced vegetation. Native vegetation includes several juniper trees and an area of well-established Joshua Trees. Ornamental and shade trees, including palm trees, are scattered around the property.

Soil surface visibility was fair. Recent growth of introduced grasses and weeds impaired visibility in some areas. Visibility was rated at about 40%. Light conditions for survey were excellent, with bright sun and clear skies. In accordance with State Historic Preservation Office guidelines, any sites or artifacts greater than 50 years of age were to be noted and considered as potential cultural resources. There were no inhibiting factors that would have prevented the discovery and identification of surface evidence of prehistoric or historic period artifacts or features. Photos were taken to document any finds and property conditions (Attachment 2).

VI. SURVEY FINDINGS

As a result of the survey, no prehistoric period sites were identified on the property. One historic period site was recorded as site 683-1. It consists of 4 structures and other features on the western portion of the property (Attachment 3). There is a house, a barn, a converted garage and a storage shed. Its components are described below:

Structure 1, House: This structure includes a1400 square foot, 2 bedroom 1 bath house with kitchen and living room. Tax records indicate it was built in 1952. The house is a rectangular single story, wood framed building. The exterior has partly T-1-11 siding with some plywood. It is situated on a concrete slab foundation. The roof is green composition. Today the structure measures 72 feet north/south and 28 feet east/west indicating a structure of 2,016 square feet. This suggests some alteration since tax records indicate a smaller structure. Also, T-1-11 siding was not introduced until the 1960s. There is an open area wall on the east side of the house. It may represent an attached garage added at a later time. The garage door is missing. There is no fireplace. Structure 1 is the one showing on the 1958 USGS map.

A low (2 foot tall) cinder block wall capped with bricks is located at the southern side of the house. A brick walkway leads from the south to a doorway of the west side of the house. There is also a 2-foot tall wall capped with stone that lies along the western side of the house. At the northwestern corner of the house, there is an unattached plywood work/storage area measuring about 15 feet by10 feet. It opens to the east. There are also two large but informally constructed chicken wire aviaries on the north side of the house. At the time of survey one contained doves and the other contained large pigeons.

Structure 2, Barn: To the southeast of Structure 1 there is a wood-framed barn with T-1-11 siding. The structure is 45 feet north/south and 20 feet east/west. There are two large doors on the east and west sides of the barn. The eastern doorway is blocked by a stack of recycled lumber. The western doorway has large sliding doors. There is an attached corral on the north side of the barn. There is an outdoor storage area north of the barn containing various landscaping and construction materials as well as a portable aluminum storage shed.

Structure 3, Converted garage: This structure lies west of Structure 1 It is a rectangular one story wood-framed building measuring 46 feet north/south and 30 feet east/west. It has T-1-11 and plywood siding. There is no garage door but instead there is an added-on doorway allowing for entry. This building was occupied at the time of survey.

Structure 4, Storage shed: This is a wood-framed structure with a covered front porch measuring 22 feet north/south and 23 feet east/west lying southwest of Structure 1. It has T-1-11 siding. It appears to have been occupied at one time but is currently used for storage.

VII. MANAGEMENT CONCERNS

The California Environmental Quality Act (CEQA) has provisions to ensure that any cultural resources identified during the environmental review process need to be evaluated for significance, because unique or important resources require mitigation. To determine if mitigation is required, evaluation is required to assess a resource's significance in terms of National Register of Historic Places (NRHP) or CEQA criteria.

Site 683-1: The residential compound dates to mid-20th century (1952) time period making it at least 71 years of age so it must be considered for significance. This resource is considered under the NRHP criteria (A, B, C, D), for attaining eligibility to the National Register of Historic Places. Eligible sites are those:

A. That are associated with events that have made a significant contribution to the broad patterns of our history.

B. That are associated with the lives of significant persons in our past.

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

D. That have yielded or may be likely to yield, information important in history or prehistory.

The residential compound cannot be considered to be closely associated with the broad patterns of our history except in a very general way. There are similar compounds throughout the Antelope Valley and this site is not an especially notable one because it has seen many additions and alterations so the structures are not in original condition. The compound cannot be

associated with the lives of past significant persons. The compound does not meet any characteristic stated in criterion C, which typically is applied to buildings and structures. The structures are not unique or architecturally distinctive. The compound is not likely to yield information important in history because any buried materials it may contain are not likely to pre-date 1952, a period well documented in the Antelope Valley history. Therefore, the compound is considered not eligible to the National Register, hence, for the purposes of CEQA, is considered not significant.

Since no Native American or significant historic period cultural resources were identified on the property, no impacts to significant cultural resources are anticipated when development occurs. No further cultural resource measures are recommended.

While unlikely, potentially significant buried material could exist on the property. Under CEQA "inadvertent finds" (unexpected buried sites found after completion of a phase I or II study as a result of construction exposure) are subject to evaluation and, if significant, appropriate impact mitigation. In the event that unanticipated cultural materials (arrowheads, grinding stones, etc.) or features (old foundations, cellars, privy pits, etc.) are encountered during any future excavation work, the work must stop at the discovery site. A professional cultural resource consultant will need to evaluate the buried find.

In the event any bones of possible human origin are uncovered, during any future construction, the Los Angeles County Coroner must be notified and permitted to investigate the find prior to any further disturbance at the location of discovery.

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ATTACHMENTS

ATTACHMENT 1

STATE OF CALIFORNIA Gavin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Reginald Pagaling
Chumash

VICE-CHAIRPERSON
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

SECRETARY
Sara Dutschke
Miwok

PARLIAMENTARIAN
Wayne Nelson
Luiseño

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Stanley Rodriguez
Kumeyaay

COMMISSIONER
Laurena Bolden
Serrano

COMMISSIONER
Reid Milanovich
Cahuilla

COMMISSIONER
Vacant

EXECUTIVE SECRETARY
Raymond C. Hitchcock
Miwok, Nisenan

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

October 13, 2023

Richard Norwood
RTFactfinders

Via Email to: artefct@gmail.com

Re: #683 Duke Residential Project, Los Angeles County

Dear Mr. Norwood:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Los Angeles County
10/13/2023

Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Fax #	Email Address	Cultural Affiliation	Counties	Last Updated
Fernandeno Tataviam Band of Mission Indians	N	Sarah Brunzell, CRM Manager	1019 Second Street San Fernando, CA, 91340	(818) 837-0794		CRM@tataviam-nsn us	Tataviam	Kern,Los Angeles,Ventura	5/25/2023
Morongo Band of Mission Indians	F	Ann Brierty, THPO	12700 Pumarra Road Banning, CA, 92220	(951) 755-5259	(951) 572-6004	abrierty@morongo-nsn gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego	
Morongo Band of Mission Indians	F	Robert Martin, Chairperson	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110	(951) 755-5177	abrierty@morongo-nsn.gov	Cahuilla Serrano	Imperial,Los Angeles,Riverside,San Bernardino,San Diego	
Quechan Tribe of the Fort Yuma Reservation	F	Jordan Joaquin, President, Quechan Tribal Council	P O Box 1899 Yuma, AZ, 85366	(760) 919-3600		executivesecretary@quechantribe com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
Quechan Tribe of the Fort Yuma Reservation	F	Manfred Scott, Acting Chairman - Kw'ts'an Cultural Committee	P O. Box 1899 Yuma, AZ, 85366	(928) 210-8739		culturalcommittee@quechantribe com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
Quechan Tribe of the Fort Yuma Reservation	F	Jill McCormick, Historic Preservation Officer	P O Box 1899 Yuma, AZ, 85366	(928) 261-0254		historicpreservation@quechantrib e com	Quechan	Imperial,Kern,Los Angeles,Riverside,San Bernardino,San Diego	5/16/2023
San Fernando Band of Mission Indians	N	Donna Yocum, Chairperson	P O Box 221838 Newhall, CA, 91322	(503) 539-0933	(503) 574-3308	dyocum@sfbmi org	Kitanemuk Vanyume Tataviam	Kern,Los Angeles,San Bernardino,Ventura	5/8/2023
San Manuel Band of Mission Indians	F	Alexandra McCleary, Cultural Lands Manager	26569 Community Center Drive Highland, CA, 92346	(909) 633-0054		alexandra.mccleary@sanmanuel-nsn.gov	Serrano	Kern,Los Angeles,Riverside,San Bernardino	3/27/2023
Serrano Nation of Mission Indians	N	Wayne Walker, Co-Chairperson	P O Box 343 Patton, CA, 92369	(253) 370-0167		serranonation1@gmail.com	Serrano	Los Angeles,Riverside,San Bernardino	10/10/2023
Serrano Nation of Mission Indians	N	Mark Cochrane, Co-Chairperson	P. O Box 343 Patton, CA, 92369	(909) 578-2598		serranonation1@gmail.com	Serrano	Los Angeles,Riverside,San Bernardino	10/10/2023

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050 5 of the Health and Safety Code, Section 5097 94 of the Public Resource Section 5097 98 of the Public Resources Code

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed #683 Duke Residential Project, Los Angeles County.

Record: PROJ-2023-004798
Report Type: List of Tribes
Counties: Los Angeles
NAHC Group: All

ATTACHMENT 2

PHOTO 1: View southwest from the northeast property corner.

PHOTO 2: View northeast from the southwest property corner.

PHOTO 3: Site 683-1, Structure 1, eastern elevation.

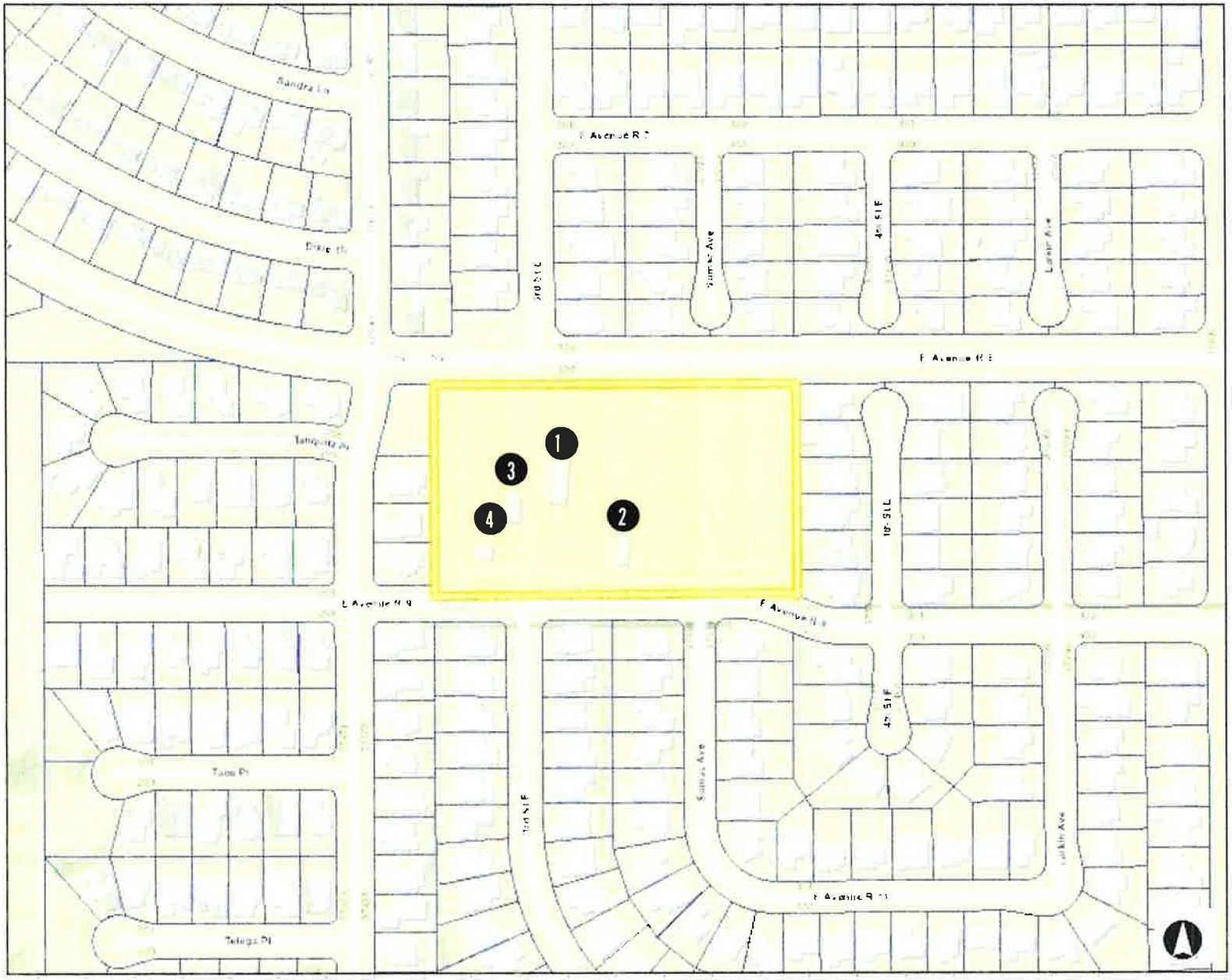
PHOTO 4: Site 683-1, Structure 2, western elevation.

PHOTO 5: Site 683-1, Structure 3, converted garage, western elevation.

PHOTO 6: Site 683-1, Structure 4, storage shed, southwestern elevation.

ATTACHMENT 3

Site 683-1



Legend

- Parcels

Notes

The yellow line is the property boundary

0.1 0 0.06 0.1 Miles

County of Los Angeles

Appendix G Geotechnical Engineering (Soils) Report

GEOTECHNICAL ENGINEERING REPORT

Prepared For
Mr. Carlos Ramirez

Tentative Tract Map 82364
Los Angeles County, California
APN 3010-009-007

Job No.: 23-197
August 10, 2023

BRUIN GEOTECHNICAL SERVICES, INC.
44732 Yucca Avenue
Lancaster, California 93534
www.bruingsi.net

BRUIN
GEOTECHNICAL
SERVICES INC.
est. 2004

SOIL AND MATERIAL
TESTING AND INSPECTIONS

August 10, 2023 Job No.: 23-197

Mr. Carlos Ramirez
c/o Duke Engineering and Associates
44732 Yucca Avenue
Lancaster, CA 93534

Subject: **Geotechnical Engineering Report for Tentative Tract Map 82364**
Vicinity of Avenue R-8 and Kimberly Lane, Palmdale, Los Angeles County, California
APN 3010-009-007

Dear Mr. Ramirez:

Presented herewith in is our Geotechnical Engineering Report for the subject project. Our work was performed in accordance with the scope of work outlined in our original proposal dated April 7, 2023.

This report presents the results of our field investigation, laboratory testing, along with our engineering judgment, opinions, conclusions, and recommendations pertaining to the proposed development.

It has been a pleasure to be of service to you on this project. Should you have any questions regarding the contents of this report, or should you require additional information, please contact the undersigned at (661) 273-9078.

Respectfully submitted,

BRUIN GEOTECHNICAL SERVICES, INC.

Ryan D. Duke, P.E.
RDD/mes

REGISTERED PROFESSIONAL ENGINEER
RYAN DUKE
9/2024
C 79729
CIVIL ENGINEER
STATE OF CALIFORNIA

BRUIN
GEOTECHNICAL
SERVICES INC.
est. 2004

SOIL AND MATERIAL
TESTING AND INSPECTIONS

August 10, 2023 Job No.: 23-197

EXECUTIVE SUMMARY

There appear to be no significant geotechnical constraints on-site that cannot be mitigated by our recommendations, the proposed planning, design, and utilization of sound construction practices.

Based on our geotechnical investigation of the subject site, the information obtained from our subsurface exploration, and review of available reports and literature, it is our professional opinion that the proposed development is feasible at the site provided that the geotechnical engineering recommendations contained in this report are implemented in the design and construction of the project.

The following key elements should be noted from this investigation:

- The subject site is located within the seismically active Southern California area. As such, the proposed development shall be designed in accordance with seismic considerations specified in the 2022 California Building Code (CBC) and the County requirements.

- The Limitations and Uniformity of Conditions Section should be read for an understanding of the report limitations.

This Executive Summary should be used in conjunction with the entire report for design and/or construction purposes. It should be recognized that specific details were not included or fully developed in this summary, and the report must be read in its entirety for a complete interpretation of the items contained herein.

SUMMARY OF RECOMMENDATIONS

DESIGN ITEM	RECOMMENDATIONS
REMEDIAL GRADING	
Structure Over-Excavation	84” below existing or finish grade, whichever is lower
Scarification	12” compacted at 90%
Horizontal Limits	5 feet beyond foundation perimeter
Traffic Pavement Concrete (Driveway)	Scarify 24” compacted to 95%
Exterior Non-Traffic Bearing Concrete Flatwork	Scarify 24” compacted to 90%
Native Soil Shrinkage	15-20%
PERIMETER (CONTINUOUS) FOUNDATION DESIGN VALUES	
Allowable Net Bearing Capacity	1,500 psf
Width	Minimum 15 inches
Embedment (Single-Story)	Minimum 15 inches below lowest adjacent soil elevation
Embedment (Two-Story)	Minimum 24 inches below lowest adjacent soil elevation
Reinforcement	Minimum four No. 4 bars, two top and two bottom
ISOLATED (COLUMN/PIER) FOUNDATION DESIGN VALUES	
Allowable Net Bearing Capacity	1,800 psf
Width	Minimum 24 inches square
Embedment (Single-Story & Two-Story)	Minimum 24 inches below lowest adjacent soil elevation
Reinforcement	No. 4 mat, one top and one bottom
LATERAL LOAD RESISTANCE	
Allowable Passive Pressure	300 psf per foot
Coefficient of Friction	0.32
SOIL EXPANSION	
Expansion Index	0
Classification	Very Low
LATERAL EARTH PRESSURES	
Active (Well-Drained Soil)	34 psf
At Rest (Restrained Wall)	60 psf
CORROSION AND CHEMICAL ATTACK	
Soil Resistivity	<500 ohm-cm
Sulfate Attack Potential	0.1148% (Exposure Category S1)
INTERIOR SLAB-ON-GRADE	
Thickness	Minimum 4” thick over 36” of compacted soil
Reinforcement	No. 4 bars, 16” on-center both ways
Vapor Barrier	Min. 15 mil.

GEOTECHNICAL ENGINEERING REPORT
TABLE OF CONTENTS

FIGURES	
Figure 1	**Vicinity Map**
Figure 2	**Boring Location Map**

APPENDIXES	
Appendix A	**Boring Logs and Classification Key**
Appendix B	**Laboratory Test Data**
Appendix C	**Seismic Design Summary Report**
Appendix D	**General Earthwork and Grading Guidelines**

GEOTECHNICAL ENGINEERING REPORT
TENTATIVE TRACT MAP (TTM) 82364
VICINITY OF KIMBERLY LANE & EAST AVE R-8
PALMDALE, LOS ANGELES COUNTY, CALIFORNIA
APN 3010-009-007

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation performed by Bruin Geotechnical Services, Inc. for the proposed residential subdivision at the subject site based on discussions and preliminary site plans provided by the client. This report is specific to the proposed development.

The purpose of this investigation was to evaluate the on-site subsurface soil conditions relative to geotechnical engineering characteristics and to provide geotechnical recommendations relative to proposed residential development.

The scope of the authorized geotechnical investigation included the following tasks:

- Performing a site reconnaissance
- Conducting field subsurface exploration through soil borings and sampling
- Laboratory testing program of selected soil samples
- Performing engineering analyses of the data
- Preparing this Geotechnical Engineering Report

This study also includes a review of published and unpublished literature and geotechnical maps with respect to active and potentially active faults located in proximity to the site which may have impact on the seismic design of the proposed structure.

2.0 SITE LOCATION AND DESCRIPTION

The subject site, herein after referred to as Site, is located at 308 East Avenue R-8, Palmdale, Los Angeles County, California. The rectangular-shaped parcel consists of approximately 4.85 acres total. The site is located in a developed residential neighborhood surrounded by single family residences in the parcels to the east and west, East Avenue R-8 to the north, and East Avenue R-9 to the south.

At the time of our investigation, the subject contained an existing single-family residence, two (2) accessory dwelling units (ADUs), a detached garage, small shed, dirt driveway, and perimeter fence. The site vegetation consisted of landscaped trees and very few, low annual weeds and shrubs. The topography of the site gently slopes down at an

approximate six to seven (6-7) percent slope down toward the northeast. The elevation of the Site is approximately 2,750 feet above mean sea level. The aforementioned site description is intended to be illustrative and is specifically not intended for use as a legal description of the Site.

Access to the Site is from either East Avenue R-8 or East Avenue R-9, both of which are a paved roads.

The general location of the subject site is shown on Figure 1.

3.0 PROPOSED GRADING AND CONSTRUCTION

Based on our review of the preliminary site plans and discussions, Bruin GSI understands that Tract 82364 will be subdivided into 14 lots, with 13 residential lots and one lot for a proposed retention basin. The structures are anticipated to be one or two-story single-family residences. We anticipate typical wood- or light gauge steel stud framing, with stucco and other light material finishes with conventional concrete continuous and isolated foundations and slab-on-grade floors. No basements are planned. We anticipate maximum structural loads of 1,800 pounds per lineal foot and 30 to 50 kips for isolated foundations.

Exterior improvements are anticipated to include paved streets, underground utilities, concrete flatwork (sidewalks, driveways, etc.), and landscape and hardscape areas. It is anticipated that the drainage will consist of sloped surfaces to drainage swales to curbs and gutters flowing to an approved area. The proposed structures will be connected to a public sewer system and existing utilities lines from the street.

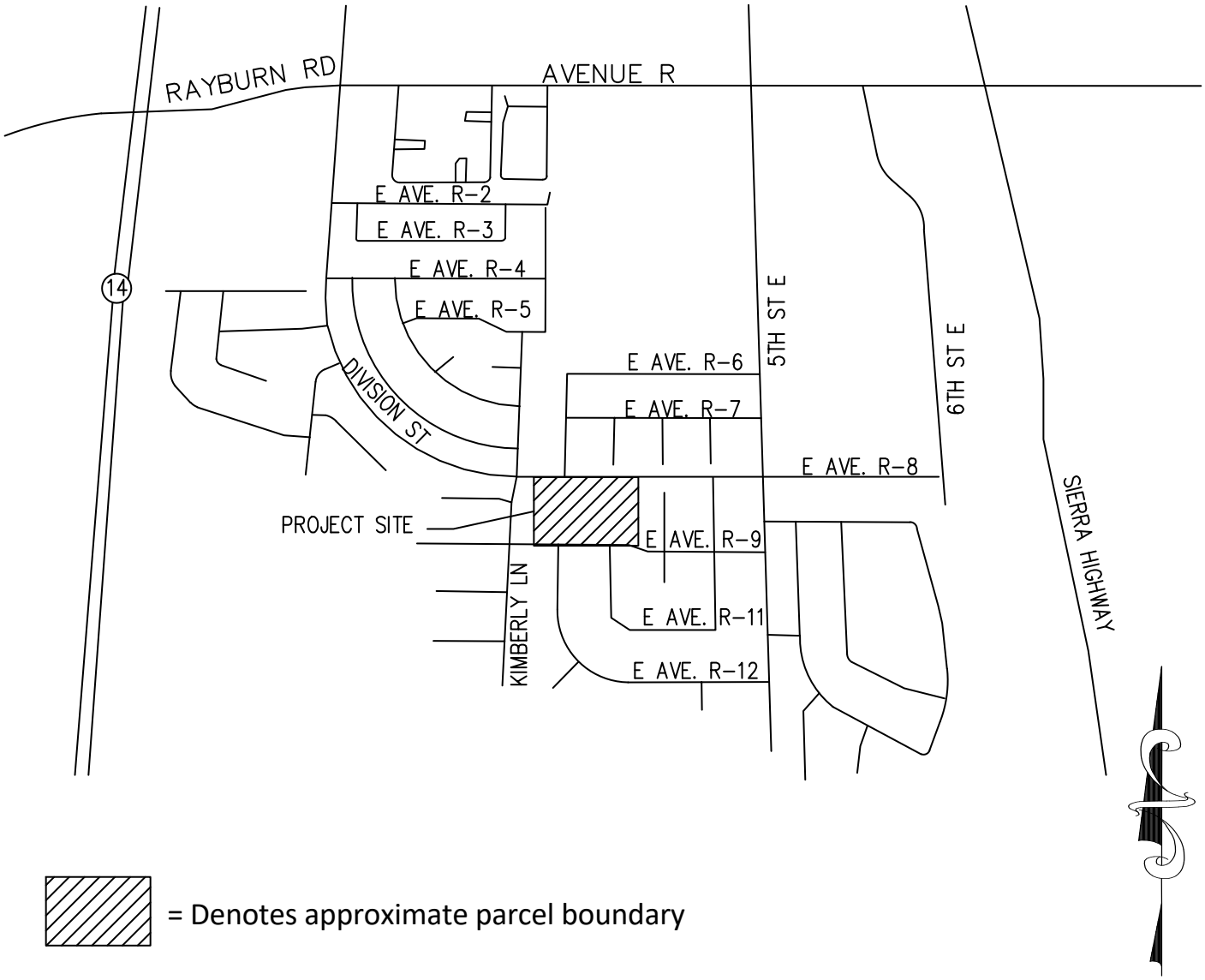
Due to the gently sloping topography and proposed terracing, it appears the proposed earthwork will consist of conventional cut and fill methods to grade the Site, with anticipated maximum slope heights of approximately one to twelve (1-12) feet to achieve design grades.

4.0 GEOTECHNICAL INVESTIGATION

The geotechnical investigation included a field subsurface exploration program and a laboratory testing program on soil samples collected. These programs were performed in accordance with our proposal for Geotechnical Engineering Report dated April 7, 2023. The scope of work did not include environmental assessment or investigation for the presence or absence of hazardous substances or toxic materials in structures, soil, surface water, groundwater, or air, below or around the site. The field subsurface exploration and laboratory testing programs are described below.

Vicinity Map

N.T.S.



= Denotes approximate parcel boundary

BRUIN GEOTECHNICAL SERVICES INC. est. 2004 ™

www.bruingsi.net

Project:

Tentative Tract Map 82364
Vicinity of Kimberly Lane & Avenue R-8
Palmdale Los Angeles County, California APN
3010-009-007

Job Number:

23-197

Figure 1

4.1 Field Exploration Program

A site reconnaissance was made by our representative prior to instigating the field exploration program. The Site was observed, and boundaries roughly located for purposes of underground utility locating. As required by law, Bruin GSI contacted Underground Service Alert (one-call notification service) to attain underground utility marking and clearance, a minimum of 72 hours prior to performing the field subsurface investigation.

The field exploration program was initiated on August 11, 2022, under the technical supervision of our engineer. A total of six (10) exploratory borings were drilled using a CME 75 drill rig with eight (8) inch hollow stem auger in accordance with generally accepted geotechnical exploration procedures (ASTM D 1452). The borings were advanced to maximum depths of twenty (20) feet below ground surface (bgs). The approximate locations of the borings within the area of the proposed construction were determined by sighting and pacing from existing site improvements, such as streets, and should be only considered accurate to the degree implied by the method used. The borings locations are shown on Figure 2.

Soil samples were obtained at various depth intervals, consisting of relatively undisturbed brass ring samples (Modified California split-spoon sampler) and Standard Penetration Test (SPT) samples driven by a 140-pound hammer falling 30 inches. After seating of the sampler, the number of blows required to drive the sampler one foot was recorded in six (6) inch increments, in general accordance with procedures presented in ASTM D 1586.

Bulk samples were also collected at various depths from auger cuttings during drilling and represent a mixture of soils within the noted depths. The soil samples were returned to the laboratory for analysis and testing.

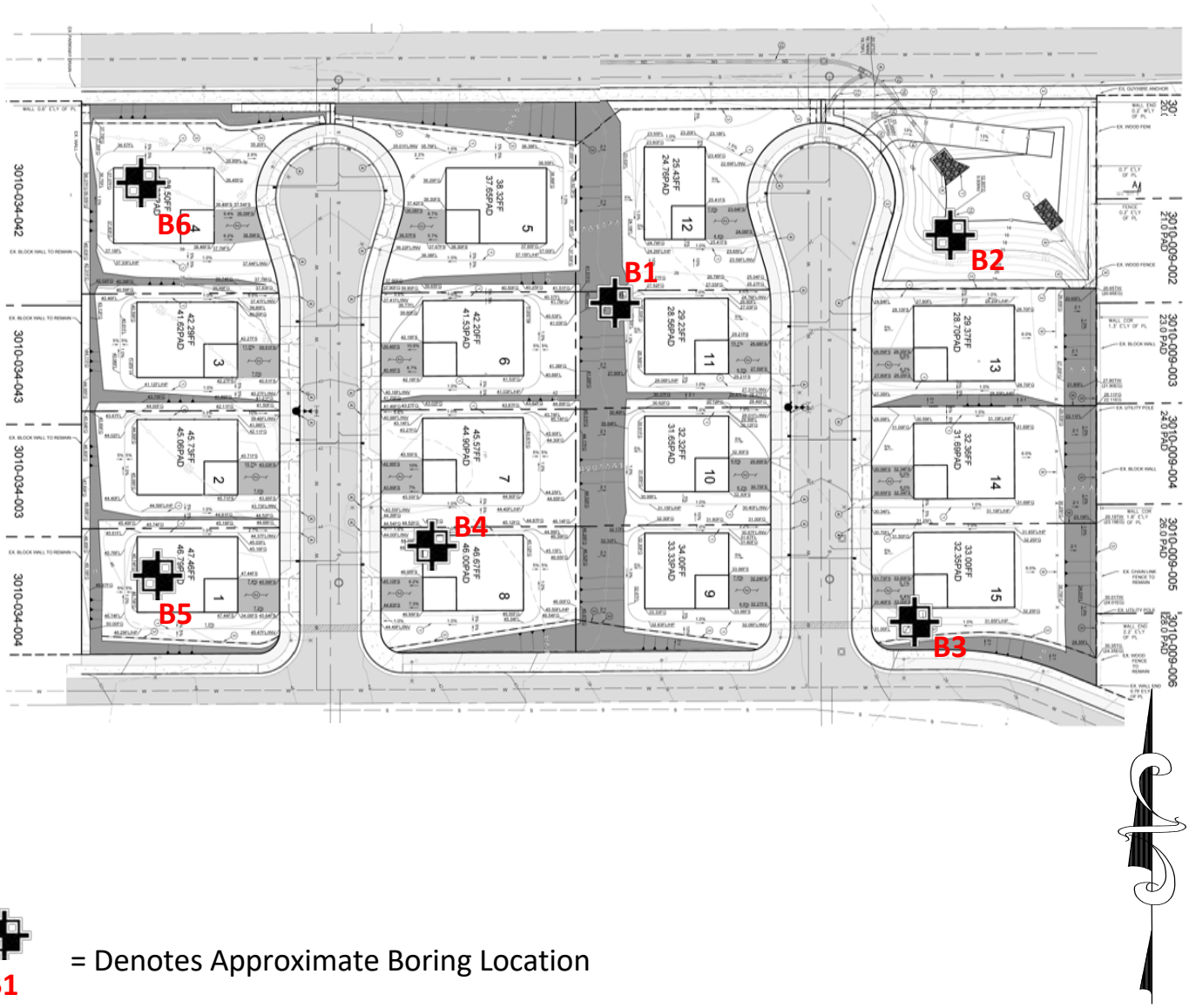
Final boring logs presented in Appendix A are Bruin GSI's interpretation of the field logs prepared by our representative during drilling, as well as laboratory test results. The stratification lines represent approximate boundaries between soil types. The actual soil transitions may be gradual.

4.2 Site and Subsurface Conditions

Native alluvial materials were encountered within all of our exploratory borings. The soil strata encountered consisted of interbedded layers of silty sand (SM) poorly graded sands (SP) sandy silt (ML), and occasional clay (CL). The native materials were noted to be dry to very moist or wet, and loose to moderately dense or firm. For more detailed descriptions of the subsurface materials refer to the boring logs in Appendix A.

Boring Location Map

N.T.S.



B1 = Denotes Approximate Boring Location

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Project:

Tentative Tract Map 82364
Vicinity of Kimberly Lane & Avenue R-8
Palmdale Los Angeles County, California APN
3010-009-007

Job Number:

HOTMOT

Figure 2

4.3 Groundwater Conditions

Groundwater was encountered in one of our exploratory borings, at nineteen (19) feet below ground surface (bgs). Bruin GSI reviewed available reports and electronic databases to assess historic water level conditions in the vicinity of the Site. Sources reviewed included the historically highest groundwater contours prepared by County of Los Angeles, Department of Public Works, Water Resources Division electronic database, historically highest groundwater levels in the immediate site vicinity indicate that groundwater level at the site are seventeen to twenty (17-20) feet bgs. Based on this information, groundwater is not a design factor for this project.

4.4 Laboratory Testing

The field boring logs and soil samples were reviewed to assess which samples would be analyzed further. The selected soil samples collected during drilling activities at the Site were then tested in the laboratory to assist in evaluating engineering properties of subsurface materials deemed within structural influence.

The soil samples were classified in accordance with the Unified Soils Classification System and a testing program was established. The samples were tested to determine the following:

- In-situ moisture and dry unit weight determinations were determined in accordance with ASTM D 2937.

- Relative strength characteristics were estimated from results of direct shear tests (ASTM D 3080) performed on bulk soil samples remolded to approximately 90% of the maximum dry density as determined by ASTM D 1557 test method.

- Consolidation potential was determined on select soil samples in accordance with ASTM D 2435.

- Soil chemical analysis on a soil sample from the site was performed by Anaheim Test Lab, which included pH, resistivity, soluble sulfates and soluble chlorides as well as other chemical contents.

The following additional tests were performed:

- Identification of soils ASTM D 2488
- Expansion Index ASTM D 4829
- Maximum density – Optimum moisture ASTM D 1557
- Material Finer than the No. 200 Sieve ASTM D 1140

- Sand Equivalent Value ASTM D 2419

Pertinent tabular and graphic test results are presented in Appendix B.

4.5 Soil Engineering Properties

Physical tests were performed on the bulk and relatively undisturbed samples to characterize the engineering properties of the native soils.

Moisture content and dry unit weight determinations were performed on samples to evaluate the in-situ unit weights of the different materials. Moisture contents were generally one to fourteen (1-14) percent. In-place dry densities ranged generally 100 pounds per cubic foot (pcf) to 121 pcf. Moisture content and dry unit weight results are shown on the excavation logs in Appendix A.

The expansion index tests (ASTM D 4829) indicate that the surficial soils are within the “very low” expansion category.

Consolidation test results reveal that some samples tested in the upper seven to eight feet (7-8) feet of soil has a slight to moderate potential to hydro-consolidate.

5.0 REGIONAL GEOLOGY AND SEISMIC HAZARDS

The project site is located in a seismically active area typical of Southern California and likely to be subjected to a strong ground shaking due to earthquakes on nearby faults.

The San Andreas Fault zone is the largest active fault rift zone, which is several miles wide, and passes through the Antelope Valley, extending from the Gulf of Mexico through the western portion of the State of California to a point at Cape Mendocino in northern California. The San Andreas Fault is predicted to have an event every 100-200 years based on geologic records. The San Andreas Fault has had two major eruptions in the last 150 years: 1) in the Southern California area in 1857, and 2) in San Francisco in 1906. In each event, approximately 320 kilometers of surface rupture has taken place, as well as a horizontal displacement of approximately 9 meters. Additional faulting has occurred adjacent to the San Andreas Fault causing numerous events of various magnitudes throughout the length of the San Andreas Fault.

The project site is located in an area in which active seismic occurrences are recorded on a yearly basis. Seismic studies conducted show a major break along the San Andreas Fault could be responsible for an event of approximately 8.4 on the Richter scale. A seismic event of this magnitude could cause bedrock accelerations as large as 0.5g. Events of this

magnitude are anticipated to occur approximately every 150 years. The last occurrence of this magnitude was in 1857.

No known active faults have been mapped across the subject site. The potential hazards due to active fault ground rupture are considered minimal. According to current publications by the State of California, the project site is not located within the Alquist-Priolo special studies zone.

5.1 CBC Design Parameters

The following coefficients have been estimated in accordance with the requirements of the 2022 CBC, utilizing the Structural Engineers Association of California and California's Office of Statewide Health Planning and Development Seismic Design Maps Application:

https://seismicmaps.org/

The following seismic parameters are provided, based on the approximate latitude and longitude at the southwest corner of the subject site:

Latitude	34.56441474°
Longitude	-118.12453527°

Spectral Response Acceleration, Short Period) - S_s	2.435g	0.2(sec)
Spectral Response Acceleration at 1 sec. - S_1	1.039g	1.0(sec)
Mapped Spectral Response, Short period - S_{DS}	1.623g	0.2(sec)
Mapped Spectral Response at 1 sec. - S_{D1}	*	1.0(sec)
Site Coefficient – F_A	1.0	
Site Coefficient – F_V	*	
Site Modified Spectral Acceleration, Short period -S_{MS}	2.435g	
Site Modified Spectral Acceleration, Short period -S_{M1}	*	

Site Classification (2022 CBC, further defined in ASCE7-16 Chapter 20) = D Stiff Soil

* The actual method of seismic design should be determined by the Structural Engineer in accordance with Section 11.4.8 Site-Specific Ground Motion Procedures of the ASCE 7-16. Refer to Appendix C for the Design Maps Summary Report provided by the Structural Engineers Association of California and California's Office of Statewide Health Planning and Development website.

The actual method of seismic design should be determined by the Structural Engineer.

5.2 Liquefaction Potential

Liquefaction is a seismic phenomenon in which loose, saturated, granular (non-cohesive) soils react as a fluid when subject to high-intensity ground shaking. Research and historical data indicate loose granular soils with a specific range of grain size distribution, saturated by a relatively shallow groundwater table are most susceptible to liquefaction.

The effects of liquefaction on level ground include settlement, sand boils and bearing capacity failures below structures.

In view of the relatively firm silty sand and sandy silt encountered in the borings, relative densities, and depth to static groundwater (over 100 feet), it is Bruin GSI's opinion that the potential for on-site liquefaction or seismically induced dynamic settlement should be negligible. Based on our review of the Seismic Hazards Map, the Site is not located in an area requiring a liquefaction analysis.

6.2.1 Other Liquefaction Associated Hazards

Potential hazards associated with liquefaction include lateral spreading and slow slides, foundation bearing failure, and ground surface settlement. Considering the upper native soils are not likely to liquefy, these hazards are not considered to be design factors for this project.

5.3 Other Secondary Seismic Hazards

Seismic hazards relative to earthquakes include landslides, ground lurching, tsunamis, seiches and seismic-induced settlement. As site topography is relatively flat, hazards from landslides are considered negligible. Ground lurching is generally associated with fault rupture and liquefaction. As these hazards are considered unlikely, it is Bruin GSI's opinion that the potential for ground lurching is low. Tsunami hazards are considered nonexistent due to the site location.

5.4 Soil Settlement

Differential soil settlement occurs when supporting soils are not uniform in density or classification and seismic shaking causes one type of soil to settle more than the other. When unaccounted for in design, such settlement can result in damage to structures, pavement and subsurface utilities. Soils with potential for hydro-

consolidation can also cause differential settlement under loading conditions and the induction of moisture.

Re-compaction of the upper site soils is intended to remedy most potentials of settlement due to structures supported on native soils with non-uniform densities, soil classifications and hydro-consolidation.

Settlement of structures founded on compacted fill will be relatively small, less than one (1) inch. Differential settlement is anticipated to be on the order of 50% of the total settlement in a thirty (30) foot span. Most settlement should take place during construction.

5.5 Erosion

The subject site drainage occurs by minor sheet flow and erosion could occur. Appropriate analysis, grading and drainage design and site maintenance should minimize the sheet flow erosion potential.

6.0 111 STATEMENT

Subsequent to compliance with the recommendations provided in this report and based on the site reconnaissance, subsurface exploration, and laboratory analysis, it is our opinion the proposed structures will be safe from hazards associated with faulting, landslides, slippage, and settlement. The proposed development will not adversely impact the existing geologic stability of adjacent sites.

7.0 EFFECT OF PROPOSED GRADING ON ADJACENT PROPERTIES

It is our opinion that the proposed grading and construction will not adversely affect the stability of adjoining properties provided that grading and construction are performed in compliance with the recommendations presented herein.

8.0 OPINIONS AND CONCLUSIONS

Based upon the results of our investigation, the proposed development is considered feasible from a geotechnical standpoint provided the recommendations presented herein are incorporated into the design and construction. If changes in the design of the structure are made or variations of changed conditions are encountered during construction, Bruin GSI should be contacted to evaluate their effects on these recommendations.

The upper seven to eight (7-8) feet of soil were found to be non-uniform with some areas of the site soils subject to hydro-consolidation. Based on the laboratory testing and subsurface data obtained, it is Bruin GSI's opinion that the upper site soils will not provide a uniform soil support system without remediation through re-compaction. In order to provide a more uniform soil support system and minimize the potential for differential settlement, the proposed structures should be supported by a re-compacted fill mat.

Provided that the recommendations in this report are incorporated into the design and construction, it is Bruin GSI's opinion that conventional shallow (continuous and isolated) foundations may be designed to support the proposed structures. Refer to Section 9.2 for details and soil values regarding foundation design.

9.0 GEOTECHNICAL RECOMMENDATIONS

The following geotechnical engineering recommendations for the proposed development are based on observations from the field investigation program and the laboratory test results and our experience with sites of similar conditions.

The local Department of Building and Safety should be contacted prior to the start of construction to assure the project is properly permitted and inspected during construction. Any grading performed at the site shall be incompliance with the recommendations provided in this report, the local building code and the Earthwork and Grading Specifications for Rough Grading presented in Appendix D.

Field observations and testing during rough-grading operations should be provided by Bruin GSI so a decision can be formed regarding the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the project geotechnical specifications. **Any work related to grading performed without the full knowledge of, and under the supervision of the Geotechnical Consultant, may render the recommendations of this report invalid.**

9.1 Earthwork

Prior to any grading, the site should be cleared and grubbed of all vegetation. All pavements, vegetation, trash, debris and abandoned underground utilities shall be removed from the area to be graded and should not be incorporated into engineered fill.

Any depressions resulting from removals during grubbing process (trees etc.) shall be observed by the Geotechnical Consultant. Depressions requiring backfill within structural areas will require placement of engineered fill, observed, and tested by the Geotechnical Consultant.

It is our professional opinion that the grading of the site can be performed with conventional earth-moving equipment.

9.2 Remedial Grading for Building Pads

To provide a more uniform bearing for the proposed structure foundations, slab-on-grade, and structural retaining walls and, subsequent to clearing and grubbing of the area to graded, the existing native soils shall be excavated to a depth of eighty-four (84) inches below existing grade or finish grade, whichever is lower. The excavation shall extend a minimum of five (5) feet beyond the limits of the proposed foundations, where obtainable. The bottom of the excavation shall be a level elevation.

The Geotechnical Consultant shall inspect the resulting surfaces prior to scarification and fill placement. A minimum of twenty-four (24) inches of compacted fill is required beneath the proposed foundations.

Subsequent to approval of the resulting surface by the Geotechnical Consultant, the resulting soil surface shall be scarified (ripped) an additional twelve (12) inches, properly moisture conditioned or aerated to near optimum moisture content, and mechanically compacted with heavy compaction equipment to 90% relative compaction as determined by ASTM D 1557 test method. **Compaction shall be verified by testing.**

9.3 Remedial Grading for Flexible (Asphalt-Concrete) and Rigid (PCC) Pavement

Subsequent to clearing and grubbing the area to be graded, the existing native soils shall be excavated twelve (12) inches below existing grade or finish grade, whichever is lower. The exposed surface shall be scarified (ripped) an additional twelve (12) inches. The excavation shall extend a minimum of three (3) feet beyond the limits of the proposed pavement, where obtainable. The Geotechnical Consultant shall inspect the resulting surfaces prior to fill placement.

Subsequent to approval of the resulting surface by the Geotechnical Consultant, the resulting soil surface shall be properly moisture conditioned or aerated to near optimum moisture content, and mechanically compacted with heavy compaction equipment to 90% relative compaction (95% relative compaction beneath proposed PCC pavement in the upper twelve inches) as determined by ASTM D 1557 test method. **Compaction shall be verified by testing**.

9.4 Remedial Grading and Exterior Non-Traffic Bearing Concrete Flatwork (Sidewalks, Patios, Walkways, etc.)

Subsequent to clearing and grubbing the area to be graded, the existing native soils shall be excavated twelve (12) inches below existing grade or finish grade, whichever is lower. The excavation shall extend a minimum of two (2) feet beyond the limits of the proposed flatwork, were obtainable. The Geotechnical Consultant shall inspect the resulting surfaces prior to fill placement.

Subsequent to approval of the resulting surface by the Geotechnical Consultant, the resulting soil surface shall be scarified an additional six (6) inches, properly moisture conditioned or aerated to near optimum moisture content, and mechanically compacted with mechanical compaction equipment to 90% relative compaction as determined by ASTM D 1557 test method. **Compaction shall be verified by testing**.

9.5 Fill Placement and Compaction Requirements

The excavated native soils may be used as engineered fill to backfill the excavation. Materials for engineered fill should be free of organic material, debris, and other deleterious substances, and should not contain rocks greater than eight (8) inches in maximum dimension.

All native soil shall be moisture conditioned or air dried as necessary to achieve near optimum moisture condition, placed in lifts (eight to ten inches, measured loose) and then compacted in place by mechanical compaction equipment to a minimum relative compaction of 90% as determined in accordance with Test Method ASTM D 1557.

All import soil fill (meeting the requirements of Section 10.8) should be placed in eight-inch-thick maximum lifts measured loose, moisture conditioned or air dried as necessary to near optimum moisture condition, and then compacted in place to a minimum relative compaction of 90% as determined in accordance with Test Method ASTM D 1557. **A representative of the project consultant should be present on-site during grading operations to verify proper placement and compaction of all fill, as well as to verify compliance with the other geotechnical recommendations presented herein.**

9.6 Native Soil Shrinkage

A shrinkage factor of the upper site soils is estimated at fifteen to twenty (15-20) percent. This estimate is based on the limited data collected from the subsurface exploration and laboratory test data with an average degree of compaction of 92% and may vary depending on contractor methods.

During compaction, an additional one-half of an inch (1/2”) subsidence of the underlying soil is estimated. Losses from site clearing and grubbing operations mat effect quantity calculations and should be taken into account. Actual shrinkage of the soil may vary.

We recommend monitoring the rough grading excavations by survey with comparison to grading contractor earthwork yardage estimates to determine a closer estimate of actual shrinkage so adjustments (if necessary) may be made during grading.

9.7 Fill Slope Construction and Stability

Provided all material is properly compacted as recommended, fill slopes may be constructed at a 2:1 (horizontal to vertical) gradient or flatter. Permanent cut slopes may be constructed at 2:1 or flatter. Fill slopes constructed as recommended at a slope ratio not exceeding 2:1 (horizontal: vertical), are expected to be both grossly and surficially stable and are expected to remain so under normal conditions.

Proper drainage should be planned so water is not allowed to flow over the tops of slopes. The slopes should be planted as soon as possible to minimize erosion and maintenance.

If slopes are planned steeper than 2:1, the Geotechnical Consultant shall be notified for slope stability determinations.

9.8 Imported Soils

If imported soils are required to complete the planned grading, these soils shall be free of organic matter and deleterious substances, meeting the following criteria:

- 100% passing a 2-inch sieve
- 60% to 100% passing the #4 sieve
- no more than 20% passing a #200 sieve
- expansion index less than 20
- liquid limit less than 35
- plasticity index less than 12
- R-value greater than 40
- Low corrosion potential
    - Soluble Sulfates less than 1,500 ppm
    - Soluble Chlorides less than 150 ppm
    - Minimum Resistivity greater than 8,000 ohm-cm

Prospective import soils should be observed, tested and pre-approved by this firm prior to importing the soils to the site. Final approval of the import soil will be given once the material is on site either in place or adequate quantities to finish the grading.

9.9 Grading Observations and Testing

The grading of the site shall be observed and tested by the Geotechnical Consultant to verify compliance with the recommendations. Any grading performed without full knowledge of the Geotechnical Consultant may render the recommendations of this report invalid.

10.0 POST-GRADING AND DESIGN CONSIDERATIONS

10.1 Pad Drainage

A surface drainage system consisting of a combination of sloped concrete flatwork, swales and sheet flow gradients in landscape areas, and roof gutters and downspouts should be designed for the site. The roof gutters and downspouts should also be tied directly into the proposed area drain system. Drainage from structures should be designed at minimum 5% gradient to approved areas. The purpose of this drainage system will be to reduce water infiltration into the subgrade soils and to direct surface waters away from building foundations, walls and slope areas.

Concrete flatwork surfaces and paved sloped surfaces should be inclined at a minimum gradient of 2% away from the building foundations and similar structures. A minimum twelve-inch-high berm should be maintained along the top of the descending slope to prevent any water from flowing over the slope.

The owner is advised that all irrigation and drainage devices should be properly maintained throughout the lifetime of the development.

10.2 Foundation Design Recommendations

The proposed structure shall be constructed on a conventional concrete foundation system. Provided the recommendations in this report are incorporated into site development, foundation for load bearing walls and interior columns constructed on compacted certified fill may be designed as follows:

10.2.1 Allowable Bearing Capacity

Continuous Foundations Design Values: An allowable "net" bearing capacity of 1,500 psf. can be utilized for dead and sustained live loads. This value includes a minimum safety factor of three (3) and may be increased by one-third (1/3) for total loads, including seismic forces.

Continuous foundations for single and two-story structures should be embedded a minimum of fifteen (15) inches and twenty-four (24) inches below lowest adjacent soil elevation, respectively and be a minimum of fifteen (15) inches in width. Reinforcement shall consist of a minimum of two No. 4 bars, one top and one bottom. Actual depth, width, and reinforcement requirements for continuous foundations will be dependent on the Expansion Index of the bearing soils, applicable sections of the governing building code and requirements of the structural engineer.

The allowable bearing capacity for continuous foundations may be increased by 200 psf. for each additional six inches of foundation depth and 200 psf. for each additional one foot of foundation width. The allowable bearing capacity should not exceed 2,000 psf. for continuous foundations to keep estimated settlements within allowable limits.

Isolated Pad (Column or Pier) Foundations Design Values: An allowable "net" bearing capacity of 1,800 psf can be utilized for dead and sustained live loads. This value includes a minimum safety factor of three (3) and may be increased by one-third (1/3) for total loads, including seismic forces.

Isolated foundations should be a minimum of twenty-four (24) inches square and embedded a minimum of twenty-four (24) inches below lowest adjacent soil elevation. Actual depth, width, and reinforcement requirements for isolated foundations will be dependent on the Expansion Index of the bearing soil, applicable sections of the governing building code and requirements of the structural engineer.

The allowable bearing capacity for continuous foundations may be increased by 150 psf for each additional six (6) inches of foundation depth and 150 psf for each additional one foot of foundation width. The allowable bearing capacity should not exceed 2,300 psf for isolated foundations to keep estimated settlements within allowable limits.

10.2.2 Lateral Load Resistance

Lateral load resistance for the spread footings will be developed by passive soil pressure against sides of footings below grade and by friction acting at the base of the concrete footings bearing on compacted fill. An allowable passive pressure of 300 Z PSF, where Z = Depth (in feet) below finish grade. In passive pressure calculations, the upper one (1) foot of soil should be subtracted from the depth, "Z", unless confined by pavement or slab. An appropriate safety factor should be used for design calculations.

Friction along the foundation base may provide resistance to lateral loading. The coefficient of friction was estimated to be 0.32 for site soils compacted to 90% of the maximum dry density as determined by ASTM D 1557 test method and may be used for dead load forces and includes a reduction factor of one-third (1/3).

For design of building foundations, passive resistance may be combined with frictional resistance provided that a one-third (1/3) reduction in the coefficient of friction is used.

10.2.3 Footing Reinforcement

Reinforcement for concrete footings should be designed by the structural engineer based on the anticipated loading conditions and expansion index of the supporting soil. Preliminary expansion index for the native soil is categorized as "very low" as determined by ASTM D 4829. Footings should be reinforced with a minimum of two (2) No. 4 bars, one (1) top and one (1) bottom.

10.2.4 Footing Observations

All footing trenches should be observed by a representative of the project geotechnical consultant to verify that they have been excavated into competent soils prior to placement of forms, reinforcement, or concrete. The excavations should be trimmed neat, level, and square. All loose, sloughed or moisture-softened soils and/or any construction debris should be removed prior to placing of concrete. **Excavated soils derived from footing and/or utility trenches should not be placed in building slab-on-grade areas or exterior concrete flatwork areas unless the soils are compacted to at least 90 percent of maximum dry density.**

10.2.5 Foundation Setbacks

Footings of structures (including retaining walls) located above a slope having a total height of ten (10) feet or less should have a minimum setback of five (5) feet, measured from the outside edge of the footing bottom along a horizontal line to the face of the slope. For footings above slopes having a total height greater than ten (10) feet, the setback should be, at minimum, equal to one third of the total height of the slope but need not exceed forty (40) feet. Refer to CBC Section 1804.

10.3 RETAINING WALLS AND STRUCTURES BELOW GRADE

The project may include shallow retaining walls or walls below grade (i.e., loading docks, light standards, flagpoles, or similar structures supporting soil materials. These walls are anticipated to be shallow (i.e., approximately 10 feet or less in height). Design lateral earth pressures, backfill criteria, and drainage recommendations for walls below grade are presented.

10.3.1 Lateral Earth Pressures

	Driving Earth Pressure*	Resisting Earth Pressure*
Well-Drained Soil	34	300***
Well-Drained Soil (2:1 Backfill)	60	
At-Rest (Restrained Wall)	55**	

*Equivalent fluid pressure (PSF) per foot of soil height

**For design purposes, a wall is considered restrained if it prevented from movement greater than 0.002H (H= height of wall in feet) at the top of the wall.

***The upper one foot of soil should be subtracted from the depth, “Z”, unless confined by pavement or slab. This is an ultimate value.

Note: The pressures recommended above are based on the assumption that the backfill will be compacted to 90% of the maximum dry density. The use of select may lower the recommended driving earth pressure. The revisiting pressure

provided is an ultimate value. An appropriate factor of safety is recommended.

Friction acting along the base of the foundation may provide resistance to lateral loading. The coefficient of friction is estimated to be 0.32 for native soils compacted to 90% of the maximum dry density, and may be used with dead loads. This value may be increased by one-third (1/3) for total loads, including seismic forces. Frictional and passive resistance may be combined without reduction.

The above values are for retaining walls that have been supplied with a proper sub-drain system. All walls should be designed to support any adjacent structural surcharge loads imposed by other nearby walls, footings or vehicular traffic within a distance approximately equal to the height of the wall.

Retaining walls over six (6) feet in height may need to be designed for a seismic load force that is applied to the static forces when the seismic shaking occurs. The geotechnical consultant should be contacted for retaining walls over six (6) feet in height.

10.3.2 Wall Backfill

Backfill behind shallow retaining walls or walls below grade should consist of non-expansive granular materials. Wall backfill should not contain organic material, rubble, debris, and rocks or cemented fragments larger than three (3) inches in greatest dimension. In the case where no shoring was used, the granular backfill should extend outward from the base of the wall to ground surface at a 1:1 (horizontal: vertical) slope. The geotechnical consultant should be allowed the opportunity to sample and test and comment about the adequacy of the proposed imported backfill material once adequate quantities to complete the project are on site.

Backfill should be placed in lifts not exceeding eight to ten (8 – 10) inches in thickness measured loose, moisture conditioned to above optimum moisture content and mechanically compacted with hand-operated equipment to minimum 90% of the maximum dry density as determined by ASTM D 1557. Walls below grade that are not free to deflect should be properly braced prior to placement and compaction of backfill. **Compaction should be verified by testing.**

10.3.3 Drainage and Waterproofing

It is recommended that waterproofing be provided behind the retaining walls to help reduce efflorescent formation.

Walls designed for drained earth pressures shall have adequate drainage provided behind the walls. Sub-drains or weep holes at the base of the walls shall be incorporated into design. Wall back-drains shall be designed by a registered Civil Engineer.

11.0 CORROSION AND CHEMICAL ATTACK

Soluble sulfate, pH, resistivity and chloride concentration test results are presented in Appendix B. The Resistivity (CTM 643) test results on a bulk soil sample from the site indicated that on-site soils are **severely corrosive** when in contact with ferrous material (<500 ohm-cm). Corrosion test results also indicate that the surficial soils at the site have a sulfate attack potential of 0.1148% by weight on concrete (Exposure Category S1).

Based on the preliminary chemical analysis performed on a sample of the native soil, foundation concrete shall consist of Type II cement with a minimum compressive strength of 4,000 psi and maximum water-cement ratio of 0.50 as indicated in the ACI 318 Table 19.3.2.1.

A higher compressive strength may be required by the structural engineer. Additional soil chemical analysis during grading is recommended. The minimum concrete compressive strength should be determined by the structural engineer.

The chemical test results should be distributed to the project design team for their interpretations pertaining to the corrosivity or reactivity of the construction materials (ferrous metals, and piping).

12.0 EXCAVATIONS

It is Bruin GSI's opinion that standard construction techniques should be sufficient for site excavations. All excavations should be made in accordance with applicable regulations, including CAL/OSHA for and OSHA type "C" soil. Project safety is the contractor's responsibility and the owner. Bruin GSI will not be responsible for project safety.

The attention of contractors, particularly the underground contractors, should be drawn to the State of California Construction Safety Orders for "Excavations, Trenches, and

Earthwork." Trenches or excavations greater than five (5) feet in depth should be shored or sloped back in accordance with OSHA Regulations prior to entry.

Open excavations, un-shored or un-surcharged (above the groundwater level) may be cut vertically to a maximum depth of no more than five (5) feet. Excavations higher than five (5) feet should be sloped back at a minimum 1.5:1 (horizontal to vertical) slope or flatter or shored. Sloughing will occur if the soil is dry or dries our while open. No excavation should be made within a 1:1 line projected outward from the toe of any existing foundation or structure.

No heavy equipment or other surcharge loads (i.e., excavation spoils) should be allowed within the top of slope a distance equal to the depth of the excavation, both measured from the top of the excavation.

Soil backfill around foundations or behind walls below grade should be placed in lifts not exceeding eight to ten inches, measured loose, moisture conditioned to near optimum moisture content and uniformly mechanically compacted to minimum 90% relative compaction as determined by ASTM D 1557 test method. Flooding or jetting is not recommended.

13.0 UTILITY TRENCHES AND BACKFILL

Standard construction techniques should be sufficient for site utility trench excavations. Utility trenches often settle even when backfill is placed under optimum conditions.

Trench backfill shall be moisture conditioned to near optimum moisture content, placed in lifts not exceeding eight to ten inches, measured loose, and uniformly compacted to minimum 90% of the maximum dry density with mechanical compaction equipment. **No flooding or jetting is recommended.**

Backfill of public utilities within road right-of-ways or on the subject site should be placed in strict conformance with the requirements of the governing agency. As a minimum it is recommended that utility trench backfill should be moisture conditioned to near optimum moisture content, placed in lifts not exceeding eight to ten (8-10) inches, measured loose, (depending on means of compaction) and uniformly compacted to minimum 90% of the maximum dry density with mechanical compaction equipment. If aggregate base is used for backfill material, it should be moisture conditioned to near optimum moisture content, placed in eight to ten inch lifts, measured loose, and uniformly compacted to minimum 95% of the maximum dry density using mechanical compaction equipment. **Compaction should be verified by testing.**

For purposes of this section of the report, “bedding” is defined as material placed in a trench up to one (1) foot above a utility pipe, and “backfill” is all material placed in the trench above the bedding. Unless concrete bedding is required around utility pipes, free-draining sand should be used as bedding. Sand proposed for use as bedding should be tested in our laboratory to verify its suitability and measure its compaction characteristics. **Sand bedding should be compacted by mechanical means to achieve at least 90% relative compaction based on ASTM D 1557.**

Backfill operations should be observed and tested by the Geotechnical Consultant to monitor compliance with these recommendations.

Where utility trenches enter the footprint of the building, trenches should be backfilled through their entire depths with on-site fill materials, sand-cement slurry, or concrete rather than with any sand or gravel shading. This “Plug” of less- or non-permeable materials will mitigate the potential for water to migrate though the backfilled trenches from outside of the building to the areas beneath the foundations and floor slabs.

The backfill soil should be moisture conditioned to near optimum moisture content, placed in lifts not exceeding eight to ten inches (8-10), measured loose, (depending on means of compaction) and uniformly compacted to minimum 90% of the maximum dry density with mechanical compaction equipment.

14.0 INTERIOR CONCRETE SLAB-ON-GRADE

It should be understood that as a manufactured product, concrete will crack even under ideal conditions. It is our experience that shrinkage is more pronounced in the Antelope Valley due to environmental conditions (high winds, daily extreme temperature differences and low humidity). Appropriate mix designs, placement procedures and concrete curing methods should be planned and implemented during construction in order to reduce the occurrence and magnitude of concrete shrinkage cracking.

Interior slab-on-grade construction should be supported by compacted soil, prepared as recommended in the “Remedial Grading for Proposed Building Pad(s)” Section of this report.

14.1 Vapor Barrier and Water Proofing

It is recommended that a vapor retarded/waterproofing be placed below the concrete slab on grade. Vapor/moisture transmission through slabs does occur and can impact various components of the structure.

Vapor retarded/waterproofing designing and inspection of installation is not the responsibility of the geotechnical engineer (most often the responsibility of the architect). Bruin Geotechnical Services, Inc. does not practice in the field of water and moisture vapor transmission evaluation/mitigation. Therefore, we recommend that a qualified person/firm be engaged/consulted to evaluate the general and specific water and moisture vapor transmission paths and any impact on the proposed development. This person/firm should provide recommendations for mitigation of potential adverse impact of water and moisture vapor transmission on various components of the structure as deemed necessary. The actual waterproofing design shall be provided by the architect, structural engineer, or contractor with experience in waterproofing.

In order to promote good building practices and alert the rest of the design/construction team of the appropriate standards and expect recommendations pertaining to vapor barriers/retarders, engineers (especially those aware of the issues surrounding blow-slab moisture protection and its effect on the success of their projects) should consider recommending and citing specific performance characteristics. The following paragraph includes criteria from the latest standards and expert recommendations and should be considered for use in your firm's own recommendations:

Vapor barrier shall consist of a minimum 15 mil extruded polyolefin plastic (no recycled content of woven materials permitted). Permeance as tested before and after mandatory conditions (ASTM E 17455 Section 7.1 and Sub-Paragraph 7.1.1-7.1.5): less than 0.01 perms [grains/(ft^2-hr-inHg)] and comply with the ASTM E1745 Class A requirements. Install vapor barrier according to ASTM E1643, including proper perimeter seal. Basis of design: Stego Wrap Vapor Barrier 15 mil and Stego Crete Claw Tape (perimeter seal tape). Approved Alternatives: Vaporguard by Reef Industries, Sundance 15 mil Vapor Barrier by Sundance Inc.

14.2 Thickness and Joint Spacing

Concrete slab-on-grade should be at least four (4) inches thick and provided with frequent construction joints or expansion joints. The slab-on-grade should have a minimum compressive strength of 2,500 psi at 28 days. More stringent requirements may be required by the structural engineer.

14.3 Reinforcement

Reinforcement of the slab-on-grade is contingent on the structural engineer's recommendations and the Expansion Index of the supporting soil. As a minimum, reinforcement should consist of No. 4 bars spaced sixteen (16) inches on center, both ways. The reinforcement should be positioned near the middle of the slabs by

means of concrete chairs or brick. Additional reinforcement may be required by the structural engineer.

14.4 Subgrade Preparation

As further measure to minimize cracking of concrete flatwork, the subgrade soils and all utility line trenches below concrete slab-on-grade areas should first be compacted to a minimum relative compaction of **90%** and then thoroughly moistened to achieve a moisture content that is near optimum moisture content. **A representative of the project geotechnical consultant should observe and verify the density and moisture content of the soils, and the depth or moisture penetration prior to pouring concrete.**

15.0 EXTERIOR CONCRETE FLATWORK (PATIOS, WALKWAYS, SIDEWALKS, etc.)

It should be understood that as a manufactured product, concrete will crack even under ideal conditions. It is our experience that shrinkage is more pronounced in the Antelope Valley due to environmental conditions (high winds, daily extreme temperature differences and low humidity). Appropriate mix designs, placement procedures and concrete curing methods should be planned and implemented during construction in order to reduce the occurrence and magnitude of concrete shrinkage cracking.

Exterior slab-on-grade construction should be supported by compacted soil, prepared as recommended in the "Remedial Grading and Exterior Non-Traffic Bearing Concrete" Section of this report. At locations where slabs cross trenches, observation and testing of trench backfill should be performed to confirm uniformity of conditions.

15.1 Thickness and Joint Spacing

To reduce the potential of unsightly cracking, concrete sidewalks, patio-type slabs should be at least four (4) inches thick and provided with frequent construction joints or expansion joints, especially at area of re-entrant corners, to help control cracking. Exterior perimeter slabs should be designed relatively independent of the foundation stems (free-floating) to help cracking due to settlement and/or expansion.

15.2 Reinforcement

Reinforcement of the exterior slab-on-grade is contingent on the structural engineer's recommendations and the Expansion Index of the supporting soil. As a minimum, reinforcement should consist of No. 3 bars spaced twenty-four (24) inches on center, both ways. The reinforcement should be positioned near the

middle of the slabs by means of concrete chairs or brick. Additional reinforcement may be required by the structural engineer.

15.3 Subgrade Preparation

As further measure to minimize cracking of concrete flatwork, the subgrade soils below concrete flatwork areas should first be compacted to a minimum relative compaction of 90% and then thoroughly moistened to achieve a moisture content that is near optimum moisture content. Pre-wetting of the soils to a depth of six (6) inches a maximum of 24-hours prior to concrete placement will promote uniform curing of the concrete and minimize the development of shrinkage cracks. **A representative of the project geotechnical consultant should observe and verify the density and moisture content of the soils, and the depth or moisture penetration a maximum of 24-hours prior to pouring concrete.**

16.0 RIGID (PCC) PAVEMENT

It should be understood that as a manufactured product, concrete will crack even under ideal conditions. It is our experience that shrinkage is more pronounced in the Antelope Valley due to environmental conditions (high winds, daily extreme temperature differences and low humidity). Appropriate mix designs, placement procedures and concrete curing methods should be planned and implemented during construction in order to reduce the occurrence and magnitude of concrete shrinkage cracking.

Exterior slab-on-grade construction should be supported by compacted soil, prepared as recommended in "Remedial Grading for Flexible (Asphalt-Concrete) and Rigid PCC Pavement" section of this report. At locations where slabs cross trenches, observation and testing of trench backfill should be performed to confirm uniformity of conditions.

16.1 Thickness and Joint Spacing

To reduce the potential of unsightly cracking, rigid concrete pavement should be at least four inches thick and provided with frequent construction joints or expansion joints, especially at area of re-entrant corners, to help control cracking. Perimeter pavement should be designed relatively independent of the foundation stems (free-floating) to help cracking due to settlement and/or expansion.

16.2 Reinforcement

Reinforcement of the exterior pavement is contingent on the structural engineer's recommendations and the Expansion Index of the supporting soil. As a minimum, reinforcement should consist of No. 3 bars spaced twenty-four (24) inches on

center, both ways. The reinforcement should be positioned near the middle of the slabs by means of concrete chairs or brick. Additional reinforcement may be required by the structural engineer.

16.3 Subgrade Preparation

As further measure to minimize cracking of concrete flatwork, the upper twelve inches of subgrade soils below concrete flatwork areas should first be compacted to a minimum relative compaction of **95%** and then thoroughly moistened to achieve a moisture content that is near optimum moisture content. Pre-wetting of the soils to a depth of six (6) inches a maximum of 24-hours prior to concrete placement will promote uniform curing of the concrete and minimize the development of shrinkage cracks. **A representative of the project geotechnical consultant should observe and verify the density and moisture content of the soils, and the depth or moisture penetration a maximum of 24-hours prior to pouring concrete.**

17.0 PRELIMINARY FLEXIBLE PAVEMENT DESIGN

Asphalt-concrete pavements shall be designed per the Caltrans Highway Design Manual based on R-Value and Traffic Index. An R-value of the native soil of 60 was utilized for the preliminary structural pavement section. During grading as soils are mixed, soil samples should be obtained and tested for R-Value determination.

For pavement design, the preliminary flexible pavement layer thickness is as follows:

RECOMMENDED ASPHALT PAVEMENT SECTION LAYER THICKNESS

Pavement Material	Recommended Thickness (TI = 5.0) Residential
Asphalt Concrete	3.5”
Class II Aggregate Base	5.0”
Compacted Subgrade	24”

Pavement Material	Recommended Thickness (TI = 9.0) Secondary Arterial
Asphalt Concrete	5.0”
Class II Aggregate Base	9.0”
Compacted Subgrade	24”

Pavement Material	Recommended Thickness (TI = 10.0) Major Arterial
Asphalt Concrete	5.0”
Class II Aggregate Base	10.0”
Compacted Subgrade	24”

Asphalt concrete should conform to Sections 203 and 302 of the latest edition of the Standard Specifications for Public Works Construction (“Greenbook”).

Class II aggregate base should conform to Section 26 of the Caltrans Standard Specifications, latest edition. The aggregate base and sub-base material should be compacted to at least 95 percent of the maximum dry density as determined by ASTM Method D 1557.

18.0 CONSTRUCTION CONSIDERATIONS

Based on our field exploration program, earthwork can be performed with conventional construction equipment.

18.1 Temporary Dewatering

Groundwater was not encountered in any of our borings to the maximum depth of our explorations. Based on the anticipated excavation depths, the need for temporary dewatering is considered low.

18.2 Construction Slopes

Excavations during construction should be conducted so that slope failure and excessive ground movement will not occur. The short-term stability of excavation depends on many factors, including slope angle, engineering characteristics of the subsoils, height of the excavation and length of time the excavation remains unsupported and exposed to equipment vibrations, rainfall, and desiccation.

Where spacing permits, and providing that adjacent facilities are adequately supported, open excavations may be considered. In general, unsupported slopes for temporary construction excavations should not be expected to stand at an inclination steeper than 1:1 (horizontal: vertical). The temporary excavation side walls may be cut vertically to a height of three (3) feet and then laid back at a 1:1 slope ratio above a height of three (3) feet.

Surcharge loads (equipment, spoil piles, etc.) should be kept away from the top of temporary excavations a horizontal distance equal to the depth of excavation.

Surface drainage should be controlled along the top of temporary excavations to preclude wetting of the soils and erosion of the excavation faces. Even with the implementation of the above recommendations, sloughing of the surface of the temporary excavations may still occur, and workmen should be adequately protected from such sloughing.

18.3 Temporary Shoring

If shoring is considered, Bruin GSI should be notified in order to provide appropriate design parameters.

19.0 ADDITIONAL SERVICES

Final project plans and specifications should be reviewed prior to construction to confirm that the full intent of the recommendations presented herein have been applied to design and construction. This report is based on the assumption that an adequate testing and inspection program along with client consultation will be performed during final design and construction phases to verify compliance with the recommendations of this report.

Retaining Bruin GSI as the geotechnical consultant to provide additional services from preliminary design through project completion will assure continuity of services.

Additional services include:

- Consultation during design stages of the project.
- Review, stamp, and signature of the grading and building plans.
- Observation and testing during rough grading, fine grading and trench backfill as well as placement of engineered fill.
- Consultation as required during construction.

Cost estimates can be prepared if requested. Please contact our office.

20.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report is based on the development plans provided to our office. If structure design changes or structure locations changes occur, the conclusion and recommendations in this report may not be considered valid unless the changes are reviewed, and the conclusions of this report are modified or approved by the Geotechnical Consultant.

The subsurface conditions and characteristics described herein have been projected from individual borings or test pits placed across the subject property. Actual variations in the subsurface conditions and characteristics may occur.

If conditions encountered during construction differ from those described in this report, this office should be notified so as to consider the necessity for modifications. No responsibility for construction compliance with the design concepts, specifications, or recommendations is assumed unless on-site construction review is performed during the course of construction, which pertains to the specific recommendations contained herein.

It is recommended that Bruin GSI be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design specifications. If Bruin GSI is not accorded the privilege of making this recommended review, Bruin GSI can assume no responsibility for misinterpretation of the recommendations contained in this report.

This report has been prepared in accordance with generally accepted practice and standards in this community at this time. No warranties, either expressed or implied, are made as to the professional advice provided under the terms of the agreement and included in this report. This report has been prepared for the exclusive use of Mr. Carlos Ramirez and their authorized agents. Unauthorized reproduction of any portion of this report without expressed written permission is prohibited.

If parties other than Bruin GSI are engaged to provide construction geotechnical services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project by concurring with the findings and recommendations in this report or providing alternate recommendations.

21.0 CLOSURE

The conclusions, recommendations, and opinions presented herein are: (1) based upon our evaluation and interpretations of the limited data obtained from our field and laboratory programs; (2) based upon an interpolation of soil conditions between and beyond the borings; (3) are subject to confirmation of the actual conditions encountered during construction; and, (4) are based upon the assumption that sufficient observation and testing will be provided during the grading, infrastructure installation and building phases of site development.

APPENDIX A

Boring Logs and Classification Key

	Date(s) drilled	**5/12/2023**	**LOG OF BORING 1**
	Drilling Contractor	**GP Drilling**	**Page 1 of 1**
	Drilling Method	**Hollow Stem Auger**	
	Drill Rig Type	**CME 75**	Logged By: **SF**
	Drill Bit Size/Type	**8"**	Checked By: **MS**
	Sampling Method(s)	**SPT**	Total Depth of Borehole **20' BGS**
Client: **Duke Engineering**	Groundwater	**None Encountered**	Boring Location: **See Figure 2**
Project Number: 23-197	Borehole Backfill	**Native/ Cuttings**	Notes:
Project Location: Palmdale	Hammer Data	**140#, 30" drop**	

Depth	Sample	USCS	Graphic Log	Material Description	Penetration Resistance (Blows/6")	Dry Unit Weight pcf	Water Content %
		ML		Light brown fine sandy silt Loose, dry	3-4	DIST	6.1
		SM		Light brown silty fine to medium sand Loose, slightly moist	4-4	99.7	5.3
5'							
		SM		Light brown silty fine to coarse sand w/ clay binder Medium dense, slightly moist	8-11	96.3	11.9
		SM		Light brown silty fine to coarse sand w/ clay binder Medium dense, slightly moist	6-10	104.3	5.8
10'							
		ML		Light brown sandy silt w/ clay Medium dense, moist	4-8	122.8	16
15'		SM		Reddish brown silty fine to medium sand w/ occ. coarse sand Very dense, wet	6-54	122.4	11.4
20'		SM		Reddish brown silty fine to coarse sand w/ occ. #4 gravel	NR	NR	NR
				Refusal @ 20' bgs - Very dense soil (cemented) No groundwater No caving			
25'				NR = No recovery			
30'							

Date(s) drilled	**5/12/2023**	**LOG OF BORING 2**	
Drilling Contractor	**GP Drilling**	**Page 1 of 1**	
Drilling Method	**Hollow Stem Auger**		
Drill Rig Type	**CME 75**	Logged By:	**SF**
Drill Bit Size/Type	**8"**	Checked By:	**MS**
Sampling Method(s)	**SPT**	Total Depth of Borehole	**20' BGS**
Client: **Duke Engineering**	Groundwater	**None Encountered**	Boring Location: **See Figure 2**
Project Number 23-197	Borehole Backfill	**Native/ Cuttings**	Notes:
Project Location Palmdale	Hammer Data	**140#, 30" drop**	

Depth	Sample	USCS	Graphic Log	Material Description	Penetration Resistance (Blows/6")	Dry Unit Weight pcf	Water Content %
		SM		Grey silty fine to coarse sand w/ clay binder (very cemented)	19-26	104.5	15.3
				Dense, slightly moist			
		ML		Grey fine to medium silt w/ clay binder (cemented)	17-21	97.3	19.1
5'				Very dense, slightly moist			
		SM/ML		Grey silty fine to medium sand w/ clay binder (cemented)	18-56	119.5	7.0
				Very dense, slightly moist			
		ML		Grey fine to medium sandy silt (cemented)	50/6"	119.2	6.6
				Very dense, slightly moist			
10'		ML		Grey fine to medium sandy silt (cemented)	50/6"	112.3	5.0
				Very dense, slightly moist			
		SM		Grey slightly silty fine to coarse sand	50/6"	117.6	4.0
				Very dense, slightly moist			
15'		SM		Grey slightly silty fine to coarse sand		120.8	11.1
				Very dense, slightly moist			
20'		SM		Grey very silty fine to medium sand w/ slight coarse sand & occ. #4 gravel (cemented)		DIST	4.0
				Very dense, slightly moist			
				Boring terminated @ 20' bgs			
				No groundwater			
25'				No caving			
30'							

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Date(s) drilled	**5/12/2023**	**LOG OF BORING 3**	
Drilling Contractor	**GP Drilling**	**Page 1 of 1**	
Drilling Method	**Hollow Stem Auger**		
Drill Rig Type	**CME 75**	Logged By:	**SF**
Drill Bit Size/Type	**8"**	Checked By:	**MS**
Sampling Method(s)	**SPT**	Total Depth of Borehole	**15' BGS**
Client: **Duke Engineering**	Groundwater	**None Encountered**	Boring Location: **See Figure 2**
Project Number 23-197	Borehole Backfill	**Native/ Cuttings**	Notes:
Project Location Palmdale	Hammer Data	**140#, 30" drop**	

Depth	Sample	USCS	Graphic Log	Material Description	Penetration Resistance (Blows/6")	Dry Unit Weight pcf	Water Content %
	■	SP		Light brown silty fine to coarse sand	4-4	104.7	6.7
				Loose, slightly moist			
	■	SP		Light brown silty fine to coarse sand	3-3	102.1	6.2
				Very dense, slightly moist			
5'	■	ML		Yellowish brown fine to medium sandy silt w/ coarse sand	4-5	104.4	5.4
				Loose, slightly moist			
	■	SM		Reddish brown silty fine to medium sand w/ coarse sand	5-8	109.3	4.1
				Medium dense. Slightly moist			
10'	■	ML		Reddish brown fine to medium sandy silt (cemented)	4-6	95.7	7.3
				Medium dense, slightly moist			
15'	■	SM		Reddish brown silty fine to medium sand w/ slight coarse sand	50/3"	DIST	2.8
				Very dense, slightly moist			
				Boring terminated @ 15' bgs			
				No groundwater			
20'				No caving			
25'							
30'							

Date(s) drilled	**5/12/2023**	**LOG OF BORING 4**	
Drilling Contractor	**GP Drilling**	**Page 1 of 1**	
Drilling Method	**Hollow Stem Auger**		
Drill Rig Type	**CME 75**	Logged By:	**SF**
Drill Bit Size/Type	**8"**	Checked By:	**MS**
Sampling Method(s)	**SPT**	Total Depth of Borehole	**20' BGS**
Client: **Duke Engineering**	Groundwater	**19' BGS**	Boring Location: **See Figure 2**
Project Number 23-197	Borehole Backfill	**Native/ Cuttings**	Notes:
Project Location Palmdale	Hammer Data	**140#, 30" drop**	

Depth	Sample	USCS	Graphic Log	Material Description	Penetration Resistance (Blows/6")	Dry Unit Weight pcf	Water Content %
		SM		Yellowish brown silty fine to medium sand w/ coarse sand & occ. #4 gravel Medium dense, slightly moist	3-4-7		4.6
5'		SM		Yellowish brown silty fine to medium sand w/ coarse sand Medium dense, slightly moist	4-5-6		13.7
		ML		Yellowish brown fine to medium sandy silt w/ slight coarse sand Medium dense, slightly moist	6-8-8		11.8
10'		SM		Yellowish brown silty fine to medium sand w/ coarse sand Medium dense, slightly moist	3-5-6		11.9
		ML/SM		Yellowish brown ver silty fine to medium sand w/ coarse sand (slightly cemented) Medium dense, slightly moist	5-6-6		10.5
15'		ML		Brown fine to medium sandy silt w/ clay binder & occ. coarse sand to #4 gravel Medium dense, slightly moist	3-6-7		15.7
			∇	Groundwater Encountered @ 19' BGS			
20'		SP		Yellowish brown fine to coarse sand w/ silt medium dense, wet	7-9-9		13.7
25'				Boring terminated @ 20' BGS Groundwater Encountered @ 19' BGS No caving			
30'							

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Date(s) drilled	**5/12/2023**	**LOG OF BORING 5**	
Drilling Contractor	**GP Drilling**	**Page 1 of 1**	
Drilling Method	**Hollow Stem Auger**		
Drill Rig Type	**CME 75**	Logged By:	**SF**
Drill Bit Size/Type	**8"**	Checked By:	**MS**
Sampling Method(s)	**SPT**	Total Depth of Borehole	**18' BGS**
Client: **Duke Engineering**	Groundwater	**None Encountered**	Boring Location: **See Figure 2**
Project Number 23-197	Borehole Backfill	**Native/ Cuttings**	Notes:
Project Location Palmdale	Hammer Data	**140#, 30" drop**	

Depth	Sample	USCS	Graphic Log	Material Description	Penetration Resistance (Blows/6")	Dry Unit Weight pcf	Water Content %
		SM		Brown very silty fine to medium sand w/ occ. coarse sand to #4 gravel	2-2-2		6.1
				Loose, slightly moist			
		SM		Yellowish silty fine to medium sand w/ coarse sand	3-4-4		6.3
				Loose, slightly moist			
5'							
		SM		Reddish brown silty fine to medium sand w/ coarse sand	3-3-4		10.6
				Loose, slightly moist			
		ML		Reddish brown fine to coarse sandy silt w/ clay binder (slightly cemented)	7-10-10		15.3
				Medium dense, slightly moist			
10'		SM/ML		Reddish brown very silty fine to coarse sand w/ clay binder (slightly cemented)	7-6-6		14.5
				Medium dense, slightly moist			
		SM		Light reddish brown silty fine to medium sand w/ occ. Coarse sand	26-50-1		5.7
				Very dense, slightly moist			
15'		SM		Pale brown silty fine to coarse sand w/ occ #4 - 3/8" gravel (slightly cemented)	50-4-5		3.5
				Very dense, slightly moist			
		SM		Pale brown slightly silty fine to coarse sand (slightly cemented)	NR		1.9
				Very dense, slightly moist			
20'							
				Refusal at 18' BGS - Very dense soil (cemented)			
				Boring terminated @ 18' BGS			
				No groundwater			
				No caving			
25'							
30'							

Date(s) drilled	**5/12/2023**	**LOG OF BORING 6**	
Drilling Contractor	**GP Drilling**	**Page 1 of 1**	
Drilling Method	**Hollow Stem Auger**		
Drill Rig Type	**CME 75**	Logged By:	**SF**
Drill Bit Size/Type	**8"**	Checked By:	**MS**
Sampling Method(s)	**SPT**	Total Depth of Borehole	**15' BGS**
Client: **Duke Engineering**	Groundwater	**None Encountered**	Boring Location: **See Figure 2**
Project Number 23-197	Borehole Backfill	**Native/ Cuttings**	Notes:
Project Location Palmdale	Hammer Data	**140#, 30" drop**	

Depth	Sample	USCS	Graphic Log	Material Description	Penetration Resistance (Blows/6")	Dry Unit Weight pcf	Water Content %
		ML		Brown fine to medium sandy silt w/ coarse sand Loose, slightly moist	3-5	106.5	6.3
5'		SM/SP		Yellowish brown silty fine to coarse sand w/ occ. #4 gravel Loose, slightly moist	5-7	112.9	8.6
		ML		Pale brown fine to medium sandy silt w/ coarse sand Medium dense, slightly moist	6-9	99.6	6.2
		ML		Pale brown fine to medium sandy silt w/ coarse sand Medium dense, slightly moist	7-10	100.1	5.8
10'		SM		Brown silty fine to medium sand w/ coarse sand Medium dense, slightly moist	8-8	101.5	7.1
15'		SM		Brown silty fine to medium sand w/ coarse sand (cemented) Medium dense, slightly moist	9-13	116.8	11.0
20'				Boring terminated @ 15' bgs No groundwater No caving			
25'							
30'							

BRUIN GEOTECHNICAL SERVICES, INC.

GEOTECHNICAL REPORTS | MATERIAL TESTING | CONSTRUCTION INSPECTION

SOIL CLASSIFICATION KEY

MAJOR DIVISIONS			SYMBOL		TYPICAL NAMES
Coarse Grained Soils 50% or more larger than #200 sieve	**Gravels** More than half coarse-fraction is larger than No. 4 sieve size	Clean gravels with little or no fines	GW		Well graded gravels, gravel-sand mixtures
			GP		Poorly graded gravels, gravel-sand mixtures
		Gravel with over 12% fines	GM		Silty gravels, poorly graded gravel-sand-silt mixtures
			GC		Clayey gravels, poorly graded gravel-sand-clay mixtures
	Sands More than half coarse-fraction is smaller than No. 4 sieve size	Clean sands with little or no fines	SW		Well graded sands, gravelly sands
			SP		Poorly graded sands, gravelly sands
		Sands with over 12% fines	SM		Silty sands, poorly graded sand-silt mixtures
			SC		Clayey sands, poorly graded sand-clay mixtures
Fine Grained Soils 50% or more smaller than #200 sieve	**Silts and Clays** Liquid limit less than 50		ML		Inorganic silts, rock flour, clayey silts
			CL		Inorganic clays of low to medium plasticity, sandy clays, silty clays
			OL		Organic clays and organic silty clays of low plasticity
	Silts and Clays Liquid limit greater than 50		MH		Inorganic silts, micaceous or diatomaceous fine sandy/silty soils, elastic silts
			CH		Inorganic clays with high plasticity, fat clays
			OH		Organic clays of medium to high plasticity, organic silts
Highly Organic Soils			Pt		Peat and other highly organic soils

CLASSIFICATION SYSTEM BASED ON THE UNIFIED SOIL CLASSIFICATION SYSTEM

Boring Log Key

Depth	Sample	USCS	Graphic Log	Material Description	Penetration Resistance (Blows/6")	Dry Unit Weight pcf	Water Content %
1	2	3	4	5	6	7	8

COLUMN DESCRIPTIONS

1	Depth in feet below the ground surface
2	Sampling Method see "symbols" below
3	USCS symbol
4	Graphic depiction of the subsurface material
5	Description of the material encountered. May include consistency, moisture, color, and other descriptors
6	Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval
7	Dry weight per unit volume of soil sample measured in laboratory units in pounds per cubic foot
8	Water content of the sample expressed as a percentage of the dry weight of the sample

ABBREVIATIONS

DIST = Disturbed Sample
N/R = No Recovery
CHEM = Chemical Test
N/A = Not Analyzed

SAMPLING METHOD SYMBOLS


California Split Spoon (CSS)


Standard Penetration Test (SPT)


Bulk Sample


Grab Sample

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.

2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

APPENDIX B

Laboratory Test Data

SUMMARY OF LABORATORY TEST RESULTS

SIEVE ANALYSIS

Percent passing individual sieves

Sample I.D.	1/2"	3/8"	#4	#10	#40	#100	#200
B1@1	99	99	97	91	81	71	66
B5@1		100	99	95	71	52	43
B4@2		100	99	96	74	53	44
B5@3		100	99	96	73	52	44
B4@7		100	99	96	79	63	57
B2@8		100	99	96	78	62	56
B5@8			100	98	83	69	64
B2@10		100	99	994	67	46	37
B4@11	99	99	98	94	72	57	52
B2@12			100	98	70	45	38
B1@15		100	99	91	55	37	32
B3@15			100	96	53	30	25
B4@15		100	98	95	81	70	64
B5@15	96	95	90	84	49	28	22
B2@20	99	98	95	92	71	49	40

SAND EQUIVALENT

Sample I.D.	Sand Equivalent
B3@5	26
B3@7	42

EXPANSION INDEX

Sample I.D.	Expansion Index	Classification
B1@0-5’	0	Non-Expansive

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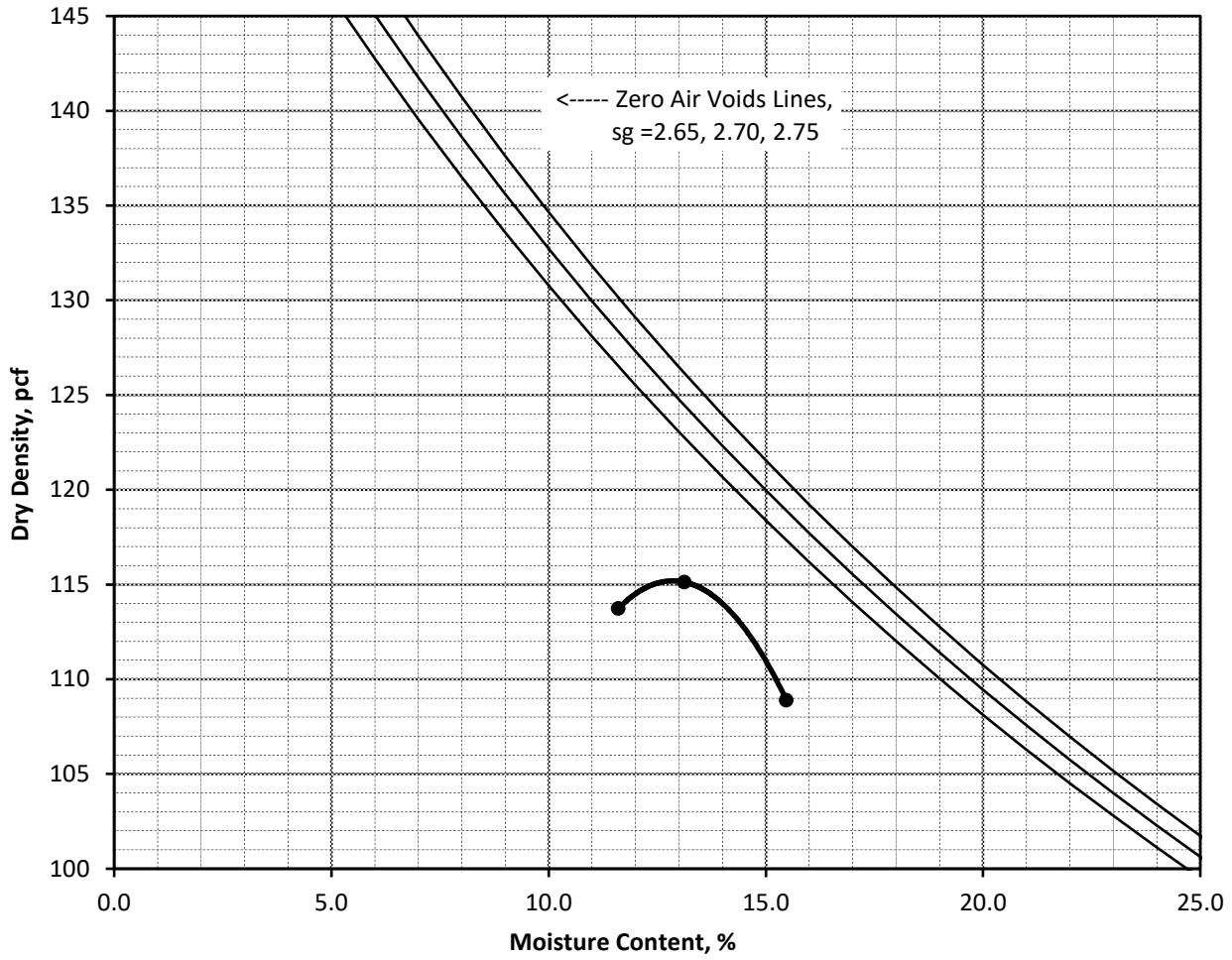
44732 Yucca Avenue
Lancaster, CA 93534
661-273-9078

Maximum Density/Optimum Moisture Proctor ASTM D698/D1557

Job Number:	23-197	
Client:	Duke-Ramirez	ASTM D 1557 A
Sample ID:	Bulk Sample 0-5' BGS	Rammer Type: 10#
Sample Location:	B2	
Description:	Grey very silty fine to coarse sand w/ clay	

Maximum Density:	**115.0**
Optimum Moisture:	**13.0**



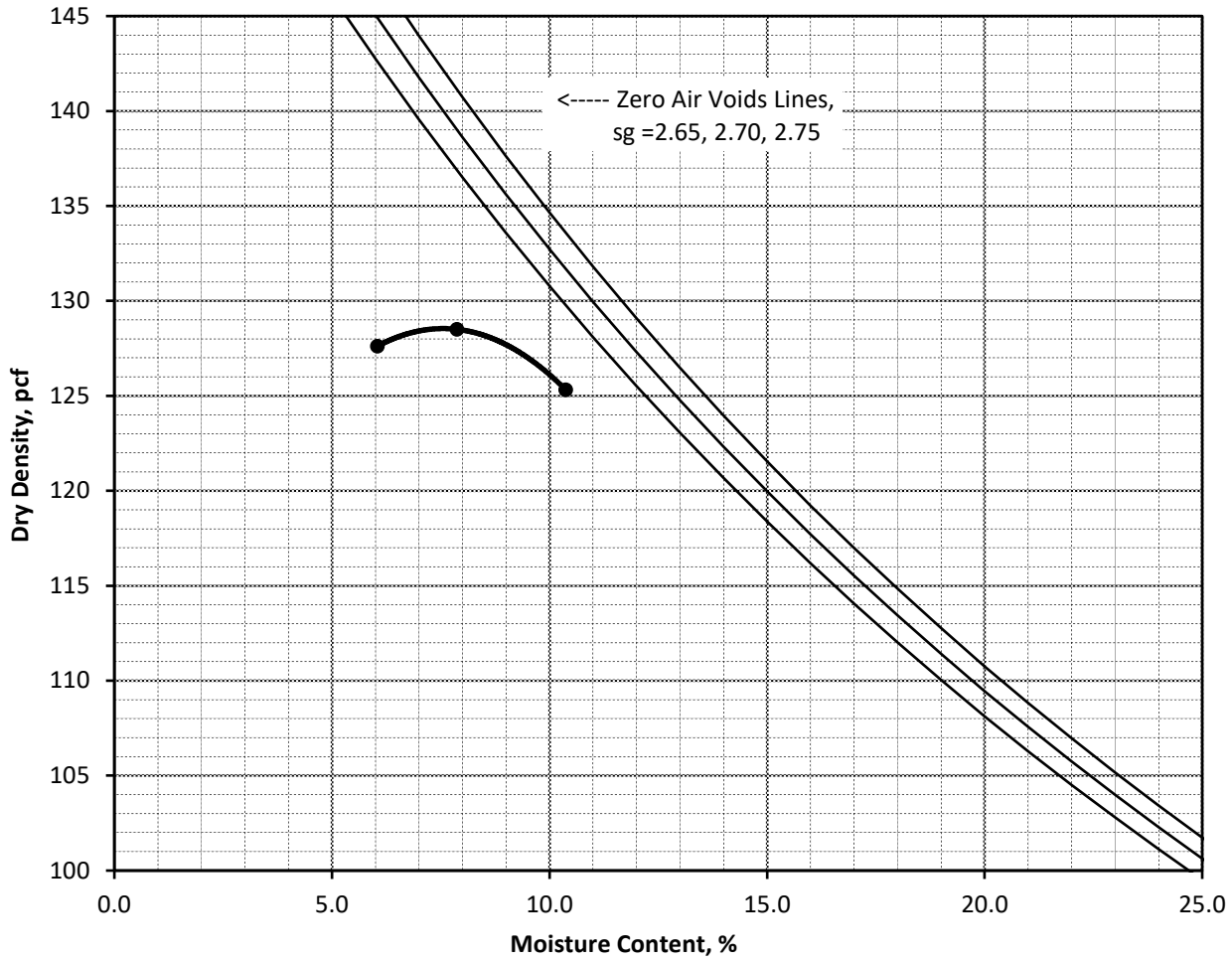
---- Zero Air Voids Line, Specific Gravity: 2.7 (assumed)

Bruin Geotechnical Services, Inc.
44732 Yucca Avenue
Lancaster, CA 93534
661-273-9078

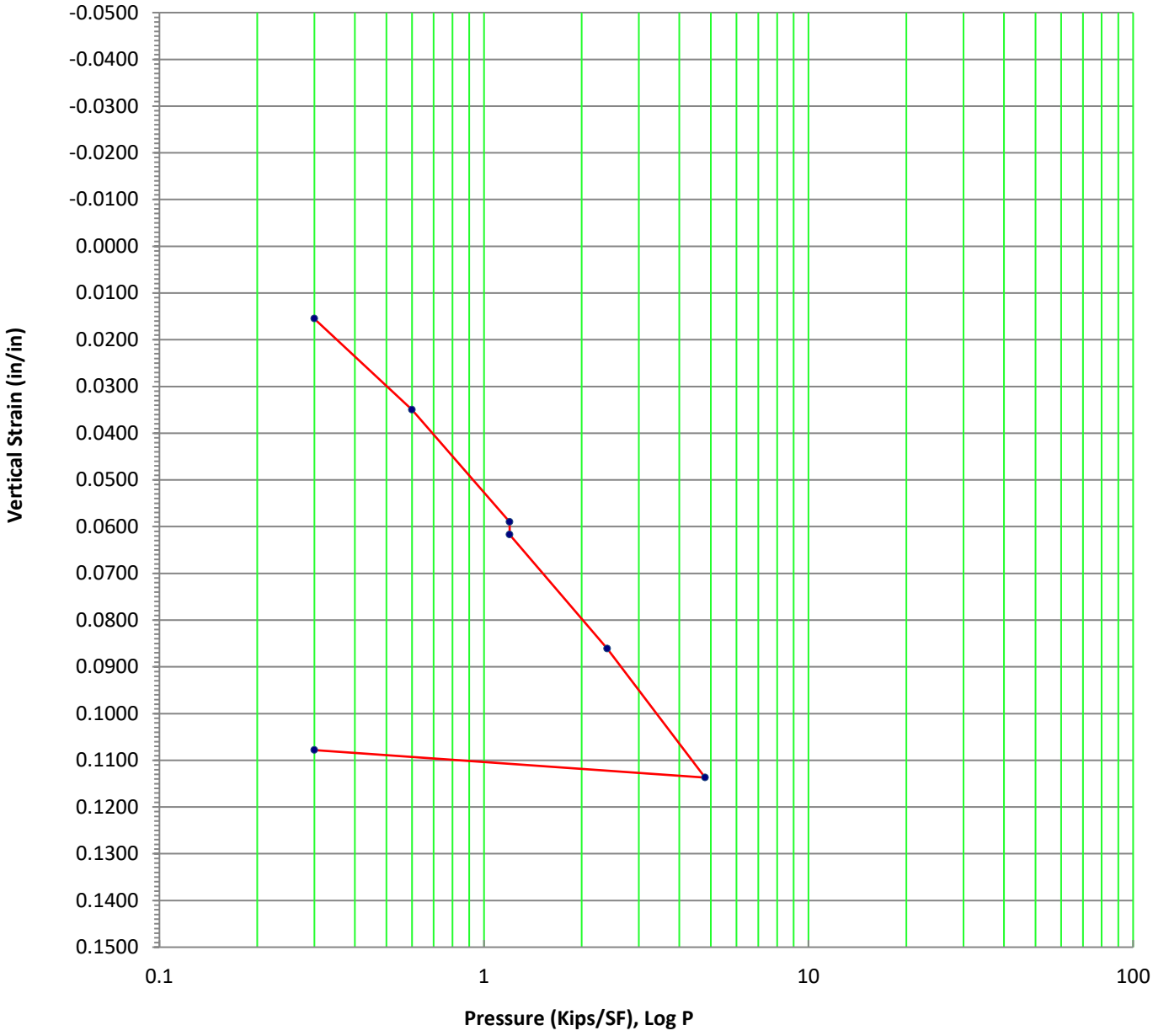
Maximum Density/Optimum Moisture Proctor ASTM D698/D1557

Job Number:	23-197	
Client:	Duke-Ramirez	ASTM D 1557 A
Sample ID:	Bulk Sample 0-5' BGS	Rammer Type: 10#
Sample Location:	B5	
Description:	(SM) Yellowish silty fine to medium sand w/ coarse sand & occ. #4 gravel	

Maximum Density:	**128.5**
Optimum Moisture:	**7.9**



---- Zero Air Voids Line, Specific Gravity: 2.7 (assumed)



Consolidation Test

Duke-Ramirez

Sample location:	B1@3	
Material:	SM	
Initial Dry Density:	99.7	PCF
Moisture Content:	5.3	%
% Hydroconsolidation:	0.3	%

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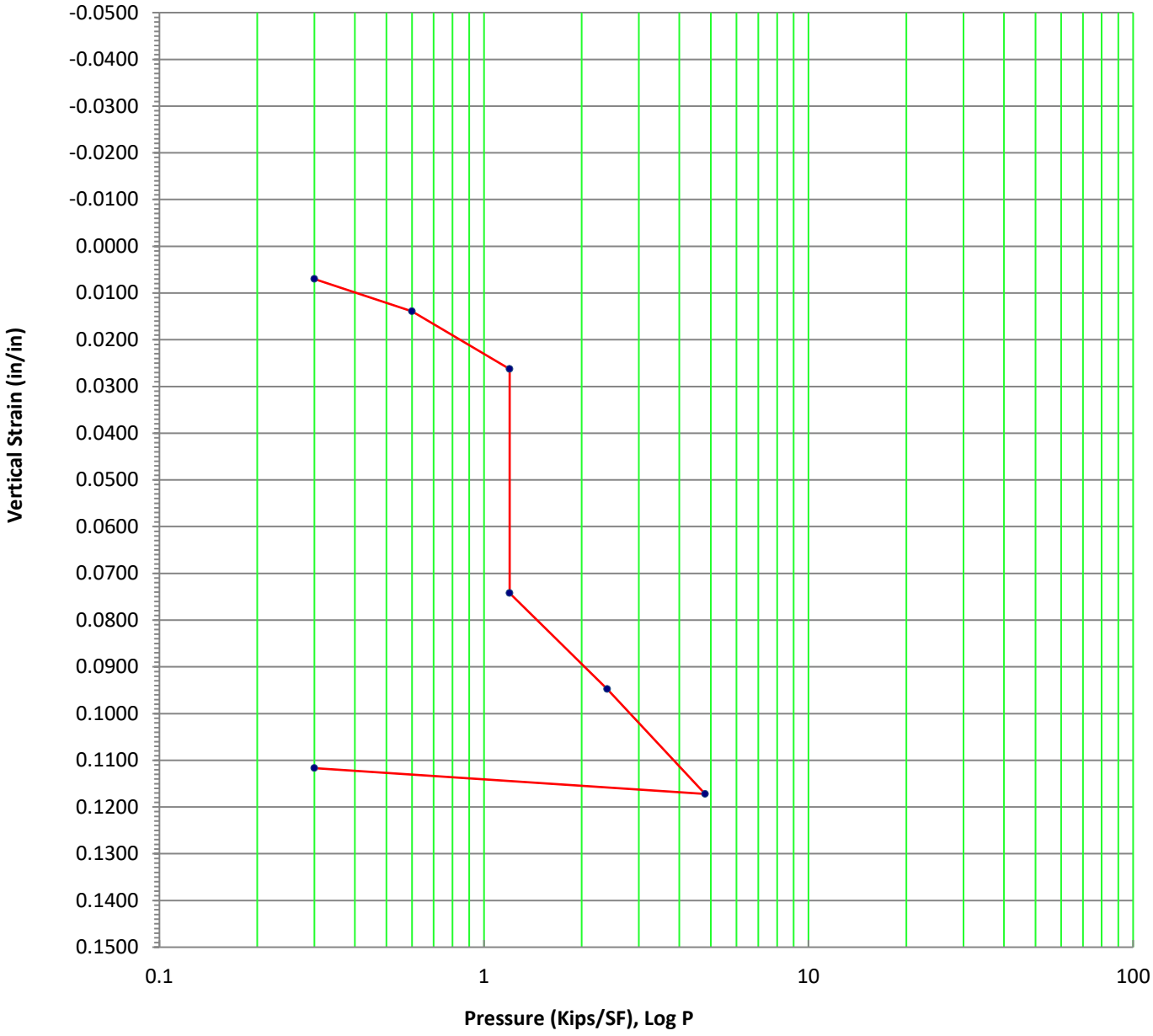
est. 2004

Test Method: ASTM D-2435

J.N. 23-197



Consolidation Test

Duke-Ramirez

Sample location:	B6@5	
Material:	SM/SP	
Initial Dry Density:	112.9	PCF
Moisture Content:	8.6	%
% Hydroconsolidation:	4.8	%

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Test Method: ASTM D-2435

J.N. 23-197

Consolidation Test

Duke-Ramirez

Sample location:	B1@6	
Material:	SM	
Initial Dry Density:	96.4	PCF
Moisture Content:	11.9	%
% Hydroconsolidation:	0.9	%

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Test Method: ASTM D-2435

J.N. 23-197

Consolidation Test

Duke-Ramirez

Sample location:	B6@7	
Material:	ML	
Initial Dry Density:	98.8	PCF
Moisture Content:	6.2	%
% Hydroconsolidation:	0.5	%

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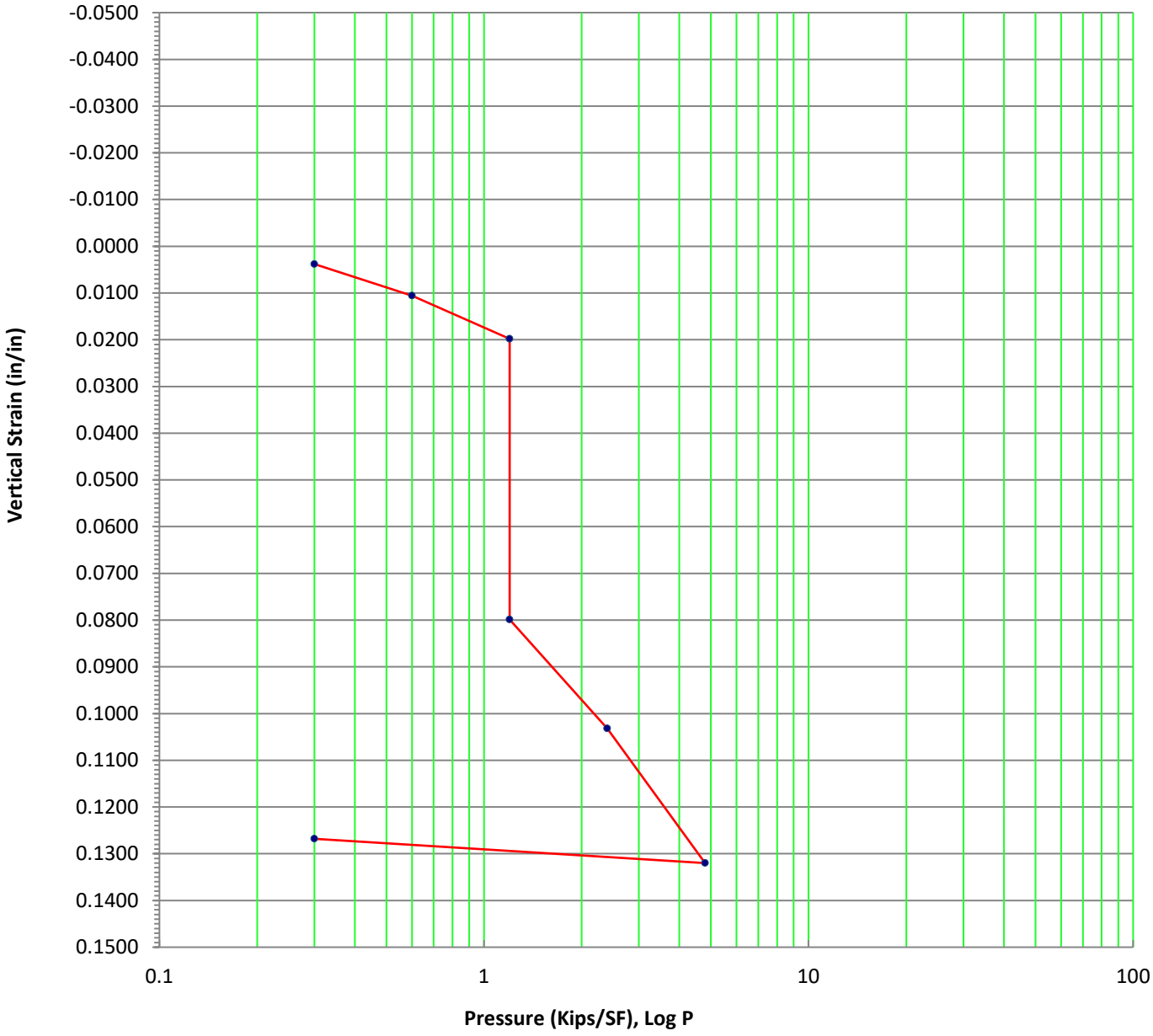
Test Method: ASTM D-2435

J.N. 23-197



Consolidation Test

Duke-Ramirez

Sample location:	B6@9	
Material:	ML	
Initial Dry Density:	100.1	PCF
Moisture Content:	5.8	%
% Hydroconsolidation:	6.0	%

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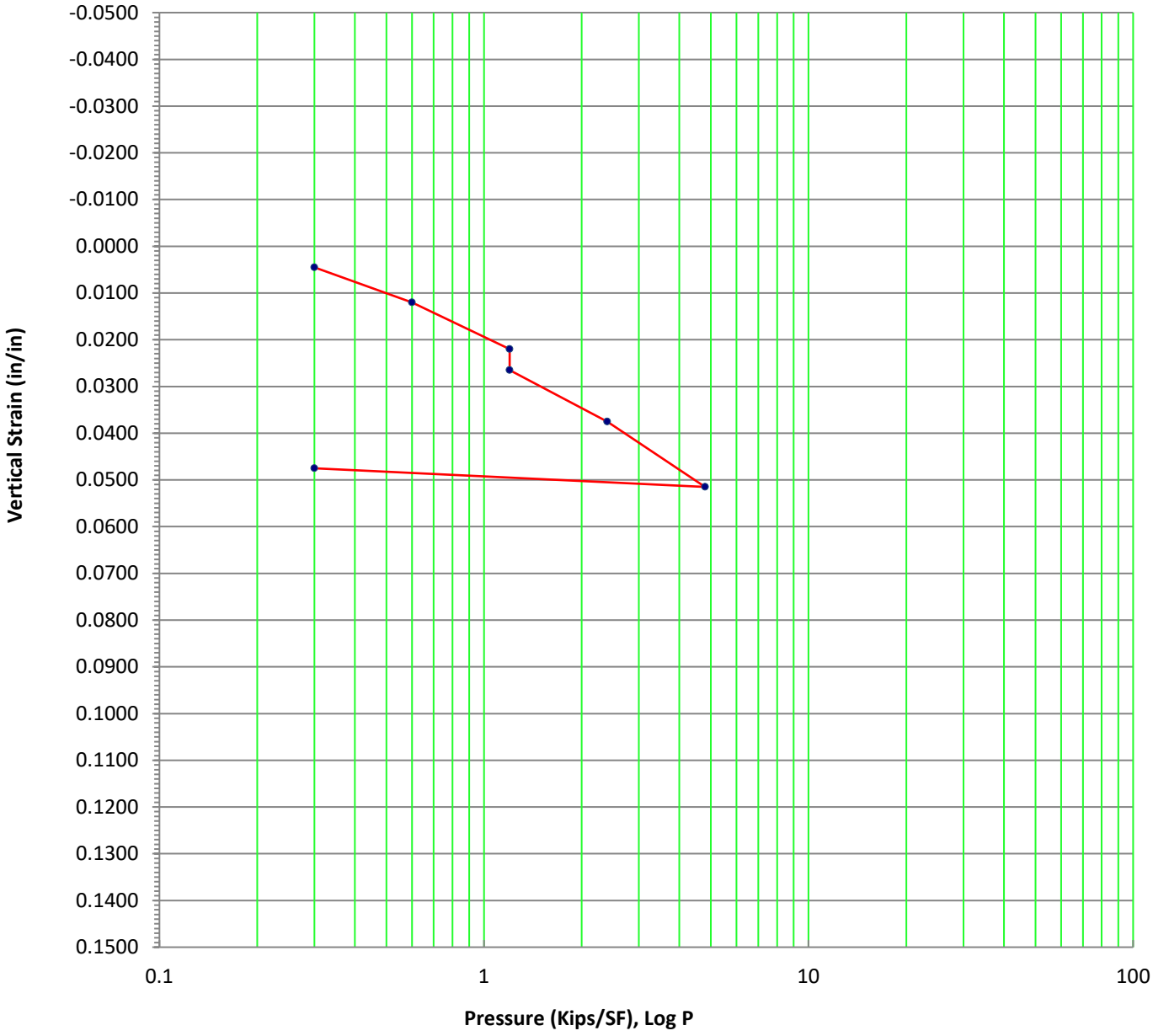
Test Method: ASTM D-2435

J.N. 23-197



Consolidation Test

Duke-Ramirez

Sample location:	B1@9	
Material:	SM	
Initial Dry Density:	104.4	PCF
Moisture Content:	5.8	%
% Hydroconsolidation:	0.5	%

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Test Method: ASTM D-2435

J.N. 23-197

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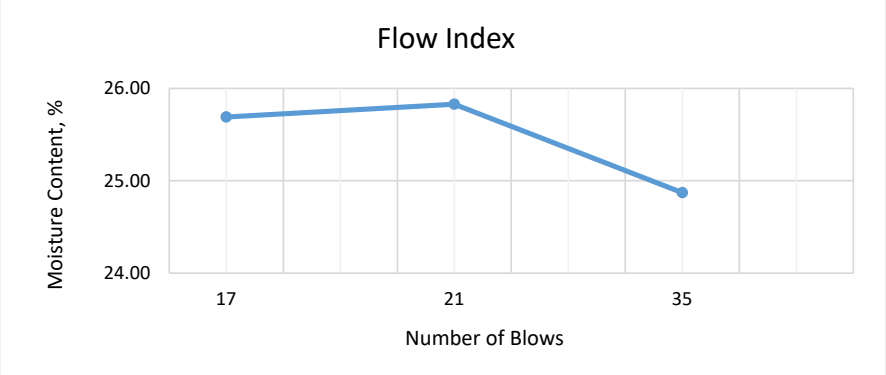
44732 Yucca Avenue
Lancaster, CA 93534
661-273-9078

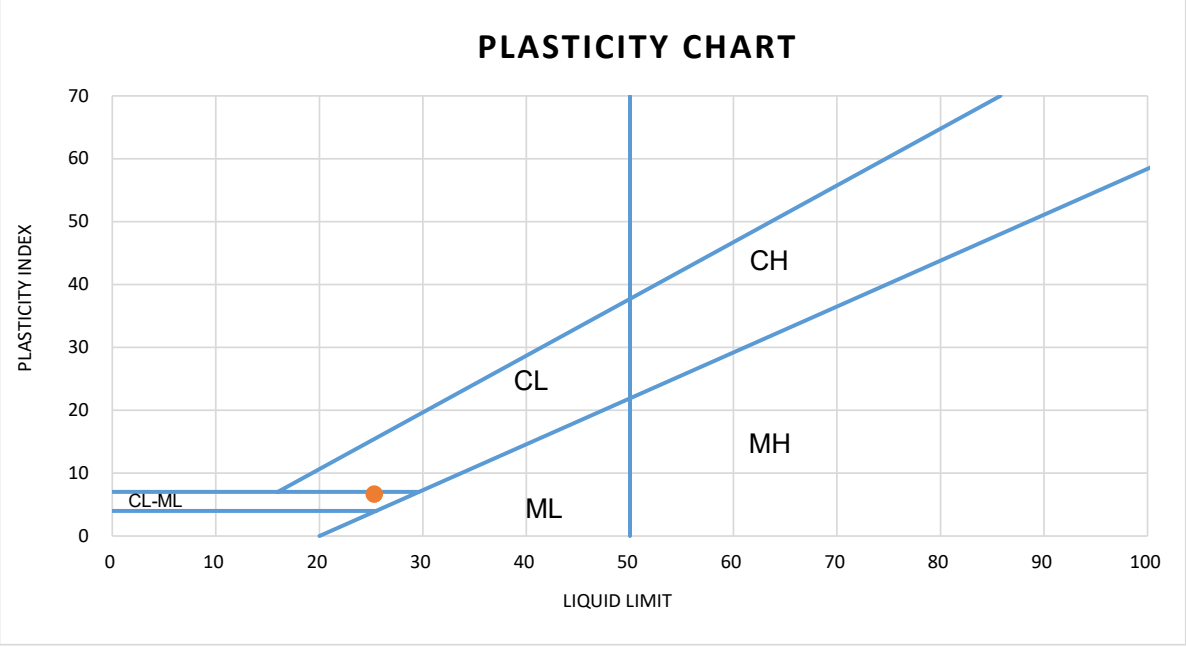
Plasticity Index ASTM D4318

Job Number:	23-197	May. 31, 2023
Client:	Duke-Ramirez	
Lab ID Number:	B1@12'	
Description:	(CL) Light brown sandy clay	

Data Summary			
Number of Blows:	17.0	21.0	35.0
Water Content:	26%	26%	25%

Liquid Limit:	**25**
Plastic Limit:	**19**
Plasticity Index:	**7**





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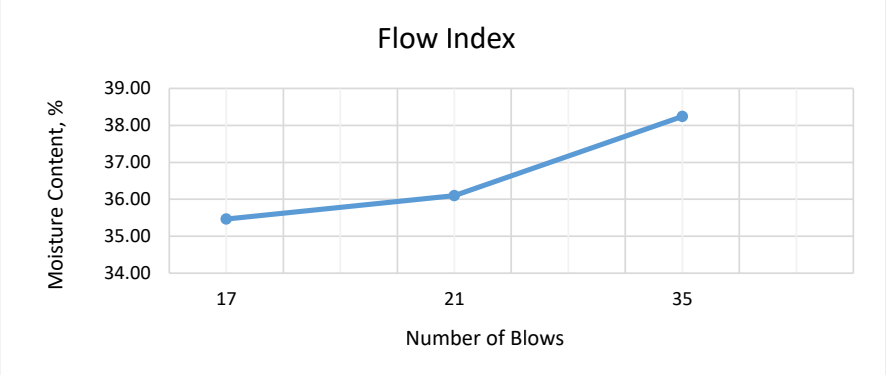
44732 Yucca Avenue
Lancaster, CA 93534
661-273-9078

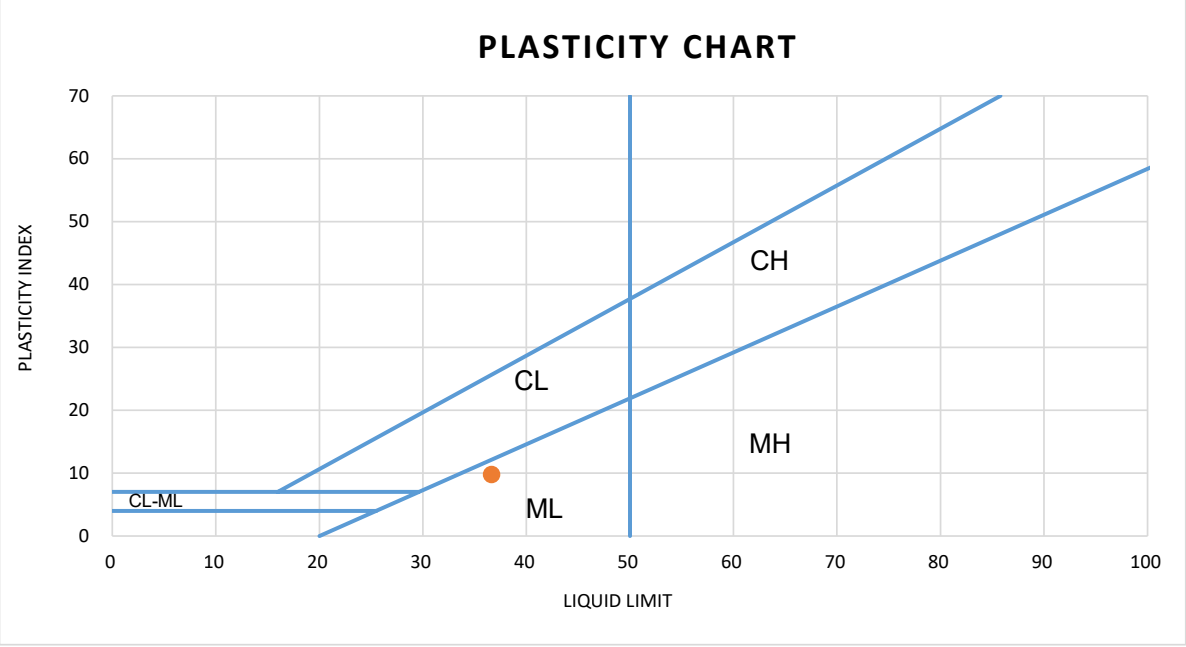
Plasticity Index ASTM D4318

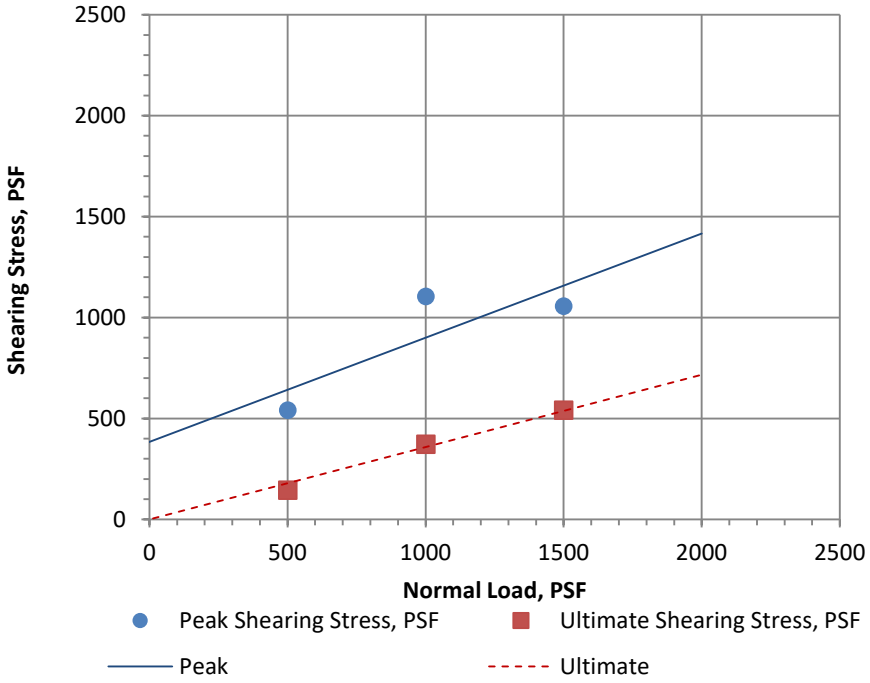
Job Number:	23-197	May. 31, 2023
Client:	Duke-Ramirez	
Lab ID Number:	B2@4'	
Description:	Grey silty clay (very cemented)	

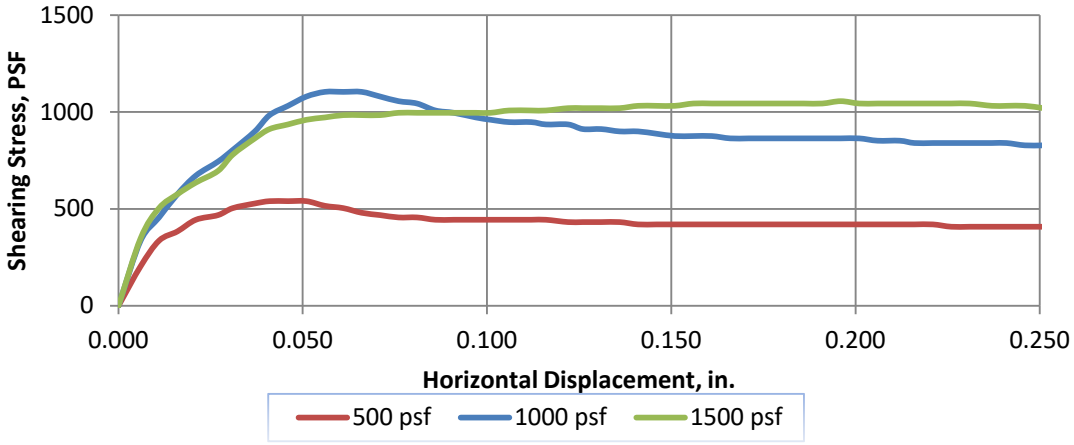
Data Summary			
Number of Blows:	17.0	21.0	35.0
Water Content:	35%	36%	38%

Liquid Limit:	**37**
Plastic Limit:	**27**
Plasticity Index:	**10**









Sample Description: (SM) - Grey very silty fine to coarse sand w/ clay (very cemented)

DIRECT SHEAR DATA (ASTM D-3080)

Sample ID	Symbol	Depth, feet	Dry Density, PCF	Average deg. of saturation
B2	●	0-5'	100	88

* Sample remolded to 90% relative compaction as determined by ASTM D-1557 Test Method

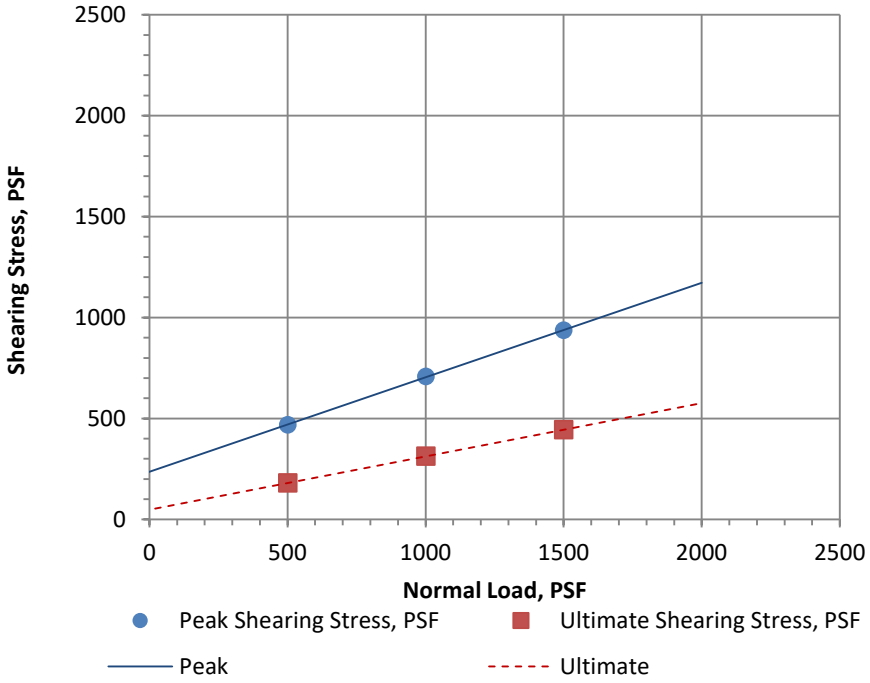
	Peak	Ultimate
Angle of friction, (degrees)	27	22
Cohesive Strength (PSF)	384	0

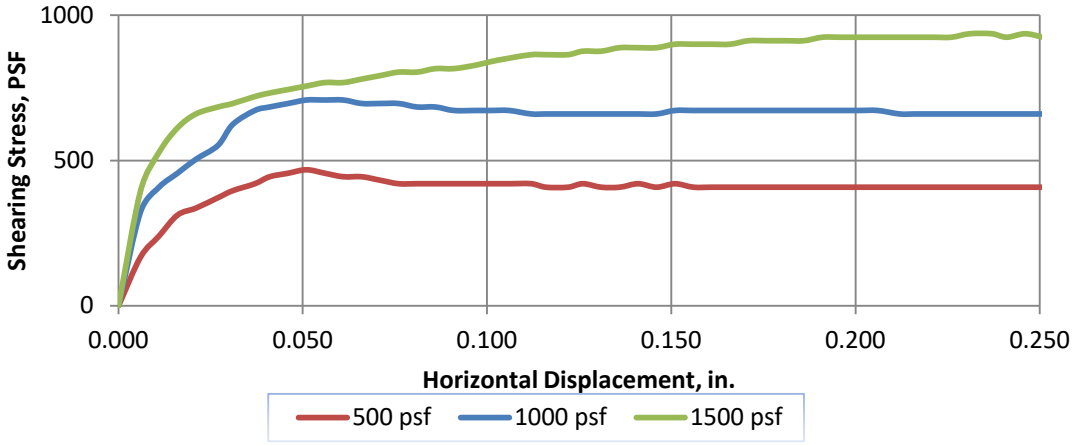
Direct Shear Test

Duke-Ramirez

BRUIN GEOTECHNICAL SERVICES INC.

23-197





Sample Description: (SM) - Yellowish silty fine to medium sand w/ coarse sand & occ. #4 gravel

DIRECT SHEAR DATA (ASTM D-3080)

Sample ID	Symbol	Depth, feet	Dry Density, PCF	Average deg. of saturation
B5	●	0-5'	113	91

* Sample remolded to 90% relative compaction as determined by ASTM D-1557 Test Method

	Peak	Ultimate
Angle of friction, (degrees)	25	15
Cohesive Strength (PSF)	236	48

Direct Shear Test

Duke-Ramirez

BRUIN GEOTECHNICAL SERVICES INC.

23-197

ANAHEIM TEST LAB, INC

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949) 336-6544

Bruin Geotechnical Services, Inc.
44732 Yucca Avenue
Lancaster, CA 93534

DATE: 5/25/2023

P.O. NO.: Transmittal

LAB NO.: C-7071

SPECIFICATION: CTM-643/417/422

MATERIAL: Soil

Project No.: 23-197
Project: Duke - Ramirez
Site Address: 308 East Ave R-8
Site City & State: Palmdale, CA
Boring ID: B2 @ 0-5'

ANALYTICAL REPORT

CORROSION SERIES
SUMMARY OF DATA

pH	MIN. RESISTIVITY per CT. 643 ohm-cm	SOLUBLE SULFATES per CT. 417 (% by weight)	SOLUBLE CHLORIDES per CT. 422 ppm
7.2	<500	0.1148%	670

RESPECTFULLY SUBMITTED

WES BRIDGER, LAB MANAGER

ANAHEIM TEST LAB, INC

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949) 336-6544

TO:

Bruin Geotechnical Services, Inc.
44732 Yucca Avenue
Lancaster, CA 93534

DATE: 5/28/2023

P.O. NO.: Transmittal

LAB NO.: C-7071

SPECIFICATION: CA 301

MATERIAL: Brown, Sandy Silt

Project No.: 23-197
Project: Duke - Ramirez
Site Address: 308 E Ave R-8
Site City & State: Palmdale, CA
Boring ID: B2 @ 0-5'

ANALYTICAL REPORT
"R" VALUE

BY EXUDATION	BY EXPANSION
60	48

RESPECTFULLY SUBMITTED

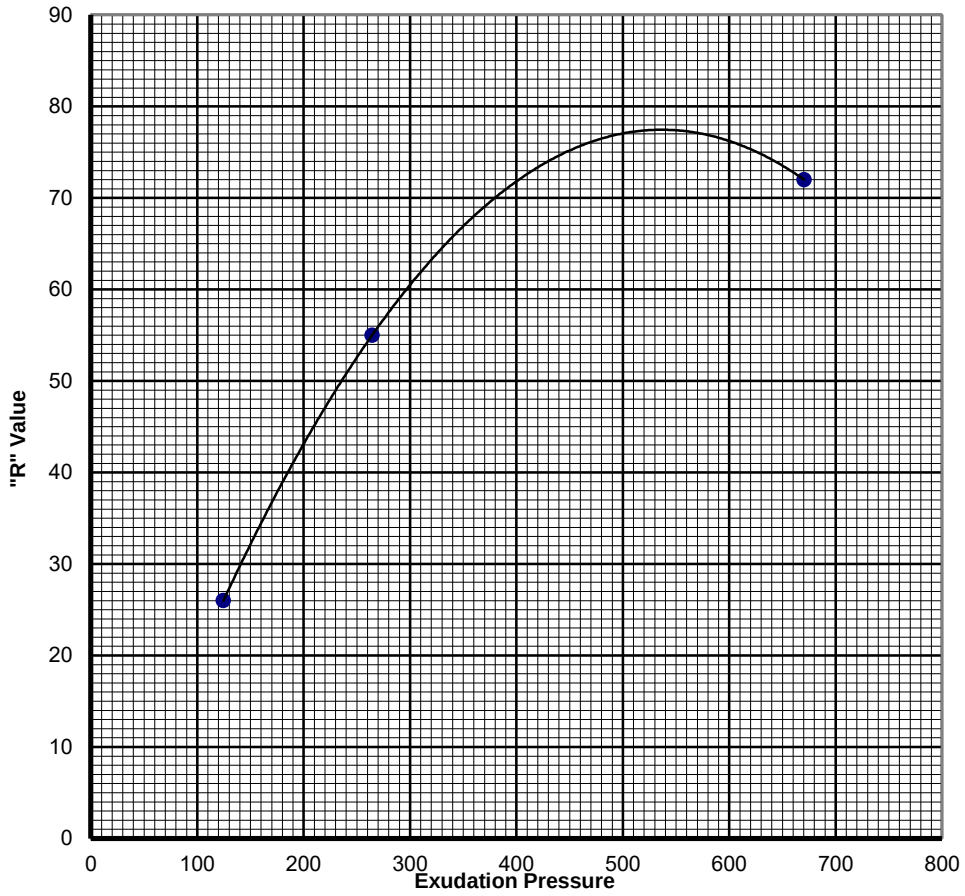
WES BRIDGER LAB MANAGER

"R" VALUE CA 301

Client: Bruin Geotechnical Services, Inc. **ATL No.:** C 7071 **Date:** 5/28/2023
Client Reference No.: 23-197
Sample: B2 @ 0-5' **Soil Type:** Brown, Sandy Silt

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	70	300	350	
Initial Moisture Content	%	11.5	11.5	11.5	
Moisture at Compaction	%	15.7	13.8	12.5	
Briquette Height	in.	2.54	2.54	2.46	
Dry Density	pcf	112.8	115.1	117.1	
EXUDATION PRESSURE	psi	125	264	670	
EXPANSION PRESSURE	psf	0	95	204	
Ph at 1000 pounds	psi	43	25	16	
Ph at 2000 pounds	psi	94	52	30	
Displacement	turns	4.99	4.33	4.13	
"R" Value		26	55	72	
CORRECTED "R" VALUE		26	55	72	

Final "R" Value	
BY EXUDATION: @ 300 psi	**60**
BY EXPANSION: TI = 5.0	**48**

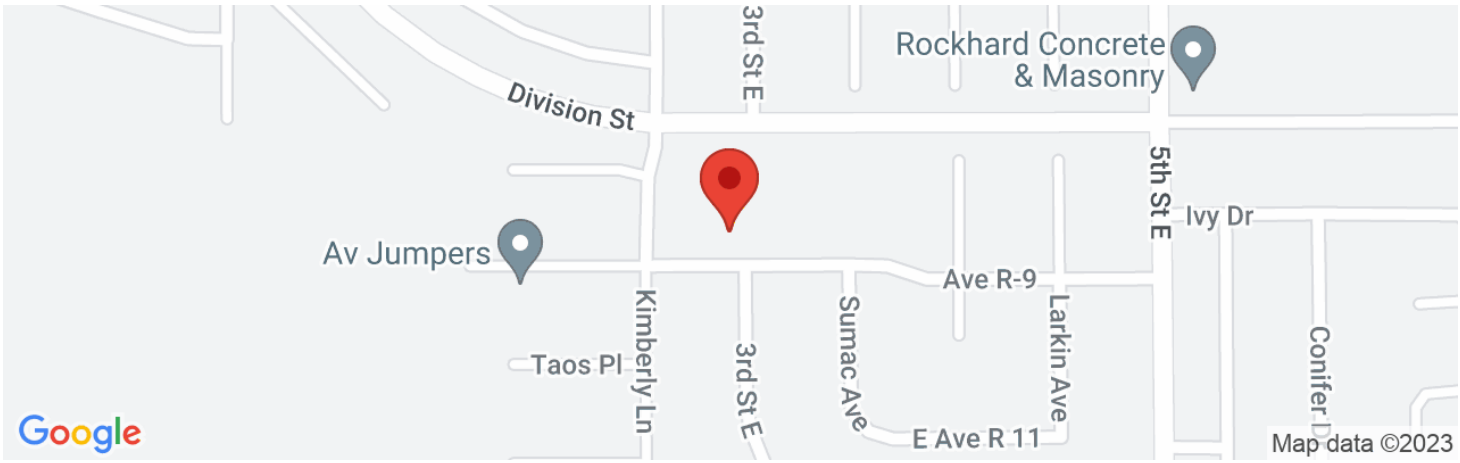


APPENDIX C

USGS Seismic Design Summary Report

23-197 Duke - Ramirez

Latitude, Longitude: 34.56441474, -118.12453527



Date	6/16/2023, 1:09:10 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Stiff Soil

Type	Value	Description
S_S	2.435	MCE_R ground motion. (for 0.2 second period)
S_1	1.039	MCE_R ground motion. (for 1.0s period)
S_{MS}	2.435	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.623	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	1.046	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	1.151	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
SsRT	2.869	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	3.276	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.435	Factored deterministic acceleration value. (0.2 second)
S1RT	1.237	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	1.424	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.039	Factored deterministic acceleration value. (1.0 second)
PGAd	1.046	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	1.318	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.876	Mapped value of the risk coefficient at short periods
C_{R1}	0.869	Mapped value of the risk coefficient at a period of 1 s
C_V	1.5	Vertical coefficient

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APPENDIX D

General Earthwork and Grading Guidelines

Earthwork and Grading Specifications for Rough Grading

1.0 General

1.1 **Intent:** These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 **The Geotechnical Consultant of Record:** Prior to commencement of work, the owner shall employ a qualified Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observations, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to confirm that the attained level of compaction is being accomplished as specified. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 **The Earthwork Contractor:** The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the project plans and specifications. The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "equipment" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of

grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate personnel will be available for observation and testing. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultants, unsatisfactory conditions, such as unsuitable soil, improper moisture-condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in the specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified. It is the contractor's sole responsibility to provide proper fill compaction.

2.0 Preparation of Areas to be Filled

2.1 **Clearing and Grubbing:** Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 10 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminant dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed. The contractor is responsible for all hazardous waste relating to his work. The Geotechnical Consultant does not have expertise in this area. If hazardous waste is a concern, then the Client should acquire the services of a qualified environmental assessor.

2.2 **Processing:** Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free from oversize material and the working surface is reasonably uniform, flat, and free from uneven features that would inhibit uniform compaction.

2.3 **Overexcavation:** In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading pan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.4 **Benching:** Where fills are to be places on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter that 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.

2.5 **Evaluation/Acceptance of Fill Areas:** All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observes, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

3.0 Fill Material

3.1 **General:** Material to be used as fill shall be essentially free of organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

3.2 **Oversize:** Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 **Import:** If importing of fill material is required for grading, proposed import material shall meet the requirements of the geotechnical report(s). The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so the suitability can be determined and appropriate tests performed.

4.0 Fill Placement and Compaction

4.1 **Fill Layers:** Approved fill material shall be placed in areas prepared to receive fill in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates that grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 **Fill Moisture Conditioning:** Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain relatively uniform moisture content within 2% of optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).

4.3 **Compaction of Fill:** After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 **Compaction of Fill Slopes:** In addition to normal compaction procedures specified above, compaction of slopes, shall be accomplished by backrolling of slopes with sheepfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

4.5 **Compaction Testing:** Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 **Frequency of Compaction Testing:** Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 **Compaction Test Locations:** The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less then 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical repot(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land survey/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well we over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfills

7.1 The Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.

7.2 All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding Material shall have a Sand Equivalent greater then 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.

7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.

Appendix H Hydrology Report

HYDROLOGY STUDY

APN 3010-009-007
Ave R-8
Palmdale, California

PROJECT 2020-011

Prepared For:

Carlos Ramirez
10217 Sully Drive
Sun Valley, CA 91352

Prepared By:

Duke Engineering
44732 Yucca Avenue
Lancaster, California 93534
Phone: (661) 992-8199

Date: August 31, 2021

Table of Contents

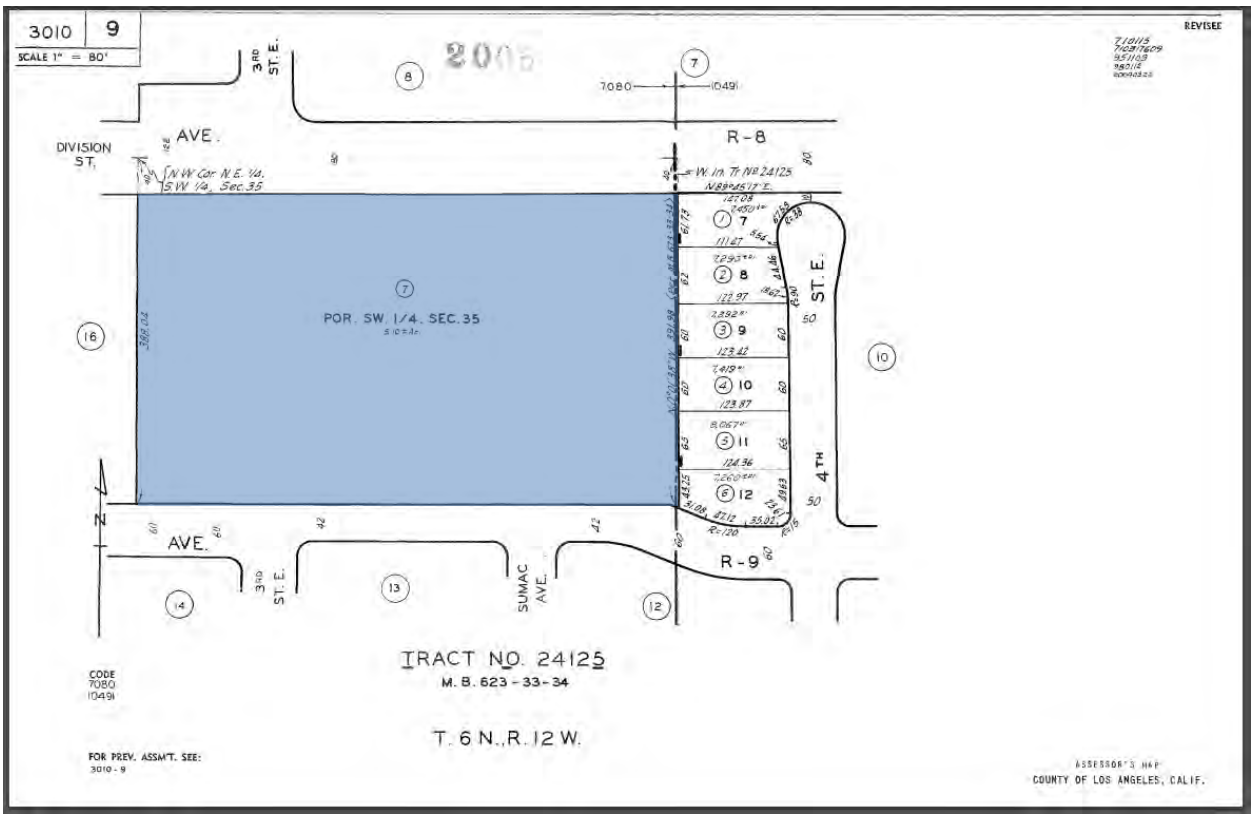
Introduction:

The purpose of this report is to address the drainage conditions within and tributary to the subject property located on Ave R-8 about 100 feet east of Kimberly Lane and 130 feet west of 4th Street East in the City of Palmdale. This report will quantify the storm water run-off from both the pre-developed and post-developed conditions to adequately size storm water mitigation measures.

The proposed will consist of 15 single family residences which will be served by a detention basin on the subject development.

Project Location

The project site is located between Avenue R-8 and Avenue R-9 (see map below). The subject property is approximately 5 acres and currently has about five structures situated on the property. The project is an infill development as there are developed properties on all sides.



Existing Conditions:

The existing condition of the project site is a single family residence with a few structures on-site that will be demolished and is developed to R-1-7,000 standards on all sides. To the East of the project site is currently undeveloped native desert. On-site the existing terrain has two subareas. Subarea 1A drains from the southwest corner of the site to the driveway at the middle of the northern property with an average slope of 5.3%; most of the west side of the property is included in this subarea. Subarea 2B drain from the middle of the southern property line to the northeast corner of the site at a slope of 5.7%; most of the eastern side of the property is included in this subarea. The site has been previously graded but has no concentrated flow paths within the site. The current storm drainage sheet flows through the project site. Currently there is no tributary area on any side of the project.

Proposed Conditions:

The proposed conditions consist of half street improvements to Ave R-8 and Ave R-9; both streets will continue to drain west to east. 3rd Street East and Sumac Avenue will also be extended to terminate in cul-de-sacs with access from the south; these streets will both drain from south to north to be captured by catch basins at the end of the cul-de-sacs and connect to the proposed storm drain system.

The storm drain system to which the curb inlet catch basins at the end of the cul-de-sacs direct storm water will outlet into the proposed detention basin on the lot at the north-east corner of the site. The tributary area of the catch basin on 3rd Street East includes the eight lots on the west side of the site. The tributary area of the catch basin on Sumac Ave includes the four lots on the west side of the street. The three lots on the east side of the site will each drain to the back of their respective lot where three yard inlets in sump condition for each lot will direct water into a storm drain which will run through the site and into the storm drain system in the street. The detention basin has a volume of 13,436 Cu. Ft. It is shown in Section 5 that there is a maximum outflow from the site of 0.23 CFS for a 25-yr storm with a basin volume of 13,436 Cu. Ft. The Pre-Developed out-flow rate is 5.48 CFS, so the outflow rate of 0.23 CFS is acceptable as it is less than 85% of the predeveloped outflow rate of 4.66 CFS.

Rainfall Data:

This site has the following rainfall data:

Storm Frequency = 50 Year
Isohyet Line = 3.7 (See Section 4)
Soil Number = 176 (See Section 4)

Storm Runoff:

The LA County HydroCalc program is used to determine the storm runoff values. The individual sub areas are shown on the hydrology map (Section 2 & 3).

Conveyance:

There is no off-site tributary drainage upstream from the property, and therefore no offsite analysis is needed.

The proposed improvements will complement the existing drainage pattern by outflowing onto Avenue R-8.

The post-developed flow rate for a 25-year storm for each section of pipe is shown on the post-developed map in section 3. The storm drain system will be analyzed in section 6 for this peak flow rate.

The proposed 3rd Street East and Sumac Avenue have been designed so that the maximum flow generated from subareas 1A and 2B respectively are contained below the curb. This is shown in section 7.

The Basin primary outlet of a parkway drain will be sizes using 125% of the maximum post-developed basin in-flow rate, 6.3 CFS. See section 8 for this calculation.

Infiltration:

An infiltration rate of 0.91 in/hr was used in both drawdown time calculations and the basin routing calculations. The detention basin has a total height of 24".

Drawdown Time = 24 in/(0.91 in/hr) = 26.4 hours < 72 hours maximum allowed

Model:

The site was modeled using Bentley CivilStorm Software. The .csv hydrograph output from HydroCalc was input into the program for each subarea. Each subarea is routed to its respective catch basin and directed into the proposed storm drain system. This runoff then reaches the detention basin where infiltration occurs during the simulation. See section 5 for the model layout.

The detention system used in CivilStorm has a volume of 130,000 Cu. Ft. It has a constant flow infiltration rate of 0.123 cfs, calculated by multiplying the infiltration rate from the soils report of 0.91 in/hr by the total area where infiltration will occur, which is 5,851 Sq. Ft.

Conclusion

In conclusion, the area has been assessed and quantified to sufficiently size the proposed storm drain improvements and storm water detention facilities. This analysis quantified the areas which flow towards each of the proposed improvements within the site. The analysis has also determined the volume required to mitigate the delta Q for the project and storm drain conduit sizes required to convey this storm water.

It is of our opinion that this analysis sufficiently quantifies the project area, storm water runoff flow rates, and calculated storm drain device sizes to safely collect and convey the storm water run-off.

Please contact our office for any additional questions.

Sincerely,

Ryan Duke P.E.

RCE 79729

Principle Engineer

SECTION 1:
CATCH BASIN CAPACITY CALCULATIONS

Yard Inlet Catch Basins: 6” Diameter

Subareas 4B, 5C, and 7C each include 3 catch basins in sump condition. These will be analyzed only once using the maximum flow rate in these subareas, 0.31 CFS. The original perimeter of each 6” circular catch basin is 18.85” (6*pi), but the effective perimeter of each is 9.42” with 50% clogging applied. The entire catch basin perimeter for this analysis is 28.27”, or 2.36’, as there are 3 catch basins in each sump for each subarea. Using the equation below to calculate head, the depth of flow at the catch basin during a peak flow rate of 0.31 CFS is 1.49”. The sump is 2’ deep, so the 6” diameter circular catch basins will not allow the sump to overflow.

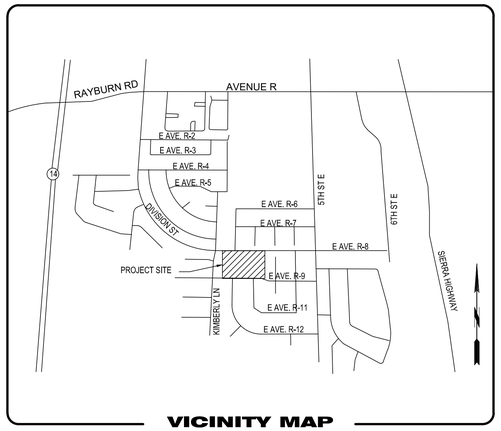
Capacity Calculation:

$Q = 3.0P(H^{3/2})$

$H = [Q/(3P)]^{2/3} = [0.31/(3*2.36)]^{2/3} = 0.124’ = 1.49”$

SECTION 2:

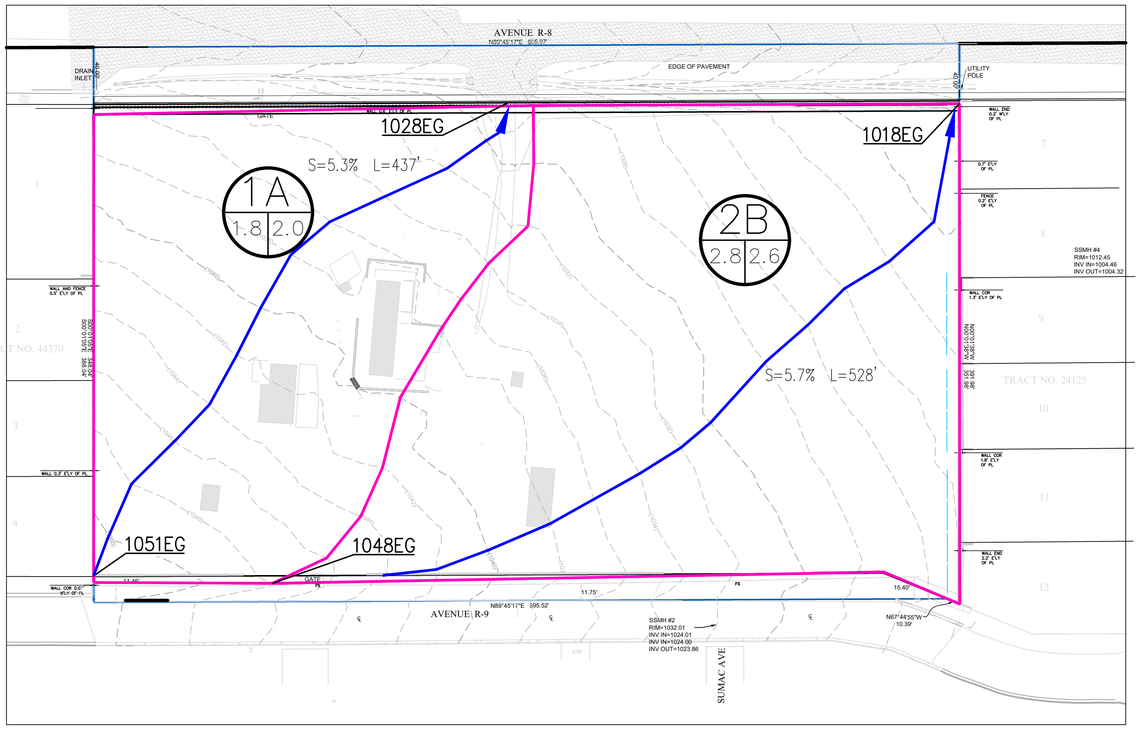
ON-SITE PRE-DEVELOPED CONDITIONS (MAP & HYDROCALC)



VICINITY MAP
NTS

LEGEND

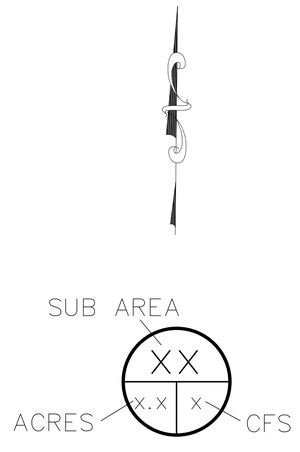
FLOW PATH	
DA BOUNDARY	



OVERALL SITE

HYDROLOGY ANALYSIS POST

SUB-AREA	AREA	CFS	AC-FT
1A	1.8	1.96	0.12
2B	2.8	2.58	0.14
TOTAL	4.60	4.54	0.26



PROJECT DEVELOPER

CARLOS RAMIREZ

CIVIL ENGINEERS

Duke Engineering
CIVIL & STRUCTURAL
LANCASTER - CALIFORNIA

Sheet Title

PRE DEVELOPED HYDROLOGY MAP

Drawn By: PUCKETT

Checked By: DUKE

Project No. 21071

Sheet

PRE-DEV

Peak Flow Hydrologic Analysis

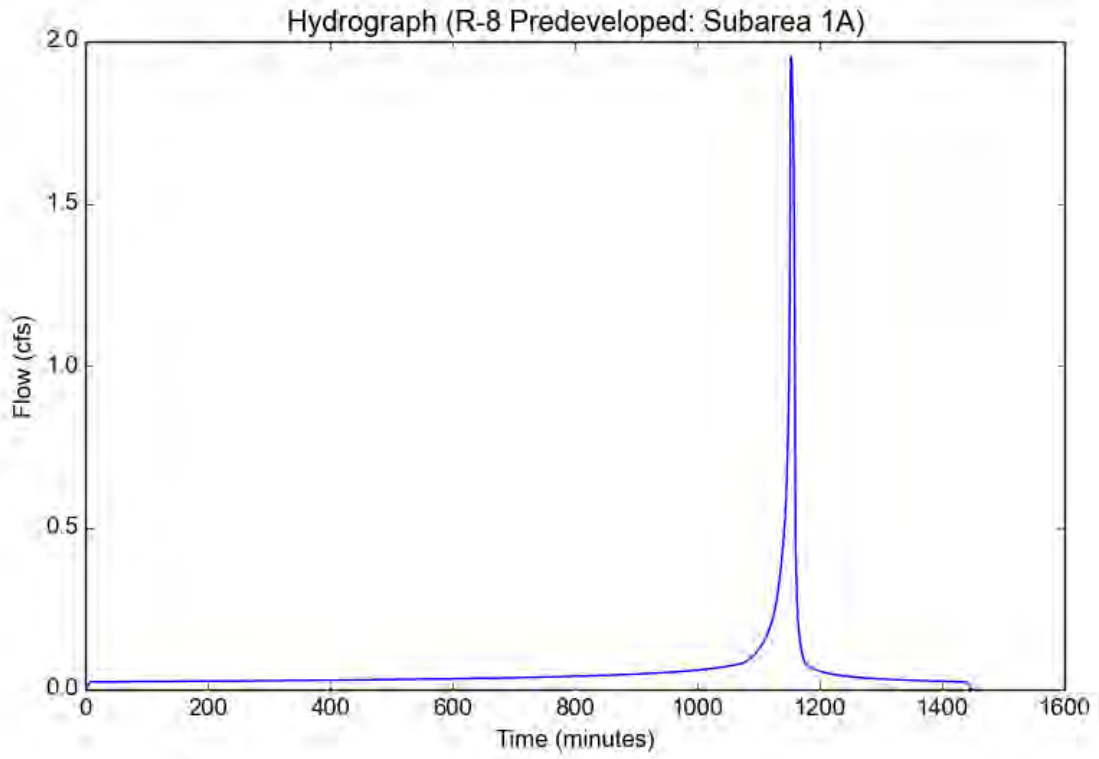
File location: C:/Users/Zac/Favorites/R-8 Predeveloped - Subarea 1A.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	R-8 Predeveloped
Subarea ID	Subarea 1A
Area (ac)	1.8
Flow Path Length (ft)	437.0
Flow Path Slope (vft/hft)	0.053
50-yr Rainfall Depth (in)	3.7
Percent Impervious	0.1
Soil Type	176
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.2486
Peak Intensity (in/hr)	1.554
Undeveloped Runoff Coefficient (Cu)	0.676
Developed Runoff Coefficient (Cd)	0.6984
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	1.9536
Burned Peak Flow Rate (cfs)	1.9536
24-Hr Clear Runoff Volume (ac-ft)	0.116
24-Hr Clear Runoff Volume (cu-ft)	5052.2076



Peak Flow Hydrologic Analysis

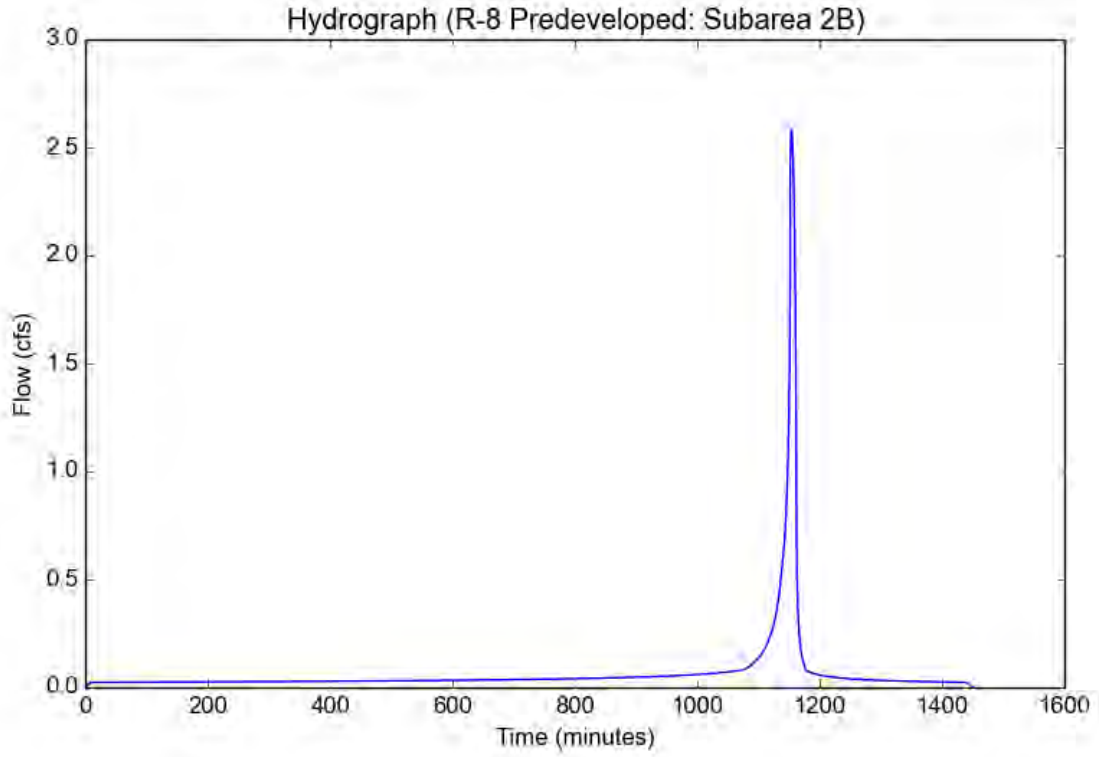
File location: C:/Users/Zac/Favorites/R-8 Predeveloped - Subarea 2B.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	R-8 Predeveloped
Subarea ID	Subarea 2B
Area (ac)	2.8
Flow Path Length (ft)	528.0
Flow Path Slope (vft/hft)	0.057
50-yr Rainfall Depth (in)	3.7
Percent Impervious	0.02
Soil Type	176
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

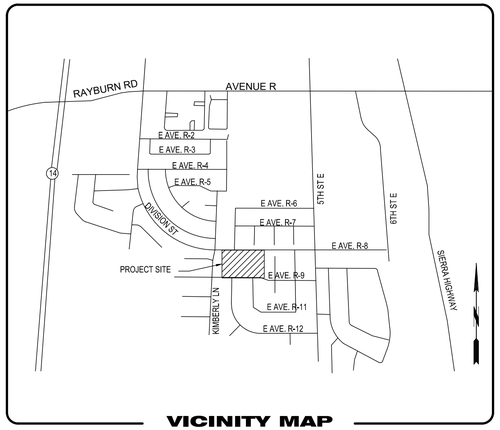
Output Results

Modeled (25-yr) Rainfall Depth (in)	3.2486
Peak Intensity (in/hr)	1.3993
Undeveloped Runoff Coefficient (Cu)	0.6541
Developed Runoff Coefficient (Cd)	0.659
Time of Concentration (min)	10.0
Clear Peak Flow Rate (cfs)	2.5821
Burned Peak Flow Rate (cfs)	2.5821
24-Hr Clear Runoff Volume (ac-ft)	0.136
24-Hr Clear Runoff Volume (cu-ft)	5926.1321



SECTION 3:

ON-SITE POST-DEVELOPED CONDITIONS (MAP & HYDROCALC)



VICINITY MAP
NTS

PIPE FLOW

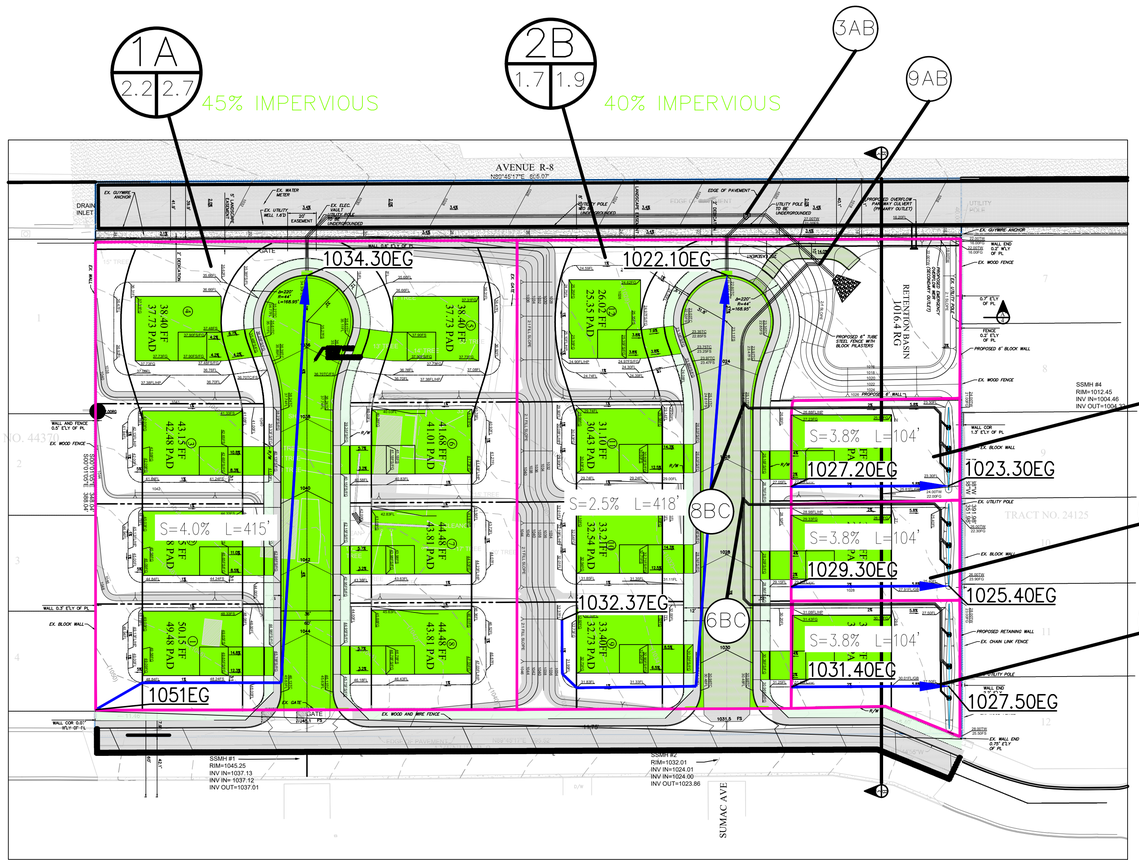
STORM DRAIN HYDROLOGY ANALYSIS POST		
PIPE NAME	LENGTH	CFS
1A–3AB	337'	2.66
2B–3AB	45'	1.90
3AB–9AB	64'	4.56
4B–6BC	274'	0.30
5C–6BC	184'	0.31
6BC–8BC	68'	0.61
7C–8BC	184'	0.31
8BC–9AB	260'	0.92
9AB–BASIN	12'	5.48
TOTAL	4.5	5.48

LEGEND

FLOW PATH
DA BOUNDARY
IMPERVIOUS AREA

OVERALL SITE

HYDROLOGY ANALYSIS POST			
SUB–AREA	AREA	CFS	AC–FT
1A	2.2 AC	2.66	0.29
2B	1.7 AC	1.90	0.21
4B	0.2 AC	0.30	0.02
5C	0.2 AC	0.31	0.02
7C	0.2 AC	0.31	0.02
TOTAL	4.5 AC	5.48	0.6



SUB AREA
XX
X.X ACRES
X CFS

PROJECT DEVELOPER

CARLOS RAMIREZ

CIVIL ENGINEERS

Duke Engineering
CIVIL & STRUCTURAL
LANCASTER - CALIFORNIA

Sheet Title

POST DEVELOPED HYDROLOGY MAP

Drawn By: PUCKETT
Checked By: DUKE

Project No. 21071

Sheet

POST-DEV

Peak Flow Hydrologic Analysis

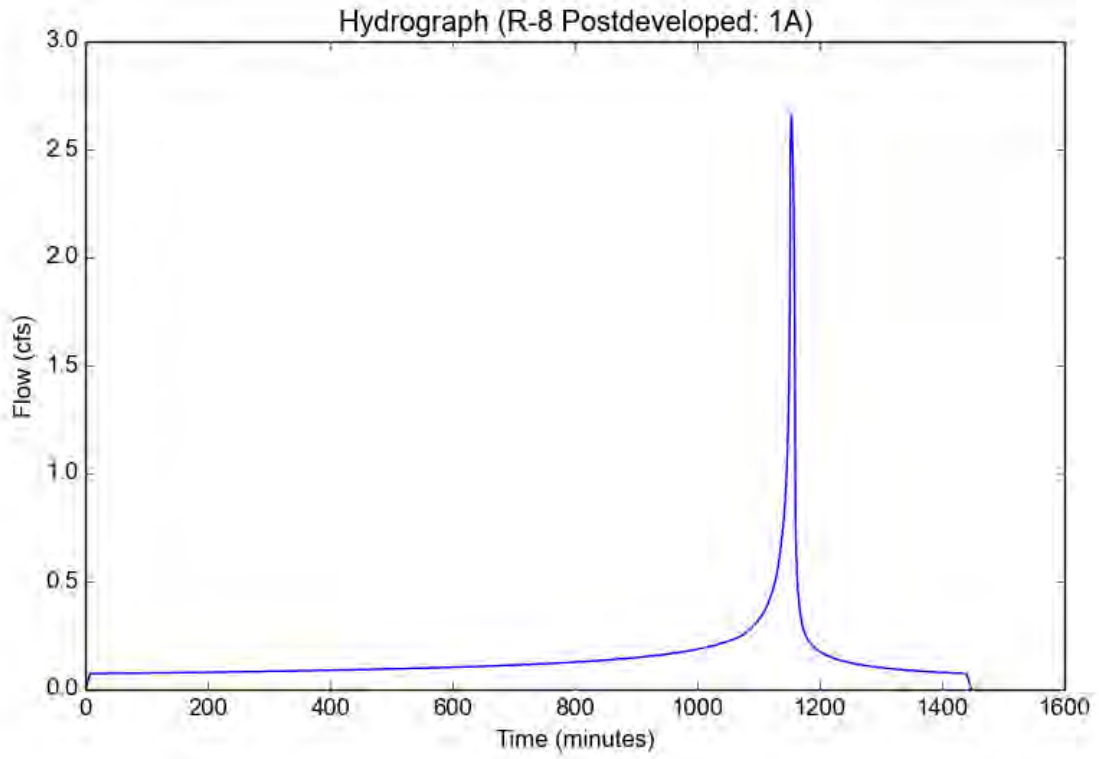
File location: C:/Users/Zac/Favorites/R-8 Postdeveloped Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	R-8 Postdeveloped
Subarea ID	1A
Area (ac)	2.2
Flow Path Length (ft)	415.0
Flow Path Slope (vft/hft)	0.04
50-yr Rainfall Depth (in)	3.7
Percent Impervious	0.45
Soil Type	176
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.2486
Peak Intensity (in/hr)	1.554
Undeveloped Runoff Coefficient (Cu)	0.676
Developed Runoff Coefficient (Cd)	0.7768
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	2.6558
Burned Peak Flow Rate (cfs)	2.6558
24-Hr Clear Runoff Volume (ac-ft)	0.2934
24-Hr Clear Runoff Volume (cu-ft)	12778.6889



Peak Flow Hydrologic Analysis

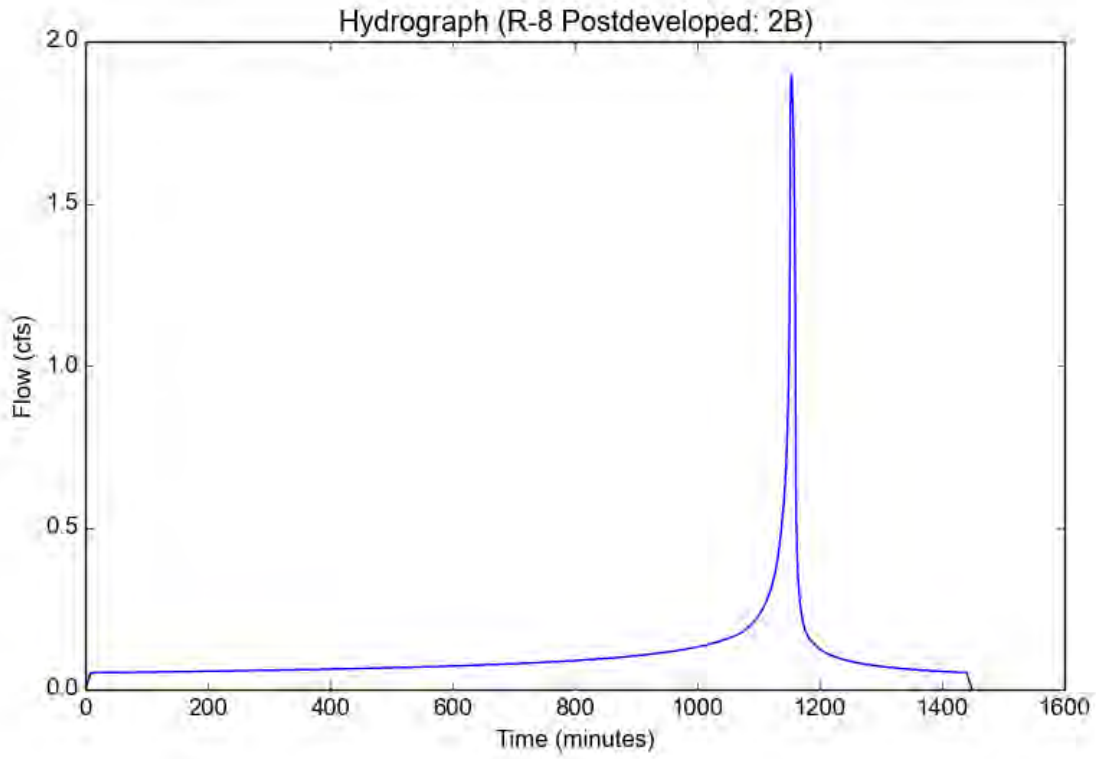
File location: C:/Users/Zac/Favorites/R-8 Postdeveloped Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	R-8 Postdeveloped
Subarea ID	2B
Area (ac)	1.7
Flow Path Length (ft)	418.0
Flow Path Slope (vft/hft)	0.025
50-yr Rainfall Depth (in)	3.7
Percent Impervious	0.4
Soil Type	176
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.2486
Peak Intensity (in/hr)	1.4704
Undeveloped Runoff Coefficient (Cu)	0.6641
Developed Runoff Coefficient (Cd)	0.7585
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	1.8959
Burned Peak Flow Rate (cfs)	1.8959
24-Hr Clear Runoff Volume (ac-ft)	0.2099
24-Hr Clear Runoff Volume (cu-ft)	9143.1128



Peak Flow Hydrologic Analysis

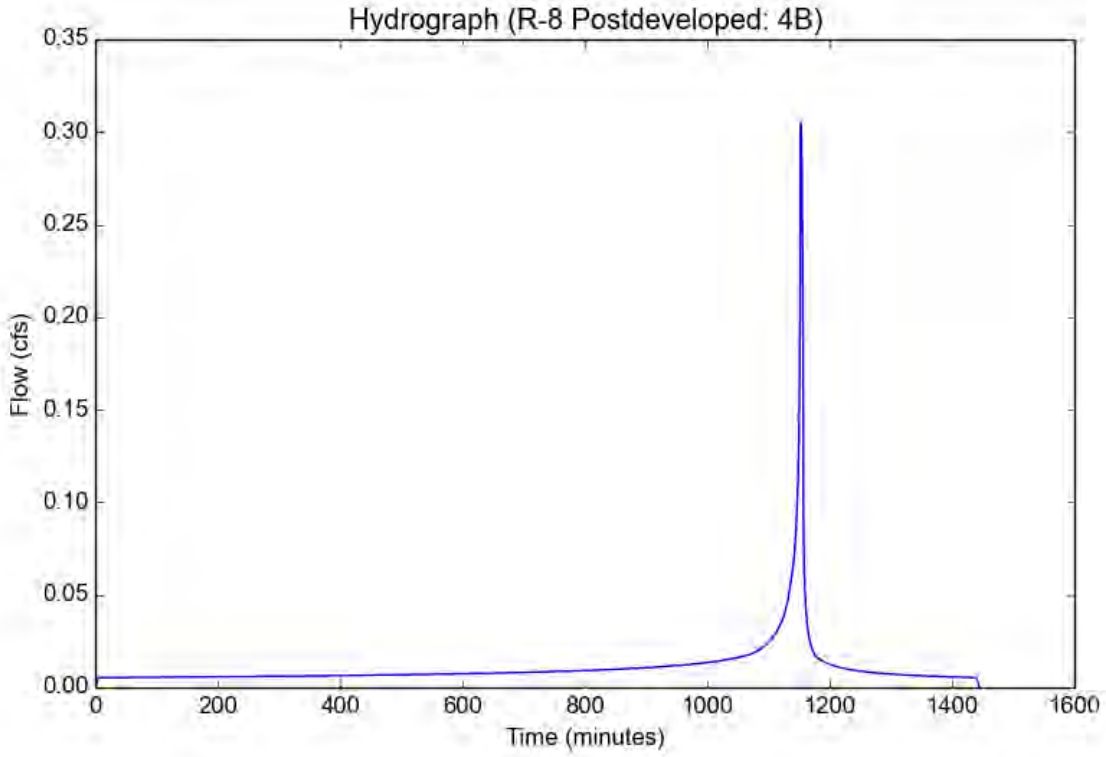
File location: C:/Users/Zac/Favorites/R-8 Postdeveloped Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	R-8 Postdeveloped
Subarea ID	4B
Area (ac)	0.2
Flow Path Length (ft)	104.0
Flow Path Slope (vft/hft)	0.038
50-yr Rainfall Depth (in)	3.7
Percent Impervious	0.33
Soil Type	176
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.2486
Peak Intensity (in/hr)	1.9382
Undeveloped Runoff Coefficient (Cu)	0.7303
Developed Runoff Coefficient (Cd)	0.7863
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3048
Burned Peak Flow Rate (cfs)	0.3048
24-Hr Clear Runoff Volume (ac-ft)	0.022
24-Hr Clear Runoff Volume (cu-ft)	957.2729



Peak Flow Hydrologic Analysis

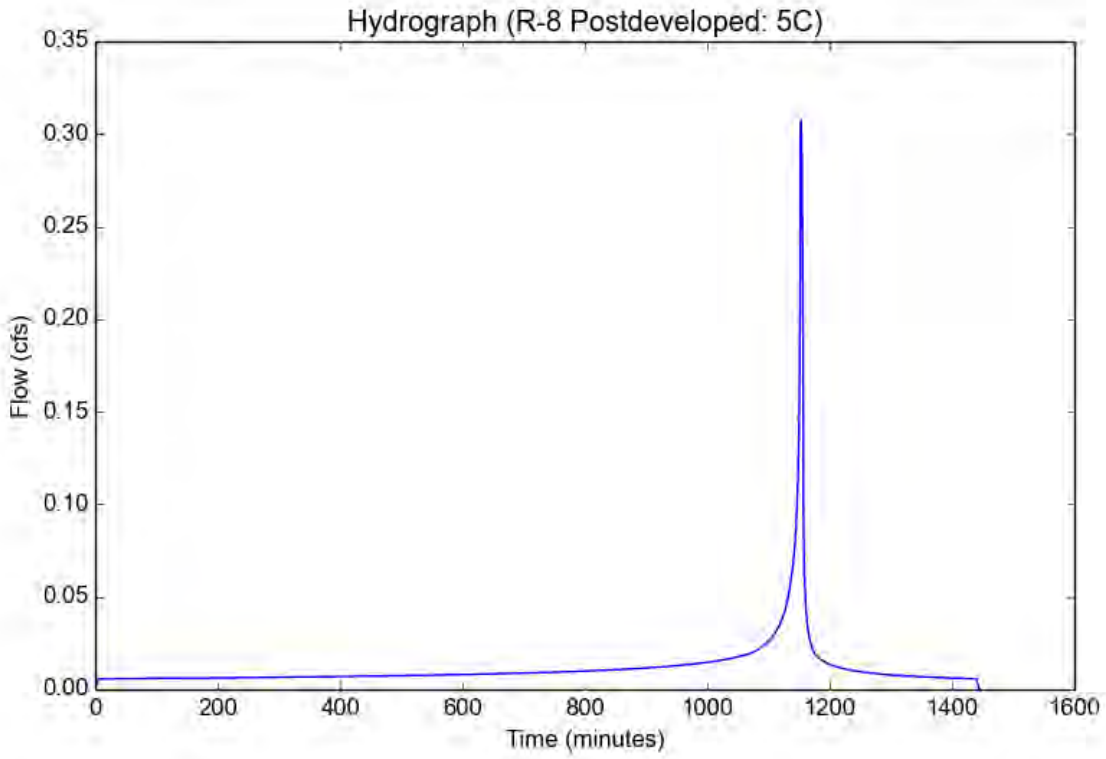
File location: C:/Users/Zac/Favorites/R-8 Postdeveloped Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	R-8 Postdeveloped
Subarea ID	5C
Area (ac)	0.2
Flow Path Length (ft)	104.0
Flow Path Slope (vft/hft)	0.038
50-yr Rainfall Depth (in)	3.7
Percent Impervious	0.37
Soil Type	176
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	3.2486
Peak Intensity (in/hr)	1.9382
Undeveloped Runoff Coefficient (Cu)	0.7303
Developed Runoff Coefficient (Cd)	0.7931
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3074
Burned Peak Flow Rate (cfs)	0.3074
24-Hr Clear Runoff Volume (ac-ft)	0.0235
24-Hr Clear Runoff Volume (cu-ft)	1025.7995



Peak Flow Hydrologic Analysis

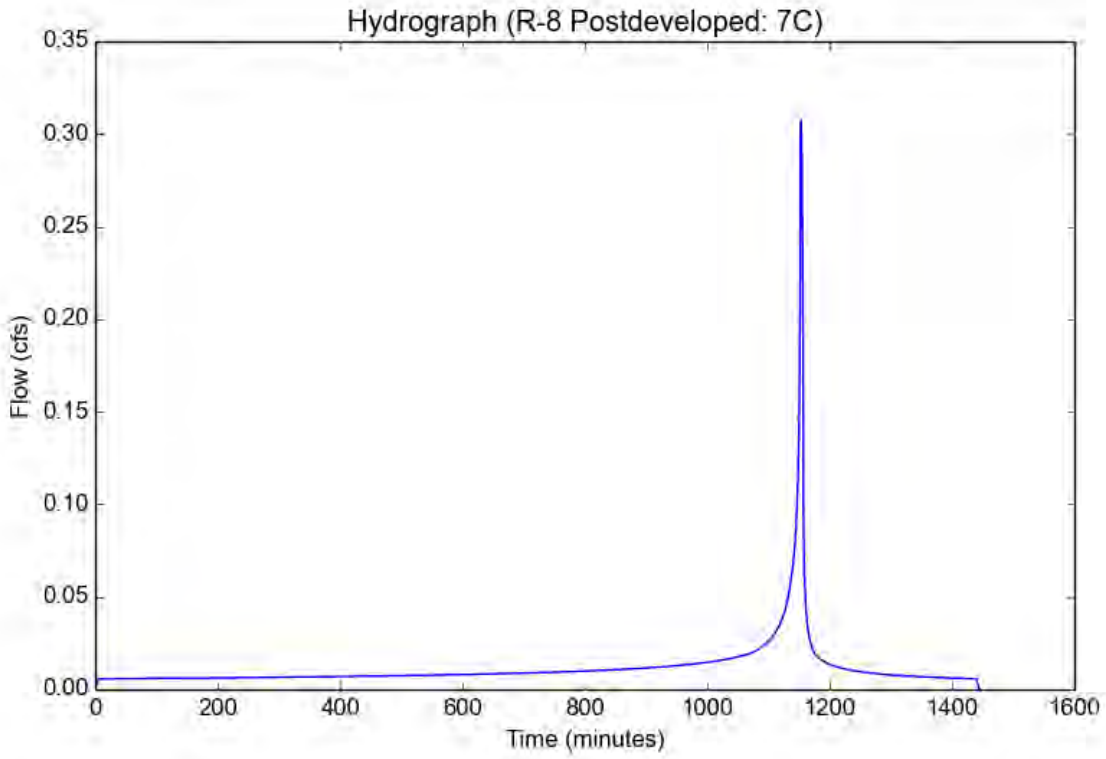
File location: C:/Users/Zac/Favorites/R-8 Postdeveloped Report.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	R-8 Postdeveloped
Subarea ID	7C
Area (ac)	0.2
Flow Path Length (ft)	104.0
Flow Path Slope (vft/hft)	0.038
50-yr Rainfall Depth (in)	3.7
Percent Impervious	0.37
Soil Type	176
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

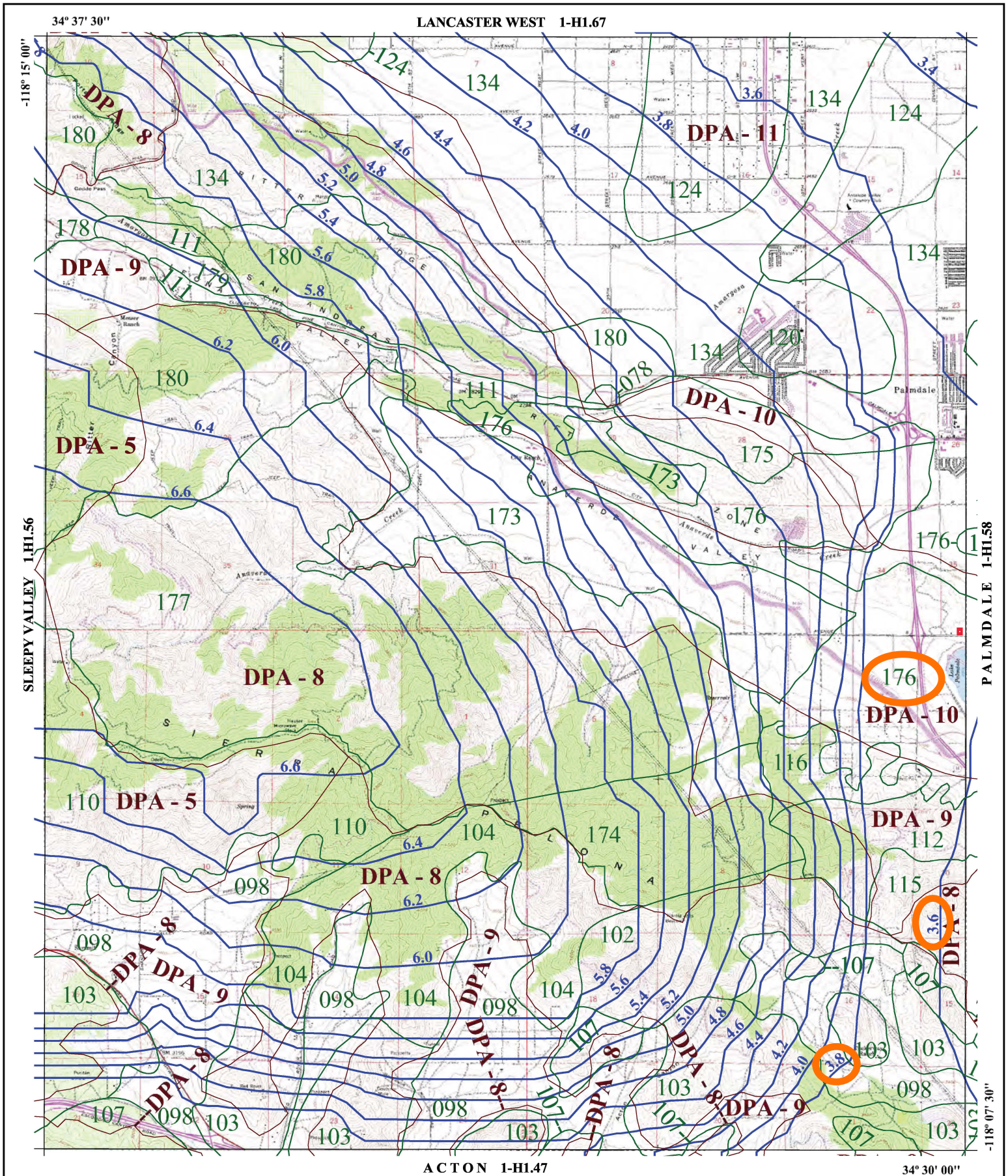
Output Results

Modeled (25-yr) Rainfall Depth (in)	3.2486
Peak Intensity (in/hr)	1.9382
Undeveloped Runoff Coefficient (Cu)	0.7303
Developed Runoff Coefficient (Cd)	0.7931
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.3074
Burned Peak Flow Rate (cfs)	0.3074
24-Hr Clear Runoff Volume (ac-ft)	0.0235
24-Hr Clear Runoff Volume (cu-ft)	1025.7995



SECTION 4:

ISOHYET MAP



016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

N W E S

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

RITTER RIDGE
50-YEAR 24-HOUR ISOHYET

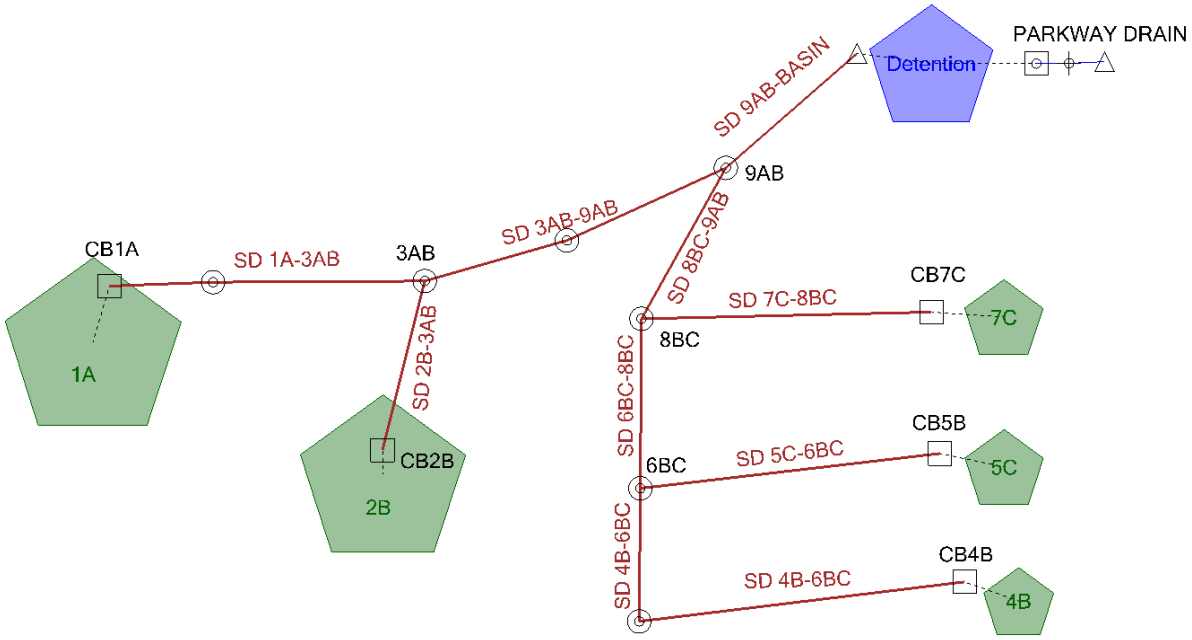
1-H1.57

LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

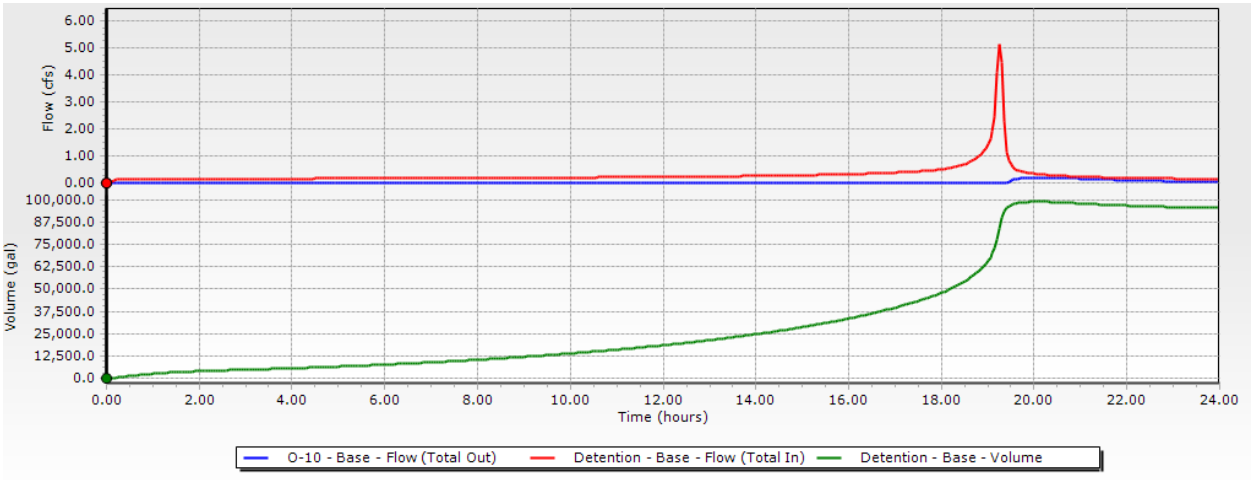
SECTION 5:

CivilStorm ANALYSIS

The figure below shows the layout of the model in civistorm. When the detention basin is full, water overflows into the parkway drain The pond's inflow and volume and outfall's outflow are analyzed with in the routing below.



Below is a graph of the data presented in the routing that follows.



New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
0.00	0.00	0.00	0.0
0.05	0.00	0.01	8.0
0.10	0.00	0.05	50.6
0.15	0.00	0.10	162.6
0.20	0.00	0.13	325.3
0.25	0.00	0.14	501.5
0.30	0.00	0.14	669.7
0.35	0.00	0.14	832.7
0.40	0.00	0.14	990.5
0.45	0.00	0.14	1,143.0
0.50	0.00	0.14	1,290.2
0.55	0.00	0.14	1,432.1
0.60	0.00	0.14	1,568.8
0.65	0.00	0.14	1,700.1
0.70	0.00	0.14	1,826.2
0.75	0.00	0.14	1,946.9
0.80	0.00	0.14	2,065.0
0.85	0.00	0.14	2,177.8
0.90	0.00	0.14	2,288.0
0.95	0.00	0.14	2,392.8
1.00	0.00	0.14	2,494.9
1.05	0.00	0.14	2,591.7
1.10	0.00	0.14	2,685.9
1.15	0.00	0.14	2,777.4
1.20	0.00	0.14	2,866.2
1.25	0.00	0.14	2,952.4
1.30	0.00	0.14	3,033.2
1.35	0.00	0.14	3,114.0
1.40	0.00	0.15	3,189.5
1.45	0.00	0.15	3,265.0
1.50	0.00	0.15	3,335.1
1.55	0.00	0.15	3,405.2
1.60	0.00	0.15	3,472.7
1.65	0.00	0.15	3,537.4
1.70	0.00	0.15	3,602.2
1.75	0.00	0.15	3,661.6
1.80	0.00	0.15	3,721.0
1.85	0.00	0.15	3,777.7
1.90	0.00	0.15	3,831.7
1.95	0.00	0.15	3,885.8
2.00	0.00	0.15	3,937.1
2.05	0.00	0.15	3,985.8
2.10	0.00	0.15	4,034.4
2.15	0.00	0.15	4,083.1
2.20	0.00	0.15	4,126.4
2.25	0.00	0.15	4,169.6
2.30	0.00	0.15	4,212.9
2.35	0.00	0.15	4,256.2

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
2.40	0.00	0.15	4,294.1
2.45	0.00	0.15	4,332.0
2.50	0.00	0.15	4,369.9
2.55	0.00	0.15	4,407.8
2.60	0.00	0.15	4,445.7
2.65	0.00	0.15	4,483.6
2.70	0.00	0.15	4,521.5
2.75	0.00	0.15	4,559.4
2.80	0.00	0.15	4,597.3
2.85	0.00	0.15	4,635.2
2.90	0.00	0.15	4,673.2
2.95	0.00	0.15	4,711.1
3.00	0.00	0.15	4,749.0
3.05	0.00	0.15	4,787.0
3.10	0.00	0.15	4,824.9
3.15	0.00	0.15	4,862.9
3.20	0.00	0.15	4,900.9
3.25	0.00	0.15	4,938.8
3.30	0.00	0.15	4,976.8
3.35	0.00	0.15	5,014.8
3.40	0.00	0.15	5,058.2
3.45	0.00	0.15	5,101.6
3.50	0.00	0.15	5,142.3
3.55	0.00	0.16	5,183.0
3.60	0.00	0.16	5,223.7
3.65	0.00	0.16	5,267.2
3.70	0.00	0.16	5,307.9
3.75	0.00	0.16	5,348.6
3.80	0.00	0.16	5,392.1
3.85	0.00	0.16	5,435.5
3.90	0.00	0.16	5,479.0
3.95	0.00	0.16	5,522.5
4.00	0.00	0.16	5,566.0
4.05	0.00	0.16	5,609.5
4.10	0.00	0.16	5,653.0
4.15	0.00	0.16	5,696.5
4.20	0.00	0.16	5,740.0
4.25	0.00	0.16	5,786.2
4.30	0.00	0.16	5,835.2
4.35	0.00	0.16	5,884.1
4.40	0.00	0.16	5,933.1
4.45	0.00	0.16	5,982.1
4.50	0.00	0.16	6,031.1
4.55	0.00	0.16	6,080.1
4.60	0.00	0.16	6,129.1
4.65	0.00	0.16	6,178.2
4.70	0.00	0.16	6,227.2
4.75	0.00	0.16	6,276.2

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
4.80	0.00	0.16	6,325.3
4.85	0.00	0.16	6,374.3
4.90	0.00	0.16	6,423.4
4.95	0.00	0.16	6,472.5
5.00	0.00	0.16	6,521.5
5.05	0.00	0.16	6,570.6
5.10	0.00	0.16	6,625.2
5.15	0.00	0.16	6,679.7
5.20	0.00	0.16	6,734.3
5.25	0.00	0.16	6,788.9
5.30	0.00	0.16	6,843.5
5.35	0.00	0.16	6,898.1
5.40	0.00	0.16	6,952.7
5.45	0.00	0.16	7,007.3
5.50	0.00	0.16	7,062.0
5.55	0.00	0.16	7,116.6
5.60	0.00	0.16	7,171.3
5.65	0.00	0.16	7,225.9
5.70	0.00	0.17	7,280.6
5.75	0.00	0.17	7,335.3
5.80	0.00	0.17	7,390.0
5.85	0.00	0.17	7,450.2
5.90	0.00	0.17	7,510.3
5.95	0.00	0.17	7,570.5
6.00	0.00	0.17	7,630.8
6.05	0.00	0.17	7,691.0
6.10	0.00	0.17	7,751.2
6.15	0.00	0.17	7,811.5
6.20	0.00	0.17	7,871.7
6.25	0.00	0.17	7,932.0
6.30	0.00	0.17	7,992.3
6.35	0.00	0.17	8,052.6
6.40	0.00	0.17	8,112.9
6.45	0.00	0.17	8,173.2
6.50	0.00	0.17	8,233.6
6.55	0.00	0.17	8,299.4
6.60	0.00	0.17	8,365.3
6.65	0.00	0.17	8,431.1
6.70	0.00	0.17	8,497.0
6.75	0.00	0.17	8,562.9
6.80	0.00	0.17	8,628.8
6.85	0.00	0.17	8,694.7
6.90	0.00	0.17	8,760.7
6.95	0.00	0.17	8,826.6
7.00	0.00	0.17	8,892.6
7.05	0.00	0.17	8,958.6
7.10	0.00	0.17	9,024.6
7.15	0.00	0.17	9,090.6

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
7.20	0.00	0.17	9,162.1
7.25	0.00	0.17	9,233.7
7.30	0.00	0.18	9,305.2
7.35	0.00	0.18	9,376.8
7.40	0.00	0.17	9,448.4
7.45	0.00	0.17	9,520.0
7.50	0.00	0.17	9,591.7
7.55	0.00	0.18	9,666.1
7.60	0.00	0.18	9,740.5
7.65	0.00	0.18	9,812.2
7.70	0.00	0.18	9,883.9
7.75	0.00	0.18	9,955.6
7.80	0.00	0.18	10,032.9
7.85	0.00	0.18	10,110.2
7.90	0.00	0.18	10,187.5
7.95	0.00	0.18	10,264.8
8.00	0.00	0.18	10,342.1
8.05	0.00	0.18	10,419.5
8.10	0.00	0.18	10,496.9
8.15	0.00	0.18	10,574.3
8.20	0.00	0.18	10,651.7
8.25	0.00	0.18	10,729.1
8.30	0.00	0.18	10,806.6
8.35	0.00	0.18	10,886.8
8.40	0.00	0.18	10,969.9
8.45	0.00	0.18	11,052.9
8.50	0.00	0.18	11,136.0
8.55	0.00	0.18	11,219.1
8.60	0.00	0.18	11,302.2
8.65	0.00	0.19	11,385.4
8.70	0.00	0.19	11,468.6
8.75	0.00	0.19	11,551.8
8.80	0.00	0.19	11,635.0
8.85	0.00	0.19	11,718.2
8.90	0.00	0.19	11,807.0
8.95	0.00	0.19	11,895.9
9.00	0.00	0.19	12,029.2
9.05	0.00	0.19	12,118.1
9.10	0.00	0.19	12,207.1
9.15	0.00	0.19	12,296.0
9.20	0.00	0.19	12,385.0
9.25	0.00	0.19	12,474.0
9.30	0.00	0.19	12,563.1
9.35	0.00	0.19	12,654.9
9.40	0.00	0.19	12,749.6
9.45	0.00	0.19	12,844.3
9.50	0.00	0.19	12,939.0
9.55	0.00	0.19	13,033.7

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
9.60	0.00	0.19	13,128.5
9.65	0.00	0.19	13,223.3
9.70	0.00	0.19	13,318.2
9.75	0.00	0.20	13,413.1
9.80	0.00	0.20	13,510.7
9.85	0.00	0.20	13,611.3
9.90	0.00	0.20	13,711.8
9.95	0.00	0.20	13,812.4
10.00	0.00	0.20	13,913.0
10.05	0.00	0.20	14,013.7
10.10	0.00	0.20	14,114.3
10.15	0.00	0.20	14,215.0
10.20	0.00	0.20	14,318.6
10.25	0.00	0.20	14,422.2
10.30	0.00	0.20	14,525.8
10.35	0.00	0.20	14,632.2
10.40	0.00	0.20	14,738.7
10.45	0.00	0.20	14,845.3
10.50	0.00	0.20	14,951.8
10.55	0.00	0.20	15,058.4
10.60	0.00	0.20	15,165.1
10.65	0.00	0.20	15,274.5
10.70	0.00	0.20	15,386.9
10.75	0.00	0.21	15,499.2
10.80	0.00	0.21	15,611.7
10.85	0.00	0.21	15,724.1
10.90	0.00	0.21	15,836.6
10.95	0.00	0.21	15,949.1
11.00	0.00	0.21	16,061.7
11.05	0.00	0.21	16,177.2
11.10	0.00	0.21	16,295.4
11.15	0.00	0.21	16,413.8
11.20	0.00	0.21	16,532.2
11.25	0.00	0.21	16,650.6
11.30	0.00	0.21	16,769.1
11.35	0.00	0.21	16,887.6
11.40	0.00	0.21	17,009.0
11.45	0.00	0.21	17,133.2
11.50	0.00	0.21	17,257.5
11.55	0.00	0.22	17,381.9
11.60	0.00	0.22	17,506.3
11.65	0.00	0.22	17,630.8
11.70	0.00	0.22	17,755.3
11.75	0.00	0.22	17,882.6
11.80	0.00	0.22	18,012.9
11.85	0.00	0.22	18,143.2
11.90	0.00	0.22	18,273.6
11.95	0.00	0.22	18,404.1

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
12.00	0.00	0.22	18,534.5
12.05	0.00	0.22	18,665.1
12.10	0.00	0.22	18,801.4
12.15	0.00	0.22	18,934.9
12.20	0.00	0.23	19,071.2
12.25	0.00	0.23	19,207.7
12.30	0.00	0.23	19,344.2
12.35	0.00	0.23	19,483.6
12.40	0.00	0.23	19,625.9
12.45	0.00	0.23	19,768.3
12.50	0.00	0.23	19,910.8
12.55	0.00	0.23	20,053.3
12.60	0.00	0.23	20,195.9
12.65	0.00	0.23	20,341.4
12.70	0.00	0.23	20,489.8
12.75	0.00	0.23	20,638.3
12.80	0.00	0.23	20,786.8
12.85	0.00	0.23	20,935.4
12.90	0.00	0.24	21,084.1
12.95	0.00	0.24	21,238.6
13.00	0.00	0.24	21,393.2
13.05	0.00	0.24	21,547.8
13.10	0.00	0.24	21,702.5
13.15	0.00	0.24	21,857.3
13.20	0.00	0.24	22,017.9
13.25	0.00	0.24	22,178.6
13.30	0.00	0.24	22,339.3
13.35	0.00	0.24	22,500.2
13.40	0.00	0.24	22,664.0
13.45	0.00	0.25	22,830.7
13.50	0.00	0.25	22,997.5
13.55	0.00	0.25	23,164.5
13.60	0.00	0.25	23,331.5
13.65	0.00	0.25	23,501.4
13.70	0.00	0.25	23,671.5
13.75	0.00	0.25	23,844.5
13.80	0.00	0.25	24,017.7
13.85	0.00	0.25	24,193.8
13.90	0.00	0.26	24,372.9
13.95	0.00	0.26	24,552.1
14.00	0.00	0.26	24,731.4
14.05	0.00	0.26	24,913.6
14.10	0.00	0.26	25,098.9
14.15	0.00	0.26	25,284.3
14.20	0.00	0.26	25,469.8
14.25	0.00	0.26	25,658.3
14.30	0.00	0.26	25,849.8
14.35	0.00	0.27	26,041.4

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
14.40	0.00	0.27	26,233.1
14.45	0.00	0.27	26,430.8
14.50	0.00	0.27	26,628.6
14.55	0.00	0.27	26,826.4
14.60	0.00	0.27	27,027.4
14.65	0.00	0.27	27,231.3
14.70	0.00	0.27	27,435.4
14.75	0.00	0.27	27,642.5
14.80	0.00	0.28	27,852.7
14.85	0.00	0.28	28,063.0
14.90	0.00	0.28	28,273.5
14.95	0.00	0.28	28,489.9
15.00	0.00	0.28	28,706.4
15.05	0.00	0.29	28,923.2
15.10	0.00	0.29	29,145.9
15.15	0.00	0.29	29,368.7
15.20	0.00	0.29	29,591.7
15.25	0.00	0.29	29,820.7
15.30	0.00	0.29	30,049.9
15.35	0.00	0.30	30,282.2
15.40	0.00	0.30	30,517.6
15.45	0.00	0.30	30,753.1
15.50	0.00	0.30	30,991.8
15.55	0.00	0.30	31,233.5
15.60	0.00	0.30	31,478.4
15.65	0.00	0.31	31,726.5
15.70	0.00	0.31	31,974.7
15.75	0.00	0.31	32,229.0
15.80	0.00	0.31	32,483.4
15.85	0.00	0.32	32,741.1
15.90	0.00	0.32	33,001.9
15.95	0.00	0.32	33,265.9
16.00	0.00	0.32	33,533.0
16.05	0.00	0.32	33,803.3
16.10	0.00	0.33	34,076.8
16.15	0.00	0.33	34,353.5
16.20	0.00	0.33	34,633.4
16.25	0.00	0.33	34,916.5
16.30	0.00	0.34	35,202.8
16.35	0.00	0.34	35,495.3
16.40	0.00	0.34	35,788.1
16.45	0.00	0.34	36,087.1
16.50	0.00	0.35	36,389.3
16.55	0.00	0.35	36,694.8
16.60	0.00	0.35	37,006.6
16.65	0.00	0.36	37,321.7
16.70	0.00	0.36	37,640.0
16.75	0.00	0.36	37,964.6

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
16.80	0.00	0.37	38,292.6
16.85	0.00	0.37	38,623.8
16.90	0.00	0.37	38,961.4
16.95	0.00	0.38	39,302.4
17.00	0.00	0.38	39,649.7
17.05	0.00	0.39	40,000.3
17.10	0.00	0.39	40,357.4
17.15	0.00	0.39	40,720.9
17.20	0.00	0.40	41,090.8
17.25	0.00	0.40	41,464.1
17.30	0.00	0.41	41,847.0
17.35	0.00	0.41	42,236.3
17.40	0.00	0.42	42,629.1
17.45	0.00	0.42	43,031.5
17.50	0.00	0.43	43,440.4
17.55	0.00	0.43	43,859.0
17.60	0.00	0.44	44,284.2
17.65	0.00	0.45	44,719.0
17.70	0.00	0.45	45,163.6
17.75	0.00	0.46	45,614.8
17.80	0.00	0.47	46,075.9
17.85	0.00	0.48	46,546.7
17.90	0.00	0.48	47,030.5
17.95	0.00	0.49	47,527.2
18.00	0.00	0.50	48,036.8
18.05	0.00	0.52	48,565.5
18.10	0.00	0.53	49,113.5
18.15	0.00	0.55	49,677.6
18.20	0.00	0.56	50,267.3
18.25	0.00	0.58	50,879.5
18.30	0.00	0.60	51,517.4
18.35	0.00	0.62	52,181.2
18.40	0.00	0.65	52,877.1
18.45	0.00	0.67	53,605.4
18.50	0.00	0.70	54,372.4
18.55	0.00	0.73	55,184.7
18.60	0.00	0.77	56,042.4
18.65	0.00	0.81	56,952.0
18.70	0.00	0.86	57,923.4
18.75	0.00	0.92	58,969.6
18.80	0.00	0.98	60,100.5
18.85	0.00	1.06	61,335.9
18.90	0.00	1.16	62,695.7
18.95	0.00	1.29	64,216.0
19.00	0.00	1.43	65,924.0
19.05	0.00	1.62	67,866.8
19.10	0.00	1.90	70,157.2
19.15	0.00	2.46	73,070.2

New Graph

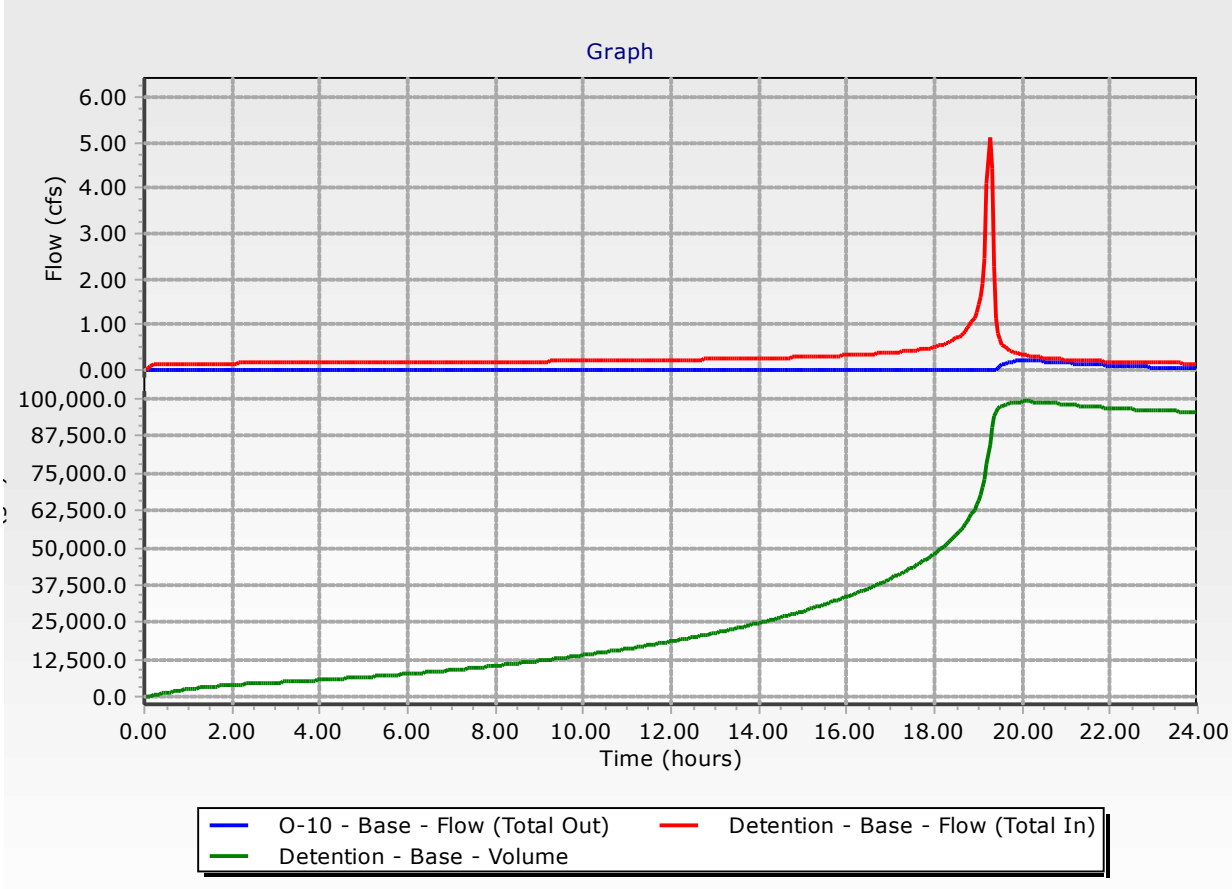
Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
19.20	0.00	4.08	77,755.7
19.25	0.00	5.10	84,249.0
19.30	0.00	4.43	90,432.9
19.35	0.00	2.28	94,075.4
19.40	0.00	1.12	95,647.4
19.45	0.06	0.80	96,559.4
19.50	0.10	0.66	97,196.6
19.55	0.12	0.57	97,667.4
19.60	0.14	0.51	98,019.0
19.65	0.16	0.47	98,288.8
19.70	0.17	0.44	98,500.7
19.75	0.18	0.42	98,668.2
19.80	0.18	0.40	98,798.1
19.85	0.19	0.38	98,900.7
19.90	0.19	0.37	98,975.9
19.95	0.20	0.35	99,027.3
20.00	0.20	0.34	99,058.1
20.05	0.20	0.33	99,075.2
20.10	0.20	0.32	99,078.6
20.15	0.20	0.31	99,068.3
20.20	0.20	0.31	99,047.8
20.25	0.20	0.30	99,017.0
20.30	0.20	0.29	98,979.4
20.35	0.20	0.29	98,934.9
20.40	0.19	0.28	98,887.0
20.45	0.19	0.27	98,832.3
20.50	0.19	0.27	98,777.6
20.55	0.19	0.26	98,716.0
20.60	0.18	0.26	98,654.5
20.65	0.18	0.25	98,593.0
20.70	0.18	0.25	98,524.6
20.75	0.17	0.25	98,456.2
20.80	0.17	0.24	98,387.9
20.85	0.17	0.24	98,319.6
20.90	0.16	0.24	98,251.2
20.95	0.16	0.23	98,182.9
21.00	0.16	0.23	98,114.6
21.05	0.15	0.23	98,046.3
21.10	0.15	0.22	97,978.0
21.15	0.15	0.22	97,909.7
21.20	0.14	0.22	97,841.4
21.25	0.14	0.21	97,773.2
21.30	0.14	0.21	97,708.3
21.35	0.13	0.21	97,646.9
21.40	0.13	0.21	97,585.5
21.45	0.13	0.20	97,524.0
21.50	0.13	0.20	97,462.6
21.55	0.12	0.20	97,401.2

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
21.60	0.12	0.20	97,339.8
21.65	0.12	0.20	97,281.9
21.70	0.11	0.19	97,227.3
21.75	0.11	0.19	97,172.8
21.80	0.11	0.19	97,118.2
21.85	0.11	0.19	97,063.7
21.90	0.10	0.19	97,009.1
21.95	0.10	0.19	96,954.6
22.00	0.10	0.18	96,906.9
22.05	0.10	0.18	96,859.2
22.10	0.09	0.18	96,811.5
22.15	0.09	0.18	96,763.8
22.20	0.09	0.18	96,716.1
22.25	0.09	0.18	96,668.4
22.30	0.09	0.18	96,624.1
22.35	0.08	0.17	96,583.2
22.40	0.08	0.17	96,542.3
22.45	0.08	0.17	96,501.5
22.50	0.08	0.17	96,460.6
22.55	0.08	0.17	96,419.8
22.60	0.07	0.17	96,378.9
22.65	0.07	0.17	96,338.0
22.70	0.07	0.17	96,304.0
22.75	0.07	0.16	96,270.0
22.80	0.07	0.16	96,235.9
22.85	0.06	0.16	96,201.9
22.90	0.06	0.16	96,167.8
22.95	0.06	0.16	96,133.8
23.00	0.06	0.16	96,099.8
23.05	0.06	0.16	96,065.8
23.10	0.06	0.16	96,031.7
23.15	0.06	0.16	96,004.5
23.20	0.05	0.15	95,977.3
23.25	0.05	0.15	95,950.1
23.30	0.05	0.15	95,922.9
23.35	0.05	0.15	95,895.6
23.40	0.05	0.15	95,868.4
23.45	0.05	0.15	95,841.2
23.50	0.05	0.15	95,814.0
23.55	0.04	0.15	95,786.8
23.60	0.04	0.15	95,759.6
23.65	0.04	0.15	95,732.4
23.70	0.04	0.15	95,712.0
23.75	0.04	0.15	95,691.6
23.80	0.04	0.14	95,671.2
23.85	0.04	0.14	95,650.8
23.90	0.04	0.14	95,630.4
23.95	0.04	0.14	95,610.0

New Graph

Time (hours)	O-10 - Base - Flow (Total Out) (cfs)	Detention - Base - Flow (Total In) (cfs)	Detention - Base - Volume (gal)
24.00	0.04	0.13	95,582.8



SECTION 6:

Storm Drain System Manning's Calculation

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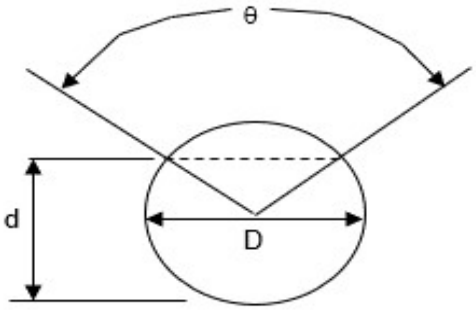
Pipe 1A-3AB @ Minimum 3.3% Slope



R = A/P	D =	24	in
A = Cross Section Area	d =	4.14	in
P = Wetted Perimeter	n =	0.013	
S = Slope of Channel	Angle =	98.1607	θ
n = Manning's Roughness Coefficient	S =	0.033	ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.362	1.713	0.211	7.362	2.663
Flow Depth = 4.14 INCHES. 17.25% FULL				

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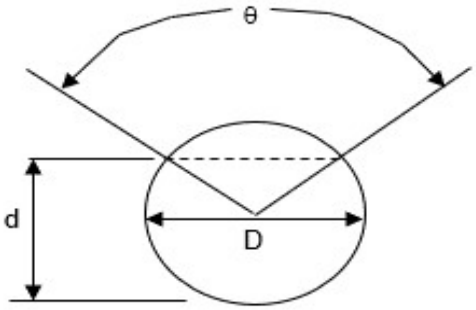
Pipe 2B-3AB @ Minimum 4.2% Slope



R = A/P	D =	24	in
A = Cross Section Area	d =	3.57	in
P = Wetted Perimeter	n =	0.013	
S = Slope of Channel	Angle =	90.74415	θ
n = Manning's Roughness Coefficient	S =	0.031	ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.292	1.584	0.184	6.518	1.903
Flow Depth = 3.57 INCHES. 14.88% FULL				

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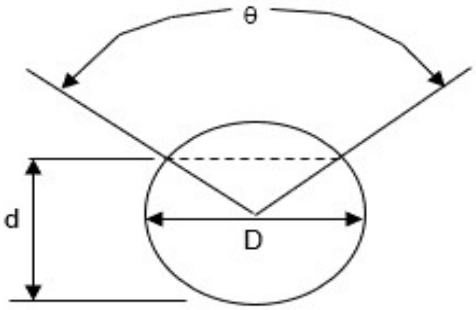
Pipe 3AB-9AB @ Minimum 0.5% Slope



R = A/P

A = Cross Section Area

P = Wetted Perimeter

S = Slope of Channel

n = Manning's Roughness Coefficient

D = 24 in

d = 8.78 in

n = 0.013

Angle = 148.86977 θ

S = 0.005 ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
1.041	2.598	0.401	4.392	4.570
Flow Depth = 8.78 INCHES. 36.58% FULL				

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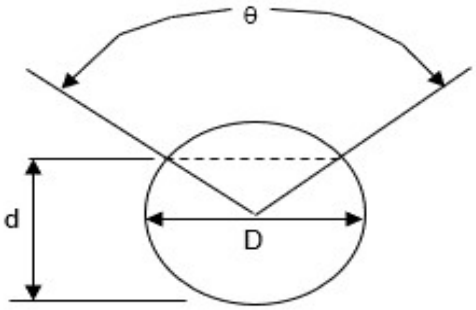
Pipe 4B-6BC @ Minimum 1.3% Slope



R = A/P

A = Cross Section Area

P = Wetted Perimeter

S = Slope of Channel

n = Manning's Roughness Coefficient

D = 12 in

d = 2.21 in

n = 0.013

Angle = 101.65361 θ

S = 0.013 ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.099	0.887	0.112	3.028	0.301
Flow Depth = 2.21 INCHES. 18.42% FULL				

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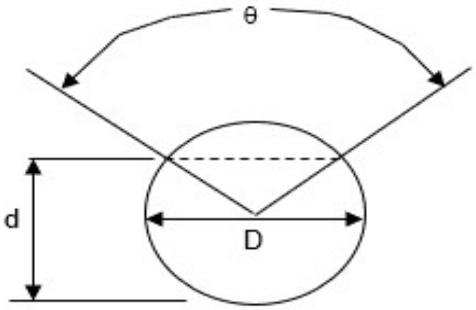
Pipe 5C-6BC @ Minimum 1.3% Slope



R = A/P	D =	12	in
A = Cross Section Area	d =	2.25	in
P = Wetted Perimeter	n =	0.013	
S = Slope of Channel	Angle =	102.63563	θ
n = Manning's Roughness Coefficient	S =	0.013	ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.102	0.896	0.114	3.061	0.312
Flow Depth = 2.25 INCHES. 18.75% FULL				

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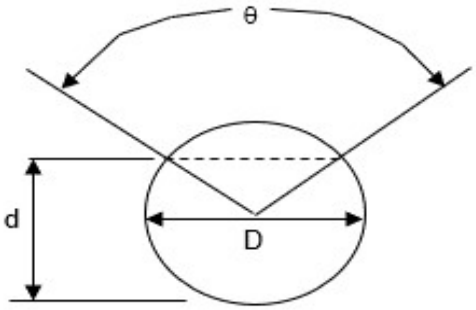
Pipe 6BC-8BC @ Minimum 3.0% Slope



R = A/P

A = Cross Section Area

P = Wetted Perimeter

S = Slope of Channel

n = Manning's Roughness Coefficient

D = 24 in

d = 2.09 in

n = 0.013

Angle = 68.653861 θ

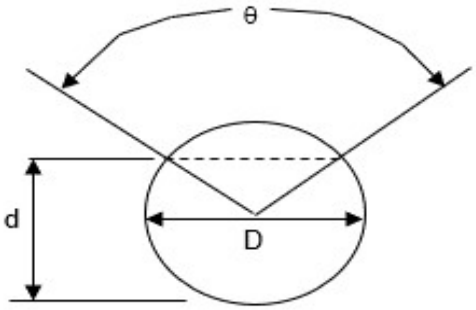
S = 0.030 ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.133	1.198	0.111	4.582	0.611
Flow Depth = 2.09 INCHES. 8.71% FULL				

Duke Engineering
CIVIL & STRUCTURAL
LANCASTER - CALIFORNIA

Pipe 7C-8BC @ Minimum 1.2% Slope



R = A/P

A = Cross Section Area

P = Wetted Perimeter

S = Slope of Channel

n = Manning's Roughness Coefficient

D = 12 in

d = 2.29 in

n = 0.013

Angle = 103.61094 θ

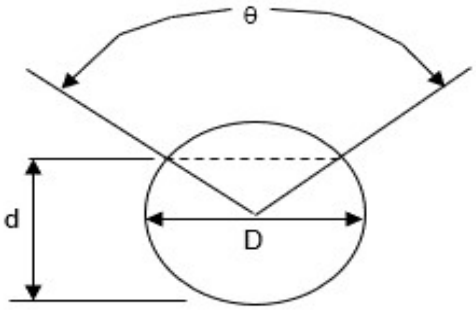
S = 0.012 ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.105	0.904	0.116	2.972	0.311
Flow Depth = 2.29 INCHES. 19.08% FULL				

Duke Engineering
CIVIL & STRUCTURAL
LANCASTER - CALIFORNIA

Pipe 8BC-9AB @ Minimum 1.9% Slope



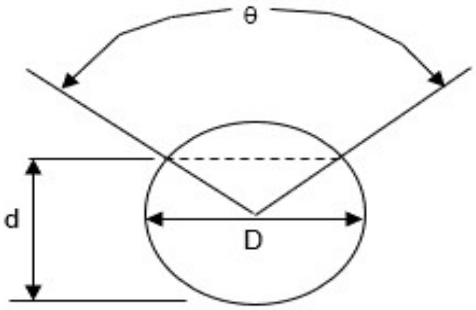
R = A/P	D =	24	in
A = Cross Section Area	d =	2.84	in
P = Wetted Perimeter	n =	0.013	
S = Slope of Channel	Angle =	80.48211	θ
n = Manning's Roughness Coefficient	S =	0.019	ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
0.209	1.405	0.149	4.427	0.926
Flow Depth = 2.84 INCHES. 11.83% FULL				

Duke Engineering
CIVIL & STRUCTURAL
LANCASTER - CALIFORNIA

Pipe 9AB-BASIN @ Minimum 0.5% Slope



R = A/P

A = Cross Section Area

P = Wetted Perimeter

S = Slope of Channel

n = Manning's Roughness Coefficient

D = 24 in

d = 9.69 in

n = 0.013

Angle = 157.80257 θ

S = 0.005 ft/ft

Mannings Formula = $Q = (1.486/n)\ A\ R_h^{2/3}\ S^{1/2}$

Area, ft^2	Wetted Perimeter	Hydraulic Radius	Velocity (ft/s)	Flow Rate (cfs)
1.188	2.754	0.431	4.615	5.483
Flow Depth = 9.69 INCHES. 40.38% FULL				

SECTION 7:
STREET CAPACITY ANALYSIS

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 31 2021

3rd Street East

User-defined

Invert Elev (ft)	= 1.27
Slope (%)	= 4.00
N-Value	= 0.013

Calculations

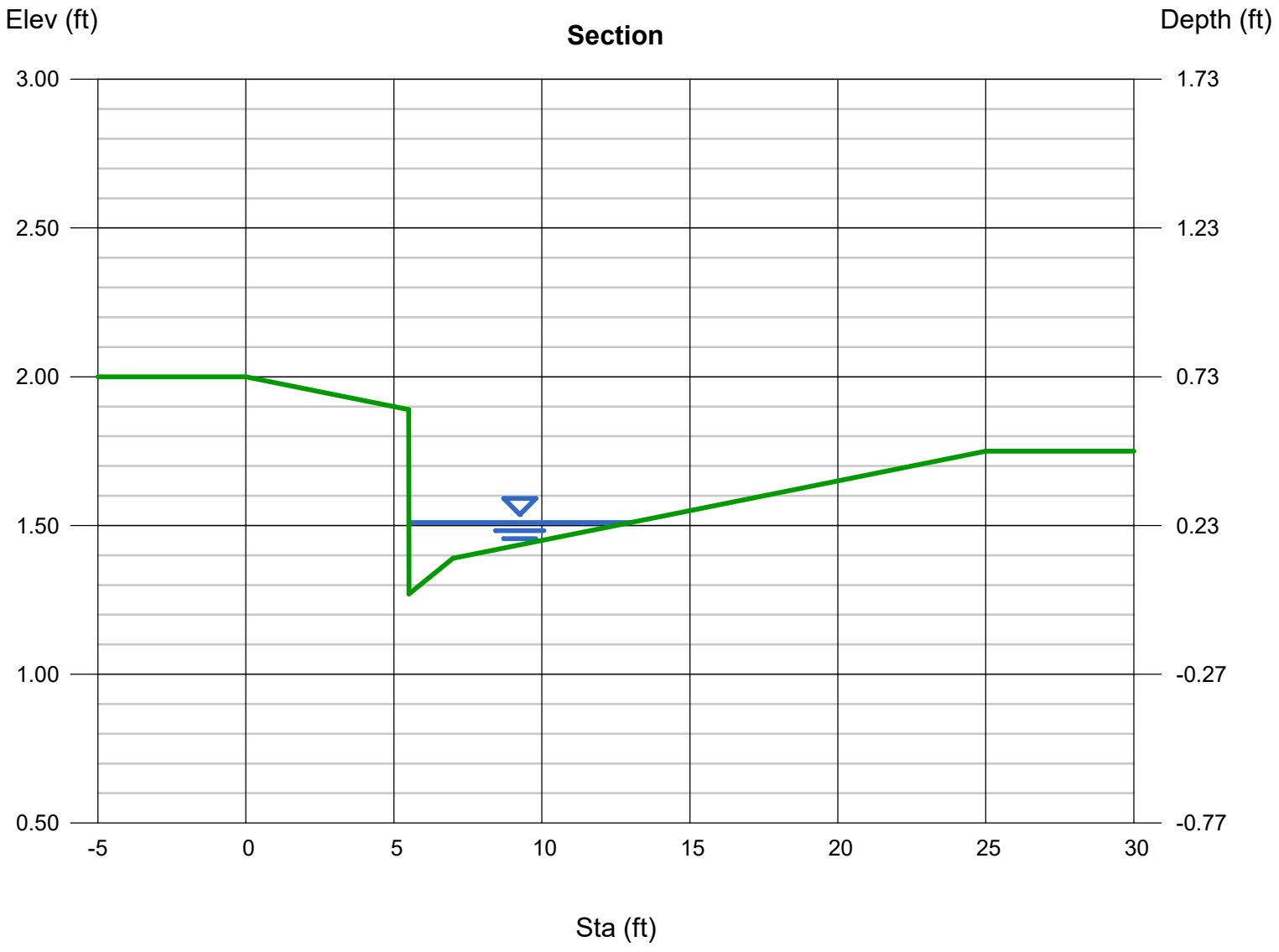
Compute by:	Known Q
Known Q (cfs)	= 2.66

Highlighted

Depth (ft)	= 0.24
Q (cfs)	= 2.660
Area (sqft)	= 0.63
Velocity (ft/s)	= 4.23
Wetted Perim (ft)	= 7.74
Crit Depth, Yc (ft)	= 0.32
Top Width (ft)	= 7.49
EGL (ft)	= 0.52

(Sta, El, n)-(Sta, El, n)...

(0.00, 2.00)-(5.50, 1.89, 0.013)-(5.51, 1.27, 0.013)-(7.00, 1.39, 0.013)-(25.00, 1.75, 0.013)



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 31 2021

Sumac Ave Street Capacity

User-defined

Invert Elev (ft)	= 1.27
Slope (%)	= 3.00
N-Value	= 0.013

Calculations

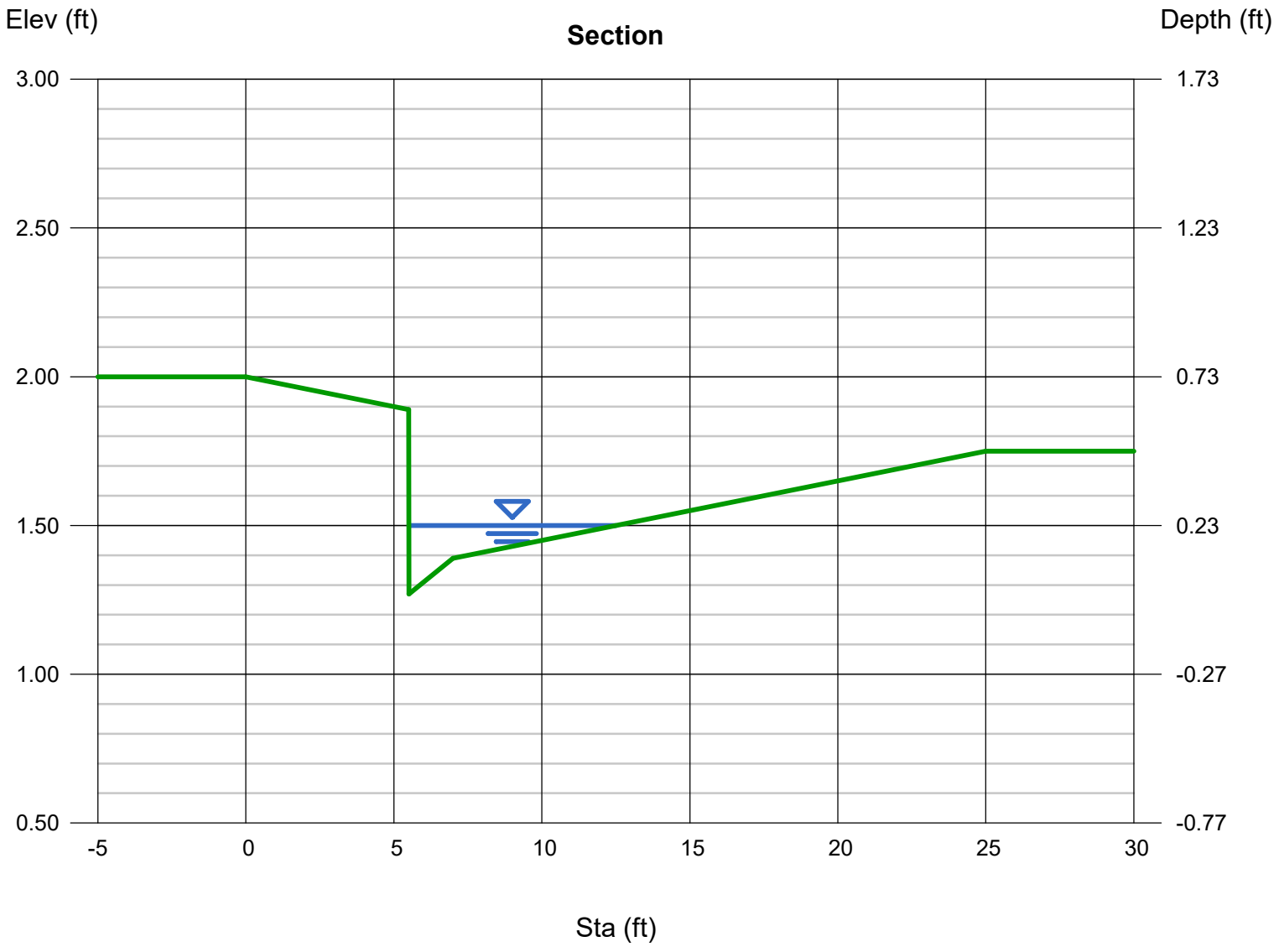
Compute by:	Known Q
Known Q (cfs)	= 1.90

Highlighted

Depth (ft)	= 0.23
Q (cfs)	= 1.900
Area (sqft)	= 0.56
Velocity (ft/s)	= 3.42
Wetted Perim (ft)	= 7.23
Crit Depth, Yc (ft)	= 0.29
Top Width (ft)	= 6.99
EGL (ft)	= 0.41

(Sta, El, n)-(Sta, El, n)...

(0.00, 2.00)-(5.50, 1.89, 0.013)-(5.51, 1.27, 0.013)-(7.00, 1.39, 0.013)-(25.00, 1.75, 0.013)



SECTION 8:

PARKWAY DRAIN CAPACITY ANALYSIS

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 31 2021

Parkway Drain Capcaity Analysis

Rectangular

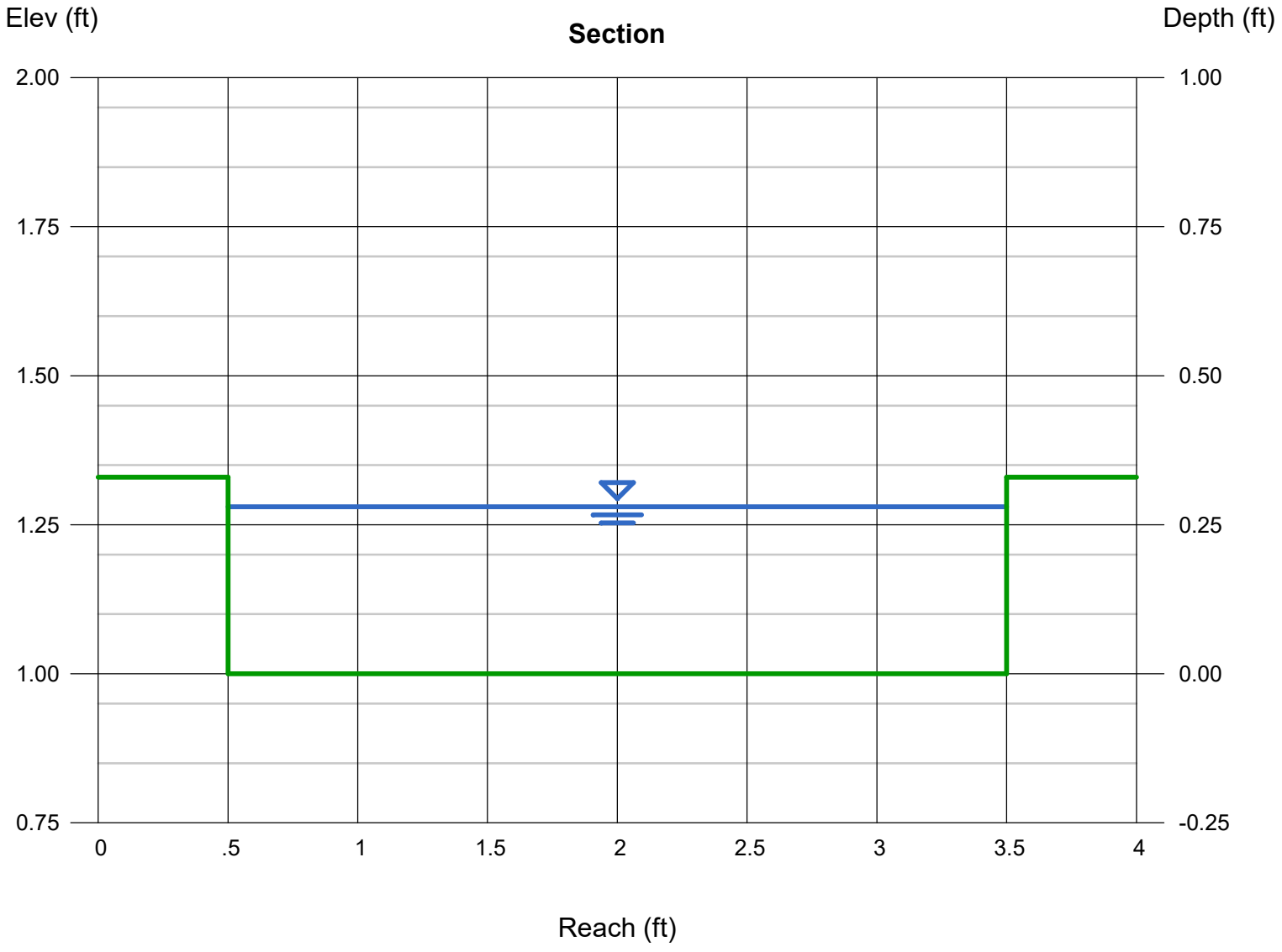
Bottom Width (ft)	= 3.00
Total Depth (ft)	= 0.33
Invert Elev (ft)	= 1.00
Slope (%)	= 3.83
N-Value	= 0.013

Calculations

Compute by:	Known Q
Known Q (cfs)	= 6.85

Highlighted

Depth (ft)	= 0.28
Q (cfs)	= 6.850
Area (sqft)	= 0.84
Velocity (ft/s)	= 8.15
Wetted Perim (ft)	= 3.56
Crit Depth, Yc (ft)	= 0.33
Top Width (ft)	= 3.00
EGL (ft)	= 1.31



SECTION 9:

CURB INLET CAPACITY ANALYSIS

Weir Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 31 2021

3rd St East Curb Inlet Capacity for 25-yr Storm

Rectangular Weir

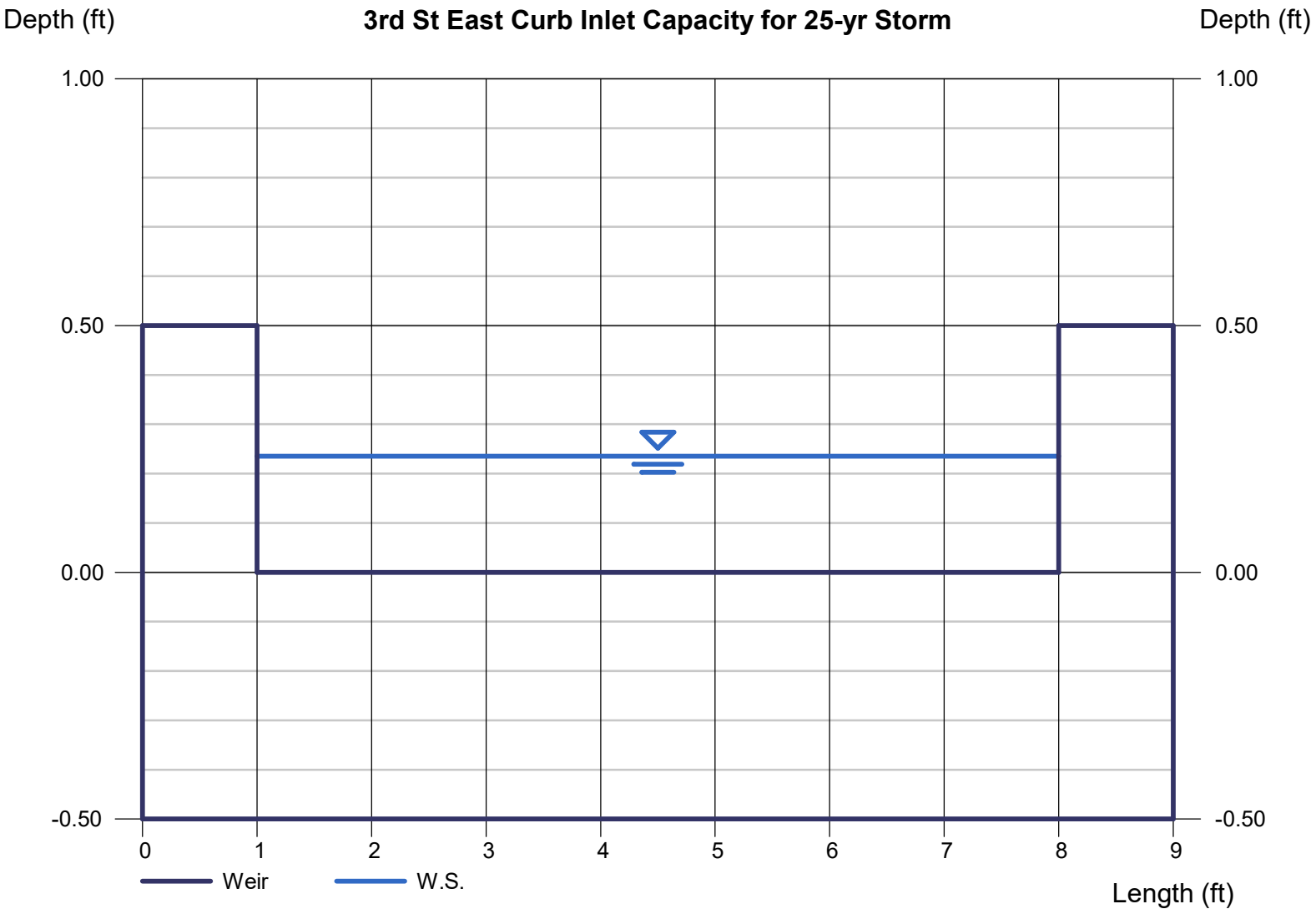
Crest	= Sharp
Bottom Length (ft)	= 7.00
Total Depth (ft)	= 0.50

Calculations

Weir Coeff. Cw	= 3.33
Compute by:	Known Q
Known Q (cfs)	= 2.66

Highlighted

Depth (ft)	= 0.24
Q (cfs)	= 2.660
Area (sqft)	= 1.65
Velocity (ft/s)	= 1.62
Top Width (ft)	= 7.00



Weir Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 31 2021

Sumac Ave Curb Inlet Capacity for 25-yr Storm

Rectangular Weir

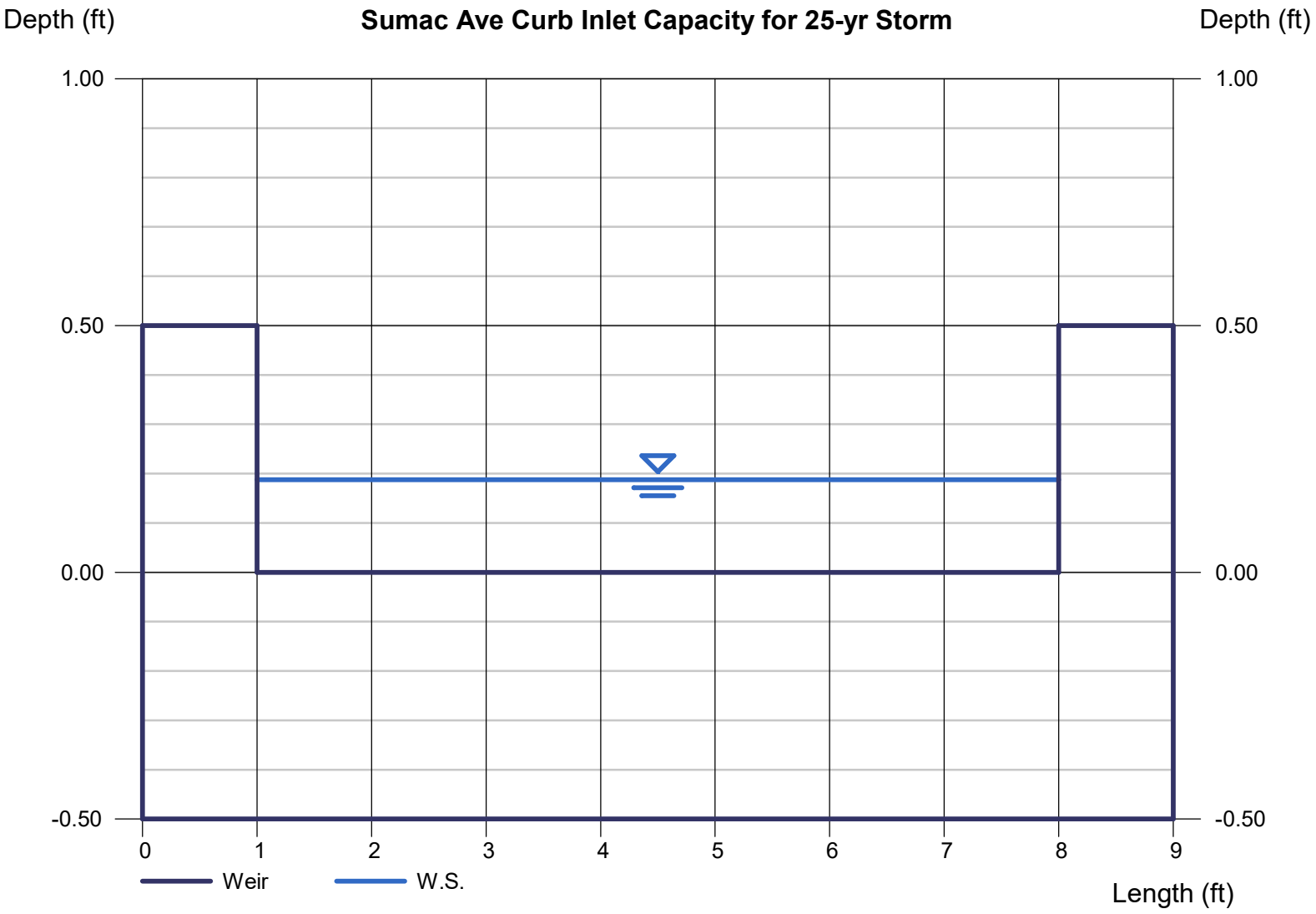
Crest	= Sharp
Bottom Length (ft)	= 7.00
Total Depth (ft)	= 0.50

Calculations

Weir Coeff. Cw	= 3.33
Compute by:	Known Q
Known Q (cfs)	= 1.90

Highlighted

Depth (ft)	= 0.19
Q (cfs)	= 1.900
Area (sqft)	= 1.31
Velocity (ft/s)	= 1.45
Top Width (ft)	= 7.00



Appendix I Acoustical Analysis (Noise)

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

September 19, 2023

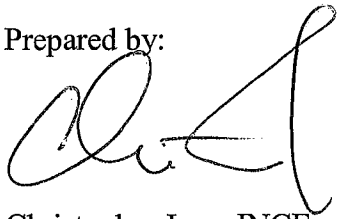
ACOUSTICAL ANALYSIS

TRACT 82364

AVENUE R-8

CITY OF PALMDALE

Prepared by:



Christopher Jean, INCE

Prepared for:

MS. PATTY DE LA CRUZ
DUKE ENGINEERING
44732 Yucca Avenue
Lancaster, California 93534

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

SUMMARY

This analysis has been completed to determine the exterior and interior noise exposure and the necessary mitigation measures for the proposed Tract 82364 project located on Avenue R-8 in the City of Palmdale. A list of requirements and recommendations is given in the following summary. Details are discussed in the body of the report.

A. EXTERIOR NOISE CONTROL

Sound walls a least six feet high shall be erected atop an earthen berm 1.5 feet high along the north side of Lots 4, 5 and 12. A sound barrier at least five feet (5') high must be erected along the north side of Lot 13.

B. NOISE CONTROL BARRIER CONSTRUCTION MATERIALS

The required noise control barriers may be constructed using any of the following materials:

(1) Masonry block

(2) Stucco on wood frame

(3) 3/4" plywood

(4) 1/4" tempered glass or 1/2" Lexan

(5) Earthen berm

(6) Any combination of the above materials or any material with a surface weight of at least 3.5 pounds per square foot.

Each completed noise control barrier must present a solid face from top-to-bottom and end-to-end. Cutouts are not permitted except for drain holes.

C. INTERIOR NOISE CONTROL

The buildings shall be constructed, as a minimum, in accordance with the outline of Table 4 found in the body of the report. This will be adequate for all units with the following exceptions:

(1) Add STC 40 glazing to all second floor rooms facing Avenue R-8 from Lots 4, 5 and 12

(2) Add STC 32 glazing to all second floor rooms facing only east or west from Lots 4, 5 and 12

(3) Add STC 32 glazing to all first floor rooms with any view of Avenue R-8 from Lot 12

(4) Add STC 30 glazing to all second floor rooms with any view of Avenue R-8 from Lot 13

(5) Add STC 30 glazing to all first floor rooms with any view of Avenue R-8 from Lots 11 and 12

D. VENTILATION

This analysis assumed that all windows and doors are kept closed. If the allowable interior noise levels are met by requiring that windows and doors be kept closed, then the design of the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment. The ventilation system must not compromise the dwelling or guest room noise reduction.

E. PROJECT DISCLOSURE

The acoustical code requirements represent minimal acceptable standards. Compliance with the Building Department acoustical criteria does not require, guarantee or even imply that local sound sources will be mitigated to inaudibility. Compliance with an exterior noise limit of 65 dBA CNEL means that exterior noise will remain clearly audible within the mitigated exterior space. Compliance with an interior noise limit of 45 dBA CNEL means that exterior noise sources will remain audible on the interior of a building.

Do not misrepresent the degree of exterior to interior or unit-to-unit acoustical isolation as anything more than meeting code during any phase of this project. Never, ever, use any form of the term "Soundproof" to describe any portion of this project.

1.0 INTRODUCTION

This report presents the results of a noise impact and design study of the proposed Tract 82364 located on Avenue R-8 in the City of Palmdale. This report includes a discussion of the expected exterior community noise environment and the recommendations for control of noise in the exterior and interior living spaces.

A vicinity map showing the general location of the project site is presented in Exhibit 1 – Site Location Map. An aerial photograph of the existing project site and its surroundings is shown on Exhibit 2. The project site plan is shown on Exhibit 3. The project consists of single-family housing.

2.0 APPLICABLE NOISE CRITERIA

The City of Palmdale requires all residential projects to conform to the requirements of Table 1.

TABLE 1

APPLICABLE NOISE CRITERIA (1)

Exterior	65 dBA CNEL
Interior	45 dBA CNEL

(1) Please see Noise Rating Methods (Appendix 1) for an explanation of the commonly applicable acoustical terminology.

3.0 DESIGN NOISE LEVELS

3.1 ROADWAYS

The expected future roadway noise impact was projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters that determine the projected impact of vehicular traffic noise. These include the roadway cross-section (e.g. number of lanes), the roadway active width, the average daily traffic (ADT), the vehicle travel speed, the percentage of auto and truck traffic, the roadway grade, the angle of view, the site conditions ("hard" or "soft" site), and the percentage of average daily traffic that flows each hour throughout a 24 hour period.

The forecast traffic volumes were obtained from the city of Palmdale General Plan. The percentage of truck traffic was taken from a standard arterial mix. The same source was used to project the distribution by time of day. The input data is listed in Table 2.

TABLE 2

TRAFFIC INPUT DATA

	% DAY	% EVENING	% NIGHT	% VOLUME
Autos	75.51	12.57	9.34	100.0
Medium Trucks	1.56	0.09	0.19	100.0
Heavy Trucks	0.64	0.02	0.08	100.0

Volume = 36,000 ADT on Avenue R-8
= 36,000 ADT on 5th Street East

Speed = 45 MPH on Avenue R-8 (posted)
= 50 MPH on 5th Street East (posted)

The calculations are contained in Appendix 2. The calculations yield 50' design noise levels of 74 dBA CNEL for Avenue R-8 and 75 dBA CNEL for 5th Street East. Accounting for distance and structure shielding, the 5th Street East noise level would be 54 dBA CNEL at the east edge of the project site.

3.2 RAILROAD

A line of the Metrolink railroad passes east of the site at a distance of about 2,300. This distance combined with the infrequent commuter trains means that railroad noise will not impact the project site as defined by City standards.

3.3 AIRCRAFT

There are no concentrated aircraft operations in the vicinity of the project site. Aircraft noise will not impact the site.

4.0 MITIGATION MEASURES

4.1 EXTERIOR

The mitigation of exterior noise would require a sound barrier along Avenue R-8. For purposes of analysis, the barrier height calculations assume that the barrier is located at the top of any slope between the roadway and building pads, and is only intended to reduce exterior noise to 65 dBA CNEL at the first floor level. The assumptions for the barrier height calculations are listed in Table 3 on the following page.

TABLE 3

BARRIER ANALYSIS GENERAL ASSUMPTIONS
FOR RECEIVER AND SOURCE GEOMETRY

RECEIVER ASSUMPTIONS

HORIZONTAL GEOMETRY	VERTICAL GEOMETRY
Distance behind top-of-roadways barrier: 5' to 10'	Height above pad for ground level receivers: 5'
Distance behind individual patio and balcony barriers: 1' to 3'	Height above pad for second level receivers: 14'

SOURCE ASSUMPTIONS

HORIZONTAL GEOMETRY *	VERTICAL GEOMETRY	
For roadways with grades no greater than 2%, all vehicles were located at the single lane equivalent acoustic center of the full roadway. For roadways with over 2% grade, vehicle count was divided in half and located at the single lane equivalent acoustic center for each side of the roadway.	Automobiles:	0' above center of road grade
	Medium Trucks:	2.3' above center of road grade
	Heavy Trucks:	8' above center of road grade

* = Single Lane Equivalent (SLE) location.

The barrier calculations are contained in Appendix 3. These calculations show that a barrier at least seven and a half feet (7.5') high must be erected along the north side of Lots 4, 5 and 12. As the City does not normally approve wall in excess of six feet high, it is recommended that a wall six feet high be erected atop an earthen berm 1.5 feet high. The barrier calculations also show that a barrier at least five feet (5') high must be erected along the north side of Lot 13.

The required noise control barriers may be constructed using any of the following materials:

(1) Masonry block

(2) Stucco on wood frame

(3) 3/4" plywood

(4) 1/4" tempered glass or 1/2" Lexan

(5) Earthen berm

(6) Any combination of the above materials or any material with a surface weight of at least 3.5 pounds per square foot.

Each completed noise control barrier must present a solid face from top-to-bottom. Cutouts and/or openings are not permitted except for drain holes.

4.2 INTERIOR

The City's exposure criteria for new residential construction require that the interior noise environment, attributable to outside noise sources, be limited to 45 dBA CNEL. Analysis and recommendations for control of outdoor-to-indoor noise intrusion are presented in this section.

The exterior-to-interior noise reduction expected for the planned construction was based on a detailed analysis of sample rooms and units planned for the development. Calculations of the expected typical noise reduction performance were performed for sample rooms. The analysis was based on the typical spectra expected for the primary sources of community noise impact, the typical octave-band transmission loss for each element in the planned building shell, the relative square footage of each element of the planned building shell, the expected typical interior surface treatment, and the acoustical absorption coefficient for each interior surface treatment. Corrections for the "A" Weighted room absorption factors are also included.

Each component of the building shell (e.g. exterior wall, windows, doors, etc.) provides a different amount of transmission loss for each "A" Weighted octave- band of community noise. With the knowledge of the building shell components and their individual octave band transmission loss values for the noise sources, calculations of the composite building shell transmission loss can be made for each room.

The characteristics of the basic building shell are listed in Table 4 on the following page.

TABLE 4

BASIC BUILDING SHELL CHARACTERISTICS

PANEL	CONSTRUCTION
Exterior Wall	Siding or stucco, 2" X 4" studs, R-13 fiberglass insulation, 1/2" drywall
Windows	Double pane
Sliding Glass Door	Double pane
Roof	Shingle or tile over 1/2" plywood, insulation, 5/8" drywall, vented attic
Floor	Carpeted except kitchen and baths

Table 4 construction minimums will normally provide around 20 dBA of interior noise reduction with windows and doors closed. This is normally adequate for units exposed to exterior noise levels as high as 65 dBA CNEL. However, second floor rooms (if any) on lots adjacent to Avenue R-8 will be exposed to exterior noise levels as high as 74 dBA CNEL. These rooms will require interior noise reduction levels as high as 29 dBA. As this is well beyond the expected yield of Table 4 construction minimums, sample interior noise reduction calculations were performed to determine the required upgrades to Table 4 construction. As building plans were not yet available for this analysis, a small corner bedroom with windows on two sides was assumed for the calculations.

The calculations are contained in Appendix 4, and the results are given in Table 5.

TABLE 5

ROOM NOISE REDUCTION VALUES

	NOISE REDUCTION VS. GLAZING STC								
ROOM	24	26	28	30	32	34	36	38	40
Corner Bedroom	20	22	23	25	26	27	28	28	29

The results of Table 5 show that Table 4 construction should be adequate for all units with the following exceptions:

(1) Add STC 40 glazing to all second floor rooms facing Avenue R-8 from Lots 4, 5 and 12

(2) Add STC 32 glazing to all second floor rooms facing only east or west from Lots 4, 5 and 12

(3) Add STC 32 glazing to all first floor rooms with any view of Avenue R-8 from Lot 12

(4) Add STC 30 glazing to all second floor rooms with any view of Avenue R-8 from Lot 13

(5) Add STC 30 glazing to all first floor rooms with any view of Avenue R-8 from Lots 11 and 12

4.3 VENTILATION

If interior allowable noise levels are met by requiring that windows be unopenable or remain closed, then the design of the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment. The ventilation system must not compromise the dwelling unit or guest room noise reduction.

4.4 PROJECT DISCLOSURE

The acoustical code requirements are minimal acceptable standards. Compliance with Building Department acoustical criteria does not require, guarantee or even imply that local sound sources will be mitigated to inaudibility. Compliance with an exterior noise limit of 65 dBA CNEL means that exterior noise will remain clearly audible within the mitigated exterior space. Compliance with an interior noise limit of 45 dBA CNEL means that exterior noise sources will remain audible on the interior of a structure.

Do not misrepresent the degree of exterior to interior or unit to unit acoustical isolation as anything more than meeting code during any phase of this project. Never, ever, use any form of the term "Soundproof" to describe any portion of this project.

EXHIBIT 1
SITE LOCATION

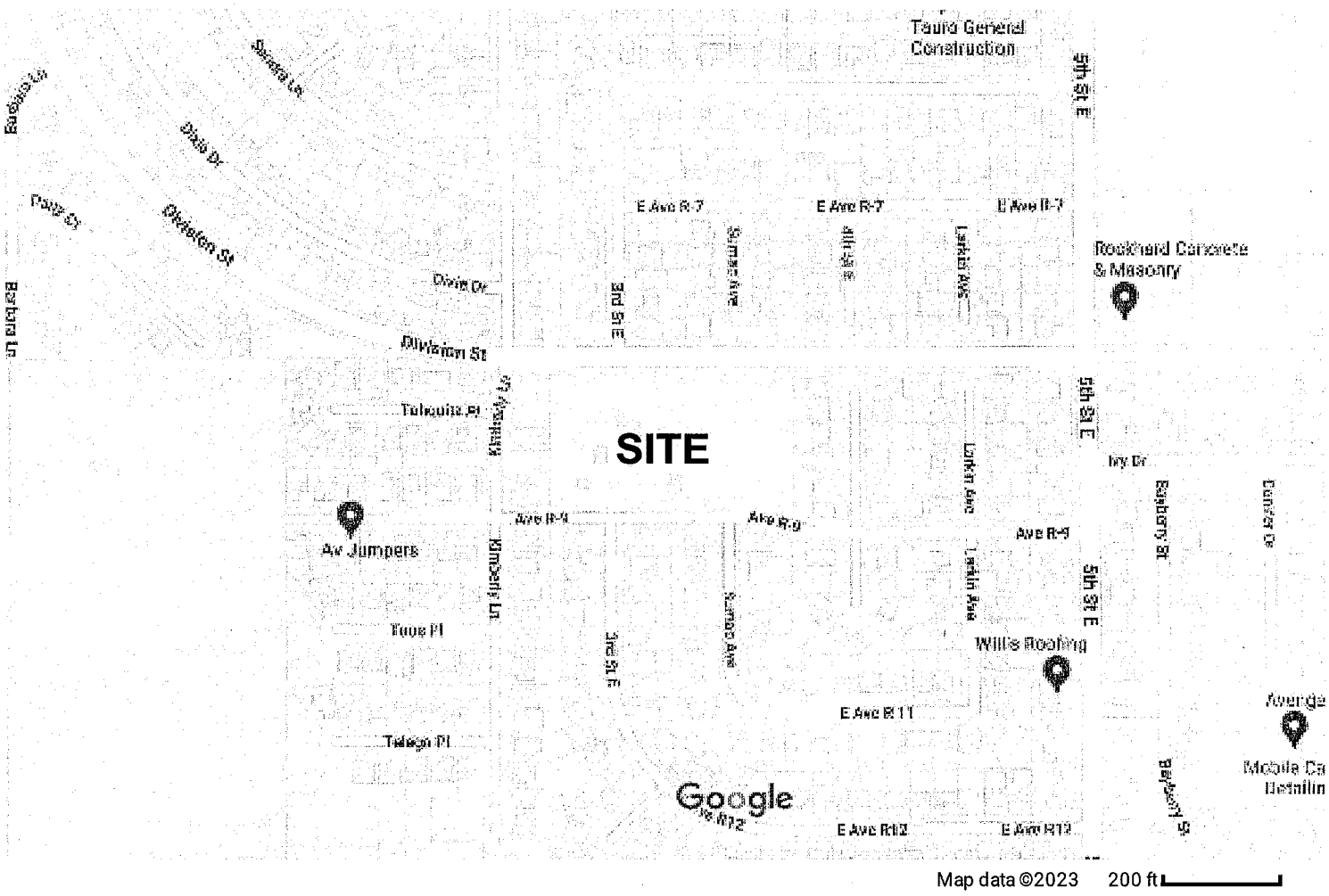
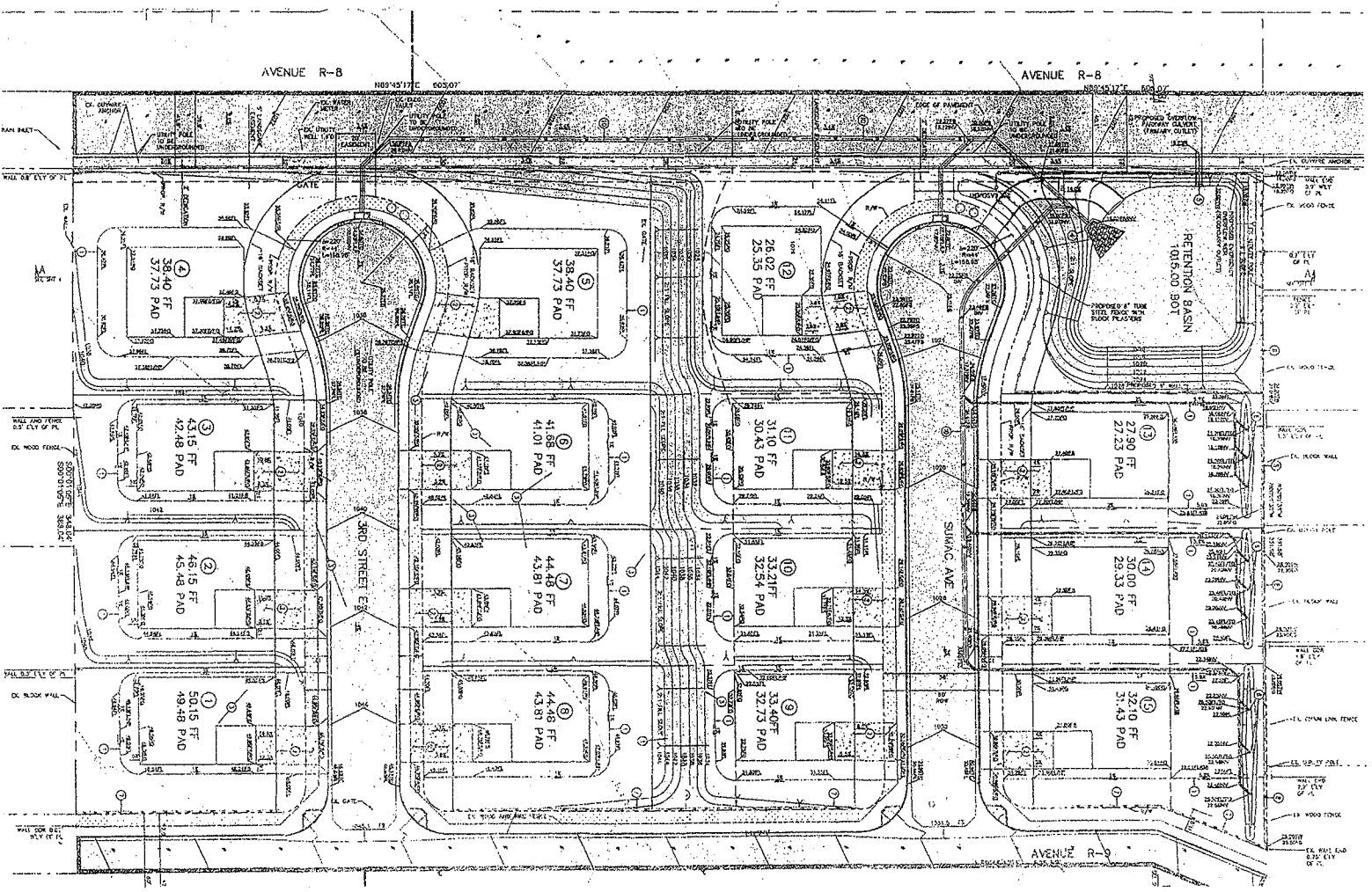


EXHIBIT 2
AERIAL PHOTO

Google Maps

Imagery ©2023 Airbus, CNES / Airbus, Maxar Technologies, U.S. Geological Survey, USDA/FPAC/GEO, Map data ©2023 200 ft

EXHIBIT 3
SITE PLAN



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APPENDIX 1

NOISE RATING METHODOLOGY

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NOISE RATING METHODOLOGY

The A-weighted decibel (dBA) or "A" scale on a sound level meter is typically used for environmental noise measurements because the weighting characteristics of the "A" scale approximate the subjective response of the human ear to a broad frequency band noise source by discriminating against the very low and very high frequencies of the audible sound spectrum.

Since community noise is seldom constant, varying from moment to moment and throughout the day, the "A" weighted noise level needs to be further described to provide meaningful data. The Environmental Protection Agency, the Federal Department of Transportation, several foreign countries and many private consultants are now using three time-exceeded percentile figures to describe noise, which are:

(1) L_{90} is the noise level that is exceeded 90 percent of any sample measurement period (such as 24 hours) and is often used to describe the background or ambient noise level.

(2) L_{50} is the noise level that is exceeded 50 percent of any sample measurement period. It is generally considered to represent the median noise level.

(3) L_{10} is the noise level that is exceeded 10 percent of any sample measurement period. It is a good descriptor of fluctuating noise sources such as vehicular traffic. It indicates the near-maximum noise levels that occur for groups of single noise events. Being related to the subjective annoyance to community noise, the L_{10} is a good design tool in the planning of acoustical barriers.

More recent noise assessment methods are based on the equivalent energy concept where Leq(x) represents the average energy content of a fluctuating noise source over a sample measurement period. The subscript (x) represents the period over which the energy is computed and/or measured. Current practice references the time quantity to either one (1) hour, eight (8) hours, or twenty-four (24) hours. When referenced to one (1) hour, Leq is also called the HNL (Hourly Noise Level).

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Since Leq is the summation of the functional products of noise level and duration, many different combinations of noise levels, duration times and time histories can produce similar Leq values. Thus a value of Leq(24) equals 50 means only that the average noise level is 50 dB. During that 24-hour period, there can be times when the noise level is higher than 50 dB and times when it is lower than 50 dB.

If the period of the measurement is only a single event, the energy content is not averaged. The energy expression for a single event is simply the sum of the functional product of the noise level and duration time of the event. This term is called the Le or SENEL (Single Event Noise Exposure Level). The summation of Le values averaged over one hour is Leq(1), over eight hours is Leq(8), over 24 hours is Leq(24), etc.

Leq is further refined into Ldn (Level Day-Night) and CNEL (Community Noise Equivalent Level), where noise that occurs during certain hours of the day are weighted (or penalized) in an attempt to compensate for the general perception that such noise is more annoying during these time periods (typically evening and nighttime hours).

(1) Ldn is the sound level in dBA that corresponds to the average energy content of the noise being measured over a 24-hour period but includes a ten (10) dBA weighting penalty for noise that occurs during the nighttime hours between 10:00 PM and 7:00 AM. The Ldn is a noise rating method recommended by the Environmental Protection Agency because it takes into account those subjectively more annoying noise events that occur during normal sleeping hours.

(2) CNEL is the sound level in dBA that corresponds to the average energy content of the noise being measured over a 24-hour period but includes a five (5) dBA penalty for noise that occurs during the evening hours between 7:00 PM and 10:00 PM, and a ten (10) dBA penalty for noise that occurs during the nighttime hours between 10:00 PM and 7:00 AM. For typical highway vehicular traffic situations, computer analysis has shown that the Ldn and CNEL values correlate within 0.5 dBA.

The percentile figures L_{10}, L_{50} and L_{90} can be directly scaled from a graphical recording of the measured noise sample over a particular time period. These figures can also be measured directly using modern automatic noise measuring equipment. Measurement of the parameters Le, Leq, Ldn and CNEL requires even more sophisticated and correspondingly expensive noise measuring equipment. As a result, engineers have devised ways of estimating Leq (and hence, Ldn) using standard instrumentation and methods.

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APPENDIX 2

FUTURE TRAFFIC NOISE CALCULATIONS

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FHWA RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT NAME :TRACT 82364
SITE LOCATION :PALMDALE
DESCRIPTION :AVENUE R-8
SITE TYPE :HARD

INPUT DATA	AUTO	MEDIUM TRUCK	HEAVY TRUCK
SPEED	45	45	45
% DAY	75.51	1.56	.64
% EVENING	12.57	0.09	0.02
% NIGHT	9.34	.19	.08
% VOLUME	100	100	100

VOLUME 36000

----AVERAGE HOURLY NOISE LEVELS AT 50 FEET----

	DAY	EVENING	NIGHT	24 HOUR	CNEL
AUTO	71.24	69.47	63.41	69.34	72.60
MEDIUM TRK.	64.62	58.25	56.72	62.32	65.39
HEAVY TRK.	65.41	56.38	57.63	63.03	66.10
TOTAL	72.94	69.98	65.11	70.90	74.11

NOISE LEVEL AT SPECIFIED DISTANCES

DISTANCE	CNEL
50	74.11
75	72.34
100	71.10
125	70.13
150	69.33
175	68.66
200	68.09
225	67.57
250	67.12
275	66.70
300	66.32
325	65.98
350	65.65
375	65.36
400	65.07
450	64.56
500	64.11
550	63.69
600	63.31
650	62.97
700	62.64

FHWA RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT NAME :TRACT 82364
SITE LOCATION :PALMDALE
DESCRIPTION :5TH STREET EAST
SITE TYPE :HARD

INPUT DATA	AUTO	MEDIUM TRUCK	HEAVY TRUCK
SPEED	50	50	50
% DAY	75.51	1.56	.64
% EVENING	12.57	0.09	0.02
% NIGHT	9.34	.19	.08
% VOLUME	100	100	100
VOLUME	36000		

----AVERAGE HOURLY NOISE LEVELS AT 50 FEET----

	DAY	EVENING	NIGHT	24 HOUR	CNEL
AUTO	72.53	70.76	64.70	70.62	73.89
MEDIUM TRK.	65.71	59.34	57.82	63.42	66.49
HEAVY TRK.	66.08	57.05	58.30	63.70	66.77
TOTAL	74.09	71.23	66.26	72.06	75.27

NOISE LEVEL AT SPECIFIED DISTANCES

DISTANCE	CNEL
50	75.27
75	73.51
100	72.26
125	71.29
150	70.50
175	69.83
200	69.25
225	68.74
250	68.28
275	67.87
300	67.49
325	67.14
350	66.82
375	66.52
400	66.24
450	65.73
500	65.27
550	64.86
600	64.48
650	64.13
700	63.81

CHRISTOPHER JEAN & ASSOCIATES, INC.
ACOUSTICAL CONSULTING SERVICES

APPENDIX 3

SOUND BARRIER HEIGHT CALCULATIONS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

BARRIER NOISE REDUCTION ANALYSIS,WALL HEIGHT VARIABLE

REFERENCE VEHICLE LEVELS AT 50 FEET

AUTO.....= 72.6
M.TRUCK.....= 65.39
H.TRUCK.....= 66.1

PROJECT.....TRACT 82364
DESCRIPTION..AVENUE R-8 SOUND WALL
SOURCE ELEVATION..... 0
RECEIVER ELEVATION..... 0
BARRIER ELEVATION..... 0
RECEIVER HEIGHT..... 5
DISTANCE TO SOURCE..... 47
DISTANCE TO RECEIVER... 10
AUTO NOISE LEVEL..... 72.03095
M.TRK NOISE LEVEL..... 64.82096
H.TRK NOISE LEVEL..... 65.53095
SOURCE NOISE LEVEL..... 73.54

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	ANL	MTNL	HTNL	TNL	TIL
5.00	66.53	59.63	65.53	69.54	4.00
FN	0.0443	0.0166	0.0000		
5.50	65.91	59.11	65.53	69.18	4.35
FN	0.1111	0.0635	0.0000		
6.00	65.44	58.57	60.37	67.25	6.29
FN	0.2081	0.1405	0.0134		
6.50	64.78	58.02	59.89	66.64	6.90
FN	0.3348	0.2475	0.0567		
7.00	64.02	57.32	59.33	65.93	7.60
FN	0.4909	0.3838	0.1294		
7.50	63.24	56.55	58.82	65.21	8.32
FN	0.6758	0.5489	0.2311		
8.00	62.47	55.77	58.14	64.46	9.07
FN	0.8885	0.7421	0.3609		
8.50	61.73	55.02	57.40	63.72	9.81
FN	1.1283	0.9624	0.5179		

BARRIER NOISE REDUCTION ANALYSIS,WALL HEIGHT VARIABLE

REFERENCE VEHICLE LEVELS AT 50 FEET

AUTO.....= 72.6
M.TRUCK.....= 65.39
H.TRUCK.....= 66.1

PROJECT.....TRAC T 82364
DESCRIPTION..LOT 13 SOUND WALL
SOURCE ELEVATION..... 0
RECEIVER ELEVATION..... 0
BARRIER ELEVATION..... 0
RECEIVER HEIGHT..... 5
DISTANCE TO SOURCE..... 163
DISTANCE TO RECEIVER... 10
AUTO NOISE LEVEL..... 67.20924
M.TRK NOISE LEVEL..... 59.99924
H.TRK NOISE LEVEL..... 60.70924
SOURCE NOISE LEVEL..... 68.71

ANGULAR CORRECTION(DB) - 0

WALL HEIGHT	ANL	MTNL	HTNL	TNL	TIL
4.00	67.21	60.00	60.71	68.71	-0.00
FN	0.0000	0.0000	0.0000		
4.50	67.21	60.00	60.71	68.71	-0.00
FN	0.0000	0.0000	0.0000		
5.00	62.16	54.98	60.71	64.96	3.75
FN	0.0042	0.0016	0.0000		
5.50	61.84	54.72	55.64	63.40	5.31
FN	0.0324	0.0239	0.0056		
6.00	61.26	54.19	55.30	62.87	5.84
FN	0.0869	0.0727	0.0359		
6.50	60.83	53.72	54.70	62.41	6.31
FN	0.1677	0.1476	0.0925		
7.00	60.27	53.20	54.29	61.88	6.83
FN	0.2741	0.2482	0.1747		
7.50	59.60	52.55	53.73	61.23	7.48
FN	0.4056	0.3739	0.2820		

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ACOUSTICAL CONSULTING SERVICES

APPENDIX 4

INTERIOR NOISE REDUCTION CALCULATIONS

P. O. BOX 2325 • FULLERTON, CALIFORNIA • 92837
PHONE: 714-805-0115

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 24

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
INT.WALL			160	
WINDOW 1	22	.05	20	0.12619
WINDOW 2	25	.05	15	0.04743
WINDOW 3	32	.05	0	0.00000
SGD	22	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	
ET*S				0.19363
-10LOG(ET*S)				7.1
10LOGA				18.8
NOISE REDUCTION				19.9

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 26

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
INT.WALL			160	
WINDOW 1	24	.05	20	0.07962
WINDOW 2	27	.05	15	0.02993
WINDOW 3	34	.05	0	0.00000
SGD	24	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	

ET*S	0.12956
-10LOG(ET*S)	8.9
10LOGA	18.8
NOISE REDUCTION	21.6

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 28

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
INT.WALL			160	
WINDOW 1	26	.05	20	0.05024
WINDOW 2	29	.05	15	0.01888
WINDOW 3	36	.05	0	0.00000
SGD	26	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	
ET*S				0.08913
-10LOG(ET*S)				10.5
10LOGA				18.8
NOISE REDUCTION				23.3

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 30

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
INT.WALL			160	
WINDOW 1	28	.05	20	0.03170
WINDOW 2	31	.05	15	0.01191
WINDOW 3	38	.05	0	0.00000
SGD	28	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	

ET*S	0.06362
-10LOG(ET*S)	12.0
10LOGA	18.8
NOISE REDUCTION	24.7

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 32

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
.INT.WALL			160	
WINDOW 1	30	.05	20	0.02000
WINDOW 2	33	.05	15	0.00752
WINDOW 3	40	.05	0	0.00000
SGD	30	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	
ET*S				0.04753
-10LOG(ET*S)				13.2
10LOGA				18.8
NOISE REDUCTION				26.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 34

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
INT.WALL			160	
WINDOW 1	32	.05	20	0.01262
WINDOW 2	35	.05	15	0.00474
WINDOW 3	42	.05	0	0.00000
SGD	32	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	

ET*S	0.03737
-10LOG(ET*S)	14.3
10LOGA	18.8
NOISE REDUCTION	27.0

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 36

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
INT.WALL			160	
WINDOW 1	34	.05	20	0.00796
WINDOW 2	37	.05	15	0.00299
WINDOW 3	44	.05	0	0.00000
SGD	34	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	
ET*S				0.03096
-10LOG(ET*S)				15.1
10LOGA				18.8
NOISE REDUCTION				27.8

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 38

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
INT.WALL			160	
WINDOW 1	36	.05	20	0.00502
WINDOW 2	39	.05	15	0.00189
WINDOW 3	46	.05	0	0.00000
SGD	36	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	

ET*S	0.02692
-10LOG(ET*S)	15.7
10LOGA	18.8
NOISE REDUCTION	28.4

WORK SHEET FOR CALCULATING ROOM NOISE REDUCTION VALUE

ROOM NAME SMALL CORNER BEDROOM + STC = 40

FLOOR AREA 100

SURFACES	TL	@	AREA	T*S
EXT.WALL 1	40		65	0.00650
EXT.WALL 2	43		70	0.00351
EXT.WALL 3	50		0	0.00000
INT.WALL			160	
WINDOW 1	38	.05	20	0.00317
WINDOW 2	41	.05	15	0.00119
WINDOW 3	48	.05	0	0.00000
SGD	38	.05	0	0.00000
DOORS	0	.04	0	0.00000
ROOF	40	.04	100	0.01000
FLOOR		.6	100	
ET*S				0.02437
-10LOG(ET*S)				16.1
10LOGA				18.8
NOISE REDUCTION				28.9

Appendix J Vehicle Miles Traveled (VMT) Analysis

1800 30th Street, Suite 260
Bakersfield, CA 93301

October 12, 2023

571-10
Electronic Mail

Shawna Ricker
Duke Engineering
759 West Lancaster Boulevard
Lancaster, CA 93534

REF: Trip Generation and Vehicle Miles Traveled (VMT) Analysis for TTM 82364 in Palmdale, CA

Dear Ms. Cruz:

This letter is in response to your request for a trip generation and VMT analysis, as required by the City of Palmdale Staff Report dated March 12, 2020. The applicant is proposing a 15 detached single-family development. The site is located between Avenue R-8 and Avenue R-9 approximately 100 feet east of Kimberly Lane and currently contains one single-family residence. The proposed project is surrounded by similar single family development.

Proposed Trip Generation

The trip generation for the proposed 15 single-family dwelling units use is based on the ITE Code 210 (Single-Family Detached Housing). The results are shown in Table 1.

Table 1
Proposed Trip Generation

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
210	Single-Family detached Housing	15 Dwelling Units	Rate	141	Rate	25% 3	75% 8	Rate	63% 9	37% 5
						11			14	

As shown in Table 1, the proposed project will generate approximately 141 daily trips. AM and PM peak hour trips will be approximately 11 and 14, respectively. The threshold for requiring a traffic impact study is whether a project adds 50 or more vehicular trips to an intersection during the peak hour. As shown on Table 1, the project does not reach the 50-trip threshold in either the

AM or PM peak hours. Therefore, intersection analysis would not be required and the project would be anticipated to not create any operational deficiencies on the adjacent street system.

VMT Analysis

VMT analysis for this project is based on the guidelines contained in the Los Angeles County Public Works *Transportation Impact Analysis Guidelines*, dated July 23, 2020 as adopted by the City of Palmdale.

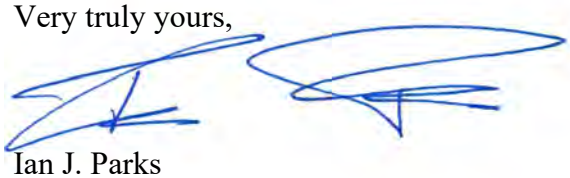
The Los Angeles County guidelines outline various criteria for a project to "screen out" of detailed VMT analysis. Following is an analysis of the project as it relates to the screening criteria:

- Small project screening, in which the project would generate less than 110 trips. While the project generates slightly more than the threshold at 141 trips, the project is close to the threshold and would be anticipated to affect the adjacent street system similarly to a small project as defined by the Los Angeles County guidelines.
- While not defined in the Los Angeles County guidelines, the project would be considered an "infill" development with homes and commercial development in all directions surrounding the project. Infill development is one of the goals included in OPR's guidelines as it would tend to reduce VMT compared to developing on the edge of development.

With the project being a relatively small project, and an infill project, it is anticipated that the project will have a less-than-significant traffic impact and no further analysis would be required.

Please contact me should you have any questions.

Very truly yours,



Ian J. Parks
R.C.E. 58155