

4.7 GREENHOUSE GAS EMISSIONS

This section summarizes greenhouse gas (GHG) emissions and discusses global climate change, its causes, and the contribution of human activities. This section also estimates the likely GHG emissions that would result from construction and operational activities associated with the Green Valley 3 Apartments Project (proposed project), including vehicular traffic, energy consumption and other emission sources. Mitigation measures are recommended, where appropriate, to reduce potential impacts to a less-than-significant level.

4.7.1 Environmental Setting

The following describes existing GHG emissions in the City of Fairfield, beginning with typical GHG types and sources, impacts of global climate change, the regulatory framework surrounding GHG emissions, and current emission levels.

4.7.1.1 Background

The following section provides background information on GHGs and global climate change.

Global Climate Change. Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades and other associated changes in global climate. The Earth's average near-surface atmospheric temperature rose $0.6 \pm 0.2^\circ$ Celsius ($^\circ\text{C}$) or $1.1 \pm 0.4^\circ$ Fahrenheit ($^\circ\text{F}$) in the 20th century. The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities. The increased amounts of carbon dioxide (CO_2) and other GHGs are the primary causes of the human-induced component of warming. GHGs are released by the burning of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.¹

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are the following:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)

¹ The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduces the heat escaping, GHGs like carbon dioxide, methane, and nitrous oxide in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, although an excess of GHG results in global warming, the *naturally occurring* greenhouse effect is necessary to keep our planet at a comfortable temperature.

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, enhancing the natural greenhouse effect, and causing near-surface atmospheric temperatures to rise. While manmade GHGs include naturally-occurring GHGs such as CO₂, methane, and N₂O, some gases, like HFCs, PFCs, and SF₆ are completely new to the atmosphere.

Certain gases, such as water vapor which can also cause atmospheric temperatures to rise, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation. For the purposes of this air quality analysis, the term “GHGs” will refer collectively only to the six gases listed above.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere (“atmospheric lifetime”). The GWP of each gas is measured relative to carbon dioxide, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO₂ over a specified time period. **Table 4.7.A: Global Warming Potential of Greenhouse Gases** shows the GWP for each type of GHG. For example, sulfur hexafluoride is 22,800 times more potent at contributing to global warming than carbon dioxide.

Table 4.7.A: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-year Time Horizon)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF ₄)	50,000	7,390
PFC: Hexafluoromethane (C ₂ F ₆)	10,000	12,200
Sulfur Hexafluoride (SF ₆)	3,200	22,800

Source: Climate Change 2007: The Physical Science Basis (Intergovernmental Panel on Climate Change [IPCC] 2007).

Because of the differential heat absorption potential of various GHGs, GHGs are typically measured and reported in terms of pounds or tons of “carbon dioxide-equivalent” (CO₂e).

The following summarizes the characteristics of the six GHGs and black carbon. Black carbon also contributes to climate change and is therefore discussed below.

Carbon Dioxide. In the atmosphere, carbon generally exists in its oxidized form, as CO₂. Natural sources of CO₂ include the respiration (breathing) of humans, animals and plants, volcanic outgassing, decomposition of organic matter, and evaporation from the oceans. Human caused sources of CO₂ include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. Natural sources release approximately 150 billion tons of CO₂ each year, far outweighing the 7 billion tons of man-made emissions of CO₂ each year. Nevertheless, natural removal processes, such as photosynthesis by land- and ocean-dwelling plant species, cannot keep pace with this extra input of man-made CO₂, and consequently, the gas is building up in the atmosphere.

In 2019, total annual CO₂ accounted for approximately 83 percent of California's overall GHG emissions.² Transportation is the single largest source of CO₂ in California, which is primarily comprised of on-road travel. Electricity production, industrial and residential sources also make important contributions to CO₂ emissions in California.

Methane. Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH₄ emissions in California and in the United States as a whole. Agricultural processes such as intestinal fermentation in dairy cows, manure management, and rice cultivation are also significant sources of CH₄ in California. Total annual emissions of CH₄ accounted for approximately 9 percent of GHG emissions in California in 2019.³

Nitrous Oxide. Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion emit N₂O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N₂O emissions in California. Nitrous oxide emissions accounted for approximately 3 percent of GHG emissions in California in 2019.⁴

Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride. HFCs are primarily used as substitutes for ozone-depleting substances regulated under the Montreal Protocol.⁵ PFCs and SF₆ are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no aluminum or magnesium production in California; however, the rapid growth in the

² California Air Resources Board (CARB). 2021b. GHGs Descriptions & Sources in California. Website: ww2.arb.ca.gov/ghg-descriptions-sources (accessed March 2022).

³ Ibid.

⁴ Ibid.

⁵ The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion.

semiconductor industry has resulted in greater use of PFCs. HFCs, PFCs, and SF₆ accounted for about 5 percent of GHG emissions in California in 2019.⁶

Black Carbon. Black carbon is the most strongly light-absorbing component of particulate matter (PM) formed from the burning of fossil fuels such as coal, diesel, and biomass. Black carbon is emitted directly into the atmosphere in the form of particulate matter less than 2.5 microns in size (PM_{2.5}) and is the most effective form of PM, by mass, at absorbing solar energy. Per unit of mass in the atmosphere, black carbon can absorb one million times more energy than CO₂.⁷ Black carbon contributes to climate change both directly, such as absorbing sunlight, and indirectly, such as affecting cloud formation. However, because black carbon is short-lived in the atmosphere, it can be difficult to quantify its effect on global warming.

Most U.S. emissions of black carbon come from mobile sources (52 percent), particularly from diesel fueled vehicles.⁸ The other major source of black carbon is open biomass burning, including wildfires, although residential heating and industry also contribute. Black carbon emissions in the U.S. are projected to decline substantially by 2030, largely due to controls on new mobile diesel emissions.⁹

Effects of Global Climate Change. Effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme weather events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems. Heat-related problems include heat rash and heat stroke. In addition, climate-sensitive diseases may increase, such as those spread by mosquitoes and other disease-carrying insects. Such diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events, such as flooding and hurricanes, can displace people and agriculture. Global climate change may also result in impacts to local air quality from increased ground-level ozone and particulate matter.¹⁰

Additionally, according to the 2006 California Climate Action Team (CAT) Report,¹¹ the following climate change effects, which are based on trends established by the United Nations Intergovernmental Panel on Climate Change (IPCC), can be expected in California over the course of the next century:

⁶ CARB, 2021. op. cit.

⁷ United States Environmental Protection Agency (USEPA). 2017. Black Carbon, Basic Information. February 14, 2017. Website: [19january2017snapshot.epa.gov/www3/airquality/blackcarbon/basic.html](https://www.epa.gov/air-quality/blackcarbon/basic.html) (accessed March 2022).

⁸ Ibid.

⁹ Ibid.

¹⁰ USEPA. 2020. Air Quality and Climate Change Research. Website: <https://www.epa.gov/air-research/air-quality-and-climate-change-research> (accessed March 2022).

¹¹ California Environmental Protection Agency (CalEPA). 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March.

- The loss of sea ice and mountain snowpack, resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;¹²
- Rise in global average sea level, primarily due to thermal expansion and melting of glaciers and ice caps in the Greenland and Antarctic ice sheets;¹³
- Changes in weather that include widespread changes in precipitation, ocean salinity, wind patterns, and more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;¹⁴
- Decline of the Sierra snowpack, which accounts for approximately one-half of the surface water storage in California by 70 percent to as much as 90 percent over the next 100 years;¹⁵
- Increase in the number of days conducive to ozone (O₃) formation by 25 to 85 percent (depending on the future temperature scenario) in high O₃ areas of Los Angeles and the San Joaquin Valley by the end of the 21st century; and ¹⁶
- High potential for erosion of California's coastlines and seawater intrusion into the Delta and levee systems due to the rise in sea level.¹⁷

A summary of these potential effects is provided in **Table 4.7.B: Potential Impacts of Global Warming and Expected Consequences for California.**

Emissions Inventories. An emissions inventory that identifies and quantifies the primary human-generated sources and sinks of GHGs is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, United States, and California GHG emission inventories.

Global Emissions. Worldwide emissions of GHGs in 2018 totaled 25.6 billion metric tons of CO₂e. Global estimates are based on country inventories developed as part of the programs of the United Nations Framework Convention on Climate Change.¹⁸

¹² California Environmental Protection Agency (CalEPA). 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. March.

¹³ Ibid.

¹⁴ Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: The Physical Science Basis, Summary for Policymakers*. February.

¹⁵ CalEPA. 2006, op. cit.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ United Nations Framework Convention on Climate Change (UNFCCC). 2021. GHG Data from UNFCCC. Website: unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/ghg-data-unfccc/ghg-data-from-unfccc (accessed March 2022).

Table 4.7.B: Potential Impacts of Global Warming and Expected Consequences for California

Potential Water Resource Impacts	Anticipated Consequences Statewide
Reduction of the State’s average annual snowpack	<ul style="list-style-type: none"> • The decline of the Sierra snowpack would lead to a loss in half of the surface water storage in California by 70% to 90% over the next 100 years • Potential loss of 5 million acre-feet or more of average annual water storage in the State’s snowpack • Increased challenges for reservoir management and balancing the competing concerns of flood protection and water supply • Higher surface evaporation rates with a corresponding increase in tropospheric water vapor
Rise in average sea level	<ul style="list-style-type: none"> • Potential economic impacts related to coastal tourism, commercial fisheries, coastal agriculture, and ports • Increased risk of flooding, coastal erosion along the State’s coastline, seawater intrusion into the Sacramento-San Joaquin River Delta (Delta) and levee systems
Changes in weather	<ul style="list-style-type: none"> • Changes in precipitation, ocean salinity, and wind patterns • Increased likelihood for extreme weather events, including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones
Changes in the timing, intensity, location, amount, and variability of precipitation	<ul style="list-style-type: none"> • Potential increased storm intensity and increased potential for flooding • Possible increased potential for droughts • Long-term changes in vegetation and increased incidence of wildfires • Changes in the intensity and timing of runoff • Possible increased incidence of flooding and increased sedimentation • Sea level rise and inundation of coastal marshes and estuaries • Increased salinity intrusion into the Delta • Increased potential for Delta levee failure • Increased potential for salinity intrusion into coastal aquifers (groundwater) • Increased potential for flooding near the mouths of rivers due to backwater effects
Increased water temperatures	<ul style="list-style-type: none"> • Increased environmental water demand for temperature control • Possible increased problems with foreign invasive species in aquatic ecosystems • Potential adverse changes in water quality, including the reduction of dissolved oxygen levels • Possible critical effects on listed and endangered aquatic species
Changes in urban and agricultural water demand	<ul style="list-style-type: none"> • Changes in demand patterns and evapotranspiration
Increase in the number of days conducive to O ₃ formation	<ul style="list-style-type: none"> • Increased temperatures • Potential health effects, including adverse impacts to respiratory systems

Source: *Environmental Water Account Draft Supplemental EIS/EIR to the Environmental Water Account Final EIS/EIR*, Bureau of Reclamation Mid-Pacific Region, Sacramento, California (U.S. Department of the Interior, October 2007).

EIR = Environmental Impact Report

EIS = Environmental Impact Statement

O₃ = ozone

United States Emissions. In 2019, the year for which the most recent data are available, the United States emitted about 6,558 million metric tons of CO₂e (MMT CO₂e). Overall, emissions in 2019 decreased by 1.7 percent since 2018 and were 13 percent below 2005 levels. This decrease was driven largely by a decrease in emissions from fossil fuel combustion resulting from a decrease in total energy use in 2019 compared to 2018 and a continued shift from coal to natural gas and renewables in the electric power sector. Of the six major sectors – residential, commercial, agricultural, industry, transportation, and electricity generation – transportation accounted for the highest amount of GHG emissions in 2019 (approximately 29 percent), with electricity generation second at 25 percent, and emissions from industry third at 23 percent.¹⁹

State of California Emissions. The State emitted approximately 418.2 MMT CO₂e emissions in 2019, 7.2 MMT CO₂e lower than 2018 levels and almost 13 MMT CO₂e below the 2020 GHG targeted levels of 431 MMT CO₂e.²⁰ The CARB estimates that transportation was the source of approximately 40 percent of the State’s GHG emissions in 2019, followed by industrial sources at approximately 21 percent, and electricity generation at 14 percent. The remaining sources of GHG emissions were agriculture at 8 percent, residential activities at 7 percent, commercial activities at 4 percent, high GWP at 5 percent, and waste at 2 percent.²¹

San Francisco Bay Area Emissions. The BAAQMD established a climate protection program in 2005 to acknowledge the link between climate change and air quality. The BAAQMD regularly prepares inventories of criteria and toxic air pollutants to support planning, regulatory and other programs. The most recent emissions inventory estimates GHG emissions produced by the San Francisco Bay Area (Bay Area) in 2011.²² The inventory, which was published January 2015, updates the BAAQMD’s previous GHG emission inventory for base year 2007.

In 2011, 86.6 MMT CO₂e of GHGs were emitted in the Bay Area. Fossil fuel consumption in the transportation sector was the single largest source of the Bay Area’s GHG emissions in 2011. The transportation sector (including on-road motor vehicles, locomotives, ships and boats, and aircraft) contributed 39.7 percent of GHG emissions and the industrial and commercial sectors (excluding electricity and agriculture) contributed 35.7 percent of GHG emissions in the Bay Area. Energy production activities such as electricity generation and co-generation were the third largest contributor with approximately 14 percent of the total GHG emissions. Off-road equipment such as construction, industrial, commercial, and lawn and garden equipment contributed 1.5 percent of GHG emissions.

¹⁹ USEPA. 2021. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019. Website: <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019> (accessed March 2022).

²⁰ CARB. 2021a. *California Greenhouse Gas Emissions for 2000 to 2019, Trends of Emissions and Other Indicators Report*. Website: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2019/ghg_inventory_trends_00-19.pdf (accessed March 2022).

²¹ Ibid.

²² Bay Area Air Quality Management District (BAAQMD). 2015. *Source Inventory of Bay Area Greenhouse Gas Emissions*. January.

City of Fairfield Emissions. The City of Fairfield is currently preparing a new Climate Action Plan that will contain a series of measures to reduce GHG emissions through the year 2050. As part of this effort, an Existing Conditions, Opportunities, and Challenges Report has been prepared and includes projected GHG emissions in Fairfield assuming a “business as usual” (BAU) scenario, in which population and employment grow as expected but there are no adjustments taken to reduce GHG emissions, and projected emissions for an “adjusted business as usual” (ABAU) scenario that accounts for Statewide actions, such as a renewable energy portfolio, higher building efficiency standards, and sustainable transportation efforts. A complete assessment of City’s GHG emissions and climate change strategies will be undertaken as part of the Climate Action Plan preparation. The BAU and ABAU emissions inventories are shown in **Table 4.7.C: City of Fairfield GHG Emissions Inventories**, below.

Table 4.7.C: City of Fairfield GHG Emissions Inventories

Emissions Inventory	CO ₂ e (metric tons)
2035 City of Fairfield Community GHG Emissions Projection	
ABAU	661,315
BAU	838,598
2050 City of Fairfield Community GHG Emissions Projection	
ABAU	647,136
BAU	737,141
2018 CARB State GHG Emissions Inventory	425,300,000
2011 BAAQMD GHG Emissions Inventory for the Bay Area	86,600,000
2008 City of Fairfield Municipal GHG Emissions	16,500
2005 City of Fairfield Community GHG Emissions	663,519

Sources: City of Fairfield Existing Conditions Report (May 2021).

ABAU = adjusted business as usual

BAAQMD = Bay Area Air Quality Management District

BAU = business as usual

CARB = California Air Resources Board

CO₂e = carbon dioxide equivalent

GHG = greenhouse gas

4.7.2 Regulatory Setting

The following discusses applicable laws, regulations, and policies related to GHG emissions, including those from federal, State, regional, and local agencies.

4.7.2.1 Federal Laws and Regulations

The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the United States Environmental Protection Agency (USEPA) has the authority to regulate CO₂ emissions under the federal Clean Air Act. While there currently are no adopted federal regulations for the control or reduction of GHG emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change.

This includes the 2009 USEPA final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. Additionally, the USEPA Administrator signed an endangerment finding

action in 2009 under the Clean Air Act, finding that six GHGs (CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change, leading to national GHG emission standards.

4.7.2.2 State Laws and Regulations

The CARB is the lead agency for implementing climate change regulations in the State. Since its formation, the CARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Key efforts by the State to control and reduce GHG emissions are described below.

Assembly Bill 1493 (2002). In response to the transportation sector's significant contribution to California CO₂ emissions, Assembly Bill (AB) 1493 was enacted on July 22, 2002. AB 1493 requires the CARB to set GHG emission standards for passenger vehicles and light duty trucks (and other vehicles whose primary use is noncommercial personal transportation in the State) manufactured in 2009 and all subsequent model years. These standards (starting in model years 2009 to 2016) were approved by the CARB in 2004, but the needed waiver of Clean Air Act Preemption was not granted by the USEPA until June 30, 2009. The CARB responded by amending its original regulation, now referred to as Low Emission Vehicle III, to take effect for model years starting in 2017 to 2025.

Executive Order S-3-05 (2005). Executive Order (EO) S-3-05 was signed by the Governor on June 1, 2005, which proclaimed that California is vulnerable to the impacts of climate change. To combat those concerns, the EO established California GHG emissions reduction targets, which established the following goals:

- GHG emissions should be reduced to 2000 levels by 2010;
- GHG emissions should be reduced to 1990 levels by 2020; and
- GHG emissions should be reduced to 80 percent below 1990 levels by 2050.

The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various State agencies in order to collectively and efficiently reduce GHGs. A biannual progress report must be submitted to the Governor and State legislature disclosing the progress made toward GHG emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, the coastline, and forestry, and report possible mitigation and adaptation plans to address these impacts.

The Secretary of CalEPA leads the Climate Action Team (CAT), which comprises representatives from State agencies as well as numerous other boards and departments. CAT members work to coordinate Statewide efforts to implement global warming emission reduction programs and the State Climate Adaptation Strategy. The CAT is also responsible for reporting on the progress made toward meeting the Statewide GHG targets that were established in the EO and further defined under Assembly Bill 32, the "Global Warming Solutions Act of 2006" (AB 32). The first CAT Report to the Governor and State legislature was released in March 2006 and it presented 46 specific emission reduction strategies for reducing GHG emissions and reaching the targets established in the EO. The most recent CAT Report to the Governor and State legislature was released in December 2010.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing GHG emissions is AB 32, passed by the State legislature on August 31, 2006. This effort aimed at reducing GHG emissions to 1990 levels by 2020. The CARB established the level of GHG emissions in 1990 at 427 MMT CO₂e. The emissions target of 427 MMT required the reduction of 169 MMT from the State's projected business-as-usual 2020 emissions of 596 MMT. AB 32 required the CARB to prepare a Scoping Plan that outlined the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The Scoping Plan was approved by the CARB on December 11, 2008 and contains the main strategies California would implement to achieve the reduction of approximately 169 MMT of CO₂e, or approximately 30 percent, from the State's projected 2020 emission level of 596 MMT of CO₂e under a business-as-usual scenario (this is a reduction of 42 MMT CO₂e, or almost 10 percent from 2002 to 2004 average emissions). The Scoping Plan also included CARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. The Scoping Plan called for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO₂e);
- The Low-Carbon Fuel Standard (15.0 MMT CO₂e);
- Energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO₂e); and
- A renewable portfolio standard (RPS) for electricity production (21.3 MMT CO₂e).

The Scoping Plan identified 18 emission reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional transportation-related GHG targets, vehicle efficiency measures, goods movement, solar roof programs, industrial emissions, high-speed rail, green building strategies, recycling, sustainable forests, water, and air. The measures were estimated to result in a total reduction of 174 MMT CO₂e by 2020.

On August 24, 2011, the CARB unanimously approved both the new supplemental assessment and reapproved its Scoping Plan, which provides the overall roadmap and rule measures to carry out AB 32. The CARB also approved a more robust CEQA-equivalent document supporting the supplemental analysis of the cap-and-trade program. The cap-and-trade program took effect on January 1, 2012, with an enforceable compliance obligation that began January 1, 2013.

The CARB did not determine what amount of GHG reductions it recommends from local government operations and local land use decisions; however, the Scoping Plan stated that land use planning and urban growth decisions will play an important role in the State's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions (meanwhile, the CARB is also developing an additional protocol for community emissions). The CARB further acknowledged that decisions on how land is used will have large impacts on GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural

gas emission sectors. With regard to land use planning, the Scoping Plan expected an approximately 5.0 MMT CO₂e reduction due to implementation of SB 375 (discussed later in this subsection).

In addition to reducing GHG emissions to 1990 levels by 2020, AB 32 directed the CARB and the CAT to identify a list of “discrete early action GHG reduction measures” that could be adopted and made enforceable by January 1, 2010. On January 18, 2007, the Governor signed EO S-1-07, further solidifying California’s dedication to reducing GHGs by setting a new Low Carbon Fuel Standard. The EO set a target to reduce the carbon intensity of California transportation fuels by at least 10 percent by 2020 and directed the CARB to consider the Low Carbon Fuel Standard as a discrete early action measure. In 2011, the U.S. District Court issued an injunction preventing implementation of the Low Carbon Fuel Standard, ruling that it is unconstitutional. In 2012, the Ninth Circuit Court of Appeal stayed the District Court’s injunction, allowing implementation of the Low Carbon Fuel Standard. The Ninth Circuit decided to uphold the Low Carbon Fuel Standard.

In June 2007, the CARB approved a list of 37 early action measures, including three discrete early action measures (Low Carbon Fuel Standard, Restrictions on GWP Refrigerants, and Landfill CH₄ Capture).²³ Discrete early action measures are measures that were required to be adopted as regulations and made effective no later than January 1, 2010, the date established by Health and Safety Code Section 38560.5. The CARB adopted additional early action measures in October 2007 that tripled the number of discrete early action measures. These measures relate to truck efficiency, port electrification, reduction of PFCs from the semiconductor industry, reduction of propellants in consumer products, proper tire inflation, and SF₆ reductions from the non-electricity sector. The combination of early action measures was estimated to reduce Statewide 2020 GHG emissions by nearly 16 MMT.²⁴

The CARB approved the First Update to the Climate Change Scoping Plan on May 22, 2014. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB climate change priorities until 2020, and also sets the groundwork to reach long-term goals set forth in EOs S-3-05 and B-16-2012. The First Update highlights California’s progress toward meeting the “near-term” 2020 GHG emission reduction goals as defined in the initial Scoping Plan, and it also evaluates how to align the State’s “longer-term” GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. The CARB released a second update to the Scoping Plan, the 2017 Scoping Plan, to reflect the 2030 target set by EO B-30-15 and codified by SB 32.²⁵ The 2030 target is to reduce GHG emissions to 40 percent below 1990 levels by 2030.

Senate Bill 97 (2007). Senate Bill (SB) 97, signed by the Governor in August 2007 (Chapter 185, Statutes of 2007; Public Resources Code, Sections 21083.05 and 21097), acknowledges climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the

²³ CARB. 2007b. *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*. October.

²⁴ CARB. 2007a. “ARB approves tripling of early action measures required under AB 32” News Release 07-46. October 25.

²⁵ CARB. 2017. *California’s 2017 Climate Change Scoping Plan*. November.

State Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency guidelines for mitigating GHG emissions or the effects of GHG emissions, as required by CEQA.

The California Natural Resources Agency adopted the amendments to the *State CEQA Guidelines* in January 2010, which went into effect in March 2010. The amendments do not identify a threshold of significance for GHG emissions, nor do they prescribe assessment methodologies or specific mitigation measures. The amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion granted by CEQA to lead agencies in making their own determinations based on substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs when they perform individual project analyses.

Senate Bill 375 (2008). Signed into law on October 1, 2008, SB 375 supplements GHG reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, the CARB approved GHG reduction targets in February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). The CARB may update the targets every four years and must update them every eight years. MPOs in turn must demonstrate how their plans, policies and transportation investments meet the targets set by the CARB through Sustainable Community Strategies (SCS). The SCS are included with the Regional Transportation Plan (RTP), a report required by State law. However, if an MPO finds that their SCS will not meet the GHG reduction target, they may prepare an Alternative Planning Strategy (APS). The APS identifies the impediments to achieving the targets.

Executive Order B-30-15 (2015). The Governor signed EO B-30-15 on April 29, 2015, which added the immediate target:

- GHG emissions should be reduced to 40 percent below 1990 levels by 2030.

All State agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. The CARB was directed to update the AB 32 Scoping Plan to reflect the 2030 target, and therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue reducing emissions.

Senate Bill 350 (2015) Clean Energy and Pollution Reduction Act. SB 350, signed by the Governor on October 7, 2015, updates and enhances AB 32 by introducing the following set of objectives in clean energy, clean air, and pollution reduction for 2030:

- Raise California's RPS from 33 percent to 50 percent; and
- Increasing energy efficiency in buildings by 50 percent by the year 2030.

The 50 percent renewable energy standard will be implemented by the California Public Utilities Commission for private utilities and by the California Energy Commission for municipal utilities. Each

utility must submit a procurement plan showing it will purchase clean energy to displace other non-renewable resources. The 50 percent increase in energy efficiency in buildings must be achieved through the use of existing energy efficiency retrofit funding and regulatory tools already available to state energy agencies under existing law. The addition made by this legislation requires state energy agencies to plan for and implement those programs in a manner that achieves the energy efficiency target.

Senate Bill 32, California Global Warming Solutions Act of 2016, and Assembly Bill 197. In summer of 2016, the Legislature passed, and the Governor signed SB 32 and AB 197. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15. SB 32 builds on AB 32 and keeps the State on the path toward achieving the 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an IPCC analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million CO₂e and reduce the likelihood of catastrophic impacts from climate change.

The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air emissions data that are collected by the CARB was posted in December 2016.

Senate Bill 100 (SB 100). On September 10, 2018, the Governor signed SB 100, which raises California's RPS requirements to 60 percent by 2030, with interim targets, and 100 percent by 2045. The bill also establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all State agencies by December 31, 2045. Under the bill, the State cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order B-55-18. EO B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." EO B-55-18 directs the CARB to work with relevant State agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other Statewide goals, meaning not only should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions be offset by equivalent net removals of CO₂e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

Title 24, Building Standards Code and CALGreen Code. In November 2008, the California Building Standards Commission established the California Green Building Standards (CALGreen) Code, which sets performance standards for residential and nonresidential development to reduce environmental impacts and encourage sustainable construction practices. The CALGreen Code addresses energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality. The CALGreen Code was last updated in 2019 to include new mandatory measures for residential as well as nonresidential uses; the new measures took effect on

January 1, 2020. The 2022 CALGreen Code will go into effect on January 1, 2023, prior to anticipated project construction.

Cap and Trade. The development of a cap-and-trade program was included as a key reduction measure of the CARB AB 32 Climate Change Scoping Plan. The cap-and-trade program will help put California on the path to meet its goal of reducing GHG emissions to 1990 levels by 2020 and ultimately achieving an 80 percent reduction from 1990 levels by 2050. The cap-and-trade emissions trading program developed by the CARB took effect on January 1, 2012, with enforceable compliance obligations beginning January 1, 2013. The cap-and-trade program aims to regulate GHG emissions from the largest producers in the State by setting a Statewide firm limit, or cap, on allowable annual GHG emissions. On January 1, 2015, compliance obligations began for distributors of transportation fuels, natural gas, and other fuels.²⁶

Executive Order N-79-20. EO N-79-20, which was signed by the Governor on September 23, 2020, sets the following goals for the State: 100 percent of in-State sales of new passenger cars and trucks shall be zero-emission by 2035; 100 percent of medium- and heavy-duty vehicles in the State shall be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks; and 100 percent of off-road vehicles and equipment in the State shall be zero-emission by 2035, where feasible.

4.7.2.3 Regional Plans and Regulations

Regional regulations that are applicable to GHG emissions generated by the proposed project are implemented by the Metropolitan Transportation Commission (MTC), the Association of Bay Area Governments (ABAG), and the BAAQMD, as discussed below.

Plan Bay Area 2050. Plan Bay Area 2050 is a State-mandated, integrated long-range transportation and land use plan. As required by SB 375, all metropolitan regions in California must complete a Sustainable Communities Strategy (SCS) as part of a Regional Transportation Plan. In the San Francisco Bay Area, MTC and ABAG are jointly responsible for developing and adopting a SCS that integrates transportation, land use and housing to meet GHG reduction targets set by the CARB. Plan Bay Area 2050 connects the elements of housing, the economy, transportation and the environment through 35 strategies that will make the Bay Area more equitable for all residents and more resilient in the face of unexpected challenges. In the short-term, the Plan identifies more than 80 specific actions for MTC, ABAG and partner organizations to take over the next five years to make headway on each of the 35 strategies.

Bay Area Air Quality Management District. The BAAQMD is the regional government agency that regulates sources of air pollution within the nine Bay Area counties, including Solano County. The BAAQMD regulates GHG emissions through the following plans, programs, and guidelines.

²⁶ CARB. 2014. Cap-and-Trade Program. Website: www.arb.ca.gov/cc/capandtrade/capandtrade.htm (accessed March 2022).

Clean Air Plan. The Clean Air Plan guides the region’s air quality planning efforts to attain the CARB’s California Ambient Air Quality Standards (CAAQS).²⁷ The BAAQMD 2017 Clean Air Plan, which was adopted on April 19, 2017, by the BAAQMD Board of Directors, is the current Clean Air Plan which contains district-wide control measures to reduce ozone precursor emissions (e.g., reactive organic gases [ROG] and nitrogen oxide [NO_x]), particulate matter and GHG emissions. The Bay Area 2017 Clean Air Plan:

- Describes the BAAQMD’s plan towards attaining all State and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities;
- Defines a vision for transitioning the region to a post-carbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050;
- Provides a regional climate protection strategy that will put the Bay Area on a pathway to achieve GHG reduction targets; and
- Includes a wide range of control measures designed to decrease emissions of air pollutants that are most harmful to Bay Area residents, such as particulate matter, ozone, and toxic air contaminants; to reduce emissions of methane and other “Super Greenhouse Gases” that are potent climate pollutants in the near term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

BAAQMD Climate Protection Program. The BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy, all of which assist in reducing GHG emissions and in reducing air pollutants that affect the health of residents. The BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

BAAQMD CEQA Air Quality Guidelines. The BAAQMD *California Environmental Quality Act (CEQA) Air Quality Guidelines* were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for air toxics, odors, and GHG emissions.

²⁷ BAAQMD. 2017b. *Final 2017 Clean Air Plan*. April 19, 2017. Available online at: [www.baaqmd.gov/~media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en](http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en) (accessed March 2022).

In June 2010, the BAAQMD updated its draft *CEQA Air Quality Guidelines* and finalized them in May 2011. These guidelines superseded previously adopted agency air quality guidelines of 1999 and were intended to advise lead agencies on how to evaluate potential air quality impacts.

In May 2017, the BAAQMD published an updated version of the *CEQA Air Quality Guidelines*. The 2017 *CEQA Air Quality Guidelines* include thresholds to evaluate project impacts in order to protectively evaluate the potential effects of the project on air quality. Under the 2017 *CEQA Air Quality Guidelines*, a local government may prepare a Qualified Greenhouse Gas Reduction Strategy that is consistent with AB 32 goals. If a project is consistent with an adopted qualified Greenhouse Gas Reduction Strategy and General Plan that addresses the project's GHG emissions, it can be presumed that the project will not have significant GHG emissions under CEQA. The 2017 *CEQA Air Quality Guidelines* also included a quantitative threshold for project level analyses based on estimated greenhouse emissions as well as per capita/efficiency metrics. The quantitative thresholds were based on reductions needed to bring Bay Area into compliance with AB 32 goals by 2020. Because the project would begin operations in the post-2020 timeframe, the BAAQMD 2017 *CEQA Air Quality Guidelines* quantitative threshold of 1,100 metric tons of CO₂e per year and an efficiency-based threshold of 4.6 metric tons of CO₂e per year per service population would not directly apply, as using these thresholds would not achieve the State's post-2020 GHG reduction goals.

On April 20, 2022—after the issuance of the Notice of Preparation (NOP) for this Draft EIR—BAAQMD published updated thresholds and the *Justification Report: CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans*²⁸ that lead agencies may use to evaluate the GHG impacts of a proposed project or plan. The new thresholds are designed to control GHG emissions from new development and achieve the reductions needed to bring the Bay Area into compliance with the latest State laws, including SB 32 which set forth the GHG reduction target for the state for 2030 and EO B-55-18 that set forth GHG reduction goal for the state for the year 2045. The BAAQMD guidance accompanying the new thresholds notes that the new thresholds could be applied to projects for which an NOP has been or will be issued after April 20, 2022, and therefore do not apply to this project. However, a discussion of the project's consistency with these thresholds has been added for informational purposes.

4.7.2.4 Local Plans and Regulations

City of Fairfield General Plan. The following policies of the *City of Fairfield General Plan* pertaining to GHG emissions would be applicable to the proposed project:

Policy OS 8.2: Mitigate air pollution from fixed and vehicular sources as required by state and regional air quality plans and programs.

²⁸ BAAQMD. 2022. *Justification Report: CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans*. April.

Policy OS 8.3: Encourage more efficient use of private vehicles and increased use of mass transit and alternative transportation modes.

Policy OS 8.5: Require water conservation and energy efficiency techniques to be incorporated into the design of all development projects.

4.7.3 Significance Criteria

The significance criteria for greenhouse gas emissions impacts used in this analysis are consistent with Appendix G of the *State CEQA Guidelines*. The proposed project may be deemed to have a significant impact with respect to greenhouse gas emissions if it would:

- **Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.**
- **Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.**

Section 15064.4 of the *State CEQA Guidelines* states that: “A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project.” In performing that analysis, the lead agency has discretion to determine whether to use a model or methodology to quantify GHG emissions, or to rely on a qualitative analysis or performance-based standards. This EIR relies on both quantitative thresholds which are scaled from the State and BAAQMD numeric operational thresholds and a qualitative analysis of compliance with applicable regulatory standards. In making a determination as to the significance of potential impacts, the lead agency then considers the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting, whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project, and the extent to which the project complies with regulations or requirements adopted to implement a Statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

Construction Threshold. Due to their temporary nature, the BAAQMD has not set forth significance thresholds for construction emissions, but recommends quantification and disclosure of these emissions. Local agencies are encouraged to adopt feasible mitigation measures to reduce construction emissions. To accurately gauge the cumulative impact of the project’s GHG emissions over time, the EIR quantifies and then amortizes those emissions over the life of the project.

Operational Threshold. For the evaluation of the significance of a project’s GHG emissions, the BAAQMD 2017 *CEQA Air Quality Guidelines* include a quantitative threshold of 1,100 metric tons of CO₂e per year and an efficiency-based threshold of 4.6 metric tons of CO₂e per year per service population. Both of these numeric operational thresholds set by the BAAQMD were calculated to achieve the State’s 2020 target for GHG emissions levels (and not the SB 32 specified target of 40 percent below the 1990 GHG emissions level or the carbon neutrality goal for 2045 set forth in EO B-55-18). Construction of the proposed project is anticipated to begin in Summer 2023 and end Spring 2025. Because the proposed project would begin operations in the post-2020 timeframe, the

BAAQMD thresholds of 1,100 metric tons of CO₂e per year and 4.6 metric tons of CO₂e per year per service population would not directly apply, as using these thresholds would not achieve the State's post-2020 GHG reduction goals. Pursuant to *State CEQA Guidelines* Section 15064.4(a), the City has the discretion, in the context of a particular project, to both quantify a project-specific threshold and conduct a qualitative or a quantitative analysis. Therefore, using the BAAQMD 2020 threshold of 1,100 metric tons of CO₂e per year and 4.6 metric tons of CO₂e per year per service population as the basis, scaled thresholds were developed for evaluation of the proposed project's impact for 2025, when the proposed project is anticipated to be operational. Both thresholds were scaled consistent with State goals detailed in SB 32, EO B-30-15, EO B-55-18, and EO S-3-05 to reduce GHG emissions by 40 percent below 1990 levels by 2030 and achieve carbon neutrality by 2045.

The thresholds developed in this manner are 880 metric tons of CO₂e per year or 3.7 metric tons of CO₂e per capita service population (employees plus residents) per year. These thresholds are used in this EIR to evaluate the GHG impacts of the proposed project.

In addition, for informational purposes, this EIR includes a discussion of the project's consistency with the BAAQMD's updated thresholds. According to the BAAQMD *Justification Report: CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans*, a project would have a less-than-significant impact related to GHG emissions if it would:

- a. Include, at a minimum, the following project design elements:
 - 1) Buildings
 - a) The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development).
 - b) The project will not result in any wasteful, inefficient, or unnecessary electrical usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the *State CEQA Guidelines*.
 - 2) Transportation
 - a) Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's *Technical Advisory on Evaluating Transportation Impacts in CEQA*:
 - (1) Residential projects: 15 percent below the existing VMT per capita
 - (2) Office projects: 15 percent below the existing VMT per employee
 - (3) Retail projects: no net increase in existing VMT

- b) Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.
- b. Or be consistent with a local GHG reduction strategy that meets the criteria *under State CEQA Guidelines* Section 15183.5(b).

4.7.4 Methodology

The proposed project would result in GHG emissions from construction and operational sources. Construction activities would generate emissions at the site from off-road construction equipment, and on roadways as a result of construction-related truck hauling, vendor deliveries, and worker commuting. Operational activities would also generate GHG emissions associated with mobile sources (e.g., vehicle trips made by residents and employees associated with the apartment complex), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with electricity consumption at the project site, waste sources (land filling and waste disposal; wastewater conveyance, treatment and disposal), and water sources (emissions from energy used to produce, treat, convey and distribute water). This analysis uses the California Emissions Estimator Model version 2020.4.0 (CalEEMod) to quantify GHG emissions from both construction and operation of the proposed project. CalEEMod output is contained in Appendix A. The analysis performed for this section is based on BAAQMD *CEQA Air Quality Guidelines*.²⁹

4.7.5 Project Impacts

The following describes the potential impacts regarding GHG emissions that could result from implementation of the proposed project. As applicable, conditions of approval (COAs) and mitigation measures are presented to reduce potential impacts.

4.7.5.1 Greenhouse Gas Emissions

Impact GHG-1: Operation of the project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

This section describes the proposed project's construction- and operations-related GHG emissions and contribution to global climate change. BAAQMD has not addressed emission thresholds for construction in its *CEQA Air Quality Guidelines*; however, BAAQMD requires quantification and disclosure. Thus, this section discusses construction emissions.

Short-Term Construction Emissions. GHG emissions associated with the proposed project would occur over the short term from demolition and construction activities, which would produce combustion emissions from various sources but primarily emissions from equipment exhaust. During demolition and construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO₂, CH₄, and

²⁹ BAAQMD. 2017a. *CEQA Air Quality Guidelines*. May.

N₂O. Furthermore, CH₄ is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

CalEEMod was used to estimate construction-related emissions associated with the proposed project. The proposed project would include the excavation of 770 tons of material to be hauled offsite, which was included in CalEEMod. In addition, the proposed project would require approximately 1,750 cubic yards of cut and 12,050 cubic yards of fill, for a net of 10,300 cubic yards of fill that would be imported to the project site, which was included in CalEEMod. Construction of the proposed project is anticipated to begin in Summer 2023 and end in Spring 2025. Based on information provided by the project applicant, construction of the proposed project would result in a maximum of 150 worker trips per day, which was included in CalEEMod. The project applicant also provided construction fleet details, which were included in CalEEMod. This analysis assumes the use of Tier 2 construction equipment.

Using CalEEMod, it is estimated that construction of the proposed project would generate a total of approximately 943.6 MT CO₂e over the construction period. Although the BAAQMD does not have adopted thresholds for construction emissions, other air districts require construction GHG emissions to be amortized over the life of the project, defined as 30 years, and compared to the applicable GHG significance threshold. When amortized over the 30-year life of the project, annual emissions due to construction activities would be 31.5 MT CO₂e. These emissions were added to the operational emissions and as shown below, the combined emissions would not result in a significant impact. Furthermore, **Mitigation Measure AQ-1**, as identified in **Section 4.2: Air Quality**, would require implementation of the BAAQMD's Basic Construction Measures. These measures would also reduce the project's construction-phase GHG emissions by reducing the amount of construction vehicle idling and by requiring the use of properly maintained equipment.

Long-Term Operational Emissions. Long-term GHG emissions are typically generated from mobile sources (e.g., vehicle trips), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with energy consumption, waste sources (land filling and waste disposal), and water sources (water supply and conveyance, treatment, and distribution). Mobile-source GHG emissions would include project-generated vehicle trips to and from the project. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Energy source emissions would be generated at off-site utility providers as a result of increased electricity demand generated by the project. Waste source emissions generated by the proposed project include energy used in transporting and disposing municipal waste. In addition, water source emissions associated with the proposed project would be generated by water supply, treatment and conveyance, and wastewater collection, conveyance, and treatment. Some natural gas use would occur seasonally in the barbeque pits, which cannot be estimated but is expected to be low and result in limited GHG emissions. Emission estimates for operation of the project were calculated using CalEEMod and are shown in **Table 4.7.D: Operational GHG Emissions (Metric Tons Per Year)**. CalEEMod output sheets are included in **Appendix A**.

Table 4.7.D: Operational GHG Emissions (Metric Tons Per Year)

Emissions Source	Operational Emissions				
	CO ₂	CH ₄	N ₂ O	CO ₂ e	Percent of Total
Area Source Emissions	2.2	<0.1	<0.1	2.3	<1
Energy Source Emissions	104.0	<0.1	<0.1	105.1	15
Mobile Source Emissions	469.0	<0.1	<0.1	477.0	68
Waste Source Emissions	40.1	2.4	0.0	99.4	14
Water Source Emissions	11.7	0.3	<0.1	22.8	3
Total Operational Emissions				706.6	100
Amortized Construction Emissions				31.5	-
Total Annual Emissions				738.1	-
2025 Threshold				880	-
Exceed Threshold?				No	-

Source: LSA (October 2022).

CH₄ = methane

CO₂ = carbon dioxide

CO₂e = carbon dioxide equivalent

GHG = greenhouse gas

N₂O = nitrous oxide

As shown in **Table 4.7.D**, mobile source emissions are the largest source of emissions, at approximately 68 percent of total operational CO₂e emissions, followed by energy source emissions at approximately 15 percent of the total operational emissions. Waste source emissions are approximately 14 percent of the total. In addition, water and area source emissions are approximately 3 percent and less than 1 percent of the total, respectively.

As discussed above, a project would have less-than-significant impact related to GHG emissions if it would meet one or more of the following criteria: result in operational-related GHG emissions that are less than 880 metric tons of CO₂e per year, or result in operational-related GHG emissions of less than 3.7 metric tons of CO₂e per service population (residents plus employees). As shown in **Table 4.7.D**, the proposed project would generate approximately 706.6 MT CO₂e per year based on operational emissions only and approximately 738.1 MT CO₂e if both construction and operational emissions are added together. Both estimates are below the numeric threshold of 880 metric tons of CO₂e. Therefore, this impact would be less than significant. The impact based on the service population threshold does not need to be evaluated.

In addition, as discussed above, on April 20, 2022, the BAAQMD published updated thresholds that lead agencies may use to evaluate the GHG impacts of a proposed project or plan. As explained above, these thresholds do not apply to the project. However, a discussion of the project's consistency with these thresholds has been added for informational purposes.

Based on the BAAQMD's updated thresholds, a project would have a less-than-significant impact related to GHG emissions if it would include the project design elements related to natural gas, energy, VMT, and electric vehicles or if it would be consistent with a local GHG reduction strategy that meets the criteria under *State CEQA Guidelines* Section 15183.5(b). The City does not have an adopted GHG reduction strategy that meets the criteria under *State CEQA Guidelines* Section

15183.5(b). Therefore, this section evaluates the proposed project's consistency with the BAAQMD's project design elements.

Natural Gas Usage. As required by the BAAQMD, the project must not include natural gas appliances or natural gas plumbing/infrastructure. As discussed in **Chapter 3.0: Project Description**, the proposed building would be all electric, and would not include any natural gas service or connections. Since the proposed project would not include natural gas, the proposed project would be consistent with this design element.

Energy Usage. The project must not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the *State CEQA Guidelines*. Energy usage associated with the proposed project was evaluated in **Section 4.5: Energy**.

As noted in **Section 4.5**, the proposed project would be constructed to current Title 24 standards and would also comply with CALGreen, which would require energy saving building features and, as discussed in **Chapter 3.0: Project Description**, the proposed project would include several sustainability features. Therefore, the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the *State CEQA Guidelines*, as shown in **Section 4.5**, found that the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of fuel or energy and would incorporate renewable energy or energy efficiency measures into building design, equipment use, and transportation. As such, the proposed project would be consistent with this design element.

Vehicle Miles Traveled. In order to meet the BAAQMD's VMT threshold, the project must achieve a project-generated VMT that is below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted SB 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's *Technical Advisory on Evaluating Transportation Impacts in CEQA*. As discussed in **Section 4.12: Transportation**, the proposed project would result in a significant VMT impact if the project VMT would exceed 85 percent of the citywide average VMT per multifamily dwelling unit under existing conditions. As identified in **Section 4.12**, the proposed project is expected to result in 46.3 VMT per multifamily dwelling unit, which would exceed the 44.1 VMT per multifamily dwelling unit threshold by approximately 5 percent. Therefore, implementation of vehicle trip reduction programs would be required. **Mitigation Measure (MM) TRA-1**, which is discussed further in **Section 4.12**, would require the implementation of a Transportation Demand Management (TDM) Program, which would provide the required reduction in the VMT per multifamily dwelling unit, reducing the project's VMT impact to a less-than-significant level. Therefore, this impact would be less than significant with mitigation. As such, the proposed project would be consistent with this design element.

Electric Vehicle Charging Requirements. This criterion requires that the project achieve compliance with off-street electric vehicle (EV) charging requirements in the most recently adopted version of CALGreen Tier 2. As discussed in **Chapter 3.0: Project Description**, the project would be consistent with the CALGreen Code's 2022 mandatory EV charging requirements for EVSE, EV ready, and EV capable spaces. The project would also include

additional EV capable spaces with the necessary conduits so that they may be converted in the future into additional charging stations and/or EV ready spaces to assist the project in meeting CALGreen Tier 2 level requirements. As such, the proposed project would be consistent with this design element.

As discussed above, the new thresholds put forth by the BAAQMD do not apply to this project, and the discussion of the project's consistency with these thresholds has been provided for informational purposes. The analysis shows that the proposed project would be substantially consistent with the BAAQMD's project design elements related to natural gas, energy, electric vehicles, and VMT with implementation of **Mitigation Measure TRA-1**.

In summary, based on the estimated emissions, operation of the project would not generate GHG emissions, either directly or indirectly, that would have a significant impact on the environment.

Level of Significance prior to Mitigation: Less than Significant

Mitigation Measures: No mitigation measures are required.

Level of Significance after Mitigation: Not Applicable

4.7.5.2 Greenhouse Gas Emissions Policies

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

As discussed above, the City of Fairfield is currently preparing a new Climate Action Plan that will contain a series of measures to bring down the City's GHG emissions consistent with GHG reduction goals through the year 2050. As the plan is still under preparation, the project's consistency with that plan cannot be evaluated. Instead, the project's consistency with GHG related policies in the *City of Fairfield General Plan* is evaluated below.

As described above, the *City of Fairfield General Plan* includes policies pertaining to GHG emissions that would be applicable to the proposed project. The proposed project would be consistent with Policies OS 8.2 and OS 8.3 as the proposed project would provide housing near existing business, commercial, and employment centers in the City of Fairfield, reducing the demand for travel by single occupancy vehicles. In addition, as identified above, the project would be consistent with CALGreen's 2022 mandatory EV parking requirements for EVSE, EV ready, and EV capable spaces, with additional EV capable spaces to assist the project in meeting CALGreen Tier 2 level requirements. Therefore, the proposed project would support the use of zero emission vehicles, promote the use of alternative modes of transportation, and implement **Mitigation Measure TRA-1**, as provided in **Section 4.12: Transportation**, to further reduce vehicle trips and VMT.

Consistent with Policy OS 8.5, the proposed project would comply with and exceed the latest Title 24 standards of the California Code of Regulations, established by the California Energy Commission (CEC), regarding energy conservation and green building standards. The proposed project would include the following sustainability features: a minimum of 15 percent of the roof areas would be

reserved for future photovoltaic (PV) solar installation; the building would be equipped with automated electrical lighting controls and occupancy sensor technology; all appliances would be electric and ENERGY STAR certified; all water fixtures (faucets, showerheads, and toilets) would be low flow and/or WaterSense certified for low water use; windows would be treated with energy efficient low emissivity (Low-E) coatings; paint would have reduced amounts of volatile organic compounds (low VOC) and be Leadership in Energy and Environmental Design (LEED) version 4 qualified; heating, ventilation, and air conditioning (HVAC) equipment would consist of high-efficiency ENERGY STAR certified condensing units with a seasonal energy efficiency rating (SEER) of 15; roofing material would include an ENERGY STAR rated thermoplastic polyolefin (TPO) membrane to reflect ultraviolet rays and heat from the building; high-efficiency central heat pump boiler system would be installed for efficient hot water distribution throughout the residential building; floor systems would be fully insulated, and 2-inch by 6-inch exterior walls would provide added building insulation; energy efficient light-emitting diode (LED) light fixtures would be installed in the apartment building and for exterior lighting; and new landscape plants would be drought tolerant, native to California or other Mediterranean climates, or other low water use species. Therefore, the proposed project would not conflict with the *City of Fairfield General Plan* policies related to climate change.

In addition, the project was analyzed to determine whether it would conflict with the goals of AB 32, the AB 32 Scoping Plan, EO B-30-15, SB 32, AB 197, EO S-2-05, and EO B-55-18.

AB 32 is aimed at reducing GHG emissions to 1990 levels by 2020. AB 32 required the CARB to prepare a Scoping Plan that outlined the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The AB 32 Scoping Plan has a range of GHG reduction actions, which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program. In 2015, EO B-30-15 added the target of reducing the State's GHG emissions to 40 percent below 1990 levels by 2030. The CARB released a second update to the Scoping Plan, the 2017 Scoping Plan, to reflect the 2030 target set by EO B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15.³⁰ SB 32 builds on AB 32 and keeps the State on the path toward achieving the 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by the CARB was posted in December 2016. EO B-55-18 sets a goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter, and directs the CARB to update the Scoping Plan consistent with this objective.

As identified above, the AB 32 Scoping Plan contains GHG reduction measures that work towards reducing GHG emissions, consistent with the targets set by AB 32, EO B-30-15 and codified by SB 32 and AB 197. The measures applicable to the proposed project include energy efficiency measures, water conservation and efficiency measures, and transportation and motor vehicle measures, as

³⁰ CARB. 2017. *California's 2017 Climate Change Scoping Plan*. November.

discussed below. The Scoping Plan also promotes in-fill development as essential elements towards achieving statewide GHG reduction goals; the project would occupy an infill site.

Energy Measures. Energy efficient measures in the AB 32 Scoping Plan are intended to maximize energy efficient building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. As described above, the proposed project would be required to comply with the latest Title 24 standards, regarding energy conservation and green building standards. In addition, the proposed project would include the following sustainability features: a minimum of 15 percent of the roof areas would be reserved for future PV solar installation; the building would be equipped with automated electrical lighting controls and occupancy sensor technology; all appliances would be electric and ENERGY STAR certified; all water fixtures (faucets, showerheads, and toilets) would be low flow and/or WaterSense certified for low water use; windows would be treated with energy efficient Low-E coatings; paint would have reduced amounts of low VOC and be LEED version 4 qualified; HVAC equipment would consist of high-efficiency ENERGY STAR certified condensing units with a SEER of 15; roofing material would include an ENERGY STAR rated TPO membrane to reflect ultraviolet rays and heat from the building; high-efficiency central heat pump boiler system would be installed for efficient hot water distribution throughout the residential building; floor systems would be fully insulated, and 2-inch by 6-inch exterior walls would provide added building insulation; energy efficient LED light fixtures would be installed in the apartment building and for exterior lighting; and new landscape plants would be drought tolerant, native to California or other Mediterranean climates, or other low water use species. Therefore, the proposed project would not conflict with applicable energy measures.

Water Conservation and Efficiency Measures. Water conservation and efficiency measures in the AB 32 Scoping Plan are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. As noted above, the project would comply with the latest Title 24 standards, which include a variety of different measures, including reduction of wastewater and water use. In addition, all water fixtures (faucets, showerheads, and toilets) would be low flow and/or WaterSense certified for low water use; a central heat pump boiler system would be installed would be installed for efficient hot water distribution throughout the residential building; and new landscape plants would be drought tolerant, native to California or other Mediterranean climates, or other low water use species. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

Transportation and Motor Vehicle Measures. The goal of transportation and motor vehicle measures in the AB 32 Scoping Plan is to develop regional GHG emissions reduction targets for passenger vehicles. The second phase of Pavley standards will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. However, vehicles traveling to and from the project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. Therefore,

the proposed project would not conflict with the identified transportation and motor vehicle measures.

As described above, the proposed project would provide housing near existing business, commercial, and employment centers in the City of Fairfield, reducing the demand for travel by single occupancy vehicles. In addition, as identified above, the project would be consistent with the CALGreen Code's 2022 mandatory EV parking requirements for EVSE, EV ready, and EV capable spaces, with additional EV capable spaces to assist the project in meeting CALGreen Tier 2 level requirements. Therefore, the proposed project would support the use of zero emission vehicles, promote the use of alternative modes of transportation, and implement **Mitigation Measure TRA-1** to reduce vehicle trips and VMT.

As demonstrated above, the proposed project would not conflict with applicable Statewide action measures. The proposed project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals identified in AB 32, the AB 32 Scoping Plan, EO B-30-15, SB 32, and AB 197 and would be consistent with applicable State plans and programs designed to reduce GHG emissions. Furthermore, the analysis in **Impact GHG-1** shows that the project's emissions would be below the threshold developed by scaling the BAAQMD 2020 threshold consistent with GHG reduction targets set forth in SB 32, EO B-30-15, and EO B-55-18. Therefore, the proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. This impact would be less than significant.

Level of Significance prior to Mitigation: Less than Significant

Mitigation Measures: No mitigation measures are required.

Level of Significance after Mitigation: Not Applicable

4.7.5.3 Cumulative Impacts

Cumulative Impact C-GHG-1: The proposed project, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not result in significant cumulative impacts related to greenhouse gases.

Cumulative impacts are the collective impacts of one or more past, present, or future projects that, when combined, result in adverse changes to the environment. Climate change is a global environmental problem in which: (a) any given development project contributes only a small portion of any net increase in GHGs, and (b) global growth is continuing to contribute large amounts of GHGs across the world. Land use projects may contribute to the phenomenon of global climate change in ways that would be experienced worldwide, and with some specific effects felt in California. However, no scientific study has established a direct causal link between individual land use project impacts and global warming.

The analysis of impacts related to GHG emissions is inherently cumulative. The proposed project would not conflict with applicable Statewide and regional climate action measures. In addition, as discussed above, the project's operational emissions would not exceed the numeric threshold. As

the impact of the project's GHG emissions would be less than significant, the cumulative impact would also be less than significant.

Level of Significance prior to Mitigation: Less than Significant

Mitigation Measures: No mitigation measures are required.

Level of Significance after Mitigation: Not Applicable

This page intentionally left blank