4.2 AIR QUALITY

This section discusses the Project's potential impacts to regional and local air quality. Both temporary impacts related to construction and long-term impacts associated with the Project are discussed. Traffic projections used in emissions estimates are based on the *Traffic, Circulation, and Parking Study* prepared by Associated Transportation Engineers (ATE) dated August 25, 2014. The traffic study is included as Appendix I to this EIR. Air quality model results and calculations are based on the assessment completed as part of the *Air Quality and Greenhouse Gas Emissions Analysis Technical Report prepared by Dudek, dated September 2014* and *Heritage Ridge Project Pre-Construction Export Scenarios Air Quality and Greenhouse Gas Emissions Assessment Memorandum prepared by Dudek, dated June 2015*, and are included as Appendix B. The *Heritage Ridge Residential Project Health Risk Assessment* (HRA) prepared by Rincon Consultants dated January 2016, is included as Appendix C.

4.2.1 Setting

a. Climate and Topography. The City of Goleta is located within the South Central Coast Air Basin (SCCAB) which includes all of San Luis Obispo, Santa Barbara, and Ventura counties. The climate of the SCCAB is strongly influenced by its proximity to the Pacific Ocean and the location of the semi-permanent high-pressure cell in the northeastern Pacific. With a Mediterranean-type climate, the Project area is characterized by warm, dry summers and cool winters with occasional rainy periods. Annual precipitation averages 16 inches, with most rainfall between November and March. Average monthly temperatures range from a high of 79 degrees Fahrenheit (°F) in August to a low of 40°F in December.

Cool, humid marine air causes frequent fog and low clouds along the coast, generally during the night and morning hours in the late spring and early summer months. The region is subject to a diurnal cycle in which daily onshore winds from the west and northwest are replaced by mild offshore breezes flowing from warm inland valleys during night and early morning hours. This alternating cycle can create a situation where suspended pollutants are swept offshore at night, and then carried back onshore the following day. Dispersion of pollutants is further degraded when the wind velocity for both day and nighttime breezes is low.

The region is also subject to seasonal Santa Ana winds, which are strong northerly to northeasterly winds that originate from high-pressure areas centered over the desert of the Great Basin. These winds are usually warm, dry, and often full of dust. They are particularly strong in the mountain passes and at the mouths of canyons.

Two types of temperature inversions (warmer air on top of cooler air) are created in the area: subsidence and radiational. The subsidence inversion is a regional effect created by the Pacific high in which air is heated as it is compressed when it flows from the high-pressure area to the low-pressure areas inland. This type of inversion generally forms at about 1,000 to 2,000 feet and can occur throughout the year, but it is most evident during the summer months. Surface inversions are formed by the more rapid cooling of air near the ground at night, especially during winter. This type of inversion is typically lower (0 to 500 feet at Vandenberg AFB, for example) and is generally accompanied by stable air. Both types of inversions limit the dispersal of air pollutants within the regional airshed, with the more stable the air (low wind speeds, uniform temperatures), the lower the amount of pollutant dispersion.

b. Local Regulatory Framework. The federal and state governments have been empowered by the federal and state Clean Air Acts (42 United States Code § 7401 *et seq.* and California Health and Safety Code § 40910, *et seq.*) to regulate emissions of airborne pollutants and have established ambient air quality standards for the protection of public health. The U.S. Environmental protection Agency (EPA) is the federal agency designated to administer federal air quality regulation, while the California Air Resources Board (ARB) is the state equivalent and operates under the auspices of the California Environmental Protection Agency (CalEPA). Local control in air quality management is provided by the ARB through county-level or regional (multi-county) air pollution control districts (APCDs). The ARB establishes statewide air quality standards and is responsible for control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has established 15 air basins statewide. Goleta is located in the SCCAB, in the portion that is within the jurisdiction of the Santa Barbara County Air Pollution Control District (SBCAPCD).

Federal and state standards have been established for six criteria pollutants, including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulates less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$), and lead (Pb) (refer to Table 4.2-1). California air quality standards are identical to or stricter than federal standards for all criteria pollutants. Table 4.2-1 illustrates the current Federal and State Ambient Air Quality Standards.

Table 4.2-1
Current Federal and State Ambient Air Quality Standards

Pollutant	Federal Standard	California Standard
Ozone	0.07 ppm (8-hr avg)	0.07 ppm (8-hr avg) 0.09 ppm (1-hr avg)
Carbon Monoxide	9.0 ppm (8-hr avg) 35.0 ppm (1-hr avg)	9.0 ppm (8-hr avg) 20.0 ppm (1-hr avg)
Nitrogen Dioxide	0.100 ppm (1-hr avg) 0.053 ppm (annual avg)	0.18 ppm (1-hr avg) 0.030 ppm (annual avg)
Sulfur Dioxide	0.075 ppm (1-hr avg)	0.25 ppm (1-hr avg) 0.04 ppm (24-hr avg)
Lead	1.5 μg/m^3 (calendar quarter)	0.15 μg/m^3 (3-month avg)
Particulate Matter (PM_{10})	150 μg/m^3 (24-hr avg)	20 μg/m^3 (annual avg) 50 μg/m^3 (24-hr avg)
Particulate Matter ($PM_{2.5}$)	12 μg/m^3 (annual avg) 35 μg/m^3 (24-hr avg)	12 μg/m^3 (annual avg)

ppm= parts per million
μg/m3 = micrograms per cubic meter
Sources: California Air Resources Board, October 1, 2015. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf; EPA Particulate Matter (PM) Regulatory Actions, October 26, 2015. http://www.epa.gov/pm/actions.html.

c. Current Ambient Air Quality. The SBCAPCD monitors air pollutant levels and develops strategies to ensure that air quality standards are met. Depending on whether or not the standards are met or exceeded, Santa Barbara County is classified as being in "attainment" or as "non-attainment." Santa Barbara County is in non-attainment for the state eight-hour ozone standard and the state standard for PM_{10}. The County is unclassified (meaning there is insufficient data to designate the area or designations have yet to be made) for the state $PM_{2.5}$ standard and the federal PM_{10} standard. The County is in attainment for all other standards.

Non-attainment status within Santa Barbara County is a result of several factors, primarily the natural meteorological conditions that limit the dispersion and diffusion of pollutants (surface and subsidence inversions), the limited capacity of the local airshed to eliminate pollutants from the air, and the number, type, and density of emission sources within the air basin. The potential health effects of pollutants for which the County is in nonattainment are described below.

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

Suspended Particulates. PM_{10} is small particulate matter measuring no more than 10 microns in diameter, while $PM_{2.5}$ is fine particulate matter measuring no more than 2.5 microns in diameter. Both PM_{10} and $PM_{2.5}$ are comprised mostly of dust particles, nitrates, and sulfates. The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and fine particulates ($PM_{2.5}$) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. PM_{10} is a by-product of fuel combustion and wind erosion of soil and unpaved roads, and is directly emitted into the atmosphere through these processes. PM_{10} is also created in the atmosphere through chemical reactions. Fine particulate matter poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the fine particulate matter that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

An important fraction of the particulate matter emission inventory is that formed by diesel engine fuel combustion. Particulates in diesel emissions are very small and readily respirable. The particles have hundreds of chemicals adsorbed onto their surfaces, including many known or suspected mutagens or carcinogens. Diesel PM emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk. In addition to these general risks, diesel PM can also be responsible for elevated localized or near-source exposures ("hot spots"). Depending on the activity and proximity to receptors, these potential risks can be as high as 1,500 excess cancer cases per million (ARB, October 2000). Risk characterization scenarios have been conducted by the ARB staff to determine the potential excess cancer risks involved due to the location of individuals near to various sources of diesel engine emissions, ranging from school buses to high volume freeways.

Table 4.2-2 summarizes the annual air quality data for Goleta's local airshed, collected at the Goleta-Fairview station, located at 380 N. Fairview Avenue in Goleta. The data collected at this station is considered to be representative of the baseline air quality experienced in the City.

[1] Reactive organic compounds (ROC) are sometimes referred to as reactive organic gases (ROG)

Table 4.2-2
Ambient Air Quality Data

Pollutant	2012	2013	2014
Ozone, ppm - Worst Hour	0.065	0.075	0.096
Number of days of State exceedances (>0.09 ppm)	0	0	1
Ozone, ppm – Worst 8 Hours	0.056	0.065	0.081
Number of days of State exceedances (>0.07 ppm)	0	0	3
Number of days of Federal exceedances (>0.075 ppm)	0	0	2
Carbon Monoxide, ppm - Worst 8 Hours	0.65	*	*
Number of days of State/Federal exceedances (>9.0 ppm)	0	0	0
Nitrogen Dioxide, ppb - Worst Hour	41.0	132.0	38.0
Number of days of State exceedances (>0.18 ppm)	0	1	0
Particulate Matter <10 microns, μg/m^3 Worst 24 Hours	48.0	44.0	45.3
Number of samples of State exceedances (>50 μg/m^3)	0	0	0
Number of samples of Federal exceedances (>150 μg/m^3)	0	0	0
Particulate Matter <2.5 microns, μg/m^3 Worst 24 Hours	29.0	20.5	24.3
Number of days Federal exceedances	*	*	0

** There was insufficient (or no) data available to determine the value.*
Ppm = parts per million; ppb = parts per billion
Goleta-Fairview Station
Source: ARB Air Quality Data Statistics. Top four Summary. Accessed November 2015. Retrieved from:
http://www.arb.ca.gov/adam/topfour/topfour1.php

As shown in Table 4.2-2, between 2012 and 2014 the ozone worst hour air quality standard was exceeded one time in 2014. Also in 2014, the state ozone 8 hour standard was exceeded three times and the federal ozone 8 hour standard was exceeded two times. The standards for CO, NO_2, and particulate matter have not been exceeded in the last three years.

d. Air Quality Planning. Under the California Clean Air Act, the SBCAPCD is required to prepare an overall plan for air quality improvement for the SCCAB, known as the Clean Air Plan (CAP). The CAP was updated in 2013 from its previous update in 2010, and is the sixth triennial update to the initial CAP adopted in 1991. The 2013 CAP incorporates new scientific data and notable regulatory actions that have occurred since adoption of the 2010 CAP. The 2013 CAP was adopted by the SBCAPCD Board of Directors on March 19, 2015.

The 2013 CAP was prepared to address both federal and state requirements. The federal requirements pertain to provisions of the federal Clean Air Act that apply to the City's current designation as an attainment area for the federal 8-hour ozone standard (SBAPCD, 2015). Areas that are designated as attainment for the federal 8-hour ozone standard and attainment for the previous federal 1-hour ozone standard with an approved maintenance plan must submit an 8-hour maintenance plan under section 110(a)(1) of the federal Clean Air Act. The California Clean Air Act, under Health and Safety Code sections 40924 and 40925, requires areas to update their clean air plans every three years with the goal of attaining the state 1-hour ozone standard. The 2013 CAP provides a three-year update to the SBCAPCD's 2010 CAP. More information on carbon dioxide emissions and climate change can be found in Section 4.6, Greenhouse Gas Emissions.

e. Sensitive Receptors. Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health

and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress, such as children under 14; the elderly over 65; persons engaged in strenuous work or exercise; and people with cardiovascular and chronic respiratory diseases. The majority of sensitive receptor locations are therefore residences, schools and hospitals.

The Project site vicinity is primarily occupied by residential and light industrial development. Sensitive receptors near the Project site include residential uses (Willow Springs I and II) to the south of the project site across Camino Vista. Also, beyond S. Los Carneros Road to the west is an approved residential development. When developed, this future use would also be a sensitive receptor.

4.2.2 Impact Analysis

a. Methodology and Significance Thresholds. The air quality analysis is based on the *Air Quality and Greenhouse Gas Emissions Technical Report and Memorandum* (Dudek 2014; Dudek 2015) included in Appendix I. The City relies on the significance thresholds established by Santa Barbara County Air Pollution Control District and codified in the *Environmental Review Guidelines for the Santa Barbara County Air Pollution Control District* (County of Santa Barbara Planning and Development, July 2015) for the analysis of air quality impacts. According to the *Environmental Thresholds and Guidelines Manual*, a significant adverse air quality impact may occur when a project, individually or cumulatively:

- *Interferes with progress toward the attainment of the ozone standard by releasing emissions which equal or exceed the established long-term quantitative thresholds for NO_X and ROC; or*
- *Equals or exceeds the state or federal ambient air quality standards for any criteria pollutant (as determined by modeling).*

Cumulative air quality impacts and consistency with the CAP should be determined for all projects (i.e., whether Project-generated emissions exceed the CAP emission projections or growth assumptions).

Significance Thresholds. Based on Appendix G of the *CEQA Guidelines*, a significant impact related to air quality could occur if the Project would:

1. *Conflict with or obstruct implementation of the applicable air quality plan.*
2. *Violate any air quality standard or contribute substantially to an existing or projected air quality violation.*
3. *Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative guidelines for ozone precursors).*
4. *Expose sensitive receptors to substantial pollutant concentrations.*
5. *Create objectionable odors affecting a substantial number of people.*

Impacts associated with objectionable odors are discussed in Section 4.15, *Effects Found Not to be Significant*.

2013 Clean Air Plan Consistency. Analysis of consistency with land use and population forecasts in local and regional plans, including the CAP, is required in the County's Environmental Thresholds Manual for all projects. In order to be consistent with the CAP, all projects involving earthmoving

activities must implement SBCAPCD's standard dust control measures (SBCAPCD, April 2015b). By definition, consistency with the CAP means that direct and indirect emissions associated with the Project are accounted for in the CAP's emissions growth assumptions and the Project is consistent with policies adopted in the CAP (SBCAPCD, April 2015a). The CAP relies primarily on the land use and population projections provided by the Santa Barbara County Association of Governments (SBCAG) and the ARB on-road emissions forecast as a basis for vehicle emission forecasting. The 2013 Clean Air Plan utilized SBCAG's Regional Growth Forecast 2010-2040, adopted December 2012, to project population growth and associated air pollutant emissions for all of the Santa Barbara County incorporated and unincorporated areas.

Residential projects that involve population growth in an individual jurisdiction or sub-region of Santa Barbara County that would exceed the amount forecasted for that jurisdiction or sub-region would be considered inconsistent with the CAP (SBCAPCD, April 2015a).

Construction Emissions Thresholds. The SBCAPCD has not adopted quantitative thresholds of significance for construction emissions since such emissions are temporary. However, according to the SBCAPCD's *Scope and Content of Air Quality Sections in Environmental Documents* (SBCAPCD, April 2015b), construction-related NO_X, ROC, PM_{10}, and $PM_{2.5}$ emissions from diesel and gasoline powered equipment, paving, and other activities, should be quantified. SBCAPCD uses 25 tons per year for all pollutants except CO as a guideline for determining the significance of construction impacts. In addition, standard dust control measures must be implemented for any discretionary project involving earth-moving activities, regardless of size or duration. According to the SBCAPCD, proper implementation of these required measures reduces fugitive dust emissions to a level that is less than significant (SBCAPCD, April 2015b). Therefore, all construction activity would be required to incorporate the SBCAPCD requirements pertaining to minimizing construction-related emissions and demolition of existing structures.

Operational Emissions Thresholds. Appendix G of the CEQA Guidelines indicates that where available, the significance criteria established by the applicable air quality management district or APCD may be relied upon to determine whether the Project would have a significant impact on air quality. As described in the SBCAPCD *Scope and Content of Air Quality Sections in Environmental Documents* (SBCAPCD, April 2015b), a project will have a significant air quality effect on the environment if operation of it would:

- *Emit (from all sources, both stationary and mobile) more than 240 lbs/day for ROC and NO_X or more than 80 lbs/day for PM_{10}. [Threshold 2].*
- *Emit more than 25 lbs/day of NO_X or ROC from motor vehicle trips only [Threshold 2].*
- *Cause or contribute to a violation of any California or National Ambient Air Quality Standard (except ozone) [Threshold 2].*
- *Exceed the APCD health risk public notification thresholds adopted by the APCD Board (10 excess cancer cases in a million for cancer risk and a Hazard Index of more than 1.0 for non-cancer risk) [Threshold 4].*
- *Be inconsistent with the latest adopted federal and state air quality plans for Santa Barbara County [Threshold 1].*

The SBCAPCD does not have a daily operational threshold for CO as it is an attainment pollutant. However, the City has established criteria for triggering modeling for CO based on the County's adopted

guidance. According to the *Environmental Thresholds and Guidelines Manual*, "a project will have a significant air quality impact if it causes, by adding to the existing background CO levels, a CO 'hot spot' where the California one-hour standard of 20 parts per million carbon monoxide is exceeded" (County of Santa Barbara Planning and Development, 2015). Typically, high CO concentrations are associated with roadways or intersections operating at an unacceptable level of service (LOS) and projects contributing to adverse traffic impacts may result in the formation of CO hotspots (Dudek, 2014). Project screening for CO impacts is as follows:

- *If a project contributes less than 800 peak hour trips, then CO modeling is not required [Threshold 2], and*
- *Projects contributing more than 800 trips to an existing congested intersection at LOS D or below, or will cause an intersection to reach LOS D or below, may be required to model for CO impacts. However, projects that will incorporate intersection modifications to ease traffic congestion are not required to perform modeling to determine potential CO impacts [Threshold 2].*

The City does not specify quantitative thresholds of significance for short-term construction emissions because such emissions have already been accounted for in the 2013 Clean Air Plan. However, because the region does not meet the state standards for ozone and PM_{10}, the City of Goleta requires implementation of standard emission and dust control techniques for all construction, as outlined in the General Plan/Community Land Use Planning Policy (GP/CLUP) Policy CE 12.3 and listed as mitigation measures in the GP/CLUP FEIR (Air Quality), to ensure that these emissions remain less than significant (Dudek, 2014).

Construction Emissions Methodology. The California Emissions Estimator Model (CalEEMod version 2013.2.2) was used to estimate air pollutant emissions associated with Project construction. Construction activities associated with this development would result in temporary air quality impacts that may vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Exhaust from internal combustion engines used by construction equipment and hauling trucks (dump trucks), vendor trucks (delivery trucks), and worker vehicles would result in emissions of NO_x, ROC, CO, SO_x, PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior/interior paint and other finishes, would also produce ROC emissions; however, the contractor is required to procure architectural coatings from a supplier in compliance with the requirements of SBCAPCD's Rule 323 (Architectural Coatings). Paving of the parking lot and other surfaces would similarly produce ROC emissions, but would be required to comply with Rule 329 (Cutback and Emulsified Asphalt Paving Materials), which restricts the percent by volume of ROCs in asphalt material (Dudek, 2014).

The Project includes developing 360 residential units in eight buildings, parking areas, and recreational facilities, including a community park. Construction of the Project is expected to occur over 30 months. Estimated preliminary Project grading would include approximately 178,000-cubic yards of cut and 15,500-cubic yards of fill with approximately 115,000-cubic yards of export material, as described in Section 2.3.3 of Section 2.0, *Project Description*.

Two scenarios were modeled to estimate the pre-construction emissions that would result from exporting 115,000 cubic yards of soil from the site. Scenario 1 assumes that the existing stockpiled material would be removed using 9-cubic yard (CY) trucks, which would require a total of 12,778 round-

tri) haul truck trips; under Scenario 2, it is assumed that 20-CY trucks would be used to haul the material, resulting in approximately 5,750 round-trip haul truck trips.

Operational Emissions Methodology. CalEEMod was used to estimate air pollutant emissions from mobile sources associated with the Project. CalEEMod default data, including temperature, trip characteristics, variable start information, emission factors, and trip distances, were used for the model inputs. The estimate of vehicle trips associated with the Project is from the *Traffic, Circulation, and Parking Study* prepared by Associated Transportation Engineers (Appendix I; also refer to Section 4.13, *Transportation and Circulation*). Emission factors representing the vehicle mix and emissions for the year 2018, when the Project would be in its first year of operation, were used to estimate emissions.

CalEEMod was also used to estimate emissions from the Project area sources, which include space and water heating, gasoline-powered landscape maintenance equipment, consumer products, and architectural coatings for building maintenance. Emissions for the 132-unit senior housing development (119,710 gross square feet) and the 228-unit workforce housing development (218,019 gross square feet) were based on CalEEMod defaults for low-rise apartments [2], and emissions for a two-acre public neighborhood park were estimated using model default values for a city park (Dudek, 2014).

Health Risk Assessment Methodology. The ARB has identified diesel particulate matter as the primary airborne carcinogen in the state (ARB, n.d.). The main sources of diesel particulate matter are exhaust from heavy-duty trucks on the interstate freeway system and diesel-powered locomotives. Due to the potential for exposure of sensitive receptors to diesel particulate matter and other toxic air contaminants, ARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (June 2005) recommends avoiding siting new sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. Based on ARB's findings, the Santa Barbara County APCD also recommends that land use policies should prohibit the construction of new residences, schools, day care centers, playgrounds, and medical facilities within 500 feet of U.S. 101 (SBCAPCD, Public Health and High Traffic Roadways, accessed online September 2014). The highway segment adjacent to the Project site has 65,800 vehicles per day (Caltrans, 2014).

The ARB Handbook found that, based on traffic-related studies, additional non-cancer health risks attributable to proximity to freeways occurs within 1,000 feet and is strongest within 300 feet. California freeway studies show about a 70 percent drop-off in particulate pollution levels at 500 feet (ARB, 2005).

The Project site is located along the south side of U.S. 101 and the Union Pacific Railroad (UPRR). Residences on-site would be located as close as approximately 50 feet from the UPRR railroad tracks and 250 feet south of the closest U.S 101 lane. In addition, nearby businesses may emit additional hazardous air pollutants. These emissions are not expected to individually cause a risk; however, these emissions could add to the cumulative risk to on-site residents in the proposed residential units when considered in combination with the TACs associated with the freeway and railroad operations.

[2] To input different trip generation values for the senior housing and workforce housing, those land uses were inputted separately in CalEEMod as low-rise apartments and mid-rise apartments, respectively. For consistency, the mid-rise apartment values were replaced with the low-rise apartment values, where necessary. Low-rise apartments are characterized as one or two levels, and mid-rise apartments are characterized as more than two levels and less than nine levels. Although the Project would include buildings that are three levels, the low-rise apartment default values were utilized because they are more conservative; however, the majority of the default values were the same for the low-rise and mid-rise apartments (Dudek, 2014).

Rincon Consultants, Inc. prepared an HRA for the Project in January 2016. The HRA used the U.S. Environmental Protection Agency's (USEPA) AERMOD dispersion model and the ARB Hotspots Analysis and Reporting Program (HARP) risk analysis tool. It is based on the Project site plans that had been prepared at that time. A copy of this report is included in Appendix C.

Cancer risk is expressed as the maximum number of new cases of cancer projected to occur in a population of one million people due to exposure to the cancer-causing substance, typically over a specific exposure duration, such as the average residency (50-percentile) of 9 years or the high-end residency (95-percentile) of 30 years. For example, a cancer risk of one in one million means that in a population of one million people, not more than one additional person would be expected to develop cancer as a result of exposure to the substance causing that risk.

b. Project Impacts and Mitigation Measures.

Impact AQ-1 The Project would be consistent with the SBCAPCD 2013 Clean Air Plan (CAP) because it would not generate population in excess of that used in the CAP to forecast population-related emissions. This impact would be Class III, *less than significant [Threshold 1]*.

Consistency with land use and population forecasts in local and regional plans, including the Clean Air Plan (CAP), is required under CEQA for all projects. In order for a project to be found consistent with the CAP, the Project's direct and indirect emissions must be accounted for in the growth assumptions of the CAP (SBCAPCD, April 2015a). In addition, all projects involving earthmoving activities must implement SBCAPCD's standard dust control measures.

The 2013 CAP is based on growth projections contained in the 2007 Santa Barbara County Association of Governments (SBCAG) Regional Growth Forecast 2005-2040, in which assumptions about future land development patterns were used to generate future housing forecasts for unincorporated areas of Santa Barbara County (SBCAG, August 2007). SBCAG updated the Regional Growth Forecast in December 2012 for the period 2010 through 2040. These updated housing projections are shown in Table 4.2-3.

Table 4.2-3
SBCAG Housing Projections for Goleta

Year	Population Forecast	Households[1]
2010	29,824	10,880
2020	29,954	10,924
2035	33,912	12,307
2040	34,588	12,546

Source: SBCAG Regional Growth Forecast, December 2012.
[1] Sub-regional Household forecast is calculated by dividing population growth by census 2010 household size.

The Project involves developing 360 residential rental units, which would include 132 senior apartment units and 228 workforce apartment units. The current population of Goleta is 30,765 (DOF, 2015). The population for the workforce housing was determined based on the latest persons-per-household figure from the Department of Finance (2.76 persons per dwelling unit), and the population for the senior

housing was determined based on the Heritage Ridge Occupant/Unit Ratio Analysis study conducted by The Towbes Group, Inc. (2014) (1.11 persons per senior dwelling unit). The population for the workforce housing was estimated to be 629 persons, and the service population for the senior housing was assumed to be 147 persons. Development of the Project would add an estimated 776 residents (132 dwelling units x 1.11 people/dwelling unit + 228 dwelling units x 2.76), thus increasing the City's population to 31,541. SBCAG's 2010-2040 growth forecast projects Goleta's population to be approximately 30,000 in 2015, 33,900 in 2035, and 34,600 in 2040 (SBCAG, 2015). The Project is not expected to be operational until after 2017. Consequently, the Project was compared to the 2035 and 2040 forecasts. Population generated by the Project would not cause an exceedance of SBCAG's 2035 growth forecast of 33,900 and would not exceed the 2040 growth forecast of 34,588 for the City of Goleta (SBCAG, 2012). Development of the Project would therefore be consistent with the population forecasts contained in the 2013 CAP.

The Project would be consistent with the growth assumptions within the 2013 CAP. As discussed in Impact AQ-3, the Project would be required to implement SBCAPCD's standard dust control measures. Therefore, and impacts from the Project related to CAP consistency would not be significant (Class III).

Mitigation Measures. Mitigation not required because this impact would be less than significant.

Residual Impact. Impacts would be less than significant without mitigation.

Impact AQ-2 **The Project would result in operational air pollutant emissions from area sources, natural gas use, and increased vehicular traffic. However, the increase in emissions would not exceed thresholds established by SBCAPCD. This impact would be Class III, *less than significant [Threshold 2]*.**

Long-term regional emissions are generated by area, energy, and mobile sources. Area emissions include the use of aerosols, consumer products, and landscaping maintenance equipment. Energy emissions include emissions from the use of natural gas. Specifically, the Project would impact air quality through vehicular traffic generated by residences of the senior housing and workforce housing. Emissions associated with Project-generated daily traffic were estimated based on the trip generation rates provided by Associated Transportation Engineers (refer to Section 4.13, *Transportation and Circulation* and Appendix I).

Table 4.2-4 summarizes the maximum daily operational emissions resulting from the Project. All details of the emission calculations are provided in Appendix B.

Table 4.2-4
Estimated Operational Emissions of the Project

Source	Maximum Emissions (lbs/day)				
	ROC	NO_X	CO	PM_{10}	$PM_{2.5}$
Area Emissions	15.4	1.2	30.3	0.2	0.2
Vehicular Emissions	7.0	15.5	73.5	10.0	2.8
Combined Total Emissions	22.4	16.6	103.7	10.2	3.0
Vehicle Emissions Threshold	*25*	*25*	—	*N/A*	—
Threshold Exceeded?	No	No		N/A	
Area + Vehicle Emissions Threshold	*240*	*240*		*80*	
Threshold Exceeded?	No	No		No	

Source: Dudek, 2014, Appendix B.
Emissions are based on incorporation of the proposed sustainable project design features.
Note: Emission totals shown may not sum exactly as a result of rounding.

As shown in Tables 4.2-5, the Project would not generate vehicular emissions that would exceed the SBCAPCD mobile significance thresholds for ROC or NO_X of 25 pounds per day. Additionally, the Project's combined area and vehicle emissions would not exceed the SBCAPCD significance thresholds of 240 pounds per day for ROC and NO_X or the SBCAPCD significance threshold of 80 pounds per day for PM_{10}. This impact would be less than significant.

Table 4.2-5
Estimated Pre-Construction Air Pollutant Emissions
Scenario 1: 9-Cubic Yard Trucks

ROC (tons/year)	NO_X (tons/year)	CO (tons/year)	PM_{10} (tons/year)	$PM_{2.5}$ (tons/year)
Scenario 1: 9-Cubic Yard Trucks				
0.3	3.7	2.1	0.2	0.1
Scenario 2: 20-Cubic Yard Trucks				
0.2	2.9	2.4	0.2	0.1

Source: Heritage Ridge Project Pre-Construction Export Scenarios Air Quality and Greenhouse Gas Emissions Assessment, July 2015 (see Appendix B for Technical Reports and CalEEMod outputs)

Based on the Project's *Traffic, Circulation, and Parking Study*, the senior and workforce housing is forecast to generate 174 AM peak hour trips, and 183 PM peak hour trips (Associated Transportation Engineers, 2014). Because the Project would not contribute more than 800 trips to an existing congested intersection at LOS D or below and would not cause an intersection to reach LOS D or below, a quantitative CO hot spot impact analysis is not warranted, and impacts related to microscale CO concentrations would be less than significant. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion and very low background concentrations relative to the CAAQS and NAAQS, the potential for CO hot spots in the South Central Coast Air Basin is steadily decreasing. According to the SBCAPCD, localized CO impacts associated with congested intersections are not expected to exceed the CO health-related air quality standards due to the relatively low background ambient CO levels in the County (SBCAPCD 2014; Dudek, 2014). This impact would be less than significant.

Mitigation Measures. Mitigation would not be required because Project emissions would not exceed applicable SBCAPCD thresholds.

Residual Impact. Impacts would be less than significant without mitigation.

Impact AQ-3 Project construction would generate temporary air pollutant emissions. Such emissions may result in temporary adverse impacts to local air quality, but are below SBCAPCD guideline thresholds for construction emissions. Additionally, standard dust and emissions control measures are required by the SBCAPCD. This impact would be Class III, *less than significant [Threshold 3]*.

The Project involves the development of 360 residential units, parking areas, two recreational buildings, and a two-acre public park on the 17.36-acre Project site. Construction of the Project is expected to occur over approximately 30 months. Ozone precursors NO_X and ROC, as well as CO and diesel exhaust PM, would be emitted by the operation of construction equipment such as graders, backhoes, and generators, while fugitive dust (PM_{10}) would be emitted by activities that disturb the soil, such as grading and excavation, road construction and building construction. As discussed above, the Project would include pre-construction export of stockpiled soil currently on the site (stockpiled in two locations) prior to building construction. The pre-construction soil export would proceed according to one of two potential scenarios – one based on smaller (9 CY) haul trucks and another based on larger (20 CY) haul trucks. Table 4.2-5 summarizes estimated annual construction emissions associated with Scenario 1, which includes 25,556 one-way haul truck trips, worker trips, and operation of on-site equipment as well as estimated pre-construction air pollutant emissions associated with Scenario 2, which includes 11,500 one-way haul truck trips, worker trips, and operation of on-site equipment.

As shown in Table 4.2-5, Scenario 1 would result in higher emissions of ozone precursors ROC and NO_X, whereas Scenario 2 would result in higher emissions of CO. To provide a conservative estimate of the potential emissions associated with the pre-construction soil export, the highest potential annual emissions of each pollutant from both scenarios are included in the combined Project construction emissions (refer to Table 4.2-7, below).

In addition to emissions generated by pre-construction export of stockpiled soil, annual emissions associated with the Project construction was assumed to occur over approximately 2.5 years. The building construction phase, which would occur over approximately two years, would be the phase with the highest emissions of NO_X, CO, PM_{10}, and $PM_{2.5}$. The architectural coating phase, which is assumed to occur over the last 18 months of building construction, would result in the highest emissions of ROC.

Table 4.2-6 presents estimated annual construction emissions over the 2.5-year construction period.

Table 4.2-6
Estimated Construction Air Pollutant Emissions

Construction Year	Emissions (tons/year)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Year 1	0.4	3.0	2.9	0.3	0.2
Year 2	4.1	3.3	4.2	0.4	0.3
Year 3	2.0	1.6	2.0	0.2	0.2
Worst-Year Annual Total	**4.1**	**3.3**	**4.2**	**0.4**	**0.3**

Notes: All calculations were made using CalEEMod. See Appendix B for calculations. Site Preparation, Grading, Paving, Building Construction and Architectural Coating totals include worker trips, construction vehicle emissions and fugitive dust. Source: Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Heritage Ridge Project, Dudek 2014

Maximum potential annual construction emissions, which assume that the pre-construction export activity would overlap with the highest year of activity during the Project construction phase (as shown in Table 4.2-6, above), are presented in Table 4.2-7.

Table 4.2-7
Estimated Annual Emissions from Combined
Project Construction and Pre-Construction Export

Year	ROC (tons/year)	NO_X (tons/year)	CO (tons/year)	PM_{10} (tons/year)	$PM_{2.5}$ (tons/year)
Pre-Construction Export Emissions	0.3	3.7	2.3	0.3	0.2
Maximum Annual Construction Emissions	4.1	3.3	4.2	0.4	0.3
Maximum Annual Total	**4.4**	**7.0**	**6.5**	**0.7**	**0.4**
SBCAPCD Threshold	25	25	—	—	—
Threshold Exceeded?	**No**	**No**			

Notes: All calculations were made using CalEEMod. See Appendix B for calculations. Site Preparation, Grading, Paving, Building Construction and Architectural Coating totals include worker trips, construction vehicle emissions and fugitive dust. Source: Air Quality and Greenhouse Gas Emissions Analysis Technical Report for the Heritage Ridge Project, Dudek 2014 and Heritage Ridge Project Pre-Construction Export Scenarios Air Quality and Greenhouse Gas Emissions Assessment, July 2015 Note: Emission totals shown may not sum exactly as a result of rounding.

As shown in Table 4.2-7, the maximum potential annual construction emissions associated with the Project would not exceed the SBCAPCD's general rule of 25 tons per year of ROC or NO_X used for determining significance of construction exhaust emissions (Dudek, 2014). Therefore, impacts to air quality during pre-construction export and construction activities would not violate any air quality standards or contribute substantially to existing or projected air quality violations.

The Project site is located in Santa Barbara County and the Santa Barbara County portion of the SCCAB is a nonattainment area for the state PM_{10} standard. Therefore, the SBCAPCD requires construction emissions and dust control measures for all projects involving earthmoving activities regardless of size or duration. In accordance with standard practices, such construction emissions control measures would

be shown on grading and building plans and as a note on a separate information sheet to be recorded with map. According to the SBCAPCD's *Scope and Content of Air Quality Sections in Environmental Documents* (December 2011), implementation of required dust control measures results in fugitive dust emissions that are less than significant. The specific measures that would apply to the project in accordance with standard SBCAPCD requirements include the following:

- *During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this should include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency should be required whenever the wind speed 21 exceeds 15 mph. Reclaimed water should be used whenever possible. However, reclaimed water should not be used in or around crops for human consumption.*
- *Minimize amount of disturbed area and reduce on site vehicle speeds to 15 miles per hour or less.*
- *If importation, exportation and stockpiling of fill material is involved, soil stockpiled for more than two days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.*
- *Gravel pads shall be installed at all access points to prevent tracking of mud onto public roads.*
- *After clearing, grading, earth moving or excavation is completed, treat the disturbed area by watering, or revegetating, or by spreading soil binders until the area is paved or otherwise developed so that dust generation will not occur.*
- *The contractor or builder shall designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the Air Pollution Control District prior to land use clearance for map recordation and land use clearance for finish grading of the structure.*
- *Prior to land use clearance, the applicant shall include, as a note on a separate informational sheet to be recorded with map, these dust control requirements. All requirements shall be shown on grading and building plans.*

With implementation of SBCAPCD construction and dust control measures, this impact would be less than significant.

Mitigation Measures. Mitigation would not be required because this impact would be less than significant.

Residual Impact. Impacts would be less than significant without mitigation.

Impact AQ-4 **New sensitive receptors on the Project site would be exposed to hazardous air pollutants at levels that may cause health risks. The proposed residences closest to U.S. 101 and the Union Pacific Railroad would be exposed to hazardous air pollutants that exceed significance thresholds. This impact would be Class II, *significant but mitigable [Threshold 4].***

The conclusions of the 2016 HRA are summarized in Table 4.2-8. The HRA determined that the proposed residential units on the Project site would be exposed to a high end (95-percentile) 30-year excess cancer risk of between 42 and 59 in one million, which exceeds the SBCAPCD recommended health risk criteria of ten excess cases of cancer in one million individuals (1.0E-05) (SBCAPCD, August 2015). Thirty years is the exposure duration scenario recommended by the SBCAPCD in the *Modeling Guidelines for Health Risk Assessments* (August 2015). The health effects risk level for the average (50-percentile) residency of 9 years for an adult would be between 12 and 18 in one million, and for that of a child (9-years) would be between 18 and 26 in one million. Both of which also exceed the SBCAPCD health risk criteria. To provide context for this level of additional risk, the American Cancer Society (2007) reports that in the U.S., men have a one in two chance (0.5 probability) and women about one in three chance (0.3) probability of developing cancer during a lifetime, with nearly one in four deaths (0.23) in the U.S. attributed to cancer.

Table 4.2-8
Potential Health Risks at the MEIR Receptors

	Excess Cancer Risk	Exceed Criterion? (10^{-5})	OEHHA Chronic Hazard Quotient[1]	Exceed Criterion? (>1)
Residential 1				
9-year Resident				
Adult	1.54E-05	YES	6.41E-02	NO
Child	2.27E-05	YES	--	--
30-year Adult	5.12E-05	YES	6.41E-02	NO
Residential 2				
9-year Resident				
Adult	1.47E-05	YES	6.10E-02	NO
Child	2.17E-05	YES	--	--
30-year Adult	4.90E-05	YES	6.10E-02	NO
Residential 3				
9-year Resident				
Adult	1.77E-05	YES	7.06E-02	NO
Child	2.61E-05	YES	--	--
30-year Adult	5.89E-05	YES	7.06E-02	NO
Residential 4				
9-year Resident				
Adult	1.25E-05	YES	5.00E-02	NO
Child	1.85E-05	YES	--	--
30-year Adult	4.17E-05	YES	5.00E-02	NO

See appendix for complete model results.
1: Note that chronic risk does not change with increase in years as calculation terms cancel out.

Diesel exhaust particulates were found to be responsible for about 98% of the calculated cancer risk on-site. The HRA concluded that, because the carcinogenic health risk for lifetime residency exceeds the SBCAPCD-recommended health risk criteria for a high-end (95-percentile) 30-year residency and average (50-percentile) nine-year residency of ten excess cases of cancer in one million individuals (1.0E-05), the potential effect of exposure to freeway air pollutants for the Project would be potentially significant.

The HRA also showed that residences on-site would be exposed to chemicals such as 1,3 butadiene and formaldehyde from the exhaust of vehicles on U.S. 101. However, acute and chronic health hazards associated with inhalation of these chemicals would be below the SBCAPCD threshold (a hazard index of

1.0) for proposed residences. A hazard index is the summation of the hazard quotients for all chemicals to which an individual would be exposed. Based on this finding, future residents on-site would experience a less than significant acute and chronic health risk from freeway, railroad, and permitted sources.

The HRA analysis is based on outdoor air concentrations and conservatively assumes that interior concentrations would be the same as outdoor concentrations. EPA activity factors show that people in a residential environment spend only approximately 2.3 hours per day on an average basis outdoors.[3] Therefore, the HRA recommends a mitigation measure that includes forced air ventilation with filter screens on outside air intake ducts to be provided for all residential units on the Project site. The identified mitigation measure would reduce the future residents' exposure to toxic air contaminants associated with U.S. 101 and the UPRR to below the recommended 10 in one million threshold for a 9-year and 30-year residency.

Although the analysis of health risks assumes outdoor exposure, the finding of a potentially significant impact related to cancer risk does not mean that using exterior portions of the site would create acute, or short-term, health risks for site residents or visitors. The excess cancer risk identified in the HRA is based on a 30-year exposure, which is the high-end (95-percentile) residency, the exposure duration scenario recommended by the SBCAPCD in the *Modeling Guidelines for Health Risk Assessments* (August 2015); and is greater than the length of time that the majority of residents of the Project would be expected to live on-site.

Mitigation Measures. In accordance with the HRA for the Project, the following mitigation measure is required to reduce impacts to residential receptors on the Project site to a less than significant level.

AQ-4 **Indoor Air Pollution.** The mitigation actions listed below apply to all new residential units on the Project site:

- *Forced air ventilation with filter screens on outside air intake ducts must be provided for all residential units proposed on the site. The filter screens must have a minimum MERV 13 rating, capable of removing at least 90% of the particulate matter including fine particulate matter (PM<2.5 micron).*
- *For individual residential units with separate HVAC systems, a brochure notifying the future residents of the need for maintaining the filter screens must be prepared and provided at the time of ownership exchange. In addition, a notice of the diesel particulates risk hazard and the need for screen maintenance must be recorded in the property title and included with lease agreements.*
- *Windows and doors must be fully weatherproofed with caulking and weather-stripping that is rated to last at least 20 years.*

[3] USEPA, *Exposure Factors Handbook*, 2011; Table 16-16 Time Spent (minutes/day) in Various Rooms at Home and in All Rooms Combined, Doers Only and Table 16-22 Mean Time Spent (minutes/day) Outside and Inside, Adults 18 Years and Older, Doers Only. "Doers Only" includes data for individuals that spent >0 time in motor vehicles and had 30 or more records.

Plan Requirements and Timing: These mitigation measures must be incorporated into the Project and shown on the plans submitted to the City for zoning clearance. The brochure and the specifications for the filter screens must also be submitted to the Planning and Environmental Review Director or designee for review before the City provides zoning clearance for the project.

Monitoring: The Planning and Environmental Review Director or designee must review the hazard avoidance measures and confirm acceptable wording in the brochure and the suitability of the proposed screens before the City provides zoning clearance. City building inspectors must check for installation of the filter screens and adequate weather-proofing in the appropriate units before the City issues certificates of occupancy.

Residual Impact. Compliance with these mitigation actions would provide for the removal of particulates before they enter the indoor environment, thereby reducing the overall exposure of individual residents. With this reduction in exposure to TACs, the combined exposure from time spent both indoors and outdoors would be below significance thresholds, as shown in Table 4.2-9. Resulting impacts would be less than significant.

Table 4.2-9
Mitigated Potential Carcinogenic Health Risks Within the Project Site

	Mitigated Excess Cancer Risk	Exceed Criterion? (10^{-5})
Residential 1		
9-year Resident		
Adult	2.56E-06	NO
Child	3.77E-06	NO
30-year Adult	8.51E-06	NO
Residential 2		
9-year Resident		
Adult	2.44E-06	NO
Child	3.61E-06	NO
30-year Adult	8.15E-06	NO
Residential 3		
9-year Resident		
Adult	2.94E-06	NO
Child	4.34E-06	NO
30-year Adult	9.79E-06	NO
Residential 4		
9-year Resident		
Adult	2.08E-06	NO
Child	3.08E-06	NO
30-year Adult	6.93E-06	NO

See appendix for complete model results.

c. Cumulative Impacts. The significance thresholds used for this analysis are intended to address cumulative air quality impacts (SBCAPCD, 2015a). Due to the County's non-attainment status for ozone and the regional nature of the pollutant, if a project's total emissions of the ozone precursors, NO_X, or ROG, exceed the long-term threshold of 25 lbs/day, then the Project's cumulative impacts would be considered significant. As shown in Table 4.2-4, the Project would not exceed any of these thresholds and therefore, the Project's contribution to cumulative air quality impacts would be less than significant.

Cumulative development in the City of Goleta and the Goleta vicinity (Highway 154 to Gaviota) would contribute to the cumulative degradation of regional air quality. As discussed in Section 3.0, *Related Projects*, 1,511 residential units and more than 1.8 million square feet of non-residential development are currently planned and pending in and around Goleta. Pursuant to Goleta thresholds, the Project would have a significant cumulative impact if it were inconsistent with the adopted federal and state air quality plans of Santa Barbara County. As discussed in Impact AQ-1, the Project would be consistent with the growth assumptions within the 2013 CAP and therefore the project's impact on air quality is not cumulatively considerable.