

APPENDIX A
AIR QUALITY STUDY



Date: May 31, 2024
To: Mr. Timothy Roofian, Esq., Rodeo Credit Enterprises
From: M. S. Hatch Consulting, LLC
Subject: **REVISED Air Quality Study and Energy Analysis– Tentative Tract Map (TTM) 20426 Housing Development – Victorville, CA**

M. S. Hatch Consulting, LLC (MSHC) appreciates the opportunity to prepare the revised air quality study and energy analysis for the proposed construction and operation of the housing development shown on Tentative Tract Map (TTM) 20426 for Royal Investors Group, LLC (Royal). The project consists of 140 single family homes on a 34.48 acre land in the City of Victorville. 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 housing development to the significant emission thresholds described in the Mojave Desert Air Quality Management District (MDAQMD) California Environmental Quality Act (CEQA) and Federal Conformity Guidelines, dated February 2020, included in Attachment A. The estimated emissions of criteria pollutants and greenhouse gases for each year of construction and the total operational emissions **are well below the applicable thresholds**. Greenhouse gas emissions are presented in units of carbon dioxide equivalent (CO₂e). The proposed project is not considered one of the project types that the MDAQMD 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. This project is consistent with the existing land use plan and conforms with the applicable MDAQMD attainment or maintenance plan(s). Based on the estimated emissions from construction and operation of the project, no violation of any ambient air quality standard is expected when emissions are added to the local background.

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 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 (2025)	0.04	0.35	0.35	<0.01	0.07	0.04	56
Year 2 Construction Emissions (2026)	0.24	1.99	2.47	<0.01	0.25	0.13	504
Year 3 Construction Emissions (2027)	0.16	1.32	2.06	<0.01	0.15	0.07	418
Year 4 Construction Emissions (2028)	0.16	1.26	2.04	<0.01	0.14	0.06	416
Year 5 Construction Emissions (2029)	1.16	1.13	1.89	<0.01	0.13	0.06	385
Total Operational Emissions	2.22	1.09	7.32	0.02	1.85	0.49	2,325
Significant Emissions Threshold	25	25	100	25	15	12	100,000
Threshold Exceedance (Yes/No)	No	No	No	No	No	No	No

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; PM₁₀: particulate matter less than 10 micrometers in diameter; CO_{2e}: Carbon dioxide equivalent; MT: metric ton. Due to rounding, some of the values do not match identically with the CalEEMod output file.

Table 2. Maximum 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 (2025)	3.39	31.70	31.20	0.05	6.71	3.94	5,542
Year 2 Construction Emissions (2026)	3.22	29.20	29.70	0.06	6.58	3.82	7,204
Year 3 Construction Emissions (2027)	1.27	10.10	16.70	0.03	1.13	0.51	3,599
Year 4 Construction Emissions (2028)	1.23	9.58	16.50	0.03	1.09	0.47	3,574
Year 5 Construction Emissions (2029)	38.10	10.00	17.90	0.03	1.21	0.49	3,819
Total Operational Emissions	13.10	5.94	51.80	0.12	10.40	2.76	15,077
Significant Emissions Threshold	137	137	548	137	82	65	548,000
Threshold Exceedance (Yes/No)	No	No	No	No	No	No	No

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; PM₁₀: particulate matter less than 10 micrometers in diameter; CO_{2e}: Carbon dioxide equivalent. Due to rounding, some of the values do not match identically with the CalEEMod output file.

Project Description

The proposed project includes the construction of 140 single family homes and residential streets on a vacant lot that is approximately 34.48 acres. The project site is located north of the intersection of Bellflower Street and Dos Palmas Road in the City of Victorville. The site location is included in Figure 1 and the proposed site plan is included in Figure 2.

Figure 1. Regional Vicinity

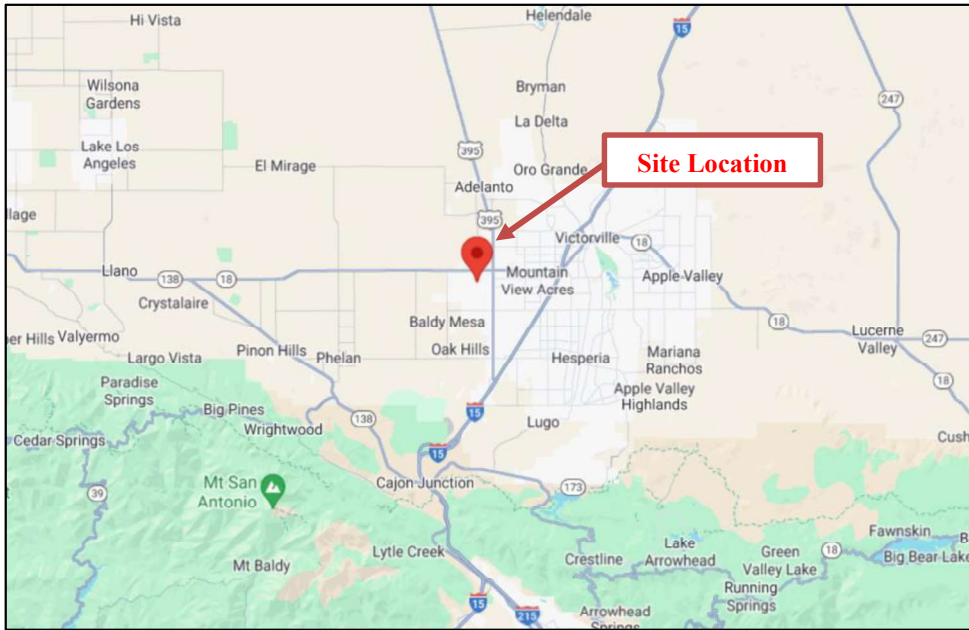
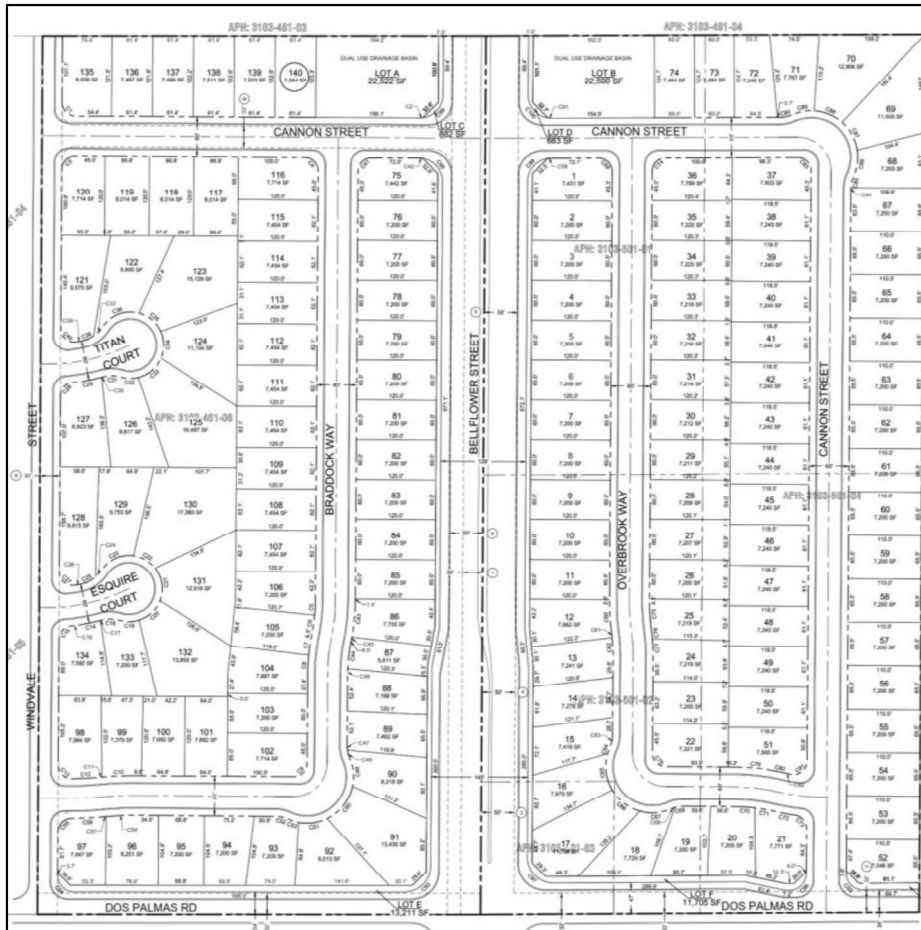


Figure 2. Site Plan – Proposed Housing Development - TTM 20426, Victorville, CA



Sources of Emissions

The emissions associated with the proposed project consist of construction and operational emissions from the housing development. Construction emissions are temporary and include emissions of criteria pollutants and greenhouse gases from construction activities during site preparation, grading, building construction, paving, 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, water and wastewater (i.e., supplying and treating water and wastewater), and refrigerants (i.e., air conditioners).

Emissions Estimates

Table 3 and 4 present the annual and maximum daily emissions summaries from the construction and operation of the proposed project, respectively. Emissions were estimated using CalEEMod Version 2022.1, and the detailed emissions report is included in Attachment B.

This project is not one of the project types that the MDAQMD 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 (2025)	0.04	0.35	0.35	<0.01	0.07	0.04	56
Year 2 Construction Emissions (2026)	0.24	1.99	2.47	<0.01	0.25	0.13	504
Year 3 Construction Emissions (2027)	0.16	1.32	2.06	<0.01	0.15	0.07	418
Year 4 Construction Emissions (2028)	0.16	1.26	2.04	<0.01	0.14	0.06	416
Year 5 Construction Emissions (2029)	1.16	1.13	1.89	<0.01	0.13	0.06	385
Operational Emissions							
Mobile	0.83	0.88	6.52	0.02	1.84	0.48	1,751
Area	1.37	0.01	0.72	<0.01	<0.01	<0.01	2
Energy	0.01	0.20	0.09	<0.01	0.02	0.02	491
Water	N/A	N/A	N/A	N/A	N/A	N/A	39
Waste	N/A	N/A	N/A	N/A	N/A	N/A	42
Refrigerants	N/A	N/A	N/A	N/A	N/A	N/A	0.37
Total Operational Emissions	2.22	1.09	7.32	0.02	1.85	0.49	2,325
Significant Emissions Threshold	25	25	100	25	15	12	100,000
Threshold Exceedance (Yes/No)	No	No	No	No	No	No	No

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; PM₁₀: particulate matter less than 10 micrometers in diameter; CO_{2e}: Carbon dioxide equivalent; MT: metric ton. Due to rounding, some of the values do not match identically with the CalEEMod output file.

Table 4. Maximum 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 (2025)	3.39	31.70	31.20	0.05	6.71	3.94	5,542
Year 2 Construction Emissions (2026)	3.22	29.20	29.70	0.06	6.58	3.82	7,204
Year 3 Construction Emissions (2027)	1.27	10.10	16.70	0.03	1.13	0.51	3,599
Year 4 Construction Emissions (2028)	1.23	9.58	16.50	0.03	1.09	0.47	3,574
Year 5 Construction Emissions (2029)	38.10	10.00	17.90	0.03	1.21	0.49	3,819
Operational Emissions							
Mobile	5.21	4.83	43.40	0.11	10.30	2.66	11,598
Area	7.86	<0.01	7.97	<0.01	<0.01	<0.01	21
Energy	0.06	1.11	0.47	0.01	0.09	0.09	2,966
Water	N/A	N/A	N/A	N/A	N/A	N/A	233
Waste	N/A	N/A	N/A	N/A	N/A	N/A	255
Refrigerants	N/A	N/A	N/A	N/A	N/A	N/A	2.21
Total Operational Emissions	13.10	5.94	51.80	0.12	10.40	2.76	15,077
Significant Emissions Threshold	137	137	548	137	82	65	548,000
Threshold Exceedance (Yes/No)	No	No	No	No	No	No	No

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; PM₁₀: particulate matter less than 10 micrometers in diameter; CO_{2e}: Carbon dioxide equivalent. Due to rounding, some of the values do not match identically with the CalEEMod output file.

Emissions Calculation Methodology

Construction and operational emissions were based on four CalEEMod land use types: *Single Family Housing*, *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 proposed housing development. The total building square footage (308,000 square feet) was based on the number of homes (140) and the average square footage per home (2,200 square feet) that was provided by Royal, as well as the lot acreage (25.45 acres). The total landscape area (812,667 square feet) was conservatively estimated based on the landscaped area for the homes and the basin lot.²

² Landscape area for the homes was calculated based on the difference between the Single Family Housing lot area and CalEEMod's default areas for the building footprint (1,950 sq. ft. for each home) and paved driveway space (480 sq. ft. for each home).

CalEEMod Land Use Type: Other Asphalt Surfaces

The *Other Asphalt Surfaces* land use type was used to model the emissions associated with the residential streets within the proposed housing development. The street acreage (6.01 acres) was provided by Royal.

CalEEMod Land Use Type: Other Non-Asphalt Surfaces

The *Other Non-Asphalt Surfaces* land use type was used to model the emissions associated with the sidewalks and gutters within the proposed housing development. The sidewalk acreage (2.00 acres) was provided by Royal.

Construction Emissions

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

Table 5 provides the anticipated construction schedule. Royal provided the proposed start date (12/1/2025) and end date for the project (12/1/2029) and indicated that work would be conducted five days per week. Based on the review of other housing 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. The durations for all phases are based on CalEEMod default values, except for Building Construction which was extended to meet the provided end date.

Table 6 provides the anticipated 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 based on CalEEMod default values.

Based on input from Royal, this project will require 2,500 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. MDAQMD Rule 403 requires that “any person shall not cause or allow the emissions of Fugitive Dust from any transport, handling, construction or storage activity so that the Visible Fugitive Dust remains visible in the atmosphere beyond the property line of the emission source”. To meet this requirement, it is assumed that the construction site will be watered three times per day.

Table 5. Construction Schedule

Construction Phase	Start Date	End Date	Days/week	Total Days
Demolition	N/A	N/A	N/A	N/A
Site Preparation	12/1/2025	1/9/2026	5	30
Grading	1/10/2026	4/24/2026	5	75
Paving	4/25/2026	7/10/2026	5	55
Building Construction	7/11/2026	12/1/2029	5	885
Architectural Coating	9/15/2029	12/1/2029	5	55

Table 6. Construction Equipment

Construction Phase	Equipment	Number of Equipment	Hours per day	Horsepower
Site Preparation	Rubber Tired Dozers	3	8	367
	Tractors/Loaders/Backhoes	4	8	84
Grading	Excavators	2	8	36
	Graders	1	8	148
	Rubber Tired Dozers	1	8	367
	Scrapers	2	8	423
	Tractors/Loaders/Backhoes	2	8	84
Paving	Pavers	2	8	81
	Paving Equipment	2	8	89
	Rollers	2	8	36
Building Construction	Cranes	1	7	367
	Forklifts	3	8	82
	Generator Sets	1	8	14
	Tractors/Loaders/Backhoes	3	7	84
	Welders	1	8	46
Architectural Coating	Air Compressors	1	6	37

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, water and wastewater (i.e., supplying and treating water and wastewater), and refrigerants (i.e., air conditioners).

For area-source emissions, it was determined that woodstoves and fireplaces would not be installed.³ All other operational emissions sources were calculated using CalEEMod default factors.

³ Based on data request form provided by Royal on 10/26/21.

Energy Analysis

The project’s estimated energy consumption is summarized in Table 7. The analysis focuses on the three sources of energy that are relevant to the proposed project: electricity, natural gas, and transportation fuel/energy for vehicle trips associated with project operations and construction. The electricity and natural gas usage is provided by CalEEMod, which quantifies energy use for occupancy.

Construction fuel consumption includes fossil fuels that will be used for construction vehicles during site preparation, grading, paving, building construction and architectural coating. Construction fuel consumption was obtained by using CalEEMod’s default construction equipment list (Table 6) to determine the fuel rate and total diesel gallons used.

Operational fuel consumption is separated into two categories: fossil fuel consumption from diesel, gasoline, and natural gas vehicles, and energy consumption from electric and plug-in hybrid vehicles. Operational fuel consumption was estimated using the California Air Resources Board’s Emission Factor 2021 (EMFAC2021) online emissions model, which provides projections for typical daily fuel usage in the MDAQMD. The construction fuel estimates and operational fuel estimates resulting from EMFAC2021 modeling are included in Attachment C.

Table 7. Project Energy Consumption

Energy Type	Project Annual Energy Consumption
Operational Electricity Consumption	1,065 MWh
Operational Natural Gas Consumption	43,806 therms
Fuel Consumption	
• Construction (Heavy-Duty Diesel Vehicle) Fuel Consumption	76,313 gallons
• Operational Automotive Fuel Consumption (Diesel, Gasoline, Natural Gas Vehicles)	192,761 gallons
• Operational Automotive Energy Consumption (Electric and Plug-in Hybrid Vehicles)	136,249 kWh

Findings

The estimated emissions of criteria pollutants and greenhouse gases for each year of construction and the total operational emissions **are well below the applicable MDAQMD 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. This project is consistent with the existing land use plan and conforms with the applicable MDAQMD attainment or maintenance plan(s). Based on the estimated emissions from construction and operation of the project, no violation of any ambient air quality standard is expected when emissions are added to the local background. Since the construction and operational emissions are below the significance thresholds, emissions mitigation measures are not required.

**ATTACHMENT A – Mojave Desert AQMD California Environmental Quality Act (CEQA)
and Federal Conformity Guidelines**



MDAQMD

California Environmental Quality Act (CEQA)

And

Federal Conformity

Guidelines

February 2020

Planning and Rule Making Section
Air Monitoring Section

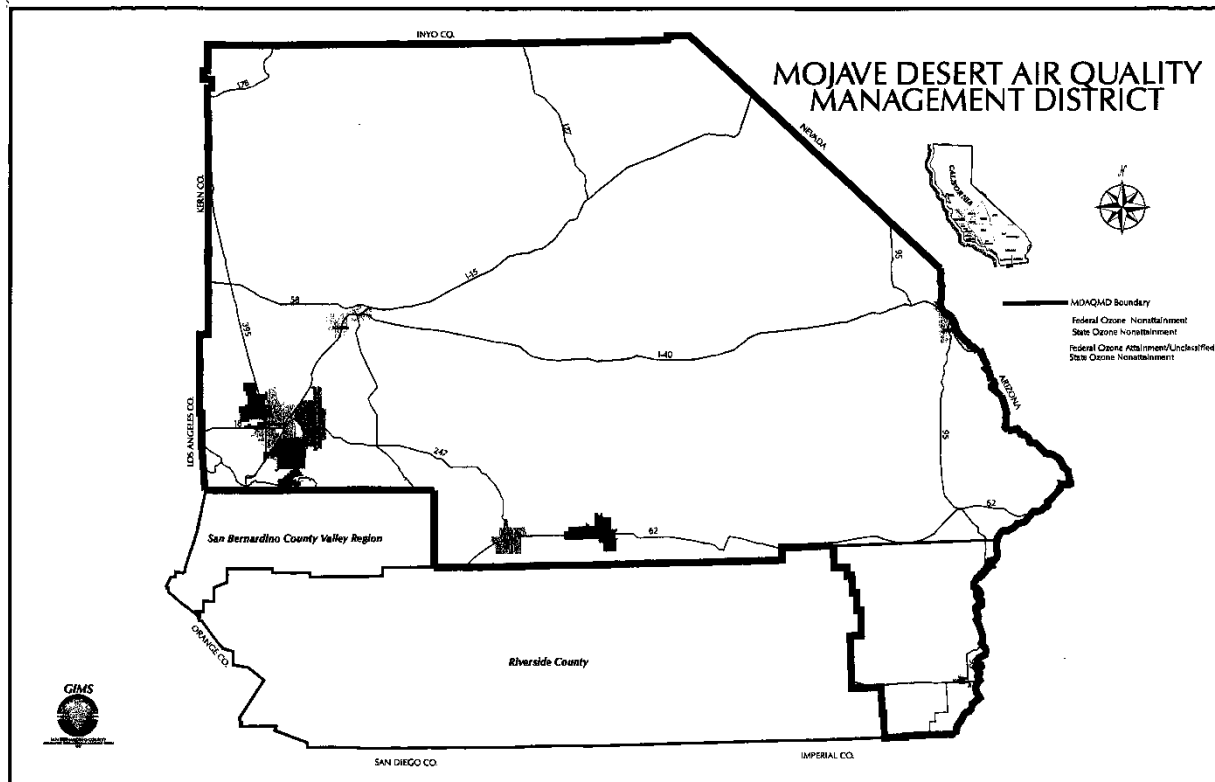
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Background

Under CEQA, the Mojave Desert Air Quality Management District (District) is an expert commenting agency on air quality and related matters within its jurisdiction or impacting on its jurisdiction. Under the Federal Clean Air Act the District has adopted federal attainment plans for ozone and PM₁₀. The District has dedicated assets 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. 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 - District Boundaries



Jurisdiction

The District has jurisdiction over the desert portion of San Bernardino County and the far eastern end of Riverside County (please refer to Map 1). This region includes the incorporated communities of Adelanto, Apple Valley, Barstow, Blythe, Hesperia, Needles, Twentynine Palms, Victorville, and Yucca Valley. This region also includes the National Training Center at Fort Irwin, the Marine Corps Air Ground Combat Center, the Marine Corps Logistics Base, the eastern portion of Edwards Air Force Base, and a portion of the China Lake Naval Air Weapons Station.

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 - Designations and Classifications

Ambient Air Quality Standard	MDAQMD
One-hour Ozone (Federal) – standard has been revoked	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; classified Severe-15**
Ozone (State)	Nonattainment; classified Moderate
PM ₁₀ 24-hour (Federal)	Nonattainment; classified Moderate (portion of MDAQMD in Riverside County is unclassifiable/attainment)
PM _{2.5} Annual (Federal)	Unclassified/attainment
PM _{2.5} 24-hour (Federal)	Unclassified/attainment
PM _{2.5} (State)	Nonattainment**
PM ₁₀ (State)	Nonattainment
Carbon Monoxide (State and Federal)	Unclassifiable/Attainment
Nitrogen Dioxide (State and Federal)	Unclassifiable/Attainment
Sulfur Dioxide (State and Federal)	Attainment/unclassified
Lead (State and Federal)	Unclassifiable/Attainment
Particulate Sulfate (State)	Attainment
Hydrogen Sulfide (State)	Unclassified (Searles Valley Planning Area is nonattainment)
Visibility Reducing Particles (State)	Unclassified

*Note: Portion of MDAQMD outside of Southeast Desert Modified AQMA is unclassified/attainment

**Note: Portion of MDAQMD outside of Western Mojave Desert Ozone Nonattainment Area is unclassifiable/attainment

Attainment Plans

The District has adopted a variety of attainment plans for a variety of nonattainment pollutants. Please refer to Table 2 for a chart of these attainment plans.

Table 2 – MDAQMD Attainment Plans

Name of Plan	Date of Adoption	Standard(s) Targeted	Applicable Area	Pollutant(s) Targeted	Attainment Date*
MDAQMD Federal 75 ppb Ozone Attainment Plan (Western Mojave Desert Nonattainment Area)	27-Feb-17	Federal eight hour ozone (75 ppb)	Western Mojave Desert Nonattainment Area (MDAQMD portion)	NO _x and VOC	2027
Federal 8-Hour Ozone Attainment Plan (Western Mojave Desert Nonattainment Area)	9-Jun-08	Federal eight hour ozone (84 ppb)	Western Mojave Desert Nonattainment Area (MDAQMD portion)	NO _x and VOC	2019 (revised from 2021)
2004 Ozone Attainment Plan (State and Federal)	26-Apr-04	Federal one hour ozone	Entire District	NO _x and VOC	2007
Attainment Demonstration, Maintenance Plan, and Redesignation Request for the Trona Portion of the Searles Valley PM ₁₀ Non-attainment Area	25-Mar-96	Federal daily and annual PM ₁₀	Searles Valley Planning Area	PM ₁₀	N/A
Triennial Revision to the 1991 Air Quality Attainment Plan	22-Jan-96	State one hour ozone	Entire District	NO _x and VOC	2005
Mojave Desert Planning Area Federal Particulate Matter Attainment Plan	31-Jul-95	Federal daily and annual PM ₁₀	Mojave Desert Planning Area	PM ₁₀	2000
Searles Valley PM ₁₀ Plan	28-Jun-95	Federal daily and annual PM ₁₀	Searles Valley Planning Area	PM ₁₀	1994
Post 1996 Attainment Demonstration and Reasonable Further Progress Plan	26-Oct-94	Federal one hour ozone	Southeast Desert Modified AQMA	NO _x and VOC	2007
Reasonable Further Progress Rate-Of-Progress Plan	26-Oct-94	Federal one hour ozone	Southeast Desert Modified AQMA	NO _x and VOC	2007

Name of Plan	Date of Adoption	Standard(s) Targeted	Applicable Area	Pollutant(s) Targeted	Attainment Date*
1991 Air Quality Attainment Plan	26-Aug-91	State one hour ozone	San Bernardino County portion	NO _x and VOC	1994

*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 visit www.mdaqmd.ca.gov.

Recommended Environmental Setting Elements

Air Quality Data

The District gathers a variety of air quality data from a variety of monitoring sites (from the USMC AGCC site on contract). Table 3 details the data available from the District for each monitoring site. Each site with current PM10 monitoring is operating a Beta Attenuation Monitor (or BAM) with realtime hourly data, and BAMs replaced TEOMs and Hi-Vols beginning in 2011.

Table 3 - Available Air Quality Data

Site	Address	Pollutants	Dates
Barstow	225 E. Mountain View	O ₃ , NO _x , CO, PM ₁₀	5/1/80 to present
Hesperia	17288 Olive	O ₃ , PM ₁₀	1/2/86 to present
Lucerne Valley	8560 Aliento Road	PM ₁₀	6/1/89 to present
Phelan	Beekley and Phelan Road	O ₃	1/1/88 to present
Trona	Market Street	O ₃ , NO _x , SO ₂ , H ₂ S, PM ₁₀	8/1//80 to 2/13/93
Trona	Athol Street	O ₃ , NO _x , SO ₂ , H ₂ S, PM ₁₀	1/25/93 to 3/1997
Trona	Telescope	O ₃ , NO _x , SO ₂ , H ₂ S, PM ₁₀	4/1997 to present
Twentynine Palms	6136 Adobe Road	O ₃ , NO _x , SO ₂ , CO, PM ₁₀	8/1/80 to 12/2005
Victorville	County Fairgrounds	O ₃ , NO _x , SO ₂ , CO, TSP	8/1980 to 12/1985
Victorville	Eighth Street	O ₃ , NO _x , SO ₂ , CO, TSP	1/1985 to 12/1989
Victorville	County Fairgrounds	O ₃ , NO _x , SO ₂ , CO, PM ₁₀	1/1990 to 4/1991
Victorville	14029 Amargosa Rd	O ₃ , NO _x , SO ₂ , CO, PM ₁₀	4/1991 to 12/1999
Victorville	14306 Park Avenue	O ₃ , NO _x , SO ₂ , CO, PM _{2.5} (dual co-located), PM ₁₀	1/2000 to present

Meteorological Data

A variety of meteorological data is available from the District for several monitoring sites

throughout the District. Table 4 contains a list of monitoring sites and the date range the following data is available for: wind speed (hourly average and peak), wind direction, temperature, barometric pressure, and relative humidity.

Table 4 - Available Meteorological Data

Site	Address	Dates
Barstow	225 E. Mountain View	1/1988 to present
Hesperia	17288 Olive Street	1/1988 to present
Lucerne Valley	8560 Aliento Road	3/2020 to present
Phelan	Beekley and Phelan Road	1/88 to present
Trona	Athol Street	2/1993 to 3/1997
Trona	Telescope	4/1997 to present
Twentynine Palms	6136 Adobe Road	1/1988 to 12/2005
Victorville	14029 Amargosa Road	4/91 to 12/1999
Victorville	14306 Park Avenue	1/2000 to present

Topography and Climate Discussion

The District covers the majority 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). The Mojave Desert is bordered in the southwest by the San Bernardino Mountains, separated from the San Gabriels by the Cajon Pass (4,200 ft). A lesser channel lies between the San Bernardino Mountains and the Little San Bernardino Mountains (the Morongo Valley).

The Palo Verde Valley portion of the Mojave Desert lies in the low desert, at the eastern end of a series of valleys (notably the Coachella Valley) whose primary channel is the San Gorgonio Pass (2,300 ft) between the San Bernardino and San Jacinto Mountains.

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 they reach the desert. Most desert moisture arrives from infrequent warm, moist and unstable air masses from the south. As can be seen from Table 5, the MDAB averages between three and seven inches of precipitation per year (from 16 to 30 days with at least 0.01 inches of precipitation). 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 Precipitation and Evaporation History

Location	Precipitation (inches)	Precipitation (days)	Evaporation (inches)	Length of Observations (years)
Trona	3.82	16		48
Randsburg	5.89	23		48
China Lake	4.42			34
Goldstone Echo	5.42	20		23
Daggett Airport	3.87	23		48
Barstow Fire	4.60	23		16
Barstow CIMIS	5.10	27	70	22
Granite Mountain	5.76	22		5
Victorville CIMIS	7.30	29	63	15
Mitchell Caverns	10.41	32		38
Mountain Pass	7.63	28		41
Parker Reservoir	5.38	24		48
Needles Airport	4.55	23		48
Twentynine Palms	3.95	19		48
Blythe Airport	3.57	17		48
Iron Mountain	3.40	19		48

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.

Friant Ranch Decision

The MDAQMD does not currently have a methodology that would correlate the expected air quality emissions of project to the likely health consequences of those emissions. However, the MDAQMD does recommend the use of specific tools which are available (such as CalEEMod) for the purposes of project evaluation. Outside of existing tools, the MDAQMD does not currently have methodologies that would provide lead agencies and the public with a consistent, reliable and meaningful analysis to correlate specific health impacts that may result from a

proposed project's air emissions.

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;
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 multi-phased project (such as 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 (short tons)	Daily Threshold (pounds)
Greenhouse Gases (CO ₂ e)	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

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.

Criteria Pollutant	Annual Threshold (short tons)	Daily Threshold (pounds)
Particulate Matter (PM _{2.5})	12	65
Hydrogen Sulfide (H ₂ S)	10	54
Lead (Pb)	0.6	3

District Contacts

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

Mojave Desert Air Quality Management District General	(760) 245-1661 14306 Park Avenue Victorville, CA 92392-2310
Planning and Rules	Tracy Walters (760) 245-1661 x6122
Air Quality and Meteorological Data	Chris Collins (760) 245-1661 x6282
CEQA and Conformity	Alan De Salvio (760) 245-1661 x6726
Permitting	Sheri Haggard (760) 245-1661 x1864

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 (CO₂) – 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 NO₂, 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 SO₂, a criteria pollutant with state and federal standards. Primarily of concern near sources.

Ozone (O₃) – 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 PM₃₀) – 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 PM₁₀, 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

Air Quality Study - Royal Investors Group, TTM 20426, Housing Development Victorville, CA Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Air Quality Study - Royal Investors Group, TTM 20426, Housing Development Victorville, CA
Construction Start Date	12/1/2025
Operational Year	2030
Lead Agency	—
Land Use Scale	Plan/community
Analysis Level for Defaults	County
Windspeed (m/s)	2.80
Precipitation (days)	1.40
Location	34.49954476279794, -117.41734266168886
County	San Bernardino-Mojave Desert
City	Victorville
Air District	Mojave Desert AQMD
Air Basin	Mojave Desert
TAZ	5105
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southwest Gas Corp.
App Version	2022.1.1.23

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
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Single Family Housing	140	Dwelling Unit	26.5	308,000	812,667	0.00	463	—
Other Asphalt Surfaces	6.01	Acre	6.01	0.00	0.00	0.00	—	—
Other Non-Asphalt Surfaces	2.00	Acre	2.00	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Unr/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	38.1	27.6	29.2	0.06	1.13	2.73	3.86	1.04	1.03	2.07	—	7,163	7,163	0.28	0.11	7,204
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	38.1	31.7	31.2	0.06	1.37	5.34	6.71	1.26	2.68	3.94	—	7,131	7,131	0.27	0.11	7,170
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.33	10.9	13.5	0.03	0.43	0.95	1.39	0.40	0.33	0.73	—	3,020	3,020	0.11	0.07	3,042
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.16	1.99	2.47	< 0.005	0.08	0.17	0.25	0.07	0.06	0.13	—	500	500	0.02	0.01	504

2.2. Construction Emissions by Year, Unmitigated

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

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	3.15	27.6	29.2	0.06	1.13	2.73	3.86	1.04	1.03	2.07	—	7,163	7,163	0.28	0.11	7,204
2027	1.27	10.0	16.7	0.03	0.34	0.79	1.13	0.32	0.19	0.51	—	3,562	3,562	0.11	0.10	3,599
2028	1.23	9.54	16.5	0.03	0.31	0.79	1.09	0.28	0.19	0.47	—	3,538	3,538	0.11	0.10	3,574
2029	38.1	10.0	17.9	0.03	0.30	0.92	1.21	0.27	0.22	0.49	—	3,782	3,782	0.11	0.11	3,819
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.39	31.7	31.2	0.05	1.37	5.34	6.71	1.26	2.68	3.94	—	5,521	5,521	0.23	0.05	5,542
2026	3.22	29.2	29.7	0.06	1.24	5.34	6.58	1.14	2.68	3.82	—	7,131	7,131	0.27	0.11	7,170
2027	1.25	10.1	15.5	0.03	0.34	0.79	1.13	0.32	0.19	0.51	—	3,482	3,482	0.11	0.10	3,516
2028	1.20	9.58	15.4	0.03	0.31	0.79	1.09	0.28	0.19	0.47	—	3,459	3,459	0.11	0.10	3,492
2029	38.1	10.0	16.7	0.03	0.30	0.92	1.21	0.27	0.22	0.49	—	3,689	3,689	0.11	0.11	3,724
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.21	1.93	1.90	< 0.005	0.08	0.32	0.41	0.08	0.16	0.24	—	335	335	0.01	< 0.005	337
2026	1.31	10.9	13.5	0.03	0.43	0.95	1.39	0.40	0.33	0.73	—	3,020	3,020	0.11	0.06	3,042
2027	0.89	7.22	11.3	0.02	0.25	0.56	0.81	0.23	0.14	0.36	—	2,500	2,500	0.08	0.07	2,525
2028	0.86	6.88	11.2	0.02	0.22	0.56	0.78	0.20	0.14	0.34	—	2,490	2,490	0.08	0.07	2,515
2029	6.33	6.17	10.3	0.02	0.19	0.54	0.72	0.17	0.13	0.30	—	2,302	2,302	0.07	0.07	2,324
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.04	0.35	0.35	< 0.005	0.02	0.06	0.07	0.01	0.03	0.04	—	55.5	55.5	< 0.005	< 0.005	55.7
2026	0.24	1.99	2.47	< 0.005	0.08	0.17	0.25	0.07	0.06	0.13	—	500	500	0.02	0.01	504
2027	0.16	1.32	2.06	< 0.005	0.04	0.10	0.15	0.04	0.02	0.07	—	414	414	0.01	0.01	418

2028	0.16	1.26	2.04	< 0.005	0.04	0.10	0.14	0.04	0.02	0.06	—	412	0.01	0.01	412	0.01	0.01	416
2029	1.16	1.13	1.89	< 0.005	0.03	0.10	0.13	0.03	0.02	0.06	—	381	0.01	0.01	381	0.01	0.01	385

2.4. Operations Emissions Compared Against Thresholds

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

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	13.1	5.66	51.8	0.12	0.17	10.2	10.4	0.17	2.59	2.76	84.0	14,586	14,670	9.01	0.51	15,077
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	11.9	5.94	34.2	0.11	0.17	10.2	10.4	0.16	2.59	2.75	84.0	13,565	13,649	9.03	0.53	14,034
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	12.2	5.97	40.1	0.11	0.17	9.99	10.2	0.16	2.53	2.69	84.0	13,565	13,649	9.02	0.52	14,044
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.22	1.09	7.32	0.02	0.03	1.82	1.85	0.03	0.46	0.49	13.9	2,246	2,260	1.49	0.09	2,325

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.21	4.48	43.4	0.11	0.08	10.2	10.3	0.07	2.59	2.66	—	11,423	11,423	0.35	0.47	11,598
Area	7.86	0.07	7.97	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.2	21.2	< 0.005	< 0.005	21.3

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Energy	0.06	1.11	0.47	0.01	0.09	—	0.09	—	—	0.09	—	2,957	0.22	0.01	2,966
Water	—	—	—	—	—	—	—	—	11.2	—	196	1.16	0.03	0.03	233
Waste	—	—	—	—	—	—	—	—	72.9	—	72.9	7.28	0.00	0.00	255
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.21
Total	13.1	5.66	51.8	0.12	0.17	10.2	10.4	0.17	2.59	2.76	84.0	14,586	9.01	0.51	15,077
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	4.66	4.83	33.8	0.10	0.08	10.2	10.3	0.07	2.59	2.66	—	10,423	0.37	0.48	10,577
Area	7.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.06	1.11	0.47	0.01	0.09	—	0.09	0.09	—	0.09	—	2,957	0.22	0.01	2,966
Water	—	—	—	—	—	—	—	—	—	—	11.2	185	1.16	0.03	233
Waste	—	—	—	—	—	—	—	—	—	—	72.9	0.00	7.28	0.00	255
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.21
Total	11.9	5.94	34.2	0.11	0.17	10.2	10.4	0.16	2.59	2.75	84.0	13,565	9.03	0.53	14,034
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	4.57	4.83	35.7	0.10	0.08	9.99	10.1	0.07	2.53	2.60	—	10,413	0.36	0.48	10,577
Area	7.51	0.04	3.93	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.5	< 0.005	< 0.005	10.5
Energy	0.06	1.11	0.47	0.01	0.09	—	0.09	0.09	—	0.09	—	2,957	0.22	0.01	2,966
Water	—	—	—	—	—	—	—	—	—	—	11.2	185	1.16	0.03	233
Waste	—	—	—	—	—	—	—	—	—	—	72.9	0.00	7.28	0.00	255
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.21
Total	12.2	5.97	40.1	0.11	0.17	9.99	10.2	0.16	2.53	2.69	84.0	13,565	9.02	0.52	14,044
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.83	0.88	6.52	0.02	0.01	1.82	1.84	0.01	0.46	0.48	—	1,724	0.06	0.08	1,751
Area	1.37	0.01	0.72	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.73	< 0.005	< 0.005	1.74
Energy	0.01	0.20	0.09	< 0.005	0.02	—	0.02	0.02	—	0.02	—	490	0.04	< 0.005	491
Water	—	—	—	—	—	—	—	—	—	—	1.85	30.6	0.19	< 0.005	38.7

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Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.14	29.2	28.8	0.05	1.24	—	1.24	1.14	—	1.14	—	5,298	5,298	0.21	0.04	5,316
Dust From Material Movement	—	—	—	—	—	5.11	5.11	2.63	2.63	2.63	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.51	0.51	< 0.005	0.02	—	0.02	0.02	—	0.02	—	93.3	93.3	< 0.005	< 0.005	93.6
Dust From Material Movement	—	—	—	—	—	0.09	0.09	0.05	0.05	0.05	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.09	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.4	15.4	< 0.005	< 0.005	15.5
Dust From Material Movement	—	—	—	—	—	0.02	0.02	0.01	0.01	0.01	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.07	0.09	0.99	0.00	0.00	0.22	0.22	0.00	0.05	0.05	—	224	224	< 0.005	0.01	227
Vendor	0.01	0.17	0.07	< 0.005	0.04	0.05	0.04	< 0.005	0.01	0.01	—	159	159	< 0.005	0.02	166
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.18	0.00	0.04	0.04	0.04	0.00	0.01	0.01	—	37.0	37.0	< 0.005	< 0.005	37.5
Vendor	< 0.005	0.03	0.01	< 0.005	0.01	0.01	0.01	< 0.005	< 0.005	< 0.005	—	26.4	26.4	< 0.005	< 0.005	27.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2027) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	6.71	9.24	0.02	0.24	—	0.24	0.22	—	0.22	—	1,712	1,712	0.07	0.01	1,718

3.11. Building Construction (2028) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.39	9.26	0.02	0.22	—	0.22	0.20	—	0.20	—	1,717	1,717	0.07	0.01	1,723
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.17	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	284	284	0.01	< 0.005	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	—	0.25	—	0.25	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	—	0.25	—	0.25	—	2,397	2,397	0.10	0.02	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.63	5.63	8.46	0.02	0.18	—	0.18	—	0.17	—	0.17	—	1,571	1,571	0.06	0.01	1,577
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	1.03	1.54	< 0.005	0.03	—	0.03	—	0.03	—	0.03	—	260	260	0.01	< 0.005	261
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.21	0.18	3.12	0.00	0.00	0.66	0.66	0.66	0.15	0.15	0.15	0.15	682	682	0.01	0.02	691
Vendor	0.01	0.42	0.17	< 0.005	0.01	0.13	0.13	0.13	0.01	0.04	0.04	0.04	433	433	< 0.005	0.06	451
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.18	2.09	0.00	0.00	0.66	0.66	0.66	0.15	0.15	0.15	0.15	604	604	0.01	0.02	612

Vendor	0.01	0.45	0.18	< 0.005	0.01	0.13	0.13	0.01	0.04	0.04	0.04	—	433	433	< 0.005	0.06	450
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.13	1.53	0.00	0.00	0.43	0.43	0.00	0.10	0.10	0.10	—	408	408	0.01	0.02	413
Vendor	0.01	0.29	0.12	< 0.005	< 0.005	0.09	0.08	< 0.005	0.02	0.02	0.03	—	284	284	< 0.005	0.04	295
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.28	0.00	0.00	0.08	0.08	0.00	0.02	0.02	0.02	—	67.5	67.5	< 0.005	< 0.005	68.4
Vendor	< 0.005	0.05	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	0.01	—	47.0	47.0	< 0.005	0.01	48.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.15. Paving (2026) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.76	7.12	9.94	0.01	0.32	—	0.32	0.29	—	0.29	—	1,511	1,511	0.06	0.01	1,516
Paving	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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Off-Road Equipment	0.11	1.07	1.50	< 0.005	0.05	—	—	0.05	0.04	—	—	228	228	0.01	< 0.005	228
Paving	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.20	0.27	< 0.005	0.01	—	—	0.01	0.01	—	—	37.7	37.7	< 0.005	< 0.005	37.8
Paving	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	1.16	0.00	0.00	0.20	0.05	0.20	0.00	0.05	—	214	214	0.01	0.01	218
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.13	0.00	0.00	0.03	0.01	0.03	0.00	0.01	—	29.5	29.5	< 0.005	< 0.005	29.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	0.01	< 0.005	0.01	0.00	< 0.005	—	4.88	4.88	< 0.005	< 0.005	4.94
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

3.17. Architectural Coating (2029) - Unmitigated

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

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.79	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	134
Architectural Coatings	36.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.79	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	134
Architectural Coatings	36.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.12	0.17	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	20.1	20.1	< 0.005	< 0.005	20.2
Architectural Coatings	5.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	5.21	4.48	43.4	0.11	0.08	10.2	10.3	0.07	2.59	2.66	—	11,423	11,423	0.35	0.47	11,598
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	5.21	4.48	43.4	0.11	0.08	10.2	10.3	0.07	2.59	2.66	—	11,423	11,423	0.35	0.47	11,598
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	4.66	4.83	33.8	0.10	0.08	10.2	10.3	0.07	2.59	2.66	—	10,423	10,423	0.37	0.48	10,577
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00
Total	4.66	4.83	33.8	0.10	0.08	10.2	10.3	0.07	2.59	2.66	—	10,423	10,423	0.37	0.48	10,577

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,553	0.10	0.01	1,559
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1,553	0.10	0.01	1,559
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	257	0.02	< 0.005	258
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	257	0.02	< 0.005	258

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.06	1.11	0.47	0.01	0.09	—	0.09	0.09	—	0.09	—	1,404	1,404	0.12	< 0.005	1,408
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	0.00

Air Quality Study - Royal Investors Group, TTM 20426, Housing Development Victorville, CA Detailed Report, 5/20/2024

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	6.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscaping Equipment	0.69	0.07	7.97	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.2	21.2	< 0.005	< 0.005	21.3
Total	7.86	0.07	7.97	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	21.2	21.2	< 0.005	< 0.005	21.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	6.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	7.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	1.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscaping Equipment	0.06	0.01	0.72	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.73	1.73	< 0.005	< 0.005	1.74
Total	1.37	0.01	0.72	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.73	1.73	< 0.005	< 0.005	1.74

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

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

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	11.2	185	196	1.16	0.03	233
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	11.2	185	196	1.16	0.03	233
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	11.2	185	196	1.16	0.03	233
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	11.2	185	196	1.16	0.03	233
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

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

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

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

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	12/1/2025	1/9/2026	5.00	30.0	—
Grading	Grading	1/10/2026	4/24/2026	5.00	75.0	—
Building Construction	Building Construction	7/11/2026	12/1/2029	5.00	885	—
Paving	Paving	4/25/2026	7/10/2026	5.00	55.0	—
Architectural Coating	Architectural Coating	9/15/2029	12/1/2029	5.00	55.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

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

Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

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

Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	4.17	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	50.4	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	15.0	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	10.1	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	623,700	207,900	0.00	0.00	20,935

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	0.00	45.0	0.00	—
Grading	2,500	0.00	225	0.00	—
Paving	0.00	0.00	0.00	0.00	9.55

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	1.54	0%
Other Asphalt Surfaces	6.01	100%
Other Non-Asphalt Surfaces	2.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005
2027	0.00	532	0.03	< 0.005
2028	0.00	532	0.03	< 0.005
2029	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	1,322	1,336	1,197	476,617	14,346	14,497	12,993	5,173,514
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
623700	207,900	0.00	0.00	20,935

5.10.3. Landscape Equipment

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

5.11. Operational Energy Consumption

5.11.1. Unmitigated

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

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	1,065,347	532	0.0330	0.0040	4,380,560
Other Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00
Other Non-Asphalt Surfaces	0.00	532	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	5,835,365	21,989,310
Other Asphalt Surfaces	0.00	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	135	—
Other Asphalt Surfaces	0.00	—
Other Non-Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
45 / 53							

Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

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

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

Equipment Type	Fuel Type
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5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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46 / 53

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres	
5.18.2. Sequestration			
5.18.2.1. Unmitigated			
Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	33.0	annual days of extreme heat
Extreme Precipitation	2.15	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	7.99	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi. Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi. Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters. Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	4	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

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

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

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

6.3. Adjusted Climate Risk Scores

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

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

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

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

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

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

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	91.1
AQ-PM	19.7
AQ-DPM	20.8
Drinking Water	30.2
Lead Risk Housing	12.8
Pesticides	0.00
Toxic Releases	21.4
Traffic	25.9
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	50.1
Impaired Water Bodies	0.00
Solid Waste	59.2
Sensitive Population	—
Asthma	88.3
Cardio-vascular	99.8

Low Birth Weights	76.0
Socioeconomic Factor Indicators	—
Education	64.3
Housing	60.9
Linguistic	—
Poverty	37.4
Unemployment	25.2

7.2. Healthy Places Index Scores

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

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	52.23918902
Employed	23.22597203
Median HI	59.20698062
Education	—
Bachelor's or higher	27.48620557
High school enrollment	100
Preschool enrollment	7.35275247
Transportation	—
Auto Access	77.83908636
Active commuting	1.039394328
Social	—
2-parent households	13.02450917
Voting	37.79032465
Neighborhood	—
Alcohol availability	92.09547029

Park access	20.46708585
Retail density	12.26741948
Supermarket access	16.14269216
Tree canopy	1.244706788
Housing	—
Homeownership	79.23777749
Housing habitability	49.21083023
Low-inc homeowner severe housing cost burden	44.83510843
Low-inc renter severe housing cost burden	19.08122674
Uncrowded housing	27.62735789
Health Outcomes	—
Insured adults	58.96317208
Arthritis	59.3
Asthma ER Admissions	12.1
High Blood Pressure	65.9
Cancer (excluding skin)	71.8
Asthma	25.7
Coronary Heart Disease	72.1
Chronic Obstructive Pulmonary Disease	45.1
Diagnosed Diabetes	50.0
Life Expectancy at Birth	18.5
Cognitively Disabled	85.7
Physically Disabled	74.5
Heart Attack ER Admissions	0.6
Mental Health Not Good	31.8
Chronic Kidney Disease	64.9
Obesity	27.3

Pedestrian Injuries	39.4
Physical Health Not Good	40.7
Stroke	58.2
Health Risk Behaviors	—
Binge Drinking	30.9
Current Smoker	30.4
No Leisure Time for Physical Activity	45.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	9.5
Elderly	81.9
English Speaking	55.8
Foreign-born	27.1
Outdoor Workers	34.3
Climate Change Adaptive Capacity	—
Impervious Surface Cover	74.6
Traffic Density	43.1
Traffic Access	23.0
Other Indices	—
Hardship	67.9
Other Decision Support	—
2016 Voting	42.2

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	42.0

Healthy Places Index Score for Project Location (b)	35.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Information was provided by the client.
Construction: Construction Phases	An estimated start date of 12/01/2025 and end date of 12/01/2029 was provided by the client. Since project is a housing development, assumed all paving was conducted prior to building construction. For architectural coating phase, assumed overlap with end of building construction phase.
Operations: Hearths	Based on information provided by the client no wood stoves or fireplaces are installed.

ATTACHMENT C – Construction and Operational Fuel Estimates

Construction Schedule

*Construction Schedule input on data request form; *Construction Schedule verified by Tim Roofian on 5/9/2024.

Phase Number	Phase Name	Phase Type	Start Date	End Date	Days/Week	Number of Days	Notes
1	Site Preparation	Site Preparation	12/1/2025	1/9/2026	5	30	Start date of 12/1/2025 and 5 days per week is provided by the client. Number of days are default provided by CalEEMod.
2	Grading	Grading	1/10/2026	4/24/2026	5	75	Number of days are default provided by CalEEMod.
3	Paving	Paving	4/25/2026	7/10/2026	5	55	Number of days are default provided by CalEEMod.
4	Building Construction	Building Construction	7/11/2026	12/1/2029	5	885	Number of days increased from the default 740 to meet the provided end date.
5	Architectural Coating	Architectural Coating	9/15/2029	12/1/2029	5	55	Assumed overlap with end of building construction phase. Number of days are default provided by CalEEMod.

total 1100
Ratio 1044 0.949090909

Off-road Equipment (from Input Sheet for CalEEMod TTM 20426, tab 3, Construction)

Construction Phase	Offroad Equipment Type	Amount	Usage (Hours/Day)	Total Usage (Hours/Day)	Total Usage (Hours/Project)	Horse Power	Load Factor	Fuel Rate (gal/hr)	Diesel Used (gal)
Site Preparation	Rubber Tired Dozers	3	8	24	720	367	0.40	7.50	5400.5
	Tractors/Loaders/Backhoes	4	8	32	960	84	0.37	1.59	1524.5
Grading	Excavators	2	8	16	1200	36	0.38	0.70	838.8
	Graders	1	8	8	600	148	0.41	3.10	1860.3
	Rubber Tired Dozers	1	8	8	600	367	0.40	7.50	4500.4
	Scrapers	2	8	16	1200	423	0.48	10.37	12449.2
	Tractors/Loaders/Backhoes	2	8	16	1200	84	0.37	1.59	1905.6
Paving	Pavers	2	8	16	880	81	0.42	1.74	1529.7
	Paving Equipment	2	8	16	880	89	0.36	1.64	1440.6
	Rollers	2	8	16	880	36	0.38	0.70	615.1
Building Construction	Cranes	1	7	7	385	367	0.29	5.44	2093.6
	Forklifts	3	8	24	1320	82	0.20	0.84	1106.1
	Generator Sets	1	8	8	7080	14	0.74	0.53	3747.7
	Tractors/Loaders/Backhoes	3	7	21	18585	84	0.37	1.59	29513.5
	Welders	1	8	8	7080	46	0.45	1.06	7488.3
Architectural Coating	Air Compressors	1	6	6	330	37	0.48	0.91	299.5

Total Construction Gallons (Diesel) 76,313.44
total from TTM 20341 127092
Ratio 1.66539482

Notes:

Fuel flow rate calculated based on the values in the table below; Fuel Flow Rate = horsepower (hp) x BSFC / HHV x Load Factor

Calculation table used to calculate the fuel flow rate

Fuel	BSFC (Btu/hp-hr)	HHV (Btu/gal)	Value	Units
Diesel	7,000	137,000	0.0511	gal/hp-hr

*Fuel usage rate calculation based on the following:

BSFC = 7,000 BTU/hp-hr (Source: AP-42, Section 3.3 Gasoline and Diesel Industrial Engines, Table 3.3.1)

HHV (diesel) = 137,000 BTU/gal (Source: AP-42, Appendix A - Miscellaneous Data and Conversion Factors)

TTM 20426 - Operational Fuel Consumption and Energy Consumption from Vehicle Trips (based on EMFAC2021 (v1.0.2) factors)

Total Fuel Consumption for TTM 20426 (Including Gasoline, Diesel, Natural Gas) = 5,173,514 miles/year
 Total Energy Consumption for TTM 20426 from Electric Vehicles and Plug in Hybrid Vehicles = 192,702 gallons/year
 Total Fuel Consumption in MDAQMD (Including Gasoline, Diesel, Natural Gas) = 553,255.188 gallons/year
 Total Energy Consumption in MDAQMD from Electric Vehicles and Plug in Hybrid Vehicles = 366,155.614 kwh/year

0.035% Percent of total for MDAQMD
 0.037% Percent of total for MDAQMD

Note: cVMT = represents conventional VMT which is powered by conventional fuel, e.g. gasoline, diesel, or natural gas. eVMT = represents electric VMT, which is powered by battery or electricity. Total VMT = sum of cVMT and eVMT

Vehicle Category	Total VMT in MDAQMD for Vehicle Category (miles/day)	Fuel Type	EMFAC2021 (v1.0.2) Data										TTM 20426 Data						
			For Vloopup	cVMT per Vehicle Category & Fuel Type	eVMT per Vehicle Category & Fuel Type	Total VMT	% of VMT per Vehicle Category	% of cVMT per Vehicle Category	% of eVMT per Vehicle Category	Energy Consumption (kWh/mile)	Fuel Consumption (gal/mile)	TTM 20426 Vehicle Fleet Mix from CalEEMod	TTM 20426 Miles/year per Vehicle Category	Total VMT per Vehicle Category & Fuel Type	cVMT per Vehicle Category (miles/year)	eVMT per Vehicle Category (miles/year)	Fuel Consumption (gal/year)	Energy Consumption (kwh/year)	
HHD	3,563,526.51	Gasoline	HHD-Gasoline	181.66	0.00	181.66	0.005%	100%	0%	0.000	0.215	2.17%	112,032	5.71	5.71	0.00	1.23	0.00	
		Diesel	HHD-Diesel	3440513.55	0.00	3440513.55	96.548%	100%	0%	0.000	0.145			108164.20	108164.20	0.00	15636.89	0.00	
		Natural Gas	HHD-Natural Gas	3517.18	0.00	3517.18	0.099%	100%	0%	0.000	0.156			110.57	110.57	0.00	17.23	0.00	
LDA	15,214,034.93	Gasoline	LDA-Gasoline	119314.12	0.00	119314.12	3.348%	0%	100%	1.806	0.000	48.30%	2,498,668	3751.04	0.00	3751.04	0.00	6774.28	
		Diesel	LDA-Diesel	19814.07	0.00	19814.07	0.130%	100%	0%	0.000	0.023			0.00	0.00	0.00	0.00	0.00	
		Natural Gas	LDA-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	0.386	0.000			210219.54	0.00	210219.54	0.00	8162.09	0.00
LDT1	1,001,236.85	Gasoline	LDT1-Gasoline	982517.39	0.00	982517.39	98.130%	100%	0%	0.000	0.027	3.85%	198,951	195231.02	195231.02	0.00	7296.69	0.00	
		Diesel	LDT1-Diesel	9.71	0.00	9.71	0.001%	100%	0%	0.000	0.037			1.93	1.93	0.00	0.07	0.00	
		Natural Gas	LDT1-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	0.386	0.000			0.00	0.00	0.00	0.00	0.00	
LDT2	6,921,068.85	Gasoline	LDT2-Gasoline	24435.27	0.00	24435.27	0.353%	100%	0%	0.000	0.028	22.56%	1,167,149	4120.69	4120.69	0.00	116.26	0.00	
		Diesel	LDT2-Diesel	99976.14	0.00	99976.14	1.445%	0%	100%	0.386	0.000			16859.69	0.00	16859.69	0.00	6509.23	0.00
		Natural Gas	LDT2-Natural Gas	51306.54	69015.15	120321.69	1.738%	43%	57%	0.302	0.032			20290.71	8652.19	11638.52	274.44	3515.18	0.00
LHDT1	907,234.58	Gasoline	LHDT1-Gasoline	466208.99	0.00	466208.99	51.388%	100%	0%	0.000	0.067	3.16%	163,565	84052.66	84052.66	0.00	5636.27	0.00	
		Diesel	LHDT1-Diesel	372739.71	0.00	372739.71	41.085%	100%	0%	0.000	0.048			67201.12	67201.12	0.00	3231.44	0.00	
		Natural Gas	LHDT1-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	0.571	0.000			0.00	0.00	0.00	0.00	0.00	
LHDT2	247,138.45	Gasoline	LHDT2-Gasoline	104394.15	0.00	104394.15	100.000%	100%	0%	0.000	0.024	0.88%	45,785	128703.87	128703.87	0.00	3075.88	0.00	
		Diesel	LHDT2-Diesel	171338.54	0.00	171338.54	69.323%	100%	0%	0.000	0.057			0.00	0.00	0.00	0.00	0.00	
		Natural Gas	LHDT2-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	0.571	0.000			3080.64	0.00	3080.64	0.00	1760.48	0.00
MCY	104,394.15	Gasoline	MCY-Gasoline	104394.15	0.00	104394.15	100.000%	100%	0%	0.000	0.024	2.49%	128,721	128703.87	128703.87	0.00	3075.88	0.00	
		Diesel	MCY-Diesel	0.00	0.00	0.00	0.000%	0%	100%	0.000	0.000			0.00	0.00	0.00	0.00	0.00	
		Natural Gas	MCY-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	0.000	0.000			0.00	0.00	0.00	0.00	0.00	
MDV	4,524,169.27	Gasoline	MDV-Gasoline	4286560.02	0.00	4286560.02	94.748%	100%	0%	0.000	0.046	15.38%	795,584	753799.78	753799.78	0.00	34903.80	0.00	
		Diesel	MDV-Diesel	62039.88	0.00	62039.88	1.371%	100%	0%	0.000	0.040			10909.83	10909.83	0.00	434.72	0.00	
		Natural Gas	MDV-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	0.386	0.000			0.00	0.00	0.00	0.00	0.00	
MH	29,671.18	Gasoline	MH-Gasoline	19666.59	0.00	19666.59	66.282%	100%	0%	0.000	0.210	0.46%	23,769	15754.24	15754.24	0.00	3304.65	0.00	
		Diesel	MH-Diesel	10004.59	0.00	10004.59	33.718%	100%	0%	0.000	0.096			8014.34	8014.34	0.00	766.01	0.00	
		Natural Gas	MH-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	0.000	0.000			0.00	0.00	0.00	0.00	0.00	
MHDT	259,920.55	Gasoline	MHDT-Gasoline	63579.37	0.00	63579.37	24.461%	100%	0%	0.000	0.183	0.58%	30,064	7353.91	7353.91	0.00	1344.43	0.00	
		Diesel	MHDT-Diesel	172510.77	0.00	172510.77	66.371%	100%	0%	0.000	0.106			19953.45	19953.45	0.00	2105.71	0.00	
		Natural Gas	MHDT-Natural Gas	575.22	0.00	575.22	0.221%	100%	0%	0.000	0.111			66.53	66.53	0.00	7.38	0.00	
OBUS	20,359.72	Gasoline	OBUS-Gasoline	13214.14	0.00	13214.14	64.903%	100%	0%	0.000	0.188	0.05%	2,331	1512.87	1512.87	0.00	284.40	0.00	
		Diesel	OBUS-Diesel	5661.05	0.00	5661.05	27.805%	100%	0%	0.000	0.130			648.13	648.13	0.00	84.25	0.00	
		Natural Gas	OBUS-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	1.081	0.000			0.00	0.00	0.00	0.00	0.00	
SBUS	22,910.59	Gasoline	SBUS-Gasoline	7439.49	0.00	7439.49	32.472%	100%	0%	0.000	0.105	0.11%	5,686	1846.22	1846.22	0.00	194.49	0.00	
		Diesel	SBUS-Diesel	14340.99	0.00	14340.99	62.595%	100%	0%	0.000	0.130			3558.92	3558.92	0.00	462.41	0.00	
		Natural Gas	SBUS-Natural Gas	0.00	0.00	0.00	0.000%	0%	100%	1.156	0.000			0.00	0.00	0.00	0.00	0.00	
UBUS	19,499.08	Gasoline	UBUS-Gasoline	4473.12	0.00	4473.12	22.947%	100%	0%	0.000	0.263	0.02%	1,211	277.84	277.84	0.00	73.00	0.00	
		Diesel	UBUS-Diesel	90.33	0.00	90.33	0.463%	100%	0%	0.000	0.096			5.61	5.61	0.00	0.54	0.00	
		Natural Gas	UBUS-Natural Gas	12205.42	0.00	12205.42	62.614%	100%	0%	0.000	0.200			758.13	758.13	0.00	151.96	0.00	

QA/QC Section	32,835,178.71	32,835,178.71	13.00	11.13	3.01	1.00	5,173,513.93	5,173,513.93	5,173,513.93	192,761.21	136,248.60
QA/QC Section	TRUE	TRUE	13 categories	11.128	3.011	1.00					
QA/QC Section	TRUE			TRUE	TRUE	TRUE			TRUE	TRUE	

Slightly higher than raw CalEEMod output because the fleet mix % is just slightly over 100%