Appendix F

Noise and Vibration Letter Report for Tamarisk 2 Apartments in Hesperia, CA; Assessor's Parcel Number 3057-121-08-0000

Yorke Engineering

October 24, 2024

October 24, 2024

Mr. Mark Maida
Maida Holdings
13302 Ranchero Road
Oak Hills, CA 92344
Work: (760) 964-7936
E-mail: Maida5150@gmail.com

Subject: Noise and Vibration Letter Report for Tamarisk 2 Apartments in Hesperia, CA; Assessor's Parcel Number 3057-121-08-0000

Dear Mr. Maida:

Yorke Engineering, LLC (Yorke) is pleased to provide this Noise and Vibration Letter Report. This report includes an analysis of potential noise and vibration impacts from the proposed residential uses on offsite uses proximate to the Project site. These evaluations will support the Applicant's submittal of a CEQA Initial Study (IS)or a Mitigated Negative Declaration (MND), as applicable.

PROJECT DESCRIPTION

Maida Holdings is proposing to develop an apartment complex to be located in Assessor's Parcel Number 3057-121-08-0000 within Hesperia, CA (the City). The Project Site is located north of Orange Street and west of Tamarisk Avenue. The City is located within the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD). The proposed apartment complex will include eight two-story eightplex multi-tenant dwellings (8 units per building) for a total of 64 residential units and a single-story clubhouse.

A total of 160 parking spaces will be provided. Construction will be on vacant and generally flat desert land with site preparation and grading activities. In order to fulfill City requirements, this Noise and Vibration Letter Report has been prepared to estimate potential impacts on offsite uses.

ENVIRONMENTAL SETTING

Noise Descriptors

Noise is typically described as any dissonant, unwanted, or objectionable sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity, the A-weighted decibel scale (dBA). Table 1 lists common sources of sound and their intensities in dBA.

Table 1: Typical Sound Level Characteristics		
Pressure (N/m^2)	**Level (dBA)**	**Sound Level Characteristic**
2000	160	Rocket Launch
600	150	Military Jet Plane Takeoff
200	140	Threshold of Pain
60	130	Commercial Jet Plane Takeoff
20	120	Industrial Chipper or Punch Press
6	110	Loud Automobile Horn
2	100	Passing Diesel Truck – Curb Line
0.6	90	Factory - Heavy Manufacturing
0.2	80	Factory - Light Manufacturing
0.06	70	Open Floor Office - Cubicles
0.02	60	Conversational Speech
0.006	50	Private Office - Walled
0.002	40	Residence in Daytime
0.0006	30	Bedroom at Night
0.0002	20	Recording or Broadcasting Studio
0.00006	10	Threshold of Good Hearing - Adult
0.00002	0	Threshold of Excellent Hearing - Child

Sources: Fundamentals of Industrial Hygiene (Niland & Elam), 7th Edition, 2021

Notes:

Reference Level P_O = 0.00002 N/m^2 = 0.0002 µbar

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

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

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

In determining the daily measure of community noise, it is important to account for the difference in human response to daytime and nighttime noise. Noise is more disturbing at night than during the day, and noise indices have been developed to account for the varying duration of noise events over time, as well as community response to them. The Community Noise Equivalent Level (CNEL) adds a 5-dB penalty for noise occurring in the evening (i.e., 7:00 p.m. to 10:00 p.m.) and a 10-dB penalty for nighttime noise (i.e., 10 p.m. to 7 a.m.) (Caltrans 2020, FTA 2018).

Vibration Descriptors

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

While not a direct health hazard, the energy transmitted through the ground as vibration may result in structural damage, which may be costly to repair and dangerous in the event of structural failure. To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of point peak velocity/peak particle velocity (PPV) in the vertical and horizontal directions (vector sum). A freight train passing at 100 feet may cause PPVs of 0.1 inch per second (in/sec), while a strong earthquake may produce PPVs in the range of 10 in/sec (Caltrans 2020, FTA 2018).

REGULATORY SETTING

California

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

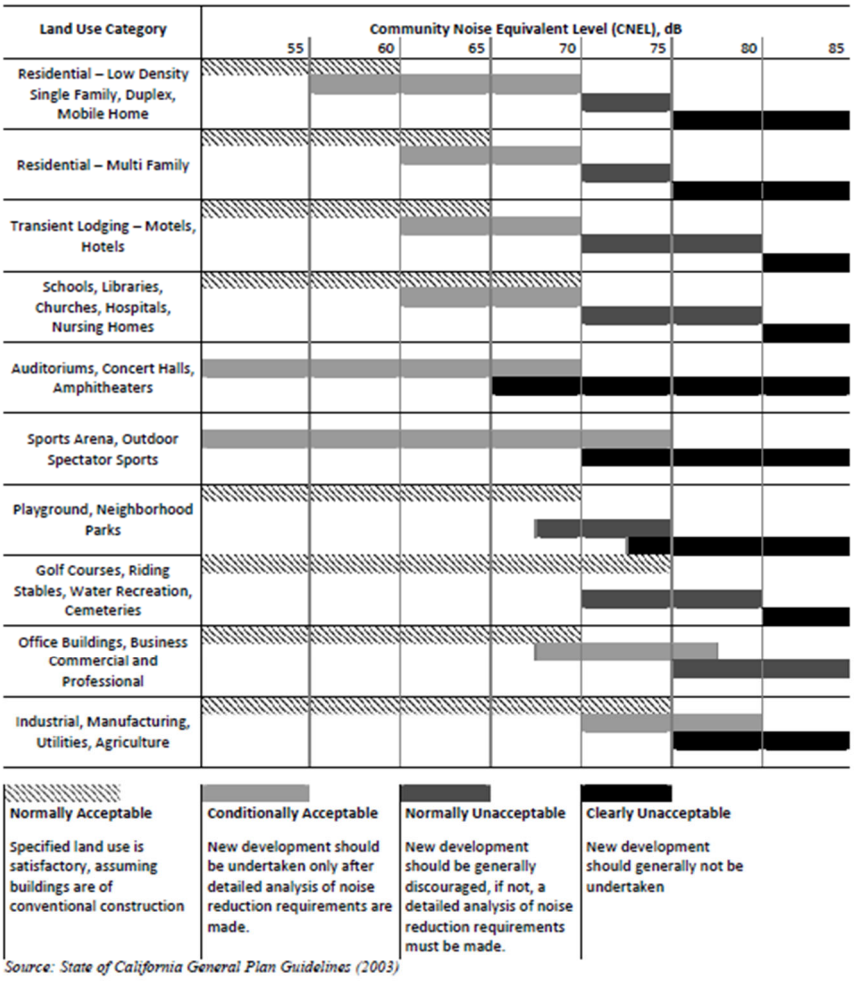
- Protect residents from the harmful and annoying effects of exposure to excessive noise;
- Prevent incompatible land uses from encroaching upon existing or programmed land uses likely to create significant noise impacts; and
- Encourage the application of state-of-the-art land use planning methodologies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

Construction vibration may be regulated at the state level in accordance with standards established by the *Transportation and Construction-Induced Vibration Guidance Manual* issued by Caltrans in 2004 and updated in 2020. Continuous sources include the use of vibratory compaction equipment and other construction equipment that creates vibration other than in single events. (Caltrans 2020).

City of Hesperia General Plan –Noise Element

The Noise Element of the City of Hesperia General Plan contains criteria to determine the compatibility of proposed developments. The State of California Land Use Compatibility Plan (Exhibit NS-1) in the City of Hesperia General Plan Noise Element lists land use categories and the acceptable and unacceptable levels of community noise exposure. The compatibility criteria shown on Exhibit NS-1 (and Table 2 of this report) provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels (City 2010).

Table 2: State of California Land Use Compatibility Plan



Source: City of Hesperia General Plan 2010, Exhibit NS-1

Table 3 shows the exterior and interior noise standards identified within the Noise Element of the City of Hesperia General Plan. The City has established these land use noise compatibility guidelines to ensure that noise sensitive land uses are not exposed to excessive levels of noise. The information is used to identify projects or activities which may require special treatment to minimize noise exposure (City 2010).

Table 3: City of Hesperia Interior and Exterior Noise Standards

Land Use Categories		Community Noise Equivalent Level (CNEL)	
Categories	**Land Uses**	**Interior[1]**	**Exterior[2]**
Residential	Single Family, Duplex, Multiple Family	45[3]	65
	Mobile Homes	n/a	65[4]
Commercial Industrial Institutional	Hotel, Motel, Transient Lodging	45	65[5]
	Commercial Retail, Bank, Restaurant	55	n/a
	Office Building, Research and Development, Professional Offices, City Office Building	50	n/a
	Amphitheatre, Concert Hall, Meeting Hall	45	n/a
	Gymnasium (Multipurpose)	50	n/a
	Sports Club	55	n/a
	Manufacturing, Warehousing, Wholesale, Utilities	65	n/a
	Movie Theatres	45	n/a
Institutional	Hospitals, School Classrooms	45	65
	Church, Library	45	n/a
Open Space	Parks	n/a	65

Interpretation

1. Indoor environment excluding: Bathrooms, toilets, closets, corridors.
2. Outdoor environment limited to:
   Private yard of single family
   Multi-family private patio or balcony which is served by a means of exit from inside.
   Mobile home park
   Hospital patio
   Park picnic area
   School playground
   Hotel and motel recreation area
3. Noise level requirement with closed windows. Mechanical ventilation system or other means of natural ventilation shall be provided per Building Code.
4. Exterior noise level should be such that interior noise level will not exceed 45 dBA CNEL.
5. Except those areas affected by aircraft noise.

Source: City of Hesperia General Plan 2010, Exhibit NS-4

City of Hesperia Municipal Code – Title 16, Chapter 16.20

Section 16.20.125 - Noise

For this Project, the City of Hesperia Municipal Code, Section 16.20.125, contains the applicable evaluation criteria, shown in Table 4 (City 2022).

Table 4: City of Hesperia Noise Standards

Affected Land Use (Receiving Noise)	Noise Level (dBA)	
	10 p.m. to 7 a.m.	7 a.m. to 10 p.m.
A-1, A-2, R-1, R-3, and RR Zone Districts	55	60*
C-1, C-2, C-3, C-4, C-R, AP, and P-I Zone Districts	65*	
I-1 and I-2 Zone Districts	70*	

* Due to wind noise, the maximum permissible noise level may be adjusted so that it is no greater than five dBA above the ambient noise level.

No person shall operate or cause to be operated any source of sound at any location or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level, when measured on any other property, either incorporated or unincorporated, to exceed:

- The noise standard for that receiving land use (as specified in Table 4) for a cumulative period of more than 30 minutes in any hour; or
- The noise standard plus five dBA for a cumulative period of more than 15 minutes in any hour; or
- The noise standard plus ten dBA for a cumulative period of more than five minutes in any hour; or
- The noise standard plus 15 dBA for a cumulative period of more than one minute in any hour; or
- The noise standard plus 20 dBA for any period of time.

If the measured ambient level exceeds any of the first four noise limit categories above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 4 of this section shall be reduced by five dBA.

Section 16.20.125, Subpart E, exempts the following noises:

- Motor vehicles not under the control of the industrial use;
- Emergency equipment, vehicles, and devices; and
- Temporary construction, repair, or demolition activities between 7 a.m. and 7 p.m. except Sundays and federal holidays.

Section 16.20.130 - Vibration

A. Vibration Standard. No ground vibration shall be allowed which can be felt without the aid of instruments at or beyond the lot line; nor will any vibration be permitted which produces a particle velocity greater than or equal to 0.2 in/sec measured at or beyond the lot line.

B. Vibration Measurement. Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity or acceleration. Readings are to be made at points of maximum vibration along any lot line next to a residential or commercial district or a community industrial lot.

C. Exempt Vibrations. The following sources of vibration are not regulated by this code:

1. Motor vehicles not under the control of the industrial use;

2. Temporary construction, maintenance or demolition activities between 7 a.m. and 7 p.m. except Sundays and federal holidays.

(SBCC § 87.1310)

CEQA Checklist Questions

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project will normally have a significant adverse environmental impact related to noise if it would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Generation of excessive groundborne vibration or groundborne noise levels.
- 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, if the project would expose people residing or working in the project area to excessive noise level.

NOISE IMPACT ANALYSIS

Noise Analysis Methodology

The noise analysis addresses the CEQA Appendix G checklist questions to determine if there would be significant noise and vibration related impacts attributable to the Project's construction and operational phases. The evaluation of potential Project construction activities impacts is conducted based on methodology developed by the U.S. Department of Transportation Federal Highway Administration (DOT FHWA) at the John A. Volpe National Transportation Systems Center and other technical references consistent with CalEEMod outputs (equipment utilization). The DOT FHWA methodology uses actual noise measurement data collected during the Boston "Big Dig" project (1991-2006) as reference levels for a wide variety of construction equipment in common use, such as on the proposed project. This noise analysis did not include field measurements of ambient noise in the vicinity of the Project site.

The FHWA noise model provides relatively conservative predictions because it does not account for site-specific geometry, dimensions of nearby structures, and local environmental conditions

that can affect sound transmission, reflection, and attenuation. As a result, actual measured sound levels at receptors may vary somewhat from predictions, typically lower. Additionally, the impacts of noise upon receptors (persons) are subjective because of differences in individual sensitivities and perceptions.

Noise impacts were evaluated against community noise standards contained in the City General Plan or other state or federal agency as applicable to the vicinity of the Project site. For this Project, the City of Hesperia Noise Ordinance, Section 16.20.125, and the Noise Element of the General Plan, contain the applicable evaluation criteria as well as construction noise thresholds described by the Federal Transit Administration.

The operations phase of the Project would result in changes in offsite traffic noise due to the addition of vehicle trips. Changes traffic noise levels was assessed based on traffic volume information provided within the City's General Plan and calculation of traffic noise with the FHWA's RD-77-108 Highway Noise Prediction Model.

The following Appendix G CEQA checklist questions, previously discussed, address whether project related noise and vibration impacts would exceed the limits identified within the adopted ordinances, General Plan, or adopted threshold used by other governmental agencies or industry accepted approaches.

Construction Noise

Would the project result in:

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

No. Temporary construction noise would be limited to daylight hours (i.e., between 7 a.m. and 7 p.m.) on weekdays and Saturdays and would permanently cease upon completion of construction. Per the City's Municipal Code Section 16.20.125 – Noise, the City specifically exempts "Temporary construction, repair, or demolition activities between seven a.m. and seven p.m. except Sundays and federal holidays." As such, the City does not consider construction noise to result in a significant noise impact if they occur within the hours prescribed with the City's Municipal Code. The Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment provides an eight-hour construction noise level threshold of 80 dBA L_{eq} during daytime at residential (noise-sensitive) uses, and 85 dBA during the daytime at commercial uses. The following analysis provides an estimate of noise exposure at the nearest offsite uses.

Table 5 shows a comparison of FHWA screening-level estimated daytime exterior noise impacts for peak construction activities at nearby receptors with respect to the FTA threshold. If the threshold is not exceeded, then a project should be considered acceptable, i.e., Less Than Significant. Since the Temporary construction noise would be limited to hours set by the City, the Project would result in less than significant noise impacts. In addition, the Project is below the FTA's construction noise threshold.

Table 5: Estimated Peak Activity Daytime Noise Impacts			
Construction Phases	**Compatible Criteria**		
	Modeled Noise Level (L_{eq} dBA)	**Significance Threshold (CNEL dBA)** [a]	**Exceeds Threshold (Yes/No)?**
Site Preparation	77	80	No
Grading	77	80	No
Building Construction	76	80	No
Paving	77	80	No
Architectural Coating	66	80	No

Sources: FHWA 2006, FTA 2018, Niland & Elam, 2021

Notes:

[a] FTA 2018

Operational Noise

Upon completion of construction and occupancy of the proposed Project, on-site operational noise would be generated mainly by trash trucks, landscaping activities, and Heating, Ventilation, and Air Conditioning (HVAC) equipment. Noise produced by these sources are regulated by the City's residential noise limits of 60 dBA during the day and 55 dBA during the night as defined in Section 16.20.125 of the Municipal Code. Compliance with these noise limits is considered by the City to result in less than significant noise impacts. Operational HVAC noise levels are based on manufacturer sound pressure levels, which range from 24-48 dBA L_{eq} measured at a distance of 50 ft from the source (Lennox 2023). Condensers are shown within the site plans at a distance of approximately 50 feet from the nearest property line. The eight HVAC condenser units would result in noise levels of 33-57 dBA L_{eq} at the nearest property line for daytime noise levels which is below the City's daytime noise limit of 60 dBA L_{eq}. Nighttime condenser noise is projected to range from 30-54 dBA L_{eq} for nighttime noise levels, which is below the City's nighttime noise limit of 55 dBA L_{eq}. The condensers are located between the proposed two story residential structures, which would substantially reduce noise levels for the majority of the property line to the north. As such, noise from HVAC units would be below the City's noise limits. HVAC condenser noise calculations are shown in Attachment 5.

Noise associated with delivery and trash-hauling trucks would be an intermittent noise source and are already a common day-to-day occurrence in the Project area due to existing residential and commercial uses that make up the developed urban area. Therefore, such services associated with the Project would not result in a substantial permanent increase in ambient noise levels without the Project. Project-related off-site noise sources (i.e., roadway traffic noise) have the potential to increase noise levels on local roadways proximate to the Project site. The determination of whether traffic related noise impacts would occur is based on whether project-related off-site noise sources (i.e. roadway traffic noise) cause the ambient noise levels proximate to the local roadways to result in an audible increase (3 dBA). Based on the trip generation calculated for the Project by CalEEMod, operation of the proposed Project would result in an additional 521 Average Daily Trips (ADT). Traffic volumes provided within the City's Hesperia General Plan Update 2010

shows that Main Street has 28,890 ADT for the year 2006 and 59,400 ADT under General Plan Buildout conditions. At these rates, the Project would represent an average 1.8% increase in daily traffic from year 2006 volumes and a 0.9% increase from General Plan Buildout conditions. Based on the FHWA's RD 77-108 Traffic Noise Prediction Model, the increase in vehicle traffic related to the Project would result in a fractional increase in traffic noise of less than 0.1 dBA along Main Street. A 3 dBA change in noise levels is considered the minimum change in outdoor noise that is perceptible with human hearing. A one dBA change in noise levels is discernable in laboratory conditions. Consequently, Project related traffic noise increases would not be audible even under controlled laboratory conditions.

Because both stationary and mobile sources of noise associated with the Project would result in noise increases that are either consistent with the City's noise limits or would not result in an substantial increase in ambient noise levels, operational phase noise impacts of the proposed Project would be less than significant.

Vibration

> Would the project result in:*Generation of excessive groundborne vibration or groundborne noise levels?*

Potential vibration generated from the Project would primarily occur from the construction phase when heavy construction equipment is used for construction activities. During the construction phase, the Project would generate vibration due to operation of off-road equipment, portable equipment, and vehicles at or near the Project site. The vibration analysis is evaluated with a threshold of 0.2 PPV consistent with the City's Municipal Code vibration limit shown in Section 16.20.130 – Vibration.

Table 6 also shows the vibration levels of construction equipment at the nearest sensitive receptors and compares them to the City's vibration threshold. Based on the information presented above and in Table 6, the nearest offsite structures would be exposed to a PPV below 0.2 in/sec when construction equipment operate at distances of 30 feet or greater. If construction equipment need to be used within 30 feet of offsite buildings, mitigation measure NOI-1 would reduce vibration impacts to less than significant levels.

Mitigation Measure

NOI-1 Vibration generated from construction equipment operating closer than 30 feet to offsite buildings need to minimize the potential for vibration induced building damage. Large construction equipment (9+ tons) would also need to operate beyond 15 feet of offsite buildings. The use of smaller equipment could be used within 15 feet of offsite buildings.

Table 6: Construction Vibration Levels at Nearest Offsite Buildings				
Equipment	**Vibration Levels at Nearest Offsite Buildings (PPV)**			
	Residential Structures to the North	**Residential Structures to the East**	**Residential Structures to the South**	**Residential Structures to the West**
	(PPV @ 30 ft)	**(PPV @ 525 ft)**	**(PPV @ 55 ft)**	**(PPV @ 735 ft)**
Large Bulldozer/Crawler Tractor	0.07	0.00	0.03	0.00
Small Bulldozer/Excavator/ Backhoe	0.00	0.00	0.00	0.00
Loaded Dump Trucks	0.06	0.00	0.02	0.00
Maximum Vibration Level	**0.07**	**0.00**	**0.03**	**0.00**
City's Vibration Criteria	**0.2**	**0.2**	**0.2**	**0.2**
Exceeds Criteria?	**No**	**No**	**No**	**No**

Source: FTA 2018 (Calculations can be found in Attachment 3).

The operations phase of the proposed Project is not anticipated to involve substantial sources of vibration due to the nature of residential uses. As such, vibration associated with Project's operations would result in less than significant impacts.

PROJECTED IMPACT: Less Than Significant with mitigation.

Would the project result in:

For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The Project site is not located within two miles of an airport. The nearest major airport is the Ontario International Airport, which is located approximately 30 miles southwest of the Project site. The Hesperia Airport is a small general aviation airport and is located approximately 4 miles to the southeast of the Project site. As such, the Project site is also located well outside the existing and projected 65-dBA CNEL noise contour of any airport. Aircraft overflights do not significantly contribute to the noise environment at the Project site. Therefore, there would be no impact related to aircraft noise.

PROJECTED IMPACT: No impact

CLOSING

Noise and vibration attributable to the Project was evaluated against applicable noise and vibration limits and those adopted for use by the City. Both the construction and operations phases of the Project were evaluated at the nearest sensitive receptor for excessive noise and at the nearest uses for vibration exposure. Temporary construction noise would be limited to hours set by the City and would permanently cease upon completion of construction. Additionally, aggregated average construction noise will be below the FTA noise level threshold. Therefore, construction-related noise is found to result in less than significant noise exposure at the nearest noise sensitive uses.

The operations phase of the Project would entail typical on-site equipment consistent with surrounding residential uses. These uses would comply with the City's noise limits identified within the Municipal Code. Compliance with these requirements would result in less than significant noise impacts from on-site equipment use at the Project site. Off-site noise from project related vehicle trips was also evaluated. Project related vehicle trips are estimated to result in a noise increase of less than 1 dBA. This increase in traffic noise levels would not result in an audible change, which generally requires a minimum of 3 dBA. As such, off-site traffic noise increases are found to result in less than significant impacts. The Project site is not located proximate to an airport or airstrip and consequently would not expose future residents to excessive levels of noise.

Vibration was also assessed for the construction phase of the Project. If larger construction equipment (9+ tons) need to operate closer than 30 feet to offsite buildings, implementation of mitigation measure NOI-1 would reduce the impacts to less than significant. The operational phase of the proposed Project would not involve activities that generate substantive levels of vibration that would affect off-site uses and consequently would result in less than significant vibration impacts. In conclusion, the Project would not result in excessive levels of noise or vibration at off-site receptors.

Thank you very much for the opportunity to be of assistance to Maida Holdings. Should you have any questions, please contact me at (949) 979-1372 (mobile) or (949) 979-1372 (office).

Sincerely,

Tin Cheung
Principal Scientist
Yorke Engineering, LLC
TCheung@YorkeEngr.com

cc: Tina Darjazanie, Yorke Engineering, LLC

Attachments:

1. CalEEMod Outputs
2. FHWA Construction Noise Modeling
3. FTA Vibration Modeling
4. FHWA Traffic Noise Modeling
5. HVAC Noise Calculations

REFERENCES

California Department of Transportation (Caltrans). 2020. Transportation and Construction Vibration Guidance Manual. Website (https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf).

City of Hesperia (City). 2022. Municipal Code – Section 16.20.125, Noise. Website (https://library.municode.com/ca/hesperia/codes/code_of_ordinances?nodeId=TIT16DECO_CH16.20GERE_ARTVGEPEST_16.20.125NO).

City of Hesperia (City). 2010 (updated 2019). General Plan, Noise Element. Website (https://www.cityofhesperia.us/DocumentCenter/View/15728/General-Plan-Update-August-2019).

Lennox. Miscellaneous Engineering Data. 2023. Website (https://www.lennoxcommercial.com/dA/98128e05d8/file/ehb_sounddata_2306.pdf).

Niland, Jill and Lucy A. Elam, Fundamentals of Industrial Hygiene – 7th Edition, National Safety Council. 2021.

U.S. Department of Transportation – Federal Highway Administration (FHWA). 2006. Roadway Construction Noise Model User's Guide. Website (https://www.fhwa.dot.gov/Environment/noise/construction_noise/rcnm/).

U.S. Department of Transportation – Federal Transit Authority (FTA). 2018. Transit Noise and Vibration Impact Assessment. Website https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf).

ATTACHMENT 1 – CALEEMOD OUTPUTS

Hesperia Apartment Buildings Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Hesperia Apartment Buildings
Construction Start Date	1/2/2025
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.80
Precipitation (days)	1.40
Location	34.424141370228895, -117.35280899935994
County	San Bernardino-Mojave Desert
City	Hesperia
Air District	Mojave Desert AQMD
Air Basin	Mojave Desert
TAZ	5183
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southwest Gas Corp.
App Version	2022.1.1.28

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
Apartments Low Rise	64.0	Dwelling Unit	4.91	39,196	52,296	—	212	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.63	1.39	10.9	17.0	0.03	0.43	0.66	1.10	0.40	0.16	0.56	—	3,288	3,288	0.12	0.07	3.05	3,315
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	13.8	13.8	31.7	31.2	0.05	1.37	7.89	9.26	1.26	3.99	5.25	—	5,521	5,521	0.23	0.07	0.08	5,542
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.08	0.91	7.54	10.7	0.02	0.30	0.58	0.88	0.28	0.18	0.46	—	2,135	2,135	0.08	0.05	0.83	2,151
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.20	0.17	1.38	1.95	< 0.005	0.06	0.11	0.16	0.05	0.03	0.08	—	353	353	0.01	0.01	0.14	356

2.2. Construction Emissions by Year, Unmitigated

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

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.63	1.39	10.9	17.0	0.03	0.43	0.66	1.10	0.40	0.16	0.56	—	3,288	3,288	0.12	0.07	3.05	3,315

Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.03	3.39	31.7	31.2	0.05	1.37	7.89	9.26	1.26	3.99	5.25	—	5,521	5,521	0.23	0.07	0.08	5,542
2026	13.8	13.8	10.3	15.4	0.03	0.38	0.66	1.04	0.35	0.16	0.51	—	3,195	3,195	0.11	0.07	0.07	3,219
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.08	0.91	7.54	10.7	0.02	0.30	0.58	0.88	0.28	0.18	0.46	—	2,135	2,135	0.08	0.05	0.83	2,151
2026	0.75	0.74	0.52	0.82	< 0.005	0.02	0.03	0.05	0.02	0.01	0.03	—	142	142	< 0.005	< 0.005	0.05	143
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.20	0.17	1.38	1.95	< 0.005	0.06	0.11	0.16	0.05	0.03	0.08	—	353	353	0.01	0.01	0.14	356
2026	0.14	0.13	0.09	0.15	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	23.5	23.5	< 0.005	< 0.005	0.01	23.7

2.4. Operations Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.91	3.70	2.71	20.5	0.04	0.10	3.03	3.13	0.10	0.77	0.87	30.6	5,086	5,117	3.29	0.18	12.8	5,267
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.27	3.07	2.82	13.5	0.04	0.10	3.03	3.13	0.10	0.77	0.86	30.6	4,756	4,786	3.30	0.19	0.61	4,926
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	25.5	25.0	2.39	41.7	0.08	3.78	2.71	6.49	3.76	0.69	4.45	430	3,733	4,162	3.64	0.20	5.13	4,319
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.65	4.56	0.44	7.62	0.01	0.69	0.50	1.18	0.69	0.13	0.81	71.2	618	689	0.60	0.03	0.85	715

2.5. Operations Emissions by Sector, Unmitigated

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

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.57	2.42	1.82	16.5	0.04	0.03	3.03	3.06	0.03	0.77	0.80	—	3,689	3,689	0.14	0.17	12.6	3,754
Area	1.31	1.26	0.62	3.88	< 0.005	0.05	—	0.05	0.05	—	0.05	0.00	751	751	0.01	< 0.005	—	752
Energy	0.03	0.02	0.27	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	626	626	0.06	< 0.005	—	629
Water	—	—	—	—	—	—	—	—	—	—	—	5.11	20.3	25.4	0.53	0.01	—	42.3
Waste	—	—	—	—	—	—	—	—	—	—	—	25.5	0.00	25.5	2.55	0.00	—	89.3
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.28	0.28
Total	3.91	3.70	2.71	20.5	0.04	0.10	3.03	3.13	0.10	0.77	0.87	30.6	5,086	5,117	3.29	0.18	12.8	5,267
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.26	2.11	1.97	13.2	0.03	0.03	3.03	3.06	0.03	0.77	0.80	—	3,368	3,368	0.15	0.17	0.33	3,424
Area	0.97	0.94	0.58	0.25	< 0.005	0.05	—	0.05	0.05	—	0.05	0.00	741	741	0.01	< 0.005	—	742
Energy	0.03	0.02	0.27	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	626	626	0.06	< 0.005	—	629
Water	—	—	—	—	—	—	—	—	—	—	—	5.11	20.3	25.4	0.53	0.01	—	42.3
Waste	—	—	—	—	—	—	—	—	—	—	—	25.5	0.00	25.5	2.55	0.00	—	89.3
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.28	0.28
Total	3.27	3.07	2.82	13.5	0.04	0.10	3.03	3.13	0.10	0.77	0.86	30.6	4,756	4,786	3.30	0.19	0.61	4,926
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	2.04	1.91	1.80	12.7	0.03	0.03	2.71	2.74	0.02	0.69	0.71	—	3,081	3,081	0.14	0.16	4.85	3,136
Area	23.4	23.1	0.32	28.9	0.05	3.73	—	3.73	3.72	—	3.72	399	4.79	404	0.37	0.03	—	422
Energy	0.03	0.02	0.27	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	626	626	0.06	< 0.005	—	629
Water	—	—	—	—	—	—	—	—	—	—	—	5.11	20.3	25.4	0.53	0.01	—	42.3
Waste	—	—	—	—	—	—	—	—	—	—	—	25.5	0.00	25.5	2.55	0.00	—	89.3

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.28	0.28
Total	25.5	25.0	2.39	41.7	0.08	3.78	2.71	6.49	3.76	0.69	4.45	430	3,733	4,162	3.64	0.20	5.13	4,319
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.37	0.35	0.33	2.32	0.01	< 0.005	0.50	0.50	< 0.005	0.13	0.13	—	510	510	0.02	0.03	0.80	519
Area	4.28	4.21	0.06	5.27	0.01	0.68	—	0.68	0.68	—	0.68	66.1	0.79	66.9	0.06	< 0.005	—	69.8
Energy	0.01	< 0.005	0.05	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	104	104	0.01	< 0.005	—	104
Water	—	—	—	—	—	—	—	—	—	—	—	0.85	3.35	4.20	0.09	< 0.005	—	7.00
Waste	—	—	—	—	—	—	—	—	—	—	—	4.23	0.00	4.23	0.42	0.00	—	14.8
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05
Total	4.65	4.56	0.44	7.62	0.01	0.69	0.50	1.18	0.69	0.13	0.81	71.2	618	689	0.60	0.03	0.85	715

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.05	0.43	0.41	< 0.005	0.02	—	0.02	0.02	—	0.02	—	72.5	72.5	< 0.005	< 0.005	—	72.8
Dust From Material Movement	—	—	—	—	—	—	0.11	0.11	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	12.0	12.0	< 0.005	< 0.005	—	12.1
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.09	0.98	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	226	226	0.01	0.01	0.02	229
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.19	3.19	< 0.005	< 0.005	0.01	3.23
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.53	0.53	< 0.005	< 0.005	< 0.005	0.54
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.07	1.74	16.3	17.9	0.03	0.72	—	0.72	0.66	—	0.66	—	2,959	2,959	0.12	0.02	—	2,970
Dust From Material Movement	—	—	—	—	—	—	2.76	2.76	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road	0.05	0.04	0.36	0.39	< 0.005	0.02	—	0.02	0.01	—	0.01	—	64.9	64.9	< 0.005	< 0.005	—	65.1
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	10.7	10.7	< 0.005	< 0.005	—	10.8
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.08	0.84	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	194	194	0.01	0.01	0.02	196
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.37	4.37	< 0.005	< 0.005	0.01	4.43
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.72	0.72	< 0.005	< 0.005	< 0.005	0.73
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.83	0.69	6.44	8.04	0.01	0.27	—	0.27	0.24	—	0.24	—	1,478	1,478	0.06	0.01	—	1,483
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	1.17	1.47	< 0.005	0.05	—	0.05	0.04	—	0.04	—	245	245	0.01	< 0.005	—	246
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.25	0.22	3.83	0.00	0.00	0.60	0.60	0.00	0.14	0.14	—	672	672	0.03	0.02	2.46	682
Vendor	0.01	0.01	0.22	0.10	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	218	218	< 0.005	0.03	0.60	227
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	0.23	0.21	0.24	2.57	0.00	0.00	0.60	0.60	0.00	0.14	0.14	—	595	595	0.03	0.02	0.06	603
Vendor	0.01	0.01	0.23	0.10	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	218	218	< 0.005	0.03	0.02	227
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.13	0.16	1.77	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	378	378	0.02	0.01	0.65	383
Vendor	0.01	0.01	0.14	0.06	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	134	134	< 0.005	0.02	0.16	140
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.03	0.32	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	62.5	62.5	< 0.005	< 0.005	0.11	63.4
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	22.3	22.3	< 0.005	< 0.005	0.03	23.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	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	0.02	0.02	0.15	0.20	< 0.005	0.01	—	0.01	0.01	—	0.01	—	37.5	37.5	< 0.005	< 0.005	—	37.7
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.21	6.21	< 0.005	< 0.005	—	6.23
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.20	0.22	2.37	0.00	0.00	0.60	0.60	0.00	0.14	0.14	—	583	583	0.01	0.02	0.06	590
Vendor	0.01	0.01	0.23	0.09	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	214	214	< 0.005	0.03	0.01	223
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.40	9.40	< 0.005	< 0.005	0.02	9.53
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.35	3.35	< 0.005	< 0.005	< 0.005	3.49
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.56	1.56	< 0.005	< 0.005	< 0.005	1.58
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.58
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Paving (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.81	0.68	6.23	8.81	0.01	0.26	—	0.26	0.24	—	0.24	—	1,350	1,350	0.05	0.01	—	1,355
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.03	0.31	0.43	< 0.005	0.01	—	0.01	0.01	—	0.01	—	66.6	66.6	< 0.005	< 0.005	—	66.8
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.0	11.0	< 0.005	< 0.005	—	11.1
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.08	0.10	1.03	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	253	253	< 0.005	0.01	0.03	256
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.9	12.9	< 0.005	< 0.005	0.02	13.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.13	2.13	< 0.005	< 0.005	< 0.005	2.16
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Architectural Coating (2026) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	13.6	13.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.01	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	6.58	6.58	< 0.005	< 0.005	—	6.61
Architectural Coatings	0.67	0.67	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.09	1.09	< 0.005	< 0.005	—	1.09
Architectural Coatings	0.12	0.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	117	117	< 0.005	< 0.005	0.01	118
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.92	5.92	< 0.005	< 0.005	0.01	6.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.98	0.98	< 0.005	< 0.005	< 0.005	0.99
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	2.57	2.42	1.82	16.5	0.04	0.03	3.03	3.06	0.03	0.77	0.80	—	3,689	3,689	0.14	0.17	12.6	3,754
Total	2.57	2.42	1.82	16.5	0.04	0.03	3.03	3.06	0.03	0.77	0.80	—	3,689	3,689	0.14	0.17	12.6	3,754
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	2.26	2.11	1.97	13.2	0.03	0.03	3.03	3.06	0.03	0.77	0.80	—	3,368	3,368	0.15	0.17	0.33	3,424
Total	2.26	2.11	1.97	13.2	0.03	0.03	3.03	3.06	0.03	0.77	0.80	—	3,368	3,368	0.15	0.17	0.33	3,424
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	0.37	0.35	0.33	2.32	0.01	< 0.005	0.50	0.50	< 0.005	0.13	0.13	—	510	510	0.02	0.03	0.80	519
Total	0.37	0.35	0.33	2.32	0.01	< 0.005	0.50	0.50	< 0.005	0.13	0.13	—	510	510	0.02	0.03	0.80	519

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	284	284	0.03	< 0.005	—	286
Total	—	—	—	—	—	—	—	—	—	—	—	—	284	284	0.03	< 0.005	—	286
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	284	284	0.03	< 0.005	—	286
Total	—	—	—	—	—	—	—	—	—	—	—	—	284	284	0.03	< 0.005	—	286
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	47.1	47.1	< 0.005	< 0.005	—	47.4
Total	—	—	—	—	—	—	—	—	—	—	—	—	47.1	47.1	< 0.005	< 0.005	—	47.4

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	0.03	0.02	0.27	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	342	342	0.03	< 0.005	—	343
Total	0.03	0.02	0.27	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	342	342	0.03	< 0.005	—	343

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	0.03	0.02	0.27	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	342	342	0.03	< 0.005	—	343
Total	0.03	0.02	0.27	0.11	< 0.005	0.02	—	0.02	0.02	—	0.02	—	342	342	0.03	< 0.005	—	343
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	0.01	< 0.005	0.05	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	56.6	56.6	0.01	< 0.005	—	56.7
Total	0.01	< 0.005	0.05	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	56.6	56.6	0.01	< 0.005	—	56.7

4.3. Area Emissions by Source

4.3.1. Unmitigated

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

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.07	0.03	0.58	0.25	< 0.005	0.05	—	0.05	0.05	—	0.05	0.00	741	741	0.01	< 0.005	—	742
Consumer Products	0.84	0.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.07	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.34	0.32	0.04	3.63	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.71	9.71	< 0.005	< 0.005	—	9.74
Total	1.31	1.26	0.62	3.88	< 0.005	0.05	—	0.05	0.05	—	0.05	0.00	751	751	0.01	< 0.005	—	752

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.07	0.03	0.58	0.25	< 0.005	0.05	—	0.05	0.05	—	0.05	0.00	741	741	0.01	< 0.005	—	742
Consumer Products	0.84	0.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.07	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.97	0.94	0.58	0.25	< 0.005	0.05	—	0.05	0.05	—	0.05	0.00	741	741	0.01	< 0.005	—	742
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	4.08	4.01	0.05	4.95	0.01	0.68	—	0.68	0.68	—	0.68	66.1	0.00	66.1	0.06	< 0.005	—	69.0
Consumer Products	0.15	0.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.03	0.03	< 0.005	0.33	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.79	0.79	< 0.005	< 0.005	—	0.80
Total	4.28	4.21	0.06	5.27	0.01	0.68	—	0.68	0.68	—	0.68	66.1	0.79	66.9	0.06	< 0.005	—	69.8

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

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

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

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	5.11	20.3	25.4	0.53	0.01	—	42.3
Total	—	—	—	—	—	—	—	—	—	—	—	5.11	20.3	25.4	0.53	0.01	—	42.3
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	5.11	20.3	25.4	0.53	0.01	—	42.3
Total	—	—	—	—	—	—	—	—	—	—	—	5.11	20.3	25.4	0.53	0.01	—	42.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	0.85	3.35	4.20	0.09	< 0.005	—	7.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.85	3.35	4.20	0.09	< 0.005	—	7.00

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	25.5	0.00	25.5	2.55	0.00	—	89.3
Total	—	—	—	—	—	—	—	—	—	—	—	25.5	0.00	25.5	2.55	0.00	—	89.3

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	25.5	0.00	25.5	2.55	0.00	—	89.3
Total	—	—	—	—	—	—	—	—	—	—	—	25.5	0.00	25.5	2.55	0.00	—	89.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	4.23	0.00	4.23	0.42	0.00	—	14.8
Total	—	—	—	—	—	—	—	—	—	—	—	4.23	0.00	4.23	0.42	0.00	—	14.8

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

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

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.28	0.28
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.28	0.28
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.28	0.28
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.28	0.28
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartment Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05	0.05

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

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

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

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

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

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

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

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

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

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

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

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

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

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

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

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

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

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

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

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

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	1/31/2025	2/7/2025	5.00	5.00	—
Grading	Grading	2/8/2025	2/19/2025	5.00	8.00	—
Building Construction	Building Construction	2/20/2025	1/8/2026	5.00	230	—
Paving	Paving	1/9/2026	2/3/2026	5.00	18.0	—
Architectural Coating	Architectural Coating	2/4/2026	3/1/2026	5.00	18.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
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	1.00	8.00	81.0	0.42

Paving	Paving Equipment	Diesel	Average	2.00	6.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	6.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Paving	Cement and Mortar Mixers	Diesel	Average	2.00	6.00	10.0	0.56
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	46.1	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	6.84	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	20.0	18.5	LDA,LDT1,LDT2

Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	9.22	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	79,372	26,457	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	7.50	0.00	—
Grading	—	—	8.00	0.00	—
Paving	0.00	0.00	0.00	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction

Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Apartments Low Rise	—	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

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
Apartments Low Rise	468	521	402	170,261	3,864	4,296	3,315	1,404,160

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments Low Rise	—
Wood Fireplaces	22
Gas Fireplaces	35

Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	6
Conventional Wood Stoves	0
Catalytic Wood Stoves	3
Non-Catalytic Wood Stoves	3
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
79371.9	26,457	0.00	0.00	—

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)
Apartments Low Rise	299,888	346	0.0330	0.0040	1,066,020

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Apartments Low Rise	2,667,595	1,415,036

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Apartments Low Rise	47.4	—

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
Apartments Low Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Low Rise	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

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

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

5.16.2. Process Boilers

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

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

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

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

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

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	33.8	annual days of extreme heat
Extreme Precipitation	3.50	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	10.8	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	95.3
AQ-PM	41.4
AQ-DPM	14.5
Drinking Water	17.9
Lead Risk Housing	28.0

Pesticides	0.00
Toxic Releases	27.7
Traffic	90.1
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	50.1
Impaired Water Bodies	0.00
Solid Waste	0.00
Sensitive Population	—
Asthma	43.8
Cardio-vascular	78.1
Low Birth Weights	61.7
Socioeconomic Factor Indicators	—
Education	67.6
Housing	47.6
Linguistic	53.9
Poverty	66.6
Unemployment	47.0

7.2. Healthy Places Index Scores

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

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	31.8747594
Employed	8.828435776
Median HI	38.08546131
Education	—

Bachelor's or higher	23.23880405
High school enrollment	13.19132555
Preschool enrollment	55.10073143
Transportation	—
Auto Access	70.20402926
Active commuting	34.31284486
Social	—
2-parent households	46.79840883
Voting	34.99294238
Neighborhood	—
Alcohol availability	73.86115745
Park access	2.194276915
Retail density	15.80905941
Supermarket access	27.08841268
Tree canopy	11.9209547
Housing	—
Homeownership	64.54510458
Housing habitability	35.39073528
Low-inc homeowner severe housing cost burden	43.82137816
Low-inc renter severe housing cost burden	2.091620685
Uncrowded housing	43.53907353
Health Outcomes	—
Insured adults	42.7691518
Arthritis	29.1
Asthma ER Admissions	49.7
High Blood Pressure	40.5
Cancer (excluding skin)	49.7
Asthma	19.7

Coronary Heart Disease	34.0
Chronic Obstructive Pulmonary Disease	19.2
Diagnosed Diabetes	36.9
Life Expectancy at Birth	25.5
Cognitively Disabled	17.4
Physically Disabled	17.3
Heart Attack ER Admissions	37.7
Mental Health Not Good	26.2
Chronic Kidney Disease	45.1
Obesity	29.7
Pedestrian Injuries	71.1
Physical Health Not Good	28.8
Stroke	29.9
Health Risk Behaviors	—
Binge Drinking	45.1
Current Smoker	23.0
No Leisure Time for Physical Activity	37.6
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	39.2
Elderly	59.3
English Speaking	46.1
Foreign-born	26.4
Outdoor Workers	14.0
Climate Change Adaptive Capacity	—
Impervious Surface Cover	84.0
Traffic Density	12.1

Traffic Access	23.0
Other Indices	—
Hardship	77.5
Other Decision Support	—
2016 Voting	47.9

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)	25.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

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

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Based on Site Plan
Construction: Construction Phases	No Demolition
Operations: Hearths	No fireplaces

ATTACHMENT 2 – FHWA Construction Noise Modeling

Length of time weighting factor (LT), %	—	—	—		—	—	—		—	—	—	—
Equivalent minutes in any hour (min/hr)	—	—	—		—	—	—		—	—	—	—
FHWA dBA adjustment factor (dBA_{adj})	—	—	—		—	—	—		—	—	—	—

Estimated Attenuated Sound Levels at Receptor (dBA)

FHWA Construction Equipment and Vehicles	Ref.	Usage	L_{REF}	Quantity	D	TC	IL	WL	RMS		SPL	
		Factor	dBA		ft	dBA/ft	dBA	dBA	L_{MAX}	L_{EQ}	L_{MAX}	L_{EQ}
Tractor (rubber tire) 2	1	40%	84	3	160	0	0	0	2.5E+07	2.9E+07	73.9	74.7
Backhoe (with loader) 1	1	40%	80	4	160	0	0	0	9.8E+06	1.6E+07	69.9	71.9
Excavator (hydraulic)	1	40%	85	1	160	0	0	0	3.1E+07	1.2E+07	74.9	70.9
Grader	1	40%	85	1	160	0	0	0	3.1E+07	1.2E+07	74.9	70.9
Tractor (rubber tire) 2	1	40%	84	1	160	0	0	0	2.5E+07	9.8E+06	73.9	69.9
Backhoe (with loader) 1	1	40%	80	3	160	0	0	0	9.8E+06	1.2E+07	69.9	70.7
Crane	1	16%	85	1	160	0	0	0	3.1E+07	4.9E+06	74.9	66.9
Forklift	1	40%	80	3	160	0	0	0	9.8E+06	1.2E+07	69.9	70.7
Generator (general purpose utility)	1	50%	82	1	160	0	0	0	1.5E+07	7.7E+06	71.9	68.9
Backhoe (with loader) 1	1	40%	80	3	160	0	0	0	9.8E+06	1.2E+07	69.9	70.7
Welding Torch	1	40%	73	1	160	0	0	0	1.9E+06	7.8E+05	62.9	58.9
Paver (asphalt)	1	50%	85	1	160	0	0	0	3.1E+07	1.5E+07	74.9	71.9
Pavement Scarifier 1	1	20%	85	2	160	0	0	0	3.1E+07	1.2E+07	74.9	70.9
Roller	1	20%	85	2	160	0	0	0	3.1E+07	1.2E+07	74.9	70.9
Backhoe (with loader) 1	1	40%	80	1	160	0	0	0	9.8E+06	3.9E+06	69.9	65.9
Drum Mixer	1	50%	80	2	160	0	0	0	9.8E+06	9.8E+06	69.9	69.9
Compressor (air)	1	40%	80	1	160	0	0	0	9.8E+06	3.9E+06	69.9	65.9

Sources: (1) DOT FHWA 2006, (2) Broch 1971, (3) Kenai 2007, (4) EPA 1971, (5) Brueck 2008, (6) Plog 1988, (7) Rogers 2006, (8) T&M 1986, (9) DH 2010, (10) Viracon 2020

ATTACHMENT 3 – FTA Vibration Modeling

Construction Generated Vibration

Residential Structures to the North		Closest Distance (feet):	30
	Approximate RMS a 66	Approximate RMS 73.000	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.068	
Small bulldozer	0.003	0.002	
Loaded trucks	0.076	0.058	
	Criteria	0.200	
Residential Structures to the East		Closest Distance (feet):	525
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.001	
Small bulldozer	0.003	0.000	
Loaded trucks	0.076	0.001	
	Criteria	0.200	
Residential Structures to the South		Closest Distance (feet):	55
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.027	
Small bulldozer	0.003	0.001	
Loaded trucks	0.076	0.023	
	Criteria	0.200	
Residential Structures to the West		Closest Distance (feet):	735
	Approximate RMS a Velocity at 25 ft,	Approximate RMS Velocity Level,	
Equipment	inch/second	inch/second	
Large bulldozer	0.089	0.001	
Small bulldozer	0.003	0.000	
Loaded trucks	0.076	0.000	
	Criteria	0.200	

Based on distance to nearest structure

[1.] Determined based on use of jackhammers or pneumatic hammers that may be used for pavement demolition at a distance of 25 feet

Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

Source: Based on methodology from the United States Department of Transportation Federal Transit Administration,*Transit Noise and Vibration Impact Assessment* (2006).

ATTACHMENT 4 – FHWA Traffic Noise Modeling

Traffic Noise Analysis - Hesperia Apartments

Roadway Segment		Speed	24-hour Traffic Volume: Existing	Future Without Project	Future With Project	Distance to CNEL from Roadway Centerline: Existing 100.0 Feet	60 CNEL	65 CNEL	70 CNEL	Future No Project 100.0 Feet	60 CNEL	65 CNEL	70 CNEL	Future With Project 100.0 Feet	60 CNEL	65 CNEL	70 CNEL	Change From Existing	Change due to Project	Noise Level (CNEL or Ldn) at Distance from Roadway Centerline: Existing 100 feet	100 feet	100 feet	Future No Proj 100 feet	100 feet	100 feet	Future Plus Proj 100 feet	100 feet	100 feet	Change From Existing	Change due to Project
Main Street	Between Mariposa and Maple	25.0	28890.0	28890.0	29411.0	69.2	413	192	89	69.2	413	192	89	69.3	418	194	90	0.1	0.08	69.2	69.2	69.2	69.2	69.2	69.2	69.3	69.3	69.3	+0.08	+0.08

Assumptions:

Fleet Mix: 92% Autos; 3% Medium Trucks; 5% Heavy Trucks; Time of Day: 70% Day, 15% Evening, 15% Night

Simplified to 2 lanes: 6.1 meters= 20.0 feet from centerline

future: 6.1 meters= 20.0 feet from centerline; 1.8% 0.9%

Noise path decay parameter for hard site

Calculations using methods of Federal Highway Administration *Highway Traffic Noise Prediction Model*,
December, 1978. Baseline California vehicle noise levels from Caltrans, TAN 95-03, 1995

Source of standard assumptions:

24-hour distribution of traffic volumes:
70% day (7-7), 15% evening (7-10), 15% night (10-7)
Analysis of L.A. County 24-hour traffic counts for selected arterial streets
conducted by Pat Mann for Inglewood Noise Element, 1974
Truck Mix

ARB standard fleet mix for air quality analysis
Heavy trucks for noise model includes heavy diesel tractor-trailers only
Medium trucks for noise model includes buses and bobtail trucks
Autos includes cars, vans, pickups and light trucks

Site parameter: 0.0 (0=hard, 1=soft)

HALFSEP 1/2 lane separation 6.1
HALFSEPFUT 1/2 lane separation (future) 6.1

Lane separation:
consider moving lanes only

2 ___ ___
+ +

4 ___ ___ ___ ___
+ <--------> +

6 ___ ___ ___ ___ ___ ___
+ <------------> +

8 + ___ ___ ___ ___ ___ ___ ___ ___
+ <----------------> +

California base noise levels:
Autos: 5.2+38.8 Log10 (speed, mi/hr) = -2.8 + 38.8 Log10 (speed, km/hr)
Light trucks: 35.3 + 25.6 Log10 (speed, mi/hr) = 30 + 25.6 Log10 (speed, km/hr)
Heavy trucks:
25-31 mi/hr: 51.9 + 19.2 Log10 (speed, mi/hr) = 47.9 + 19.2 Log10 (speed, km/hr)
35-65 mi/hr: 50.4 + 19.2 Log10 (speed, mi/hr) = 46.4 + 19.2 Log10 (speed, km/hr)
31-35 mi/hr: straight line interpolation between above two curves

ATTACHMENT 5 – HVAC Calculations

HVAC Noise

AC Noise Levels	
Minimum dBA@50 feet	24
Maximum dBA@50 feet	48
Receptor	**North - Residential**
Daytime Usage	
Source Receptor Distance (ft)	50
HVAC Quantity	8
Usage Rate	100%
Barrier Reduction dBA	0
Minimum HVAC Noise (dBA Leq)	**33**
Maximum HVAC Noise (dBA Leq)	**57**
Daytime Noise Limit	**60**
Exceeds Daytime Limit?	**No**
Nighttime Usage	
Source Receptor Distance (ft)	50
HVAC Quantity	8
Usage Rate	50%
Barrier Reduction dBA	0
Minimum HVAC Noise (dBA Leq)	**30**
Maximum HVAC Noise (dBA Leq)	**54**
Nighttime Noise Limit	**55**
Exceeds Nighttime Limit?	**No**