

## 4.6 GREENHOUSE GAS EMISSIONS

This chapter evaluates the potential for land use changes associated with adopting and implementing the proposed project to cumulatively contribute to greenhouse gas (GHG) emissions. Because no single project is large enough individually to result in a measurable increase in global concentrations of GHG emissions, global warming impacts of a project are considered on a cumulative basis. This analysis is based on the methodology recommended by the Bay Area Air Quality Management District (BAAQMD). The proposed project was evaluated using BAAQMD's plan-level review criteria, based on the preliminary information. GHG emissions are based on average daily trip (ADT) generation provided by W-Trans Transportation Consultants for the on-road transportation emissions section. The GHG emissions modeling is included in Appendix B, Air Quality and Greenhouse Gas Data, of this Draft EIR.

### 4.6.1 ENVIRONMENTAL SETTING

#### 4.6.1.1 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Human activities contribute to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. The primary source of these GHG is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHG—water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and ozone (O<sub>3</sub>)—that are the likely cause of an increase in global average temperatures observed within the 20<sup>th</sup> and 21<sup>st</sup> centuries. Other GHG identified by the IPCC that contribute to global warming to a lesser extent include nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons.<sup>1,2</sup> The major GHG are briefly described below.

- **Carbon dioxide (CO<sub>2</sub>)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH<sub>4</sub>)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal landfills and water treatment facilities.
- **Nitrous oxide (N<sub>2</sub>O)** is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated gases** are synthetic, strong GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high global warming potential gases.

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<sup>1</sup> Intergovernmental Panel on Climate Change, 2001. *Third Assessment Report: Climate Change 2001*, New York: Cambridge University Press.

<sup>2</sup> Water vapor (H<sub>2</sub>O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant because it is considered part of the feedback loop of changing radiative forcing rather than a primary cause of change.

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- **Chlorofluorocarbons (CFCs)** are GHGs covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (troposphere, stratosphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down ozone. These gases are also ozone-depleting gases and are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.
- **Hydrofluorocarbons (HFCs)** contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances to serve many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong GHGs.<sup>3,4</sup>
- **Perfluorocarbons (PFCs)** are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF<sub>4</sub>] and perfluoroethane [C<sub>2</sub>F<sub>6</sub>]) were introduced, along with HFCs, as alternatives to the ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high global warming potential.
- **Sulfur Hexafluoride (SF<sub>6</sub>)** is a colorless gas soluble in alcohol and ether, slightly soluble in water. SF<sub>6</sub> is a strong GHG used primarily in electrical transmission and distribution systems as an insulator.
- **Hydrochlorofluorocarbons (HCFCs)** contain hydrogen, fluorine, chlorine, and carbon atoms. Although ozone-depleting substances, they are less potent at destroying stratospheric ozone than CFCs. They have been introduced as temporary replacements for CFCs and are also GHGs.

GHGs are dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Some GHGs have a stronger greenhouse effect than others. These are referred to as high global warming potential gases. The global warming potential or “GWP” is used to convert GHGs to carbon dioxide (CO<sub>2</sub>) equivalence (CO<sub>2</sub>e) to show the relative potential that different GHGs have to contribute to the greenhouse effect. For example, under IPCC’s Fourth Assessment Report GWP values for methane (CH<sub>4</sub>), a project that generates 10 metric tons (MT) of CH<sub>4</sub> would be equivalent to 250 MT of CO<sub>2</sub>.<sup>5</sup> Specific climate change impacts that could affect the proposed project include water supply, wildfire risks, health impacts, and energy demand.<sup>6</sup> The GWP of GHG emissions are shown in Table 4.6-1.

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<sup>3</sup> United States Environmental Protection Agency, 2017. Greenhouse Gas Emissions, <http://www.epa.gov/climatechange/ghgemissions/gases.html>.

<sup>4</sup> Intergovernmental Panel on Climate Change, 2001. Third Assessment Report: Climate Change 2001, New York: Cambridge University Press.

<sup>5</sup> CO<sub>2</sub>-equivalence is used to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

<sup>6</sup> California Climate Change Center. 2012. Our Changing Climate 2012, Vulnerability & Adaptation to the Increasing Risks from Climate Change in California. July.

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**TABLE 4.6-1 GHG EMISSIONS AND THEIR RELATIVE GLOBAL WARMING POTENTIAL COMPARED TO CO<sub>2</sub>**

GHGs	Second Assessment Report Atmospheric Lifetime (Years)	Fourth Assessment Report Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO <sub>2</sub> <sup>a</sup>	Fourth Assessment Report Global Warming Potential Relative to CO <sub>2</sub> <sup>a</sup>
Carbon Dioxide (CO <sub>2</sub> )	50 to 200	50 to 200	1	1
Methane <sup>b</sup> (CH <sub>4</sub> )	12 (±3)	12	21	25
Nitrous Oxide (N <sub>2</sub> O)	120	114	310	298
Hydrofluorocarbons:				
HFC-23	264	270	11,700	14,800
HFC-32	5.6	4.9	650	675
HFC-125	32.6	29	2,800	3,500
HFC-134a	14.6	14	1,300	1,430
HFC-143a	48.3	52	3,800	4,470
HFC-152a	1.5	1.4	140	124
HFC-227ea	36.5	34.2	2,900	3,220
HFC-236fa	209	240	6,300	9,810
HFC-4310mee	17.1	15.9	1,300	1,030
Perfluoromethane: CF <sub>4</sub>	50,000	50,000	6,500	7,390
Perfluoroethane: C <sub>2</sub> F <sub>6</sub>	10,000	10,000	9,200	12,200
Perfluorobutane: C <sub>4</sub> F <sub>10</sub>	2,600	NA	7,000	8,860
Perfluoro-2-methylpentane: C <sub>6</sub> F <sub>14</sub>	3,200	NA	7,400	9,300
Sulfur Hexafluoride (SF <sub>6</sub> )	3,200	NA	23,900	22,800

Notes: The Intergovernmental Panel on Climate Change has published updated global warming potential (GWP) values in its Fifth Assessment Report<sup>7</sup> that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO<sub>2</sub> (radiative forcing is the difference of energy from sunlight received by the earth and radiated back into space).

a. Based on 100-year time horizon of the GWP of the air pollutant relative to CO<sub>2</sub>.

b. The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO<sub>2</sub> is not included.

Source: Intergovernmental Panel on Climate Change. 1995. Second Assessment Report: Climate Change 1995; Intergovernmental Panel on Climate Change. 2007. Fourth Assessment Report: Climate Change 2007. New York: Cambridge University Press

### 4.6.1.2 REGULATORY FRAMEWORK

#### Federal Regulations

The United States Environmental Protection Agency (USEPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat.<sup>8</sup> To regulate GHGs from passenger vehicles, the USEPA was required to issue an endangerment finding. The finding identifies emissions of six key GHGs: CO<sub>2</sub>, CH<sub>4</sub>,

<sup>7</sup> Intergovernmental Panel on Climate Change, 2013. Fifth Assessment Report: Climate Change 2013, New York: Cambridge University Press.

<sup>8</sup> US Environmental Protection Agency. 2009, December. EPA: Greenhouse Gases Threaten Public Health and the Environment. <https://yosemite.epa.gov/opa/admpress.nsf/0/08d11a451131bca585257685005bf252>.

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N<sub>2</sub>O, hydrofluorocarbons, perfluorocarbons, and SF<sub>6</sub>. The first three are applicable to the project's GHG emissions inventory because they constitute the majority of GHG emissions and, per BAAQMD guidance, are the GHG emissions that should be evaluated as part of a project's GHG emissions inventory. The following summarize the federal regulations:

- **US Mandatory Report Rule for GHGs (2009):** Requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 MT or more of CO<sub>2</sub>e per year are required to submit an annual report.
- **Update to Corporate Average Fuel Economy Standards (2010 to 2012):** Automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016 (resulting in a fleet average of 35.5 miles per gallon by 2016). Rulemaking to adopt these new standards was completed in 2010. California agreed to allow automakers who show compliance with the national program to also be deemed in compliance with State requirements. The federal government issued new standards in 2012 for model years 2017 to 2025 that will require a fleet average of 54.5 miles per gallon in 2025. However, the USEPA is currently reexamining the 2017 to 2025 emissions standards.
- **USEPA Regulation of Stationary Sources under the Clean Air Act (Ongoing):** Pursuant to its authority under the Clean Air Act, the USEPA has been developing regulations for new stationary sources such as power plants, refineries, and other large sources of emissions. Pursuant to the 2013 *Climate Change Adaptation Plan*, the USEPA was directed to develop regulations for existing stationary sources.

## State Regulations

### *GHG Emission Reduction Legislation*

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in Executive Order S-03-05, Assembly Bill 32 (AB 32), Senate Bill 32 (SB 32), Executive Order B-30-15, and Senate Bill 375 (SB 375). These State laws and other key legislation aimed at reducing GHG emissions in the California are summarized as follows:

- **Executive Order S-03-05:** Signed June 1, 2005, the following GHG reduction targets for the State included 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050.
- **Assembly Bill 32:** Also known as the Global Warming Solutions Act (2006), AB 32 was signed August 31, 2006, in order to reduce California's contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in Executive Order S-03-05. Under AB 32, California Air Resources Board (CARB) prepared the *2008 Climate Change Scoping Plan* and the *2014 Climate Change Scoping Plan*, and as discussed further below, has released the *Draft 2017 Climate Change Scoping Plan*.
- **Executive Order B-30-15:** Signed April 29, 2015, this executive order sets a goal of reducing Statewide GHG emissions to 40 percent below 1990 levels by the year 2030 and required an update to CARB's 2014 Scoping Plan.
- **Senate Bill 32 and Assembly Bill 197:** Signed September 2016, SB 32 and AB 197 made the 2030 goal under Executive Order B-30-15 a Statewide mandated legislative target. AB 197 established a joint

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legislative committee on climate change policies and required CARB to prioritize direction emissions reductions.<sup>9</sup> Pursuant to these requirements on January 20, 2017, CARB released the *Draft 2017 Climate Change Scoping Plan Update*, which includes the potential regulations and programs, including strategies consistent with AB 197 requirements, to achieve the 2030 target. CARB has adoption hearings planned for June 2017. The *Draft 2017 Scoping Plan* establishes a new emissions limit of 260 million metric tons of carbon dioxide equivalent (MMTCO<sub>2</sub>e) for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030. The *Draft 2017 Scoping Plan* identified local governments as essential partners in achieving the State’s long-term GHG reduction goals and identified local actions to reduce GHG emissions, including to achieve emissions of no more than 6 metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>e) or less per capita by 2030 and 2 MTCO<sub>2</sub>e or less per capita by 2050. For projects undergoing CEQA environmental review, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the current Scoping Plan and the State’s long-term GHG goals—and projects that exceed those thresholds may be required to incorporate either on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible, or a performance-based metric using a climate action plan or other plan to reduce GHG emissions is appropriate.<sup>10</sup>

- **Senate Bill 1383:** Signed September 19, 2016, SB 1383 is a supplement to the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants, including black carbon and CH<sub>4</sub>. Black carbon is the light-absorbing component of fine particulate matter (PM) produced during incomplete combustion of fuels (e.g., on- and off-road transportation, residential wood burning, charbroiling, and industrial processes). SB 1383 requires CARB, no later than January 1, 2018, to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve the following reductions below 2013 levels by 2030, including CH<sub>4</sub> by 40 percent, hydrofluorocarbon gases by 40 percent, and black carbon by 50 percent. This bill also establishes targets for reducing organic waste in landfills. In response to SB 1383, CARB adopted the *Final Proposed Short-Lived Climate Pollutant Strategy* on March 14, 2017.
- **Senate Bill 375:** Also known as the Sustainable Communities and Climate Protection Act, SB 375 was adopted in 2008 to connect the Scoping Plan’s GHG emissions reductions targets for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional, long-range, transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 regions in California managed by a metropolitan planning organization (MPO). The Metropolitan Transportation Commission (MTC) is the MPO for the nine-county San Francisco Bay Area region. MTC’s targets are a 7 percent per capita reduction in GHG emissions from 2005 by 2020, and 15 percent per capita reduction from 2005 levels by 2035. SB 375 requires CARB to periodically update the targets, no later than every 8 years.

<sup>9</sup> Rather than the previously-used market-based cap-and-trade program for large stationary, mobile, and other sources.

<sup>10</sup> California Air Resources Board. 2017, January 20. The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California’s 2030 Greenhouse Gas Target. [https://www.arb.ca.gov/cc/scopingplan/2030sp\\_pp\\_final.pdf](https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf).

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The 2020 targets are less than the 2035 targets because a significant portion of the built environment in 2020 has been defined by decisions that have already been made. In general, the 2020 scenarios reflect that more time is needed for large land use and transportation infrastructure changes. Most of the reductions in the interim are anticipated to come from improving the efficiency of the region's transportation network. The targets would result in 3 MMTCO<sub>2</sub>e of reductions by 2020 and 15 MMTCO<sub>2</sub>e of reductions by 2035. Based on these reductions, the passenger vehicle target in CARB's Scoping Plan (for AB 32) would be met.<sup>11</sup>

- **Assembly Bill 1493:** Also known as Pavley I, AB 1493 is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the USEPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model year 2017 through 2025 light-duty vehicles (see also the discussion on the update to the CAFE standards under Federal Laws, above). In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards.
- **Executive Order S-01-07:** Signed on January 18, 2007, the State set new low-carbon fuel standards for transportation fuels sold within the State.
- **Executive Order B-16-2012:** Signed on March 23, 2012, the State directed that CARB, the California Energy Commission, the Public Utilities Commission, and other relevant agencies to work with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate zero-emissions vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations).
- **Senate Bills 1078, 107, and X1-2, and Executive Order S-14-08:** A major component of California's Renewable Energy Program is the renewable portfolio standard established under Senate Bill 1078 and 107. Executive Order S-14-08 was signed in November 2008, which expanded the State's Renewable Energy Standard to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SB X1-2). The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects because electricity production from renewable sources is generally considered carbon neutral.
- **Senate Bill 350:** Signed in September 2015, SB 350 establishes tiered increases to the renewable portfolio standard of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 seeks to double the energy efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

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<sup>11</sup> California Air Resources Board. 2010, August. Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375. Staff Report.

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### *California Building Code: Building Energy Efficiency Standards*

Energy conservation standards for new residential and non-residential buildings were adopted in June 1977 and most recently revised in 2016 (Title 24, Part 6, of the California Code of Regulations). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. On June 10, 2015, the California Energy Commission adopted the 2016 Building Energy Efficiency Standards, which went into effect on January 1, 2017. The 2016 Building Energy Efficiency Standards continues to improve upon the previous 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. Under the 2016 Standards, residential and nonresidential buildings are 28 and 5 percent more energy efficient than the 2013 Standards, respectively.<sup>12</sup> While the 2016 Standards do not achieve zero net energy, they do get very close to the State's goal and make important steps toward changing residential building practices in California. The 2019 Standards will take the final step to achieve zero net energy for newly constructed residential buildings throughout California.<sup>13</sup>

### *California Building Code: CALGreen*

On July 17, 2008, California Green Building Standards Code (24 California Code of Regulations, Part 11, known as "CALGreen") was adopted as part of the California Building Standards Code. CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.<sup>14</sup> The mandatory provisions of the 2016 CALGreen building standards became effective on January 1, 2017.

### *2006 Appliance Efficiency Regulations*

Adopted by the California Energy Commission on October 11, 2006, the 2006 Appliance Efficiency Regulations (Title 20, California Code of Regulations, Sections 1601 through 1608) were approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non-federally regulated appliances. Though these regulations are now often viewed as "business-as-usual," they exceed the standards imposed by all other states and they reduce GHG emissions by reducing energy demand.

### *Solid Waste Regulations*

California's Integrated Waste Management Act of 1989 (AB 939), Public Resources Code 40050 et seq.) set a requirement for cities and counties throughout the State to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling, and composting. In 2008, the requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this,

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<sup>12</sup> California Energy Commission. 2015. 2016 Building Energy Efficiency Standards, Adoption Hearing Presentation. [http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/June 10.](http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/June%2010)

<sup>13</sup> California Energy Commission. 2015. 2016 Building Energy and Efficiency Standards Frequently Asked Questions. [http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016\\_Building\\_Energy\\_Efficiency\\_Standards\\_FAQ.pdf.](http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf)

<sup>14</sup> The green building standards became mandatory in the 2010 edition of the code.

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the act requires that each city and county prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity. AB 341 (Chapter 476, Statutes of 2011) increased the Statewide goal for waste diversion to 75 percent by 2020 and requires recycling of waste from commercial and multifamily residential land uses.

The California Solid Waste Reuse and Recycling Access Act (AB 1327, California Public Resources Code Sections 42900 et seq.) requires areas to be set aside for collecting and loading recyclable materials in development projects. The Act required the California Integrated Waste Management Board to develop a model ordinance for adoption by any local agency requiring adequate areas for collection and loading of recyclable materials as part of development projects. Local agencies are required to adopt the model or an ordinance of their own. Section 5.408 of CALGreen also requires that at least 50 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

AB 1826, signed on October of 2014, requires businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.

### *Water Efficiency Regulations*

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7<sup>th</sup> Extraordinary Session of 2009 to 2010 and therefore dubbed "SBX7-7." SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure water deliveries to customers, and implement other efficiency measures. SBX7-7 requires urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

The Water Conservation in Landscaping Act of 2006 (AB 1881) requires local agencies to adopt the updated DWR model ordinance or equivalent. AB 1881 also requires the Energy Commission, in consultation with the department, to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

## Regional Regulations

### *Plan Bay Area*

*Plan Bay Area* is the Bay Area's Regional Transportation Plan (RTP)/Sustainable Community Strategy (SCS). *Plan Bay Area*, adopted jointly by ABAG and MTC July 18, 2013,<sup>15</sup> lays out a development scenario for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement) beyond the per capita reduction targets identified by CARB. *Plan Bay Area* meets a 16 percent per capita reduction of GHG emissions by 2035 and a 10 percent per capita reduction by 2020 from 2005 conditions. As part of the implementing framework for *Plan Bay Area*, local governments have identified Priority Development Areas (PDAs) to focus growth. PDAs are transit-oriented, infill development opportunity areas within existing communities. Overall, well over two-thirds of all regional growth in the Bay Area by 2040 is allocated within PDAs. PDAs are expected to accommodate 80 percent (or over 525,570 units) of new housing and 66 percent (or 744,230) of new jobs in the region.<sup>16</sup> The Southeast Greenway Area is not within a Priority Development Area.<sup>17</sup>

The final draft of *Plan Bay Area 2040* was recently released and has an anticipated adoption in the fall of 2017. It would serve as a limited and focused update to *Plan Bay Area 2013*, with updated planning assumptions that incorporate key economic, demographic, and financial trends from the last several years.<sup>18</sup> Per the final draft of *Plan Bay Area 2040*, while the projected number of new housing units and new jobs within PDAs would increase to 629,000 units and 707,000 jobs compared to the adopted *Plan Bay Area 2013*, its overall share would be reduced to 77 percent and 55 percent.<sup>26</sup> However, the final draft of *Plan Bay Area 2040* plan would remain on track in meeting the 16 percent per capita reduction of GHG emissions by 2035.<sup>19</sup>

### *Climate Action 2020 and Beyond*

*Climate Action 2020 and Beyond* is the regional climate action plan for Sonoma County. *Climate Action 2020 and Beyond* builds on prior commitments to reduce GHG emissions through a community-wide climate action plan for all communities in Sonoma County, including Santa Rosa. The regional framework creates an efficient and consistent approach to address climate change but allows local governments to adopt locally appropriate measures to reduce GHG emissions. The *Climate Action 2020 and Beyond* establishes a countywide GHG reduction goal as opposed to individual goals for each jurisdiction that recognizes the shared nature of the challenge as well as the fact that Sonoma County communities each have a different capacity to achieve GHG reductions. It also provides information about local climate

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<sup>15</sup> It should be noted that the Bay Area Citizens filed a lawsuit on MTC's and ABAG's adoption of *Plan Bay Area*.

<sup>16</sup> Metropolitan Transportation Commission and Association of Bay Area Governments, 2013. *Plan Bay Area: Strategy for a Sustainable Region*, July 18.

<sup>17</sup> Associated Bay Area Governments. July 2015. *Priority Development Area Showcase*, <http://gis.abag.ca.gov/website/PDAShowcase/>.

<sup>18</sup> Metropolitan Transportation Commission and Association of Bay Area Governments. 2017, March. *Plan Bay Area 2040 Draft Plan*.

<sup>19</sup> Metropolitan Transportation Commission and Association of Bay Area Governments. 2017, March. *Plan Bay Area 2040 Draft Plan*.

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hazards and what Sonoma County communities can do to prepare. The Regional Climate Protection Agency board adopted *Climate Action 2020 and Beyond* on July 11, 2016.

### Local Regulations

#### *General Plan 2035*

The Land Use and Livability (LUL) and Open Space and Conservation (OSC) elements of the General Plan 2035 include the following goals and policies specific to reducing GHG emission and applicable to the proposed project:

- **Goal LUL-A:** Foster a compact rather than a scattered development pattern in order to reduce travel, energy, land, and materials consumption while promoting greenhouse gas emission reductions citywide.
  - **Policy LUL-A-1:** As part of plan implementation – including development review, capital improvements programming, and preparation of detailed area plans – foster close land use/transportation relationships to promote use of alternative transportation modes and discourage travel by automobile.
- **Goal LUL-E:** Promote livable neighborhoods by requiring compliance with green building programs to ensure that new construction meets high standards of energy efficiency and sustainable material use. Ensure that everyday shopping, park and recreation facilities, and schools are within easy walking distance of most residents.
  - **Policy LUL-E-2:** As part of planning and development review activities, ensure that projects, subdivisions, and neighborhoods are designed to foster livability.
- **Goal OSC-K:** Reduce energy use in existing and new commercial, industrial, and public structures.
  - **Policy OSC-K-5:** Implement measures of the Climate Action Plan which increase energy efficiency, including retrofitting existing buildings and facilitating energy upgrades.
- **Goal OSC-M:** Reduce Greenhouse Gas Emissions
  - **Policy OSC-M-1** Meet local, regional and State targets for reduction of greenhouse gas emissions through implementation of the Climate Action Plan.

#### *Climate Action Plan*

On June 5, 2012, the Santa Rosa City Council adopted the Santa Rosa Climate Action Plan (CAP). The Santa Rosa CAP recognizes the imperative to act on climate change and demonstrates the City's continued commitment to reducing GHG emissions. As described above, the City is one of the nine cities in Sonoma County to collaborate on regional efforts to reduce GHG emissions as part of the Sonoma County *Climate Action and Beyond*. The Santa Rosa CAP presents measures that will reduce local GHG emissions, meet State, regional, and local reduction targets, and streamline future environmental review of projects within Santa Rosa by following the California Environmental Quality Act (CEQA) Guidelines and meeting the BAAQMD expectations for a Qualified GHG Emissions Reduction Strategy.<sup>20</sup> The Santa Rosa CAP follows both the CEQA Guidelines and the BAAQMD guidelines by incorporating the standard elements of a

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<sup>20</sup> City of Santa Rosa. June 5, 2012. Climate Action Plan. <http://srcity.org/DocumentCenter/View/10762>

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Qualified GHG Reduction Strategy. The Santa Rosa CAP recommends various community and municipal strategies for near-term and mid-term considerations, and is centered on the following nine topic areas:

- Energy Efficiency and Conservation
- Waste Reduction, Recycling, and Composting
- Renewable Energy
- Water and Wastewater
- Parking and Land Use Management
- Agriculture and Local Food
- Improved Transport Options
- Off-Road Vehicles and Equipment
- Optimized Vehicular Travel

The Santa Rosa CAP goals, measures, and actions that are relevant to the proposed project are shown in Table 4.6-2.

**TABLE 4.6-2 POLICIES OF THE SANTA ROSA CLIMATE ACTION PLAN RELEVANT TO THE PROPOSED PROJECT**

<b>Goal 1: Energy Efficiency and Conservation</b>	
<b>Measure 1.1</b>	<b>CALGreen Requirements for New Construction.</b> Continue to enforce and require new development to meet Tier 1 CALGreen requirements, as amended, for new nonresidential and residential development.
Action 1.1.1	Require new development to comply with the current provisions, as amended, of CALGreen, Part 11 of the California Green Building Standards Code.
Action 1.1.2	Continue to require Tier 1 standards for new development and consider adding major remodels during the next building code update.
Action 1.1.3	Require all new construction to be built with net zero electricity use, beginning in 2020.
Action 1.1.4	Evaluate potential incentives for projects that have net zero electricity use, prior to 2020.
<b>Measure 1.3</b>	<b>Smart Meter Utilization.</b> Encourage existing development and require new development to utilize PG&E's Smart Meter system to facilitate energy and cost savings.
Action 1.3.1	Require new construction and major remodels to install real-time energy monitors that allow building users to track their current energy use.
<b>Measure 1.4</b>	<b>Tree Planting and Urban Forestry.</b> Plant and maintain trees on private property, streets, and open space areas.
Action 1.4.2	Implement the City's tree preservation ordinance.
Action 1.4.3	Require new development to supply an adequate number of street trees and private trees.
<b>Goal 3: Parking and Land Use Management</b>	
<b>Measure 3.2</b>	<b>Diversity and Destination Accessibility.</b> Plan for a variety of complementary land uses within walking distance of each other, such as housing, neighborhood-serving retail, and recreational facilities, to decrease the need for vehicular travel.
Action 3.2.2	Improve the non-vehicular transportation network serving common destinations in Santa Rosa in order to facilitate walking and biking.
<b>Measure 3.6</b>	<b>Traffic Calming.</b> Provide traffic calming measures to encourage people to walk or bike instead of drive.
Action 3.6.1	Install traffic calming design features such as bulb-outs, median barriers, and striped crosswalks to improve pedestrian convenience and encourage pedestrian and bicycle travel.
<b>Goal 4: Improved Transit Options</b>	
<b>Measure 4.1</b>	<b>Bicycle and Pedestrian Network.</b> Improve the bicycle and pedestrian network in Santa Rosa through design elements, training, and facilities.
Action 4.1.1	Implement the Bicycle and Pedestrian Master Plan.
Action 4.1.4	Continue to support the Safe Routes to School (SRTS) and safe routes to transit programs in Santa Rosa.
<b>Goal 5: Optimized Vehicular Travel</b>	
<b>Measure 5.1</b>	<b>Electric and Hybrid-Electric Vehicles.</b> Facilitate the purchase and convenient use of electric and hybrid vehicles

## GREENHOUSE GAS EMISSIONS

**TABLE 4.6-2 POLICIES OF THE SANTA ROSA CLIMATE ACTION PLAN RELEVANT TO THE PROPOSED PROJECT**

	in Santa Rosa.
Action 5.1.1	Provide electric vehicle recharging stations in City facilities and parking lots that are equipped with solar-generated power.
Action 5.1.6	Continue to expand the electric vehicle charging network.
<b>Goal 6: Waste Reduction, Recycling, and Composting</b>	
<b>Measure 6.1</b>	<b>Recycling and Composting.</b> Increase the amount of waste that is recycled and composted.
Action 6.1.3	Increase the City's construction and demolition ordinance to require 75% diversion by 2020 and 85% diversion by 2035.
<b>Goal 7: Water and Wastewater</b>	
<b>Measure 7.1</b>	<b>Water Conservation.</b> Continue to require and incentivize water conservation.
Action 7.1.1	Require new development to reduce potable water use in accordance with the Tier 1 standards of CALGreen.
Action 7.1.2	Continue and expand water conservation efforts including water-efficient landscaping, rainwater harvesting, and high-efficiency appliance and fixture installations.
<b>Goal 8: Agriculture and Local Food</b>	
<b>Measure 8.1</b>	<b>Local Food Systems.</b> Increase the amount of food grown and consumed locally.
Action 8.3.1	Establish community gardens and urban farms throughout the city.
<b>Goal 9: Off-Road Vehicles and Equipment</b>	
<b>Measure 9.2</b>	<b>Construction Emissions.</b> Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.
Action 9.2.1	Minimize idling times either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes or less (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Provide clear signage at all access points to remind employees of idling restrictions.
Action 9.2.2	Construction equipment shall be maintained in accordance with manufacturer's specifications.
Action 9.2.3	Work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project: <ul style="list-style-type: none"> <li>a. Substitute electrified equipment for diesel- and gasoline-powered equipment where practical.</li> <li>b. Use alternative fuels for construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.</li> <li>c. Avoid the use of on-site generators by connecting to grid electricity or utilizing solar-powered equipment.</li> </ul>

Source: City of Santa Rosa, 2015. Santa Rosa Climate Action Plan.

### 4.6.1.3 EXISTING CONDITIONS

The project site includes 57 acres of land owned by Caltrans, which is largely undeveloped. The project site includes grassland, creeks, remnant orchards, potential wetlands and rocky outcroppings. These current land uses do not generate long-term GHG emissions from mobile sources, energy use, or area sources.

## **4.6.2 STANDARDS OF SIGNIFICANCE**

### **4.6.2.1 CEQA GUIDELINES APPENDIX G**

Implementation of the proposed project would result in a significant impact if it would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant effect on the environment.
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG emissions.

### **4.6.2.2 BAAQMD SIGNIFICANT CRITERIA**

BAAQMD has a tiered approach for assessing GHG emissions impacts of a project. If a project is within the jurisdiction of an agency that has a “qualified” GHG reduction strategy, the project can assess consistency of its GHG emissions impacts with the reduction strategy.

BAAQMD has adopted screening criteria and significance criteria for development projects that would be applicable for the proposed project. If a project exceeds the Guidelines’ GHG screening-level sizes, the project would be required to conduct a full GHG analysis using the following BAAQMD significance criteria:

- 1,100 MT of CO<sub>2</sub>e per year; or
- 4.6 MT of CO<sub>2</sub>e per service population (SP) for year 2020

AB 32 requires the Statewide GHG emission be reduced to 1990 levels by 2020 on a per-capita basis; that means reducing the annual emissions of 14 tons of carbon dioxide for every man, woman, and child in California down to about 10 tons per person by 2020. Hence, BAAQMD’s per capita significance threshold is calculated based on the State’s land use sector emissions inventory prepared by CARB and the demographic forecasts for the 2008 Scoping Plan. The land use sector GHG emissions for 1990 were estimated by BAAQMD, as identified in Appendix D of the BAAQMD CEQA Guidelines, to be 295.53 MMTCO<sub>2</sub>e and the 2020 California service population (SP) to be 64.3 million. Therefore, the significance threshold that would ensure consistency with the GHG reduction goals of AB 32 is estimated at 4.6 MTCO<sub>2</sub>e/SP for year 2020. Land use development projects include residential, commercial, industrial, and public land use facilities. Direct sources of emissions may include on-site combustion of energy, such as natural gas used for heating and cooking, emissions from industrial processes (not applicable for most land use development projects), and fuel combustion from mobile sources. Indirect emissions are emissions produced off-site from energy production, water conveyance due to a project’s energy use and water consumption, and non-biogenic emissions from waste disposal. Biogenic CO<sub>2</sub> emissions are not included in the quantification of a project’s GHG emissions, because biogenic CO<sub>2</sub> is derived from living biomass (e.g. organic matter present in wood, paper, vegetable oils, animal fat, food, animal, and yard waste) as opposed to fossil fuels. Although GHG emissions from waste generation are included in the GHG inventory for the proposed project, the efficiency threshold of 4.6 MTCO<sub>2</sub>e per service population for 2020 identified above does not include the waste sector, and it is therefore not considered in the evaluation.

## GREENHOUSE GAS EMISSIONS

BAAQMD does not have thresholds of significance for construction-related GHG emissions, but requires quantification and disclosure of construction-related GHG emissions.

### Post-2020 Target Setting

For projects with a buildout horizon past the AB 32 target year of 2020, the BAAQMD thresholds are adjusted. Since the BAAQMD efficiency targets are based on the GHG reduction goals of AB 32 for year 2020, BAAQMD’s efficiency targets have been adjusted based on the long-term GHG reduction targets of SB 32, which set a goal of 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050 as shown in Table 4.6-3.

**TABLE 4.6-3 2030 GHG REDUCTION TARGETS**

GHG Sector <sup>a</sup>	Scoping Plan Scenario GHG Emissions MMTCO <sub>2</sub> e
<b>2017 Scoping Plan End Use Sector 2030 – Land Use Only Sectors</b>	
Residential – residential energy consumption	38.4
Commercial – commercial energy consumption	26.8
Transportation – transportation energy consumption	104.1
Transportation Communications and Utilities – energy that supports public infrastructure like street lighting and waste treatment facilities	4.3
Non-Energy Solid Waste – methane emissions from solid waste disposal	9.17
Total 2017 Scoping Plan Land Use Sector Target	182.8
<b>2030 Project-Level Efficiency Target</b>	
2030 Population <sup>b</sup>	44,085,600
2030 Employment <sup>c</sup>	17,394,580
2030 Service Population	61,480,180
2030 Efficiency Target	3.0 MTCO <sub>2</sub> e/SP
<b>2035 Project-Level Efficiency Target<sup>d</sup></b>	
<b>2035 Land Use Sector Target Estimate</b>	
2035 Population Estimate	18,191,720
2035 Employment Estimate	45,747,645
2035 Service Population Estimate	63,939,365
2035 Efficiency Target	2.4 MTCO <sub>2</sub> e/SP

Sources:

a. California Air Resources Boards. 2017, January 20. The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California’s 2030 Greenhouse Gas Target. [https://www.arb.ca.gov/cc/scopingplan/2030sp\\_pp\\_final.pdf](https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf).

b. California Department of Finance. 2014, December. Report P-1 (County): State and County Total Population Projections, 2010-2060 (5 -year increments). <http://www.dof.ca.gov/Forecasting/Demographics/Projections/>

c. California Department of Transportation. 2016. Long-Term Socio-Economic Forecasts by County. [http://www.dot.ca.gov/hq/tpp/offices/eab/socio\\_economic.html](http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic.html).

d. The 2035 Efficiency target is based on interpolating the 2030 land use emissions target of 182.8 MMTCO<sub>2</sub>e (40 percent below 1990 levels by 2030) and the 2050 land use emissions target of 57.4 MMTCO<sub>2</sub>e (80 percent below 1990 levels by 2050), which equates to approximately 47 percent below 1990 levels by 2035. The population and employment estimates are based on a similar forecast to estimate the service population in California in 2035.

## GREENHOUSE GAS EMISSIONS

While the State has identified additional GHG reduction goal for year 2050 (Executive Order S-03-05), because buildout of the project would occur by 2035, the applicable threshold is based on the GHG reduction target for the horizon year of the project and the legislative target under SB 32. Project emissions are compared to the project-level efficiency threshold of the 2035 GHG estimated efficiency target would be 2.4 MTCO<sub>2</sub>e/SP to be on a trajectory with the GHG reduction target of SB 32.

### 4.6.3 IMPACT DISCUSSION

#### 4.6.3.1 METHODOLOGY

The analysis in this section is based on buildout of the proposed Southeast Greenway Area as modeled using California Emissions Estimator Model (CalEEMod), Version 2016.3.1. Emissions are based on the following:

- **Transportation:** GHG emissions are based on the annual average trip generation and vehicle miles traveled data provided by W-Trans Transportation Consultants (see Appendix H of this Draft EIR). For purposes of this analysis, the estimated 3,265 average daily trips (ADT) generated under future potential development's full buildout conditions are utilized. Based on the projected 3,265 ADTs and the 2,313 project-related vehicle miles traveled (VMT) anticipated, the analysis utilized an average trip distance of 0.71 miles per trip.
- **Solid Waste Disposal:** Indirect emissions from waste generation are based on CalRecycle solid waste generation rates. Emissions calculated using CalEEMod include biogenic emissions generated from solid waste.
- **Water/Wastewater:** GHG emissions from this sector are associated with the embodied energy used to supply water, treat water, distribute water, and then treat wastewater and fugitive GHG emissions from wastewater treatment. Emissions are based on average water demand and wastewater generation using CalEEMod default indoor and outdoor water generation rates.
- **Area Sources:** Area and stationary sources are based on the CalEEMod defaults for use of consumer products and cleaning supplies.
- **Energy:** GHG emissions from this sector are from use of electricity and natural gas by the proposed buildings. For purposes of this analysis, new buildings are assumed to comply with the 2016 Building Energy Efficiency Standards, which are 28 percent more energy efficient for residential buildings and 5 percent more energy efficient for nonresidential buildings and residential buildings of 4 stories or more than the 2013 Building Energy Efficiency Standards.
- **Construction:** For purposes of this analysis, it is assumed that future potential development projects in the proposed Southeast Greenway Area would generally commence beginning of 2018 with a buildout of year 2035. In addition, while the specific timeline in how the land uses accommodated under the Southeast Greenway Area would be developed is unknown, this analysis assumes that the various construction activities (e.g., site preparation, demolition, building construction) would overlap. Construction assumptions were based on CalEEMod defaults such as construction equipment mix and worker, vendor, and haul trips.

## GREENHOUSE GAS EMISSIONS

Life-cycle emissions are not included in this analysis because not enough information is available for the Southeast Greenway Area; therefore, life-cycle GHG emissions would be speculative.<sup>21</sup>

Black carbon emissions are not included in the GHG analysis because CARB does not include this pollutant in the State's AB 32 inventory and treats this short-lived climate pollutant separately.<sup>22</sup>

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**GHG-1                      Implementation of the proposed project would not directly and indirectly generate greenhouse gas emissions that would result in an increase in community emissions from baseline conditions that would have a significant impact on the environment.**

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A project does not generate enough GHG emissions on its own to influence global climate change; therefore, this section measures the proposed project's contribution to the cumulative environmental impact. Global climate change is not confined to a particular project area and is generally accepted as the consequence of global industrialization over the last 200 years. A typical project, even a very large one, does not generate enough greenhouse gas emissions on its own to influence global climate change significantly; hence, the issue of global climate change is, by definition, a cumulative environmental impact. Therefore, this GHG analysis measures a project's contribution to the cumulative environmental impact. Future potential development under the proposed project would contribute to global climate change through direct and indirect emissions of GHG from transportation sources, energy (natural gas and purchased energy), water use and wastewater generation, waste generation, and other, off-road equipment (e.g., landscape equipment, construction activities).

The proposed project would facilitate redevelopment of the project site with residential, commercial, park and recreational uses including open space, and multimodal transportation elements. At this time, no development application for the Southeast Greenway Area is proposed. However, future development of up to 244 residential units, 12,000 square feet of commercial development, and 47.2 acres of park and recreational uses including open space resulting in construction and operational GHG emissions in the SFBAAB could occur through implementation of the proposed project. Future potential development of the proposed project would generate up to 632 new residents and 40 new employees, resulting in an increase in vehicle trips, energy use, water use, wastewater generation, and solid waste disposal onsite. In

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<sup>21</sup> Life-cycle emissions include indirect emissions associated with materials manufacture. However, these indirect emissions involve numerous parties, each of which is responsible for GHG emissions of their particular activity. The California Resources Agency, in adopting the CEQA Guidelines Amendments on GHG emissions found that lifecycle analyses was not warranted for project-specific CEQA analysis in most situations, for a variety of reasons, including lack of control over some sources, and the possibility of double-counting emissions (see Final Statement of Reasons for Regulatory Action, December 2009). Because the amount of materials consumed during the operation or construction phases of individual development projects is not known, the origin of the raw materials purchased is not known, and manufacturing information for those raw materials are also not known, calculation of life cycle emissions would be speculative. A life-cycle analysis is not warranted (Governor's Office of Planning and Research. 2008, June. CEQA and Climate Change: Addressing Climate Change through CEQA Review. Technical Advisory. <http://www.opr.ca.gov/ceqa/pdfs/june08-ceqa.pdf>).

<sup>22</sup> Black carbon emissions have sharply declined due to efforts to reduce on-road and off-road vehicle emissions, especially diesel particulate matter. The State's existing air quality policies will virtually eliminate black carbon emissions from on-road diesel engines within 10 years (California Air Resources Board. 2017a, March 14. Final Proposed Short-Lived Climate Pollutant Reduction Strategy. <https://www.arb.ca.gov/cc/shortlived/shortlived.htm>).

## GREENHOUSE GAS EMISSIONS

addition, construction activities would generate a short-term increase in GHG emissions. The GHG emissions associated with the construction and operational phases under the proposed project are shown in Table 4.6-4 and 4.6-5, respectively.

### Construction Phase

BAAQMD does not have thresholds of significance for construction-related GHG emissions. The BAAQMD advises that lead agencies quantify and disclose GHG emissions that would occur during construction and make a determination on the significance of these construction-generated GHG emissions in relation to meeting AB 32 GHG emissions reduction goals. GHG emissions from construction activities are one-time, short-term emissions and therefore would not significantly contribute to long-term cumulative GHG emissions impacts of the proposed project. One-time, short-term emissions are converted to average annual emissions by amortizing them over the service life of a building. For buildings in general, it is reasonable to look at a 30-year time frame, since this is a typical interval before a new building requires the first major renovation.<sup>23</sup> The net increase in emissions generated by the project was evaluated using CalEEMod. GHG emissions associated with construction of the proposed project are shown in Table 4.6-4. The annual construction emissions for years 2018 through 2031 are based on the CalEEMod default construction schedule with the durations of each construction activity normalized to a year 2035 buildout. Additionally, it was assumed that the various construction activities would overlap with one another (see Appendix B for further details). Because construction emissions are a one-time occurrence and would cease at project buildout, GHG emissions impacts of the proposed project would be *less than significant*.

**Table 4.6-4 Project GHG Emissions – Construction Phase**

Category	GHG Emissions (MTCO <sub>2</sub> e/Year)
2018	4,171.67
2019	2,879.42
2020	2,585.32
2021	2,529.06
2022	2,472.29
2023	2,408.14
2024	2,382.78
2025	2,330.66
2026	2,291.90
2027	2,257.18
2028	2,218.31
2029	2,199.53

<sup>23</sup> International Energy Agency, 2008, Energy Efficiency Requirements in Building Codes, Energy Efficiency Policies for New Buildings, March.

## GREENHOUSE GAS EMISSIONS

**Table 4.6-4 Project GHG Emissions – Construction Phase**

Category	GHG Emissions (MTCO <sub>2</sub> e/Year)
2030	2,214.56
2031	1,185.14
<b>Total Construction Emissions (Years 2018 to 2031)</b>	<b>34,125.96</b>
<b>30-Year Amortized Construction</b>	<b>1,138</b>

Source: PlaceWorks, CalEEMod 2016.3.1.

### Operational Phase

The total and net increase in GHG emissions from the proposed project are shown in Table 4.6-5.

**Table 4.6-5 Project GHG Emissions – Operation Phase**

	GHG Emissions (MTCO <sub>2</sub> e/Year)	
	Buildout Year 2035 MT/year	Percentage
<b>Net Increase</b>		
Area	13	1%
Energy <sup>a</sup>	638	60%
On-Road Mobile Sources	236	22%
Waste	97	9%
Water/Wastewater	71	7%
<b>Total</b>	<b>1,056</b>	<b>100%</b>
Service Population	672	
2035 Buildout Efficiency Metric Significance Threshold (Project-Level)	2.4 MTCO <sub>2</sub> e/SP/Year <sup>b</sup>	
Project Emissions Per Service Population	1.57 MTCO <sub>2</sub> e/SP/Year	
<b>Exceeds Efficiency Threshold?</b>	<b>No</b>	

Note: Emissions may not total to 100 percent due to rounding. New buildings would be constructed to the 2016 Building Energy Efficiency Standards (effective January 1, 2017) at minimum.

a Future new buildings are assumed to achieve the 2016 Building Energy Efficiency Standards which are 5 percent more energy efficient for nonresidential structures and 28 percent more energy efficient for residential buildings compared to the 2013 Building Energy Efficiency Standards. Under the Building Energy Efficiency Standards, multi-family buildings four stories and higher are regulated under the non-residential standards.

b Based on the Land Use Sector Inventory 2008 Scoping Plan and extrapolated from year 2020 to the mid-term year 2030 GHG reduction target of SB 32. Project-level thresholds are based only on the State's land use emissions inventory sectors identified in the Scoping Plan to ensure consistency with the scope of emissions included in a development project's GHG emissions inventory; and are therefore, more stringent than the plan-level thresholds, which include all GHG sectors.

c Based on the Land Use Sector Inventory 2008 Scoping Plan and adjusted to the 2030 GHG reduction target of SB 32.

Source: PlaceWorks, CalEEMod 2016.3.1.

## GREENHOUSE GAS EMISSIONS

As shown in Table 4.6-5, implementation of the proposed project would result in a net increase of GHG emissions of 1,056 MTCO<sub>2</sub>e per year and would not exceed BAAQMD's bright-line threshold of 1,100 MTCO<sub>2</sub>e /year/SP. Similarly, as potential future development under the proposed project would generate 1.57 MTCO<sub>2</sub>e/SP/year, it would meet the forecasted efficiency metric of 2.4 MTCO<sub>2</sub>e/SP/year based on the long-term GHG reduction target of SB 32 and trajectory to achieve the long-term reduction goal of Executive Order S-03-05. Average annual emissions per service population are divided by the service population<sup>24</sup> of the proposed project to estimate the proposed project's efficiency at buildout based on the GHG reduction target for the horizon year of the project (2035). Furthermore, compliance with the City's CAP would minimize GHG emissions to the extent feasible to meet the reduction target established under AB 32. Therefore overall, the proposed project's cumulative contribution to the long-term GHG emissions in the State would be considered *less than significant*.

**Significance Without Mitigation:** Less than significant.

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**GHG-2**            **Implementation of the proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.**

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### CARB's Scoping Plan

In accordance with AB 32, CARB developed the 2008 Scoping Plan to outline the State's strategy established by AB 32, which is to return to the State's GHG emissions inventory to 1990 levels by year 2020. In September 2016, SB 32 was signed into law, requiring the State's GHG emissions to return to 40 percent below 1990 levels by 2030. Executive Order B-30-15 and SB 32 require CARB to prepare another update to the Scoping Plan to address the 2030 target for the State. On January 20, 2017, CARB released the Draft 2017 Climate Change Scoping Plan Update to address the new interim GHG emissions target under SB 32. The CARB Scoping Plan is applicable to State agencies and is not directly applicable to cities/counties and individual projects. Nonetheless, the Scoping Plan has been the primary tool that is used to develop performance-based and efficiency-based CEQA criteria and GHG reduction targets for climate action planning efforts.

The 2017 Scoping Plan has adoption hearings planned for June 2017, and provides the strategies for the State to meet the 2030 GHG reduction target as established under SB 32. Statewide strategies to reduce GHG emissions in the 2017 Scoping Plan include:

- Implement Senate Bill 350, which expands the Renewables Portfolio Standard to 50 percent by 2030 and doubles energy efficiency savings.
- Expand the Low Carbon Fuel Standard to 18 percent by 2030.
- Implement the Mobile Source Strategy to deploy zero-emissions vehicle buses and trucks.
- Implement the Sustainable Freight Action Plan.

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<sup>24</sup> BAAQMD defines service population (SP) as residents and employees who live or work within the project site.

## GREENHOUSE GAS EMISSIONS

- Implement the Short-Lived Climate Pollutant Reduction Strategy, which reduces methane and hydrofluorocarbons 40 percent below 2013 levels by 2030 and black carbon emissions 50 percent below 2013 levels by 2030.
- Continue to implement Senate Bill 375.
- Create a post-2020 Cap-and-Trade Program.
- Establish a new regulation to reduce GHG emissions from the refinery sector by 20 percent.
- Develop an Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.<sup>25</sup>

The project GHG emissions shown in Table 4.6-5 include reductions associated with Statewide strategies that have been adopted since AB 32 and SB 32. Statewide strategies to reduce GHG emissions include the Low Carbon Fuel Standard (LCFS), California Appliance Energy Efficiency regulations, California Renewable Energy Portfolio standard, changes in the Corporate Average Fuel Economy (CAFE) standards, and other early action measures as necessary to ensure the State is on target to achieve the GHG emissions reduction goals of AB 32. In addition, new buildings are required to comply with the 2016 Building Energy Efficiency Standards (or future cycle update) and CALGreen. The proposed project would comply with these GHG emissions reduction measures since they are Statewide strategies. Therefore, the project's GHG emissions would be reduced from compliance with Statewide measures that have been adopted since AB 32 was adopted. Therefore, impacts would be *less than significant*.

**Significance Without Mitigation:** Less than significant.

### Plan Bay Area

To achieve ABAG's/MTC's sustainable vision for the Bay Area, the *Plan Bay Area* land use concept plan concentrates the majority of new population and employment growth in PDAs. While the proposed project is not within a PDA, one of the key principles of the proposed project is to encourage the efficient use of land through sustainable development patterns, a mixture of uses, and development intensities that support transit and walking. The proposed project would accommodate infill development projects on the CalTrans right of way within Santa Rosa near existing infrastructure. Additionally, intersection crossings with enhanced signing, striping, and/or signal operations to improve pedestrian/bike travel are proposed at Hoen Avenue and Cypress Way, and at the proposed driveway on Hoen Avenue Frontage Road. Likewise, a number of pedestrian/bicycle connections have been identified to connect to neighborhoods, provide safe routes to school, and to provide access to the Greenway between the cross streets. Numerous access points will facilitate easier pedestrian/bicycle access to the Greenway and allow areas between the roadways to be activated with foot and bicycle traffic. Therefore, the proposed project would not conflict with the land use concept plan in *Plan Bay Area* and impacts are considered *less than significant*.

**Significance Without Mitigation:** Less than significant.

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<sup>25</sup> California Air Resources Board. January 20, 2017. The 2017 Climate Change Scoping Plan Update. [https://www.arb.ca.gov/cc/scopingplan/2030sp\\_pp\\_final.pdf](https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf)

**GREENHOUSE GAS EMISSIONS**

**Santa Rosa Climate Action Plan**

As previously described under Section 4.6.1.2, Regulatory Framework, in subsection “Local Regulations,” the Santa Rosa CAP is a strategic planning document that identifies sources of GHG emissions within the city boundaries, presents current and future emissions estimates, identifies a GHG reduction target for future years, and presents strategic goals, measures, and actions to reduce emissions from the energy, transportation and land use, water, solid waste, and green infrastructure sectors. The emissions reduction strategies developed by the City follow the BAAQMD’s CEQA Guidelines and the corresponding criteria for a Qualified GHG Emissions Reduction Strategy as defined by the BAAQMD, which in turn were developed to comply with the requirements of AB 32 and achieve the goals of the CARB’s AB 32 Scoping Plan. The proposed project also incorporates several design elements that would reduce GHG emissions such as conformance to the 2016 Building Energy Efficiency Standards and CALGreen building regulations. The proposed project would be consistent with the applicable measures in the Santa Rosa CAP, as identified in Table 4.6-6.

**Table 4.6-6 Santa Rosa Climate Action Plan Goals and Actions**

Applicable Goals	Actions	Consistency Analysis
<b>Goal 1: Energy Efficiency and Conservation</b>		
<p><b>Measure 1.1: CALGreen Requirements for New Construction.</b> Continue to enforce and require new development to meet Tier 1 CALGreen requirements, as amended, for new nonresidential and residential development.</p>	<p>Action 1.1.1. Require new development to comply with the current provisions, as amended, of CALGreen, Part 11 of the California Green Building Standards Code.</p> <hr/> <p>Action 1.1.2. Continue to require Tier 1 standards for new development and consider adding major remodels during the next building code update.</p> <hr/> <p>Action 1.1.3. Require all new construction to be built with net zero electricity use, beginning in 2020.</p> <hr/> <p>Action 1.1.4. Evaluate potential incentives for projects that have net zero electricity use, prior to 2020.</p>	<p><b>Consistent.</b> While no specific site plans are being considered as part of the proposed project, future potential development under the proposed project would be required to comply with the Santa Rosa CAP Actions 1.1.1 through 1.1.3 in addition to California Building Code, 2016 Building Energy Efficiency Standards, and CALGreen.</p>
<p><b>Measure 1.3: Smart Meter Utilization.</b> Encourage existing development and require new development to utilize PG&amp;E’s Smart Meter system to facilitate energy and cost savings.</p>	<p>Action 1.3.1. Require new construction and major remodels to install real-time energy monitors that allow building users to track their current energy use.</p>	<p><b>Consistent.</b> Potential future construction associated with the proposed project would install real-time energy monitors as appropriate under Santa Rosa CAP Measure 1.3.</p>
<p><b>Measure 1.4: Tree Planting and Urban Forestry.</b> Plant and maintain trees on private property, streets, and open space areas.</p>	<p>Action 1.4.2. Implement the City’s tree preservation ordinance.</p> <hr/> <p>Action 1.4.3. Require new development to supply an adequate number of street trees and private trees.</p>	<p><b>Consistent.</b> The proposed project would allow future green space and require the preservation of many trees on site. While no specific site plans are being considered as part of the proposed project, future potential development under the proposed project would be consistent with the Santa Rosa CAP.</p>

## GREENHOUSE GAS EMISSIONS

**Table 4.6-6 Santa Rosa Climate Action Plan Goals and Actions**

Applicable Goals	Actions	Consistency Analysis
<b>Goal 3: Parking and Land Use Management</b>		
<p><b>Measure 3.2: Diversity and Destination Accessibility.</b> Plan for a variety of complementary land uses within walking distance of each other, such as housing, neighborhood-serving retail, and recreational facilities, to decrease the need for vehicular travel.</p>	<p><b>Action 3.2.2.</b> Improve the non-vehicular transportation network serving common destinations in Santa Rosa in order to facilitate walking and biking.</p>	<p><b>Consistent.</b> The proposed project would allow future development of protected bike paths and pedestrian pathways and connect various common destinations between Farmers Lane and Spring Lake Regional Park.</p>
<p><b>Measure 3.6: Traffic Calming.</b> Provide traffic calming measures to encourage people to walk or bike instead of drive.</p>	<p><b>Action 3.6.1.</b> Install traffic calming design features such as bulb-outs, median barriers, and striped crosswalks to improve pedestrian convenience and encourage pedestrian and bicycle travel.</p>	<p><b>Consistent.</b> The proposed project would allow future construction of protected bike paths and pedestrian pathways separated from vehicle traffic. Features such as bicycle and pedestrian crossings will be included will promote pedestrian and bicycle travel.</p>
<b>Goal 4: Improved Transit Options</b>		
<p><b>Measure 4.1: Bicycle and Pedestrian Network.</b> Improve the bicycle and pedestrian network in Santa Rosa through design elements, training, and facilities.</p>	<p><b>Action 4.1.1.</b> Implement the Bicycle and Pedestrian Master Plan.</p>	<p><b>Consistent.</b> The proposed project includes and expands upon proposed bike pathways in the Bicycle and Pedestrian master Plan.</p>
	<p><b>Action 4.1.4.</b> Continue to support the Safe Routes to School (SRTS) and safe routes to transit programs in Santa Rosa.</p>	<p><b>Consistent.</b> The proposed project would comply with the Safe Routes to School Program and provide pedestrian and bike routes to Montgomery High School.</p>
<b>Goal 5: Optimized Vehicular Travel</b>		
<p><b>Measure 5.1: Electric and Hybrid-Electric Vehicles.</b> Facilitate the purchase and convenient use of electric and hybrid vehicles in Santa Rosa.</p>	<p><b>Action 5.1.1.</b> Provide electric vehicle recharging stations in City facilities and parking lots that are equipped with solar-generated power.</p>	<p><b>Consistent.</b> Future projects under the proposed project would be required to adhere to any zoning requirements regarding installation of EV charging stations.</p>
	<p><b>Action 5.1.6.</b> Continue to expand the electric vehicle charging network.</p>	
<b>Goal 6: Waste Reduction, Recycling, and Composting</b>		
<p><b>Measure 6.1: Recycling and Composting.</b> Increase the amount of waste that is recycled and composted.</p>	<p><b>Action 6.1.3.</b> Increase the City's construction and demolition ordinance to require 75% diversion by 2020 and 85% diversion by 2035.</p>	<p><b>Consistent.</b> Future potential development projects associated with the proposed project would comply with the City's Construction and Demolition Ordinance. Prior to receiving a final building inspection, a construction recycling report would be submitted to show the tons recycled and disposed by material type.</p>

**GREENHOUSE GAS EMISSIONS**

**Table 4.6-6 Santa Rosa Climate Action Plan Goals and Actions**

Applicable Goals	Actions	Consistency Analysis
<b>Goal 7: Water and Wastewater</b>		
<b>Measure 7.1: Water Conservation.</b> Continue to require and incentivize water conservation.	<b>Action 7.1.1.</b> Require new development to reduce potable water use in accordance with the Tier 1 standards of CALGreen.	<b>Consistent.</b> The proposed project would comply with all Tier 1 CALGreen Standards, incorporate appropriate water efficient mechanisms, and comply with the City’s Water Efficient Landscape Ordinance.
	<b>Action 7.1.2.</b> Continue and expand water conservation efforts including water-efficient landscaping, rainwater harvesting, and high-efficiency appliance and fixture installations.	
<b>Goal 8: Agriculture and Local Food</b>		
<b>Measure 8.1: Local Food Systems.</b> Increase the amount of food grown and consumed locally.	<b>Action 8.3.1.</b> Establish community gardens and urban farms throughout the city.	<b>Consistent.</b> The proposed project includes areas zoned for urban agriculture.
<b>Goal 9: Off-Road Vehicles and Equipment</b>		
<b>Measure 9.2: Construction Emissions.</b> Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.	<b>Action 9.2.1.</b> Minimize idling times either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes or less (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Provide clear signage at all access points.	<b>Consistent.</b> Future potential construction associated with the proposed project would comply with Title 13, Section 2485 of California Code of Regulations [CCR]. Likewise, the construction contractor shall be responsible for maintaining equipment in accordance with the manufacturer’s specifications and limiting GHG emissions from construction equipment in accordance with Santa Rosa CAP Actions 9.9.2 and 9.2.3.
	<b>Action 9.2.2.</b> Construction equipment shall be maintained in accordance with manufacturer’s specifications.	
	<b>Action 9.2.3.</b> Work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project: a) Substitute electrified equipment for diesel- and gasoline-powered equipment where practical. B) Use alternative fuels for construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel. C) Avoid the use of on-site generators by connecting to grid electricity or utilizing solar powered equipment.	

Source: City of Santa Rosa, 2015. Santa Rosa Climate Action Plan.

**Significance Without Mitigation:** Less than significant.

## GREENHOUSE GAS EMISSIONS

### 4.6.4 CUMULATIVE IMPACTS

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<b>GHG-3</b>	<b>Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would not result in significant cumulative impacts with respect to GHG emissions.</b>
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As described above, GHG emissions related to the proposed project are not confined to a particular air basin but are dispersed worldwide. Therefore, the analysis of impacts in Section 4.6.3, Impact Discussion, above, also addresses cumulative impacts. A project that exceeds the BAAQMD's significance criteria in the context of emissions from all other development projected within the entire SFBAAB would cumulative contribute to impacts. As identified in impact discussion GHG-1, Table 4.6-5 shows that implementation of the proposed project would not exceed BAAQMDs efficiency metric; and therefore, GHG emissions would result in a less than significant impact. Consequently, GHG emissions impacts of the proposed project would be *less than significant*.

**Significance Without Mitigation:** Less than significant.