

## 4.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

This section analyzes impacts of the proposed project related to project air emissions, including greenhouse gas (GHG) emissions, based on air quality modeling conducted as part of the preparation of this EIR. The results of the air modeling are summarized in this section, and are included in Appendix E. This section also draws from the City of Santa Cruz *General Plan 2030* EIR (SCH#2009032007), which was certified on June 26, 2012, regarding background information on climate change. The General Plan EIR is incorporated by reference in accordance with section 15150 of the State CEQA Guidelines. Relevant discussions are summarized below under the “Climate Change” subsection. The General Plan EIR is available for review at the City of Santa Cruz Planning and Community Development Department (809 Center Street, Room 107, and Santa Cruz, California) during business hours: Monday through Thursday, 8 AM to 12 PM and 1 PM to 5 PM. The General Plan EIR is also available online on the City’s website at: <http://www.cityofsantacruz.com/government/city-departments/planning-and-community-development/general-plan>.

Public and agency comments related to air quality and emissions were received during the public scoping period in response to the Notice of Preparation (NOP). Issues raised in these comments include:

- ☐ Potential creation of a “urban heat island” due to an increase in building mass.

To the extent that issues identified in public comments involve potentially significant effects on the environment according to the California Environmental Quality Act (CEQA) and/or are raised by responsible agencies, they are identified and addressed within this EIR. Public comments received during the public scoping period are included in Appendix B.

### 4.2.1 Environmental Setting

#### Regulatory Setting

Air quality within the Monterey Bay region is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies, as discussed below, work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy making, education, and a variety of programs.

#### ***Criteria Air Pollutants***

Criteria air pollutants are defined as pollutants for which the United States Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The standards identify levels of “criteria pollutants” that are regarded as the maximum levels of ambient (background) air pollutants considered to have an adequate margin of safety necessary

to protect the public health and welfare. The standards are designed to protect the most sensitive people from illness or discomfort. Criteria pollutants include ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), coarse particulate matter (PM<sub>10</sub>), fine particulate matter (PM<sub>2.5</sub>), and lead. In California, sulfates (SO<sub>4</sub>), hydrogen sulfide (H<sub>2</sub>S), vinyl chloride, and visibility-reducing particles are also regulated as criteria air pollutants. An area is designated as “in attainment” when it is in compliance with the federal and/or state standards as further discussed below.

**Federal.** The federal Clean Air Act (FCAA), passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the FCAA, including setting National Ambient Air Quality Standards (NAAQS) for criteria air pollutants; setting hazardous air pollutant standards; approving state attainment plans; setting motor vehicle emissions standards; issuing stationary source emissions standards and permits; and establishing acid rain control measures, stratospheric O<sub>3</sub> protection measures, and enforcement provisions.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of citizens of the nation. The NAAQS (other than for O<sub>3</sub>, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O<sub>3</sub>, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The FCAA requires the EPA to reassess the NAAQS at least every five years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

**State.** The FCAA delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. The CARB, a department of the California Environmental Protection Agency (CalEPA), oversees air quality planning and control throughout California. Its responsibility lies with ensuring compliance with the California Clean Air Act (CCAA) and its amendments, as well as responding to the FCAA requirements and regulating emissions from motor vehicles sold in California. It also sets fuel specifications to further reduce vehicular emissions. CARB establishes the California Ambient Air Quality Standards (CAAQs), pursuant to the CCAA, which are generally more restrictive than the NAAQS. These standards apply to the same criteria pollutants as the FCAA and also include SO<sub>4</sub>, H<sub>2</sub>S, visibility reducing particles, and vinyl chloride.

The CAAQs describe adverse conditions; pollution levels must be below these standards before an air basin can attain the standard. Air quality is considered “in attainment” if pollutant levels are continuously below the CAAQs and violate the standards no more than once each year. The CAAQs for O<sub>3</sub>, CO, SO<sub>2</sub> (1-hour and 24-hour), NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

**Regional.** Regulatory oversight for air quality in the North Central Coast Air Basin (NCCAB) in which the City of Santa Cruz is located, rests at the regional level with the Monterey Bay Unified Air Pollution Control District (MBUAPCD),<sup>1</sup> the CARB at the state level, and the EPA Region IX office at the federal level. The MBUAPCD is one of 35 air districts established to protect air quality in California. The NCCAB is comprised of Santa Cruz, Monterey, and San Benito Counties. The MBUAPCD has primary responsibility for local air quality by controlling air pollution from stationary sources of air pollution. The District has adopted a number of rules affecting both stationary and area-wide sources of emissions for the purpose of achieving the state and federal ambient air quality standard (AAQS) for O<sub>3</sub>.

The CCAA requires each nonattainment district in the state to adopt a plan showing how the CAAQS for O<sub>3</sub> would be met with subsequent updates every three years. The MBUAPCD adopted its first Air Quality Management Plan (AQMP) in 1991 and has subsequently updated the AQMP seven times.

**Local.** The City of Santa Cruz addresses odors and pollutants in its Municipal Code. Section 24.14.264 prohibits emission of odorous gases or matter in readily detectable quantities. Section 24.14.272 prohibits emissions from any source that exceed permissible amounts or limits established by the MBUAPCD.

### ***Toxic Air Pollutants***

A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a toxic air contaminant (TAC). TACs are identified by federal and state agencies based on a review of available scientific evidence. Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced from short-term (acute) or long-term (chronic) exposure to a given TAC.

**Federal.** At the federal level, TACs are identified as Hazardous Air Pollutants (HAPs). The 1977 FCAA amendments required the EPA to identify National Emission Standards for Hazardous Air Pollutants (NESHAPS) to protect public health and welfare. HAPs include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard based on scientific studies of exposure to humans and other mammals. Under the 1990 FCAA Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

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<sup>1</sup> The District has changed its name to the Monterey Bay Air Resources District (MBARD). In this report, references to agency publications or guidance that predate the official name change use MBUAPCD.

**State.** The state Air Toxics Program was established in 1983. The California TAC list identifies more than 700 pollutants, of which carcinogenic and non-carcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. The state list includes the federal HAPs. The Air Toxics “Hot Spots” Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. “High-priority” facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

Diesel particulate matter (DPM) was identified as a TAC by the state of California in 1998. The CARB developed a comprehensive strategy to control DPM emissions. In 2000, CARB approved a Diesel Risk Reduction Plan to reduce diesel emissions from new and existing diesel-fueled vehicles and engines. The regulation is anticipated to result in an 80 percent decrease in statewide diesel health risk by 2020 compared with to the diesel risk in 2000 (CARB 2000). Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, and the In Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. All of these regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel powered equipment.

**Regional.** Air quality control agencies, including the MBUAPCD, must incorporate air toxics control measures into their regulatory programs or adopt equally stringent control measures as rules within six months of adoption by CARB. The MBUAPD also regulates TACs from new or modified sources under Rule 1000, a Board-approved protocol that applies to any source which requires a permit to construct or operate pursuant to MBUAPCD regulations and has the potential to emit carcinogenic or noncarcinogenic TACs. The MBUAPCD’s Rule 1000 also requires sources of carcinogenic TACs to install best control technology and reduce cancer risk to less than one incident per 100,000 population. Sources of noncarcinogenic TACs must apply reasonable control technology. The MBUAPCD also implements Rule 1003, Air Toxic Emissions Inventory and Risk Assessments, which establishes and implements the Air Toxics Hot Spots Act. Rule 1003 also requires that any increased cancer risk resulting from an existing facility’s emissions is less than one incident per 100,000 population (Monterey Bay Unified Air Pollution Control District, February 2008).

## **Study Area**

### ***Regional Setting and Climate***

The project study area includes a portion of the downtown area in the City of Santa Cruz. The project study area is located within the NCCAB, which is just south of the San Francisco Bay Area

Air Basin, and covers an area of 5,159 square miles. The NCCAB consists of the counties of Santa Cruz, San Benito, and Monterey. Topography and meteorology heavily influence air quality. In the project vicinity, the northwest sector of the basin is dominated by the Santa Cruz Mountains, which exert a strong influence on atmospheric circulation, which results in generally good air quality. Small inland valleys such as Scotts Valley with low mountains on two sides have poorer circulation than at Santa Cruz on the coastal plain (Monterey Bay Air Pollution Control District, February 2008).

The semi-permanent high pressure cell in the eastern Pacific is the basic controlling factor in the climate of the NCCAB. In the summer, the high pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High, forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement (Monterey Bay Unified Air Pollution Control District, February 2008).

### ***Sensitive Receptors***

The MBUAPCD's *CEQA Guidelines* (Guidelines) defines a sensitive receptor generically as any residence including private homes, condominiums, apartments, and living quarters; educational facilities such as preschools and kindergarten through grade twelve (K-12) schools; daycare centers; and health care facilities such as hospitals or retirement and nursing homes. Sensitive receptors include long-term care hospitals, hospices, prisons, and dormitories or similar live-in housing. The MBUAPCD's Guidelines indicate that identification of sensitive receptors in the vicinity of a project site should be determined as part of the CEQA review with an analysis of whether a project would expose sensitive receptors to significant amounts of pollution. The sensitive receptors closest to the project study area are residential uses located along Pacific Avenue within the study area.

### **Effects of Air Pollutants**

Ozone, the primary constituent of smog, is not directly emitted but is formed in the atmosphere over several hours from combinations of various precursors in the presence of sunlight. Nitrogen oxides (NO<sub>x</sub>) and reactive organic gases (ROGs, also termed volatile organic compounds or VOCs) are considered to be the primary compounds, or precursors, contributing to the formation of ozone. Ozone is viewed as both a secondary pollutant and a regional pollutant. The primary sources of ROG within the planning area are on- and off-road motor vehicles, cleaning and surface coatings, solvent evaporation, landfills, petroleum production and marketing, and prescribed burning. The primary sources of NO<sub>x</sub> are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes (Monterey Bay Unified Air Pollution Control District, August 2008). Short-term exposure to O<sub>3</sub> results in injury and damage to the lung, decreases in pulmonary function, and impairment of immune mechanisms (Ibid.).

Coarse particulates refer to particulate matter less than 10 microns in diameter (PM<sub>10</sub>). In 1997, EPA adopted a fine particulate matter standard of 2.5 microns or less in diameter (PM<sub>2.5</sub>), and CARB adopted an annual PM<sub>2.5</sub> standard in 2002. PM<sub>10</sub> and PM<sub>2.5</sub> are respirable particulate matter that are classified as primary or secondary depending on their origin. Primary particles are unchanged after being directly emitted (e.g., road dust) and are the most commonly analyzed and modeled form of PM<sub>10</sub>. Because it is emitted directly and has limited dispersion characteristics, this type of PM<sub>10</sub> is considered a localized pollutant. In addition, secondary PM<sub>10</sub> can be formed in the atmosphere through atmospheric chemical and photochemical reactions.

PM<sub>10</sub> and PM<sub>2.5</sub> are respirable particulate matter and because of their small size, they can be inhaled deep into the lungs and are therefore a health concern. Key health effects categories associated with PM include: premature mortality; aggravation of respiratory and cardiovascular disease; changes in lung function and increased respiratory symptoms; and altered respiratory defense mechanisms (Monterey Bay Unified Air Pollution Control District, February 2008).

Carbon monoxide (CO) is an odorless, colorless gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. Because it is directly emitted from combustion engines, CO can have adverse localized impacts, primarily in areas of heavy traffic congestion. Because it is emitted directly and has limited dispersion characteristics, CO is considered a localized pollutant (Monterey Bay Unified Air Pollution Control District, February 2008).

When CO combines with hemoglobin in the blood, the oxygen-carrying capacity of the blood is reduced and the release of oxygen is inhibited or slowed. This condition puts the following at risk: patients with angina, persons with other cardiovascular diseases, chronic obstructive lung disease, or asthma; persons with anemia, and fetuses. At higher levels, CO also affects the central nervous system. Symptoms of exposure may include headaches, dizziness, sleepiness, nausea, vomiting, confusion, and disorientation (Monterey Bay Unified Air Pollution Control District, February 2008). At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause unconsciousness and death.

## **Existing Air Quality Conditions**

### ***Ambient Air Quality Standards***

As indicated above, AAQS are set to establish levels of air quality that must be maintained to protect the public from the adverse effects of air pollution. State standards are established to protect public health, including the most sensitive members of the population. National standards include a primary standard to protect public health and a secondary standard to protect the public welfare including property, vegetation, and visibility. However, the numerical values for both standards are the same (Monterey Bay Unified Air Pollution Control District, August 2008). As indicated above, the federal and state governments have established AAQS for

six criteria pollutants: ozone, CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>25</sub>, and lead. State standards also include SO<sub>4</sub>, H<sub>2</sub>S, visibility reducing particles, and vinyl chloride.

### ***Local Ambient Air Quality and Attainment Status***

Ambient air quality is monitored at nine stations within the NCCAB. The network includes seven stations operated by the MBUAPCD and one station operated by the National Park Service at the Pinnacles National Monument. The monitoring stations operated by the MBUAPCD are part of the State and Local Air Monitoring Systems (SLAMS) network, and are located in Santa Cruz, Scotts Valley, Felton, Hollister, King City, Salinas, and Carmel Valley. The MBUAPCD also carries out wood smoke monitoring as needed, including seasonal monitoring of wood stove use in areas like the San Lorenzo Valley area in Santa Cruz County, large controlled burns such as those conducted at Fort Ord and some of those conducted for agricultural management, and for catastrophic events such as large structural fires and wildfires.

Designations in relation to state standards are made by the CARB, while designations in relation to national standards are made by the EPA. State designations are updated annually, while the national designations are updated either when the standards change or when an area requests re-designation due to changes in air quality. Designations are made according to air basin, and in some cases designations are made at the county level (Monterey Unified Air Pollution Control District, August 2008). Designations are made for each criteria pollutant according to the categories listed below. Nonattainment designations are of most concern because they indicate that unhealthy levels of the pollutant exist in the area, which typically triggers a need to develop a plan to achieve the applicable standards (Ibid.).

- ❑ **Attainment** – Air quality in the area meets the standard.
- ❑ **Nonattainment Transitional** – Air quality is approaching the standard (State only).
- ❑ **Nonattainment** – Air quality in the area fails to meet the applicable standard.
- ❑ **Unclassified** – Insufficient data to designate area, or designations have yet to be made.

Table 4.2-1 summarizes the attainment status for criteria pollutants in the NCCAB. In summary, the NCCAB is designated as a nonattainment area for state O<sub>3</sub> standards and PM<sub>10</sub> standards. The NCCAB is designated as unclassified or attainment for all other state and federal standards (California Air Resources Board, 2016; U.S. EPA, 2017).

CO emissions are generated by motor vehicles from traffic. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Air pollutant monitoring data indicate that CO levels have been at healthy levels (i.e., below state and federal standards) for years, reflecting improvements in tailpipe emissions controls. As a result, the region has been designated as attainment/unclassified for the standard. Ambient air quality monitoring at a station in Santa Cruz measured CO concentrations and found that highest measured level over any eight-hour averaging period during the last three years is

less than 1.0 parts per million (ppm), compared to the ambient air quality standard of 9.0 ppm (City of Santa Cruz, April 2012, DEIR volume).

**TABLE 4.2-1: North Central Coast Air Basin Attainment Classification**

| Pollutant                     | Averaging Time                   | Designation/Classification                |
|-------------------------------|----------------------------------|---|
| <b>Federal Standards</b>      |                                  |   |
| O <sub>3</sub>                | 8 hours                          | Unclassifiable/Attainment                 |
| NO <sub>2</sub>               | 1 hour, annual arithmetic mean   | Unclassifiable/Attainment                 |
| CO                            | 1 hour; 8 hours                  | Unclassifiable/Attainment                 |
| SO <sub>2</sub>               | 24 hours; annual arithmetic mean | Unclassifiable/Attainment                 |
| PM <sub>10</sub>              | 24 hours                         | Unclassifiable/Attainment                 |
| PM <sub>2.5</sub>             | 24 hours; annual arithmetic mean | Unclassifiable/Attainment                 |
| Lead                          | Quarter; 3-month average         | Unclassifiable/Attainment                 |
| <b>State Standards</b>        |                                  |   |
| O <sub>3</sub>                | 1 hour; 8 hours                  | Nonattainment (Transitional) <sup>a</sup> |
| NO <sub>2</sub>               | 1 hour; annual arithmetic mean   | Attainment                                |
| CO                            | 1 hour; 8 hours                  | Monterey Co. – Attainment                 |
|                               |                                  | San Benito Co. – Unclassified             |
|                               |                                  | Santa Cruz Co. – Unclassified             |
| SO <sub>2</sub>               | 1 hour; 24 hours                 | Attainment                                |
| PM <sub>10</sub>              | 24 hours; annual arithmetic mean | Nonattainment                             |
| PM <sub>2.5</sub>             | Annual arithmetic mean           | Attainment                                |
| Lead <sup>b</sup>             | 30-day average                   | Attainment                                |
| SO <sub>4</sub>               | 24 hours                         | Attainment                                |
| H <sub>2</sub> S              | 1 hour                           | Unclassified                              |
| Vinyl chloride <sup>b</sup>   | 24 hours                         | No designation                            |
| Visibility-reducing particles | 8 hours (10:00 a.m.–6:00 p.m.)   | Unclassified                              |

**Sources:** CARB 2016; EPA 2017.

**Notes:** CO = carbon monoxide; H<sub>2</sub>S = hydrogen sulfide; NO<sub>2</sub> = nitrogen dioxide; O<sub>3</sub> = ozone; PM<sub>10</sub> = coarse particulate matter; PM<sub>2.5</sub> = fine particulate matter; SO<sub>2</sub> = sulfur dioxide; SO<sub>4</sub> = sulfates

<sup>a</sup> Nonattainment-transitional is a subcategory of the nonattainment designation category for state standards that indicates that the area is nearing attainment.

<sup>b</sup> CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined.

## Odors

Odors represent emissions of one or more pollutants that are a nuisance to healthy persons and may trigger asthma episodes in people with sensitive airways. Pollutants associated with objectionable odors include sulfur compounds and methane. Typical sources of odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and



refineries. Odors are a complex problem that can be caused by minute quantities of substances (Monterey Bay Unified Air Pollution Control District, February 2008). Because people have mixed reactions to odors, the nuisance level of an odor varies. There are no known sources of objectionable odors in the vicinity of the proposed project.

## **Air Basin Plans**

### ***Air Quality Management Plan***

The 1991 AQMP for the Monterey Bay Area was the first plan prepared in response to the CCAA of 1988 that established specific planning requirements to meet the O<sub>3</sub> standard. The Act requires that the AQMP be updated every three years. The most recent update was adopted in March 2017, and is an update to the elements included in the 2012 AQMP for the years 2012-2015. The primary elements updated from the 2012 AQMP include the air quality trends analysis, emission inventory, and mobile source programs.

The NCCAB is a nonattainment area for the CAAQS for both O<sub>3</sub> and PM<sub>10</sub>. The AQMP addresses only attainment of the O<sub>3</sub> CAAQS. Attainment of the PM<sub>10</sub> CAAQS is addressed in the MBUAPCD's Particulate Plan, which was adopted in December 2005 and is summarized further below. Maintenance of the 8-hour NAAQS for O<sub>3</sub> is addressed in the District's "Federal Maintenance Plan for the Monterey Bay Region," which was adopted in March 2007 and also is summarized below.

A review of the air monitoring data for 2013-2015 indicates that there were fewer exceedance days compared to previous periods (MBARD, March 2017). The long-term trend shows progress has been made toward achieving O<sub>3</sub> standards. The number of exceedance days has continued to decline during the past 10 years despite population increases (Ibid.).

The MBUAPCD's 2017 AQMP identifies a continued trend of declining O<sub>3</sub> emissions in the NCCAB primarily related to lower vehicle miles traveled. Therefore, the MBUAPCD determined progress was continuing to be made toward attaining the 8-hour O<sub>3</sub> standard during the three-year period reviewed (Monterey Bay Air Resources District, March 2017).

### ***Federal Maintenance Plan***

The "Federal Maintenance Plan" (May 2007) presents the strategy for maintaining the NAAQS for O<sub>3</sub> in the NCCAB. It is an update to the 1994 Federal Maintenance Plan, which was prepared for maintaining the 1-hour NAAQS for O<sub>3</sub> that since has been revoked and is superseded by the current 8-hour O<sub>3</sub> standard. Effective June 15, 2004, the U.S. EPA designated the NCCAB as an attainment area for the 8-hour NAAQS for O<sub>3</sub>. The plan includes an emission inventory for the years 1990 to 2030 for VOC and NO<sub>x</sub>, the two primary O<sub>3</sub> precursor gases, as explained above. A contingency plan is included to ensure that any future violation of the standard is promptly corrected (Monterey Bay Unified Air Pollution Control District, May 2007).

### ***Particulate Matter Plan***

The purpose of the “Particulate Matter Plan” (December 2005) is to fulfill the requirements of Senate Bill 655, which was approved by the California Legislature in 2003 with the objective of reducing public exposure to particulate matter. The legislation requires CARB, in conjunction with local air pollution control districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air pollution control districts to reduce ambient levels of particulate matter in their air basins (Monterey Bay Unified Air Pollution Control District, December 2005). The Plan’s proposed activities include control measures for fugitive dust, public education, administrative functions, and continued enhancements to the MBUAPCD’s Smoke Management and emission reduction incentive programs.

### **Climate Change**

A full discussion of global climate change is presented in the *General Plan 2030* EIR (DEIR pages 4.12-1 to 4.12-20 and FEIR pages 3-26 to 3-27), which is incorporated by reference; key elements of the discussion are summarized below and have been updated where relevant. Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change may result from natural factors, natural processes, and human activities that change the composition of the atmosphere and alter the surface and features of the land. Significant changes in global climate patterns recently have been associated with global warming, an average increase in the temperature of the atmosphere near the Earth’s surface, attributed to accumulation of greenhouse gas (GHG) emissions in the atmosphere. GHGs trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. Climate change models predict changes in temperature, precipitation patterns, water availability, and rising sea levels, and these altered conditions can have impacts on natural and human systems in California that can affect California’s public health, habitats, ocean and coastal resources, water supplies, agriculture, forestry, and energy use.

### ***Greenhouse Gas Emissions***

GHGs include, but are not limited to, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), O<sub>3</sub>, fluorinated gases (hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>) and nitrogen trifluoride (NF<sub>3</sub>)), chlorofluorocarbons (CFCs), and hydrochlorofluorocarbons (HCFCs), in addition to water vapor.<sup>2</sup> Some GHGs, such as CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO<sub>2</sub> and CH<sub>4</sub> are emitted in the greatest quantities from human activities. Some industrial gases

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<sup>2</sup> California Health and Safety Code 38505 identifies seven GHGs that CARB is responsible to monitor and regulate to reduce emissions: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, HFCs, PFCs, and NF<sub>3</sub>.

are also GHGs that have a much greater heat-absorption potential than CO<sub>2</sub>, include fluorinated gases, such as HFCs, PFCs, and SF<sub>6</sub>, which are associated with certain industrial products and processes.

According to the U.S. EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2014* (U.S. Environmental Protection Agency 2016), total United States GHG emissions were approximately 6,870.5 million metric tons (MMT) CO<sub>2</sub>E<sup>3</sup> in 2014. The primary GHG emitted by human activities in the United States was CO<sub>2</sub>, which represented approximately 80.9 percent of total GHG emissions (5,556.0 MMT CO<sub>2</sub>E). The largest source of CO<sub>2</sub>, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.7 percent of CO<sub>2</sub> emissions in 2014 (5,208.2 MMT CO<sub>2</sub>E). Total United States GHG emissions have increased by 7.4 percent from 1990 to 2014, and emissions increased from 2013 to 2014 by 1.0 percent (70.5 MMT CO<sub>2</sub>E). Since 1990, United States GHG emissions have increased at an average annual rate of 0.3 percent; however, overall, net emissions in 2014 were 8.6 percent below 2005 levels (Ibid.).

According to California's 2000–2014 GHG emissions inventory (2016 edition), California emitted 441.5 MMT CO<sub>2</sub>E in 2014, including emissions resulting from out-of-state electrical generation (California Air Resources Board 2016). As with nationwide emissions, the primary GHG emitted by human activities in California was CO<sub>2</sub>, which represented approximately 84.3 percent of total GHG emissions. The largest sources of GHG emissions in California were transportation and industrial uses, followed by electric power production from both in-state and out-of-state sources, residential and commercial activities, agriculture, high global-warming potential substances, and recycling and waste (Ibid.).

During the 2000 to 2014 period, per capita GHG emissions in California have continued to drop from a peak in 2001 of 13.9 MT per person to 11.4 MT per person in 2014, representing an 18 percent decrease. In addition, total GHG emissions in 2014 were 2.8 MMT CO<sub>2</sub>E less than 2013 emissions. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California is on track to meet the 2020 target of 431 MMT CO<sub>2</sub>E (California Air Resources Board 2016).

### ***California Regulations and Plans***

The State of California passed the Global Warming Solutions Act of 2006 (AB 32), which requires reduction of GHG emissions generated within California. The Governor's Executive Order S-3-05 and AB 32 (Health and Safety Code, Section 38501 et seq.) both seek to achieve 1990 emissions levels by the year 2020. Executive Order S-3-05 further requires that California's GHG emissions

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<sup>3</sup> The Intergovernmental Panel on Climate Change (IPCC) developed the Global Warming Potential (GWP) concept to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The reference gas used is CO<sub>2</sub>, and GWP weighted emissions are measured in teragrams (or million metric tons) of CO<sub>2</sub> equivalent (Tg CO<sub>2</sub>E). A million metric tons of CO<sub>2</sub> equivalent also is referenced as MMTCO<sub>2</sub>E (City of Santa Cruz, April 2012, DEIR volume).

be 80 percent below 1990 levels by the year 2050. Senate Bill 32 requires the CARB to ensure that statewide GHG emissions are reduced to 40 percent below 1990 levels by 2030.

In 2007 the CARB approved a statewide limit on the GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 million metric tons (MMT) CO<sub>2</sub>E). In 2008, the CARB adopted the *Climate Change Scoping Plan: A Framework for Change (Scoping Plan)* in accordance with Health and Safety Code Section 38561. The *Scoping Plan* establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of approximately 28.5 percent from the otherwise projected 2020 emissions level; i.e., those emissions that would occur in 2020, absent GHG-reducing laws and regulations (referred to as "Business-As-Usual" [BAU]).

The *Scoping Plan* identified 18 emissions-reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional transportation-related greenhouse gas targets, vehicle efficiency measures, goods movement, solar roofs program, industrial emissions, high speed rail, green building strategy, recycling, sustainable forests, water, and air. The key elements of the *Scoping Plan* include the following:

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
2. Achieving a statewide renewable energy mix of 33 percent;
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions;
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (LCFS 17 Cal. Code Regs. Section 95480 et seq.); and
6. Creating targeted fees, including a public goods charge on water use, fees on high global warming potential (GWP) gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In the 2011 Final Supplement to the *Scoping Plan's* Functional Equivalent Document, the CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, the CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7 percent (down from 28.5 percent) from the BAU conditions. When the 2020 emissions level projection was updated to

account for newly implemented regulatory measures, including Pavley I (model years 2009–2016) and the Renewable Portfolio Standard (12 to 20 percent), the CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16 percent (down from 28.5 percent) from the BAU conditions.

In 2014, the CARB adopted the *First Update to the Climate Change Scoping Plan: Building on the Framework (First Update)*. The stated purpose is to “highlight California’s success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050.” The *First Update* found that California is on track to meet the 2020 emissions reduction mandate established by AB 32, and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80 percent below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the *First Update*, the CARB identified “six key focus areas comprising major components of the state’s economy to evaluate and describe the larger transformative actions that will be needed to meet the state’s more expansive emission reduction needs by 2050.” Those six areas are: 1) energy; 2) transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure); 3) agriculture; 4) water; 5) waste management; and, 6) natural and working lands. The *First Update* identifies key recommended actions for each sector that will facilitate achievement of Executive Order S-3-05’s 2050 reduction goal. Based on the CARB’s research efforts presented in the *First Update*, it has a “strong sense of the mix of technologies needed to reduce emissions through 2050.” Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings and industrial machinery; decarbonizing electricity and fuel supplies; and, the rapid market penetration of efficient and clean energy technologies.

As part of the *First Update*, the CARB recalculated the state’s 1990 emissions level using more recent global warming potentials identified by the Intergovernmental Panel on Climate Change. Using the recalculated 1990 emissions level (431 MMT CO<sub>2</sub>E) and the revised 2020 emissions level projection identified in the 2011 Final Supplement, the CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15 percent (instead of 28.5 percent or 16 percent) from the BAU conditions. The update also recommends that a statewide mid-term target and mid-term and long-term sector targets be established toward meeting the 2050 goal established by EO S-3-05 (i.e., reduce California’s GHG emissions to 80 percent below 1990 levels), although no specific recommendations are made. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California is on track to meet the 2020 target of 431 MMT CO<sub>2</sub>E (California Air Resources Board, May 2014).

On January 20, 2017, CARB released The *2017 Climate Change Scoping Plan Update (Second Update)* for public review and comment (California Air Resources Board, January 2017). This

update proposes the CARB's strategy for achieving the states 2030 GHG target, including continuing the Cap-and-Trade Program through 2030 and includes a new approach to reduce GHGs from refineries by 20 percent. The *Second Update* incorporates approaches to cutting super pollutants from the Short Lived Climate Pollutants Strategy (such as black carbon), acknowledges the need for reducing emissions in agriculture and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. When discussing project-level GHG emissions reduction actions and thresholds, the *Second Update* states "achieving no net increase in GHG emissions is the correct overall objective, but it may not be appropriate or feasible for every development project. And the inability to mitigate a project's GHG emissions to zero does not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA."

For local governments, the *Second Update* replaced the initial Scoping Plan's 15% reduction goal with a recommendation to aim for a community-wide goal of no more than 6 MT CO<sub>2</sub>E per capita by 2030 and no more than 2 MT CO<sub>2</sub>E per capita by 2050, which are consistent with the state's long-term goals. These goals are appropriate for the plan level (city, county, subregional, or regional level, as appropriate), but not for specific individual projects because they include all emissions sectors in the State. The *Second Update* recognized the benefits of local government GHG planning (e.g., through climate action plans (CAPs)) and provide more information regarding tools the CARB is working on to support those efforts. It also recognizes the CEQA streamlining provisions for project level review where there is a legally adequate CAP. It is expected that CARB will consider the *Second Update* for approval in the spring or summer 2017.

The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32, Senate Bill 32 and the Executive Orders and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. A project is considered consistent with the statutes and Executive Orders if it meets the general policies in reducing GHG emissions in order to facilitate the achievement of the state's goals and does not impede attainment of those goals. As discussed in several cases, a given project need not be in perfect conformity with each and every planning policy or goals to be consistent. A project would be consistent, if it will further the objectives and not obstruct their attainment.

### ***City of Santa Cruz Climate Action Plan***

The City's *General Plan 2030* includes goals, policies, and actions on climate change, including reducing community-wide GHG emissions 30 percent by 2020, reducing GHG emissions 80 percent by 2050 (compared to 1990 levels), and for all new buildings to be emissions-neutral by 2030. In October 2012, the City adopted a *Climate Action Plan* (CAP) that outlines the actions the City will take over the next 10 years to reduce GHGs by 30 percent and to implement the policies and actions identified in the *General Plan 2030*. The CAP addresses citywide GHG reduction strategies. The CAP provides City emissions inventories, identifies an emissions reduction target for the year 2020, and includes measures to reduce energy use, reduce vehicle trips, implement water conservation programs, reduce emissions from waste collection, increase use of solar systems, and develop public partnerships to aide sustainable practices. Measures are outlined

for the following sectors: municipal, residential, commercial, and community programs. The CAP includes an implementation chapter that identifies tracking and reporting of the success of the measures, including City staff responsibilities.

## **4.2.2 Impacts and Mitigation Measures**

### **Thresholds of Significance**

In accordance with the California Environmental Quality Act (CEQA); State CEQA Guidelines (including Appendix G); City of Santa Cruz plans, policies, and/or guidelines; and agency and professional standards, a project impact would be considered significant if the project would:

- 2a Conflict with or obstruct implementation of the air quality management plan;
- 2b Violate any air quality standards or contribute substantially to an existing or projected air quality violation, i.e. result in generation of emissions of or in excess of 137 pounds per day for ROG or NO<sub>x</sub>, 550 pounds per day of carbon monoxide, 150 pounds per day of sulfur oxides (SO<sub>x</sub>), 82 pounds per day of PM<sub>10</sub> (due to construction with minimal earthmoving on 8.1 or more acres per day or grading/excavation site on 2.2 or more acres per day for PM<sub>10</sub>), and/or 55 pounds per day of PM<sub>2.5</sub> pursuant to impact criteria for significance developed by the MBARD (MBUAPCD, “CEQA Air Quality Guidelines,” February 2008 and February 2016);
- 2c Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- 2d Expose sensitive receptors (i.e., residents, schools, hospitals) to substantial pollutant concentrations, i.e. those that exceed the MBUAPCD standards identified above and/or toxic air contaminants that exceed health exposure rates;
- 2e Create objectionable odors in substantial concentrations, affecting a substantial number of people, which could result in injury, nuisance, or annoyance to a considerable number of persons, or would endanger the comfort, health, or safety of the public;
- 2f Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- 2g Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The State CEQA Guidelines do not prescribe specific methodologies for performing a GHG emissions assessment, establish specific thresholds of significance, or mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency’s discretion to determine the appropriate methodologies and thresholds of significance that are consistent with the manner in which other impact areas are handled in CEQA. Global climate change is a

cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. There are currently no established thresholds for assessing whether the GHG emissions of a project in the NCCAB would be considered a cumulatively considerable contribution to global climate change, except the MBUAPCD has an adopted guideline for stationary source projects in which a project would not have not a significant GHG emissions impact if the project emits less than 10,000 MT/yr CO<sub>2</sub>E or complies with regulations or requirements adopted to implement a statewide, regional or local plan for the reduction or mitigation of GHG emissions (Monterey Bay Unified Air Pollution Control District, February 2016).

### **Analytical Method**

The proposed project consists of amendments to the City's Downtown Recovery Plan, General Plan, Local Coastal Plan and Zoning Code regarding development in the downtown area and Central Business District. The proposed project would not directly result in new development. However, the proposed Downtown Plan amendment would expand areas for potential additional building height that could accommodate intensified redevelopment of existing developed sites. City staff estimates that the proposed amendments could indirectly lead to development, resulting in a potential net increase of 711 new residential units and 2,200 square feet of office space with a net decrease of approximately 14,700 square feet of commercial building space over existing conditions within the downtown area. The proposed General Plan amendment would increase FAR in areas designated as RVC in the General Plan. The proposed LCP and Zoning Code amendments would not result in changes that could indirectly lead to intensified development or air emissions.

The air quality analysis used the California Emissions Estimator Model (CalEEMod), which is currently being recommended by the MBUAPCD. The CalEEMod Version 2016.3.1 was used to estimate potential project-generated criterial pollutant and GHG emissions with projected buildout resulting from the proposed plan amendments, including an estimated reduction in existing commercial uses. No specific development projects are proposed, and no project-site specific development applications have been submitted to the City. City Planning Department staff estimate that potential development and buildout estimated for the purpose of assessing environmental impacts would occur over 25 years. Construction emissions cannot be determined in the absence of specific development projects with identified construction schedules and equipment. Emissions from the operational phase of future development supported by the project and for the reduced commercial area were estimated using CalEEMod default emission factor values for mobile, area, and energy sources. In addition, project-specific trip generation and water demand rates identified in this EIR were incorporated into CalEEMod. Model outputs and assumptions are included in Appendix E.



### **Impacts and Mitigation Measures**

As described in the Initial Study (see Appendix A), exposure to diesel emission during construction would result in a less-than-significant impact (2d), and the project would not result in creation of objectionable odors (2e). Thus, no further discussion is required for these topics. The project would not conflict with or obstruct implementation of the AQMP (2a) or conflict with GHG reduction plans (2g) as explained below. The impact analyses address criteria pollutant emissions and potential violation of an air quality standard (2b) and GHG emissions (2f). Cumulative impacts (2c) are addressed in Chapter 5, CEQA Considerations.

#### ***Conflicts with Adopted Plans – No Impact***

Effective September 1, 2011 the MBUAPCD Board approved a new procedure for determining whether a residential project conflicts with the District's adopted AQMP. The procedure uses AMBAG's adopted housing unit forecast instead of population, and the MBUAPCD has developed a spreadsheet to assist jurisdictions with developing calculations, which was used to determine whether the proposed project conflicts with the AQMP as described below.

The City had 23,693 existing dwelling units as of January 1, 2017, and approximately 389 residential units have been constructed, are under construction or have been approved. With existing units, approved units and the proposed project increase of 711 residential units, there would be a total of 24,793 dwelling units within the City. Development that could occur as a result of the proposed project is estimated to occur over the next 20-25 years. Housing units with the addition of the proposed project would be below the current AMBAG forecast of 28,297 dwelling units for the year 2030 and 29,335 units in the year 2035. The proposed project with buildout under the General Plan and accounting for units that have been constructed and occupied since the General Plan was adopted, would result in approximately 27,244 dwelling units, which is within AMBAG forecasts for 2030 and 2035. Therefore, growth that could be accommodated by the proposed project is consistent with the AQMP, and would not conflict with or obstruct implementation of the AQMP (2a).

With regards to GHG reduction plans, the Scoping Plan, approved by CARB on December 12, 2008, provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. As such, the Scoping Plan is not directly applicable to specific projects. In the Final Statement of Reasons for the Amendments to the CEQA Guidelines, the California Natural Resources Agency (CNRA) observed that "[t]he [Scoping Plan] may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan" (California Natural Resources Agency, 2009). Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles)

and associated fuels (e.g., LCFS), among others. The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32 and establishes an overall framework for the measures that will be adopted to reduce California’s GHG emissions. The project would comply with all applicable regulations adopted in furtherance of the Scoping Plan to the extent required by law.

The proposed project consists of amendments to the City’s Downtown Recovery Plan, General Plan, LCP and Zoning Code to accommodate intensified development in the downtown area. To this extent, the proposed amendments are consistent with the sustainable transportation and land use planning goals set forth in the City’s Climate Action Plan that encourage higher density development along transit corridors and activity centers to support efficient, accessible, and sustainable transportation options. Based on the preceding considerations, the proposed project would not result in conflicts with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions (2g)

### ***Urban Heat Island Effect – No Impact***

A comment was raised regarding the potential for subsequent development under the proposed Plan amendments to create an “urban heat island.” The phrase “urban heat island” refers to the effect of urbanized areas on surface and air temperature compared to their rural surroundings. Buildings, roads, and other “hardscape” create an island of higher temperatures within the regional landscape. As described by the EPA, “[u]rban heat islands are caused by development and the changes in radiative and thermal properties of urban infrastructure as well as the impacts buildings can have on the local microclimate—for example tall buildings can slow the rate at which cities cool off at night. Heat islands are influenced by a city’s geographic location and by local weather patterns, and their intensity changes on a daily and seasonal basis” (U.S. Environmental Protection Agency, 2008). The term is generally used to refer to community-wide effects, particularly for large metropolitan cities. Increased temperatures due to the urban heat island effect may lead to increased energy consumption, which has implications for air quality and GHG emissions. In addition to energy-related increases in air emissions, elevated air temperatures increase the rate of ground-level O<sub>3</sub> formation.

Some cities have adopted strategies to deal with these environmental impacts, such as increasing vegetation and using more energy-efficient building materials. These strategies are often part of more general energy savings or “sustainability” practices and are not identified as “urban heat island effect” mitigation, but nevertheless they provide the benefits of reducing surface and atmospheric heat islands.

In the present case, the downtown area is within an existing urbanized and developed area. The proposed amendment would allow an increment of increased height, but the area already supports existing development, paved areas as well as larger buildings, street trees and landscaping. The area is not within a rural setting and future development would not be of the magnitude to result in creation of the effect referred to as an “urban heat island.” Future development would be subject to the City’s General Plan 2030, Zoning Code and Green Building

standards regrading energy efficiency. Furthermore, this potential effect is not related to pollutant or greenhouse gas emissions or the thresholds of significance identified for impact analysis, and no further review is required under CEQA.

**Impact 4.2-1: Criteria Pollutant Emissions.** Future development and growth accommodated by the proposed project would result in emissions of criteria pollutants, but would not exceed adopted thresholds of significance, violate any air quality standard or contribute substantially to an existing or projected air quality violation (2b). This is a *less-than-significant* impact.

### ***Construction Emissions***

Future development accommodated by the proposed plan amendments would result in construction-related emissions that could affect air quality by increasing O<sub>3</sub> precursor and particulate matter emissions for an area that already exceeds California ambient air quality standards for these pollutants. Construction activities include demolition, excavation, grading, vehicle trips (including workers, deliveries and hauling), and vehicle travel on paved and unpaved surfaces. Vehicle and equipment exhaust would generate pollutant emissions. Construction projects may also generate DPM emissions from diesel-fueled equipment.

The proposed project could indirectly lead to new development that could result in generation of particulate emissions from entrained dust, off-road equipment, vehicle emissions, architectural coatings, and asphalt pavement application during construction. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM<sub>10</sub> and PM<sub>2.5</sub> emissions. Particulate matter emissions can vary daily, depending on various factors, such as the level of activity, type of construction activity taking place, type of equipment in operation, and weather conditions. Internal combustion engines used by construction equipment, vendor trucks (e.g., delivery trucks), and worker vehicles would result in emissions of ROG, NO<sub>x</sub>, CO, PM<sub>10</sub>, and PM<sub>2.5</sub>. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce ROG emissions. Based on MBUAPCD CEQA Guidelines (2008), exhaust emissions from these typical construction activities generally would not result in a significant impact because their emissions are already accounted for in the emissions inventories of the state- and federally-required air plans, and they would not have a significant impact on the attainment and maintenance of the O<sub>3</sub> AAQS.

The scale and timing of construction is unknown, and construction activities would be variable throughout the day and overall construction period. The City's General Plan requires future development projects to implement applicable MBARD control measures and/or air quality mitigations in the design of new projects as set forth in the District's "CEQA Guidelines". The Guidelines provide screening levels for potential significant impacts, and projects that are cover 2.2 or more acres may be required to implement dust suppression measures during construction unless future project-level construction-emissions modeling indicates that pollutant thresholds established by the MBARD would not be exceeded. Therefore, implementation and application

of General Plan policies and MBARD recommended measures, if required, would reduce any future significant project construction emissions to a less-than-significant level.

### ***Operational Emissions***

Future development and growth accommodated by the proposed project would generate criteria pollutant emissions from vehicular traffic, area sources (consumer products, architectural coatings, landscaping equipment), and energy sources (natural gas appliances, space and water heating). The reduced commercial area would result in an associated reduction in emissions from these sources. The emissions associated with on-road mobile sources include running and starting exhaust emissions, evaporative emissions, brake and tire wear, and fugitive dust entrainment. The CalEEMod model was utilized to estimate operational emissions for the year 2040, which is the closest selectable year in the model to the earliest year that the project is expected to be built out over 25 years. Default trip rates in CalEEMod were adjusted to match the weekday trips provided by the traffic consultant for the project (Kimley Horn, May 2017). Default water demand estimates in CalEEMod were also adjusted to match the values provided in the City Urban Water Management Plan.

Table 4.2-2 summarizes the results of the emissions modeling. As shown, daily emissions associated with project operation would not exceed the MBUAPCD significance thresholds. The project emissions would be below the significance thresholds adopted by MBUAPCD for evaluating impacts to O<sub>3</sub> and particulate matter, and, thus, the project would not contribute substantially to existing or projected violations of those standards. Therefore, emissions of criteria pollutants associated with operation of the proposed project would result in a less-than-significant impact.

CO emissions from traffic generated by the project would be the pollutant of concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of CO. As indicated above, air pollutant monitoring data indicate that CO levels have been at healthy levels (i.e., below state and federal standards) for years, reflecting improvements in tailpipe emissions controls. As a result, the region has been designated as attainment/unclassified for the standard. The MBUAPCD's CEQA Guidelines indicated that a project could result in potentially significant CO emissions if the project would result in a decrease in intersection or road level of service (LOS) from D or better to E or F or increase delays by more than 10 seconds at intersections that operate at E or F. As discussed in Chapter 4.5, Traffic and Transportation, the project would not result in a decrease in intersection LOS to E or F. The project would result in approximately 237 weekday PM peak hour trips distributed to numerous intersections, however, the project would not result in a decrease in operations to a LOS below D, and would result in less than 10 seconds delay at intersections operation at LOS E. Thus, the proposed project does not meet the criteria for potential indirect CO emissions, and the project does not have the potential to cause a CO violation at affected intersections to which the project contributes traffic.

**TABLE 4.2-2: Estimated Maximum Daily Operational Project Emissions**

| Emission Source                       | ROG              | NO <sub>x</sub> | CO   | SO <sub>x</sub> | PM <sub>10</sub> | PM <sub>2.5</sub> |
|---------------------------------------|------------------|-----------------|------|-----------------|------------------|-------------------|
|                                       | (pounds per day) |                 |      |                 |                  |                   |
| Increased Residential and Office Uses |                  |                 |      |                 |                  |                   |
| Area                                  | 19.9             | 0.7             | 58.6 | 0.0             | 0.3              | 0.3               |
| Energy                                | 0.3              | 2.6             | 1.1  | 0.0             | 0.2              | 0.2               |
| Mobile                                | 2.4              | 10.7            | 30.8 | 0.1             | 18.4             | 5.0               |
| Subtotal                              | 22.6             | 14.0            | 90.6 | 0.1             | 19.0             | 5.5               |
| Reduced Commercial Uses               |                  |                 |      |                 |                  |                   |
| Area                                  | 0.4              | 0.0             | 0.0  | 0.0             | 0.0              | 0.0               |
| Energy                                | 0.0              | 0.0             | 0.0  | 0.0             | 0.0              | 0.0               |
| Mobile                                | 0.3              | 1.1             | 2.5  | 0.0             | 1.3              | 0.3               |
| Subtotal                              | 0.6              | 1.1             | 2.5  | 0.0             | 1.3              | 0.3               |
| Total Net Increase                    | 22.0             | 12.9            | 88.1 | 0.1             | 17.7             | 5.2               |
| Emission threshold [1]                | 137              | 137             | 550  | 150             | 82               | 55                |
| Threshold exceeded?                   | No               | No              | No   | No              | No               | No                |

[1] Monterey Bay Unified Air Pollution Control District, February 2008, February 2016.

**Notes:** Emissions were modeled with CalEEMod 2016.3.1. The maximum of summer or winter values are included above and the totals may not sum exactly due to rounding. In addition, project emissions are based on the "Mitigated" CalEEMod outputs in order to incorporate the 2016 Title 24 standards (i.e., residences and commercial uses that comply with 2016 Title 24 are 28% and 5% more efficient than 2013 Title 24, respectively), high efficiency outdoor lighting, and the 75% waste diversion consistent with State standards (Assembly Bill 341), even though compliance with these standards would not be considered actual mitigation. For the Reduced Commercial scenario, only the 75% waste diversion was assumed with no building energy improvements, since this scenario represents existing uses that would be demolished.

ROG = reactive organic gases; NO<sub>x</sub> = oxides of nitrogen; CO = carbon monoxide; SO<sub>x</sub> = sulfur oxides; PM<sub>10</sub> = coarse particulate matter; PM<sub>2.5</sub> = fine particulate matter.

Area sources = consumer product use, architectural coatings, and landscape maintenance equipment. Energy sources = natural gas appliances. Mobile sources = on-road vehicles.

See Appendix E for detailed results.

## Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

**Impact 4.2-2: Greenhouse Gas (GHG) Emissions.** Future development and growth accommodated by the proposed project would result in GHG emissions, which are not considered significant (2f). Therefore, this is a *less-than-significant* impact.

Development accommodated by the proposed project is expected to occur over the next 25 years. No stationary source emissions (such as emergency generators) are anticipated with future residential and office space accommodated by the project. Future development would result in GHG emissions from vehicular traffic, area sources (landscaping maintenance), electrical generation, natural gas consumption, water supply and wastewater treatment, and solid waste. The reduced commercial area would result in an associated reduction in emissions from these

sources. Project-specific trip generation rates and indoor water use consistent with the City Urban Water Management Plan were incorporated into the CalEEMod model. As shown in Table 4.2-3, the proposed project is estimated to result in a net increase of approximately 4,053 MT of CO<sub>2</sub>E per year.

**TABLE 4.2-3: Estimated Annual Operational Project Greenhouse Gas Emissions**

|  | MT CO <sub>2</sub> | MT CH <sub>4</sub> | MT N <sub>2</sub> O | MT CO <sub>2</sub> E |
|--|--------------------|--------------------|---------------------|----------------------|
| <i>Increased Residential and Office Uses</i> |                    |                    |                     |                      |
| Area Sources                                 | 12.0               | 0.0                | 0.0                 | 12.3                 |
| Energy                                       | 1,813.4            | 0.1                | 0.0                 | 1,825.1              |
| Mobile                                       | 2,297.2            | 0.1                | 0.0                 | 2,298.8              |
| Solid Waste                                  | 16.7               | 1.0                | 0.0                 | 41.4                 |
| Water Supply and Wastewater                  | 37.5               | 1.0                | 0.0                 | 68.9                 |
| <b>Subtotal</b>                              | <b>4,176.8</b>     | <b>2.2</b>         | <b>0.0</b>          | <b>4,246.5</b>       |
| <i>Reduced Commercial</i>                    |                    |                    |                     |                      |
| Area Sources                                 | 0.0                | 0.0                | 0.0                 | 0.0                  |
| Energy                                       | 34.4               | 0.0                | 0.0                 | 34.6                 |
| Mobile                                       | 155.1              | 0.0                | 0.0                 | 155.2                |
| Solid Waste                                  | 0.8                | 0.0                | 0.0                 | 1.9                  |
| Water Supply and Wastewater                  | 1.2                | 0.0                | 0.0                 | 2.2                  |
| <b>Subtotal</b>                              | <b>191.5</b>       | <b>0.0</b>         | <b>0.0</b>          | <b>193.9</b>         |
| <b>Total Net Increase</b>                    |                    |                    |                     | <b>4,052.6</b>       |

**Notes:** Emissions were modeled with CalEEMod 2016.3.1. The annual emission totals may not sum exactly due to rounding. Project emissions are based on the "Mitigated" CalEEMod outputs in order to incorporate the 2016 Title 24 standards (i.e., residences and commercial uses that comply with 2016 Title 24 are 28% and 5% more efficient than 2013 Title 24, respectively), high efficiency outdoor lighting, and the 75% waste diversion consistent with State standards (Assembly Bill 341), even though compliance with these standards would not be considered actual mitigation. For the Reduced Commercial scenario, only the 75% waste diversion was assumed with no building energy improvements, since this scenario represents existing uses that would be demolished.

MT CO<sub>2</sub> – metric tons carbon dioxide; MT CH<sub>4</sub> – metric tons methane; MT N<sub>2</sub>O – metric tons nitrous oxide; MT CO<sub>2</sub>E – metric tons carbon dioxide equivalent

See Appendix E for detailed results.

The project site is located within the NCCAB under the jurisdiction of the MBARD, which to date, has not adopted significance criteria or thresholds for land use projects. However, in February 2013, a staff report to the District Board indicated that the staff's current recommendation is to further review a GHG threshold of 2,000 MT CO<sub>2</sub>E per year for land-use projects or compliance with an adopted GHG Reduction Plan/Climate Action Plan (Monterey Bay Unified Air Pollution Control District, February 2013). This recommendation was made after considering AB 32 goals and scoping plan measures that would reduce regional emissions and MBUAPCD staff's review of thresholds adopted or considered in other air districts throughout the state. The threshold was considered based on projects that would contribute 75-90 percent of future GHG emissions. Other air districts in the State have adopted a threshold of 1,100 MT CO<sub>2</sub>E per year for land-use

projects, including the Bay Area Air Quality Management District, Sacramento Metropolitan Air Quality Management District, and San Luis Obispo County Air Pollution Control District (Association of Environmental Professionals 2016). Both the Bay Area and San Luis Obispo air districts also have per service population (i.e., residents plus employees) GHG emission thresholds of 4.6 and 4.9 MT CO<sub>2</sub>E per year, respectively, for land-use projects (Ibid.).

Neither the City of Santa Cruz nor the MBUAPCD has adopted GHG emission significance thresholds. The project's estimated GHG emissions (about 4,053 MT/ CO<sub>2</sub>E year) would exceed the significance threshold for development projects of 1,100 MT CO<sub>2</sub>E per year used in neighboring air districts and the 2,000 MT of CO<sub>2</sub>E per year threshold that had been under consideration by the MBUAPCD. However, the per service population emissions for operations would be about 2.4 MT CO<sub>2</sub>E per year (based on 4,053 MT CO<sub>2</sub>E per year divided by 1,728 service population of the project), which is substantially less than the thresholds established in neighboring air districts.

These quantitative thresholds are based on 2020 reduction goals and although the project buildout is estimated to be approximately 25 years, there are no established protocols or thresholds of significance for post-2020 future-year analysis (i.e., compliance with the Senate Bill 32 goal of reducing GHG emissions to 40% below 1990 levels by 2030 and Executive Order S-3-05 goal of reducing GHG emissions to 80% below 1990 levels by 2050). However, CARB forecasts that compliance with the current Scoping Plan puts the state on a trajectory of meeting these long-term GHG goals, although the specific path to compliance is unknown (CARB 2014). As discussed previously, the project would comply with all applicable state and local GHG reduction regulations and would not conflict with the state's trajectory toward future GHG reductions. In addition, since the specific path to compliance for the state in regards to the long-term goals will likely require development of technology or other changes that are not currently known or available, specific additional mitigation measures for future projects developed as a result of the proposed plan amendments would be speculative and cannot be identified at this time.

With respect to future GHG targets under Senate Bill 32 and Executive Order S-3-05, CARB has also made clear its legal interpretation that it has the requisite authority to adopt whatever regulations are necessary, beyond the AB 32 horizon year of 2020, to meet the reduction targets in 2030 and in 2050; this legal interpretation by an expert agency provides evidence that future regulations will be adopted to continue the state on its trajectory toward meeting these future GHG targets. Additionally, the City's *General Plan 2030* EIR estimated GHG emissions that could result in 2030 from potential development and buildout accommodated by the plan that included 3,350 residential dwelling units and approximately 3,140,000 additional square feet of new commercial, office, and industrial uses. The General Plan EIR analysis determined that the GHG emissions levels associated with potential buildout that would be accommodated by the General Plan would not be considered substantial compared to long-term forecasts and state and regional targets, and would be less than forecast statewide per capita emission rates. The preceding considerations support the conclusion that the project-level emissions are less than

significant and less than cumulatively considerable. Thus, the impact is considered less than significant.

It is expected that GHG emissions resulting from the proposed project would be partially offset by the incorporation of energy and water conserving features and “green” building designs that would be required under City and State building regulations, including the City’s Green Building requirements. Furthermore, the City’s *General Plan 2030* seeks to reduce citywide contribution to greenhouse gas emissions through land use planning, program development, investment in energy efficient infrastructure, and increased use of renewable energy. Green building policies and actions incorporate energy efficiency measures, water stewardship, use of sustainable building materials derived from renewable resources, reduction of waste through recycling and reuse, and smart growth and sustainable development practices. In addition to defining shorter-term strategies to address likely impacts of climate change on city infrastructure and resources, the City must also set planning goals to minimize future risks of sea level rise and climate change.

The City’s General Plan 2030 includes one goal with four policies and 19 accompanying actions that address climate change, including preparation and implementation of a “Climate Action Plan” to attain emissions reductions goals, which has been completed. In particular, the City seeks to achieve a 30% reduction in GHG emissions by 2020 and 80% by 2050 (NRC4.1.1) with all new development being carbon neutral by the year 2030. Other policies and actions seek to reduce vehicle emissions by 30% (NRC4.1.3) in addition with other transportation policies to reduce vehicle trips, and promote energy efficiency. Table 4.2-3 summarizes policies that directly or indirectly reduce greenhouse gas emissions and impacts. Additionally, policies in other chapters of the draft General Plan support local, state and federal actions to reduce carbon dioxide and GHG emissions (HZ2.1.1, HZ2.1.2) and efforts to improve local energy efficiency (NRC7.1), including a reduction in gas and electricity consumption (NRC7.1.1). A number of policies are also directed to reducing automobile trips and creating sustainable development and land use patterns, which would result in further reductions of automobile trips; Goal LU1 and supporting policies and actions seek sustainable land uses within the City.

### **Mitigation Measures**

No mitigation measures are required as a significant impact has not been identified.