

## 4.6 Greenhouse Gases and Climate Change

This section evaluates the potential for the Project to result in impacts associated with greenhouse gas (GHG) emissions during construction and operation activities.

### 4.6.1 Environmental Setting

Global warming is the name given to the increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal (International Panel on Climate Change [IPCC], 2007) with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last one hundred years. Continued warming is projected to increase global average temperature between 2 and 11 °F over the next one hundred years.

The causes of this warming have been identified as both natural processes and as the result of human actions. The IPCC concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. However, after 1950, increasing GHG concentrations resulting from human activity such as fossil fuel burning and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Increases in GHG concentrations in the Earth's atmosphere are thought to be the main cause of human-induced climate change. GHGs naturally trap heat by impeding the exit of solar radiation that has hit the Earth and is reflected back into space. Some GHGs occur naturally and are necessary for keeping the Earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last hundred years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

The principal GHGs of concern are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). Each of the principal GHGs has a long atmospheric lifetime (one year to several thousand years). In addition, the potential heat trapping ability of each of these gases vary significantly from one another. CH<sub>4</sub> is 23 times as potent as CO<sub>2</sub>, while SF<sub>6</sub> is 22,200 times more potent than CO<sub>2</sub>. Conventionally, GHGs have been reported as CO<sub>2</sub> equivalents (CO<sub>2</sub>e). CO<sub>2</sub>e takes into account the relative potency of non-CO<sub>2</sub> GHGs and converts their quantities to an equivalent amount of CO<sub>2</sub> so that all emissions can be reported as a single quantity.

The primary man-made processes that release these gases include: burning of fossil fuels for transportation, heating, and electricity generation; agricultural practices that release CH<sub>4</sub> such as livestock grazing and crop residue decomposition; and industrial processes that release smaller

amounts of high global warming potential gases such as SF<sub>6</sub>, PFCs, and HFCs. Deforestation and land cover conversion have also been identified as contributing to global warming by reducing the Earth's capacity to remove CO<sub>2</sub> from the air and altering the Earth's albedo or surface reflectance, allowing more solar radiation to be absorbed.

## **Global Climate Trends and Associated Impacts**

The rate of increase in global average surface temperature over the last hundred years has not been consistent; the last three decades have warmed at a much faster rate – on average 0.32 °F per decade. Eleven of the twelve years from 1995 to 2006, rank among the twelve warmest years in the instrumental record of global average surface temperature (going back to 1850) (IPCC, 2007).

During the same period over which this increased global warming has occurred, many other changes have occurred in other natural systems. Sea levels have risen on average 1.8 millimeters per year (mm/yr); precipitation patterns throughout the world have shifted, with some areas becoming wetter and others drier; tropical cyclone activity in the North Atlantic has increased; peak runoff timing of many glacial and snow fed rivers has shifted earlier; as well as numerous other observed conditions. Though it is difficult to prove a definitive cause and effect relationship between global warming and other observed changes to natural systems, there is high confidence in the scientific community that these changes are a direct result of increased global temperatures (IPCC, 2007).

## **California Climate Trends and Associated Impacts**

Maximum (daytime) and minimum (nighttime) temperatures are increasing almost everywhere in California but at different rates. The annual minimum temperature averaged over all of California has increased 0.33 °F per decade during the period 1920 to 2003, while the average annual maximum temperature has increased 0.1 °F per decade (Moser et al., 2009).

With respect to California's water resources, the most significant impacts of global warming have been changes to the water cycle and sea level rise. Over the past century, the precipitation mix between snow and rain has shifted in favor of more rainfall and less snow (Mote et al., 2005; Knowles and Cayan, 2006) and snow pack in the Sierra Nevada is melting earlier in the spring (Kapnick and Hall, 2009). The average early spring snowpack in the Sierra Nevada has decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage (DWR, 2008). These changes have significant implications for water supply, flooding, aquatic ecosystems, energy generation, and recreation throughout the state. During the same period, sea levels along California's coast rose seven inches (DWR, 2008). Sea level rise associated with global warming will continue to threaten coastal lands and infrastructure, increase flooding at the mouths of rivers, place additional stress on levees in the Sacramento-San Joaquin Delta, and will intensify the difficulty of managing the Sacramento-San Joaquin Delta as the heart of the state's water supply system.

## Bay Area Emissions

In the San Francisco Bay Area, GHG emissions from the transportation sector and industrial/commercial sector represent the largest sources of the Bay Area's GHG emissions, accounting for 36.4 percent each of the Bay Area's 95.8 million tons of CO<sub>2</sub>e in 2007. Electricity/co-generation sources account for about 15.9 percent of the Bay Area's GHG emissions, followed by residential fuel usage at about 7.1 percent. Off-road equipment and agricultural/farming sources currently account for approximately 3 percent and 1.2 percent of the total Bay Area GHG emissions, respectively (BAAQMD, 2010).

## City of Walnut Creek Emissions

Walnut Creek GHG emissions from the transportation sector represent the largest sources of the community's GHG emissions, accounting for 59 percent of Walnut Creek's 643,596 metric tons of CO<sub>2</sub>e in 2005. The residential sector accounted for 18 percent, as did the commercial/industrial sector. The waste and off-road sectors each accounted for two percent of the inventory, followed by water at one percent and BART accounting for less than one percent (City of Walnut Creek, 2011).

### 4.6.2 Regulatory Setting

#### Federal

##### ***U.S. Environmental Protection Agency Endangerment and Cause and Contribute Findings***

In the past, the U.S. Environmental Protection Agency (EPA) has not regulated GHGs under the Clean Air Act because it asserted that the act did not authorize the U.S. EPA to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the increase in global surface air temperatures. However, the U.S. Supreme Court held that the U.S. EPA must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.*, twelve states and cities, including California, together with several environmental organizations, sued to require the U.S. EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 (2007)). The Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and the U.S. EPA did not have a valid rationale for not regulating GHGs. On December 7, 2009, the Administrator signed two distinct findings regarding GHGs under Section 202(a) of the federal CAA:

- ***Endangerment Finding:*** the current and projected concentrations of the six key well-mixed GHGs—CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, and SF<sub>6</sub>—in the atmosphere threaten the public health and welfare of current and future generations.
- ***Cause or Contribute Finding:*** The Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

### ***Mandatory Greenhouse Gas Reporting Rule***

On September 22, 2009, U.S. EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required U.S. EPA to develop "... mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy..." The Reporting Rule will apply to most entities that emit 25,000 metric tons of CO<sub>2</sub>e or more per year. Starting in 2010, facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandates recordkeeping and administrative requirements in order for U.S. EPA to verify annual GHG emissions reports.

## **State**

### ***California Environmental Quality Act and Climate Change***

The California Environmental Quality Act (CEQA) requires lead agencies to consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to: raise sea levels, affect rainfall and snowfall, and affect habitat.

### ***Assembly Bill 1493***

In 2002, then-Governor Gray Davis signed AB 1493, which required the California Air Resources Board (CARB) to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, the CARB approved amendments to the California Code of Regulations (CCR) in 2004, adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1), require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight [GVW] rating of less than 10,000 pounds and which is designed primarily for the transportation of persons), beginning with model year 2009. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for model year 2016 are approximately 37 percent lower than the limits for the first year of the regulations, model year 2009. For light-duty trucks with an LVW of 3,751 pounds to a GVW of 8,500 pounds, as well as for medium-duty passenger vehicles, GHG emissions will be reduced approximately 24 percent between 2009 and 2016.

Because the Pavley standards (named for the bill's author, state Senator Fran Pavley) would impose stricter standards than those under the federal CAA, California applied to the U.S. EPA

for a waiver under the federal CAA; this waiver was denied in 2008. In 2009, however, the U.S. EPA granted the waiver.

### ***Executive Order S-3-05***

In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide GHG emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

### ***Assembly Bill 32 and the California Climate Change Scoping Plan***

In 2006, the California legislature passed Assembly Bill 32 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires the CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions).

Pursuant to AB 32, the CARB adopted a Scoping Plan in December 2008, which was re-approved by CARB on August 24, 2011 (CARB, 2008), outlining measures to meet the 2020 GHG reduction limits. In order to meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business as usual emissions levels or about 15 percent from today's levels. The Scoping Plan recommends measures that are worth studying further, and which the State may implement, such as new fuel regulations. It estimates that a reduction of 174 million metric tons of CO<sub>2</sub>e (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and other sources, could be achieved should the State implement all the measures summarized in **Table 4.6-1** below. The CARB has identified an implementation timeline for the GHG reduction strategies in the Scoping Plan. Some measures may require new legislation to implement, some will require subsidies, some have already been developed, and some will require additional effort to evaluate and quantify. Additionally, some emissions reductions strategies may require their own environmental review under CEQA or the National Environmental Policy Act (NEPA).

AB 32 also anticipates that local government actions will result in reduced GHG emissions. CARB has identified a GHG reduction target of 15 percent from current levels for local governments themselves and notes that successful implementation of the plan relies on local governments' land use planning and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions.

The Scoping Plan relies on the requirements of Senate Bill 375 (discussed below) to implement the carbon emission reductions anticipated from land use decisions. SB 375 was enacted to align local land use and transportation planning to further achieve the state's GHG reduction goals. SB 375 requires regional transportation plans (RTPs), developed by Metropolitan Planning Organizations

**TABLE 4.6-1  
 LIST OF RECOMMENDED ACTIONS BY SECTOR**

<b>Measure No.</b>	<b>Measure Description</b>	<b>GHG Reductions (Annual Million Metric Tons CO<sub>2</sub>e)</b>
<b>Transportation</b>		
T-1	Pavley I and II – Light Duty Vehicle Greenhouse Gas Standards	31.7
T-2	Low Carbon Fuel Standard (Discrete Early Action)	15
T-3 <sup>1</sup>	Regional Transportation-Related Greenhouse Gas Targets	5
T-4	Vehicle Efficiency Measures	4.5
T-5	Ship Electrification at Ports (Discrete Early Action)	0.2
T-6	Goods Movement Efficiency Measures. <ul style="list-style-type: none"> <li>• Ship Electrification at Ports</li> <li>• System-Wide Efficiency Improvements</li> </ul>	3.5
T-7	Heavy-Duty Vehicle Greenhouse Gas Emission Reduction Measure – Aerodynamic Efficiency (Discrete Early Action)	0.93
T-8	Medium- and Heavy-Duty Vehicle Hybridization	0.5
T-9	High Speed Rail	1
<b>Electricity and Natural Gas</b>		
E-1	Energy Efficiency (32,000 GWh of Reduced Demand) <ul style="list-style-type: none"> <li>• Increased Utility Energy Efficiency Programs</li> <li>• More Stringent Building &amp; Appliance Standards</li> </ul> Additional Efficiency and Conservation Programs	15.2
E-2	Increase Combined Heat and Power Use by 30,000 GWh (Net reductions include avoided transmission line loss)	6.7
E-3	Renewables Portfolio Standard (33% by 2020)	21.3
E-4	Million Solar Roofs (including California Solar Initiative, New Solar Homes Partnership and solar programs of publicly owned utilities) <ul style="list-style-type: none"> <li>• Target of 3000 MW Total Installation by 2020</li> </ul>	2.1
CR-1	Energy Efficiency (800 Million Therms Reduced Consumptions) <ul style="list-style-type: none"> <li>• Utility Energy Efficiency Programs</li> <li>• Building and Appliance Standards</li> <li>• Additional Efficiency and Conservation Programs</li> </ul>	4.3
CR-2	Solar Water Heating (AB 1470 goal)	0.1
<b>Green Buildings</b>		
GB-1	Green Buildings	26
<b>Water</b>		
W-1	Water Use Efficiency	1.4†
W-2	Water Recycling	0.3†
W-3	Water System Energy Efficiency	2.0†
W-4	Reuse Urban Runoff	0.2†
W-5	Increase Renewable Energy Production	0.9†
W-6	Public Goods Charge (Water)	TBD†
<b>Industry</b>		
I-1	Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	TBD
I-2	Oil and Gas Extraction GHG Emission Reduction	0.2
I-3	GHG Leak Reduction from Oil and Gas Transmission	0.9
I-4	Refinery Flare Recovery Process Improvements	0.3
I-5	Removal of Methane Exemption from Existing Refinery Regulations	0.01

**TABLE 4.6-1 (Continued)  
LIST OF RECOMMENDED ACTIONS BY SECTOR**

Measure No.	Measure Description	GHG Reductions (Annual Million Metric Tons CO <sub>2</sub> e)
<b>Recycling and Waste Management</b>		
RW-1	Landfill Methane Control (Discrete Early Action)	1
RW-2	Additional Reductions in Landfill Methane <ul style="list-style-type: none"> <li>Increase the Efficiency of Landfill Methane Capture</li> </ul>	TBD†
RW-3	High Recycling/Zero Waste <ul style="list-style-type: none"> <li>Commercial Recycling</li> <li>Increase Production and Markets for Compost</li> <li>Anaerobic Digestion</li> <li>Extended Producer Responsibility</li> <li>Environmentally Preferable Purchasing</li> </ul>	9†
<b>Forests</b>		
F-1	Sustainable Forest Target	5
<b>High Global Warming Potential (GWP) Gases</b>		
H-1	Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Services (Discrete Early Action)	0.26
H-2	SF <sub>6</sub> Limits in Non-Utility and Non-Semiconductor Applications (Discrete Early Action)	0.3
H-3	Reduction of Perfluorocarbons in Semiconductor Manufacturing (Discrete Early Action)	0.15
H-4	Limit High GWP Use in Consumer Products Discrete Early Action (Adopted June 2008)	0.25
H-5	High GWP Reductions from Mobile Sources <ul style="list-style-type: none"> <li>Low GWP Refrigerants for New Motor Vehicle Air Conditioning Systems</li> <li>Air Conditioner Refrigerant Leak Test During Vehicle Smog Check</li> <li>Refrigerant Recovery from Decommissioned Refrigerated Shipping Containers</li> <li>Enforcement of Federal Ban on Refrigerant Release during Servicing or Dismantling of Motor Vehicle Air Conditioning Systems</li> </ul>	3.3
H-6	High GWP Reductions from Stationary Sources <ul style="list-style-type: none"> <li>High GWP Stationary Equipment Refrigerant Management Program: <ul style="list-style-type: none"> <li>Refrigerant Tracking/Reporting/Repair Deposit Program</li> <li>Specifications for Commercial and Industrial Refrigeration Systems</li> </ul> </li> <li>Foam Recovery and Destruction Program</li> <li>SF Leak Reduction and Recycling in Electrical Applications</li> <li>Alternative Suppressants in Fire Protection Systems</li> <li>Residential Refrigeration Early Retirement Program</li> </ul>	10.9
H-7	Mitigation Fee on High GWP Gases	5
<b>Agriculture</b>		
A-1	Methane Capture at Large Dairies	1.0†

<sup>1</sup> This is not the SB 375 regional target. CARB will establish regional targets for each Metropolitan Planning Organization (MPO) region following the input of the regional targets advisory committee and a consultation process with MPO's and other stakeholders per SB 375.  
† GHG emission reduction estimates are not included in calculating the total reductions needed to meet the 2020 target.

(MPOs), to incorporate a “sustainable communities strategy” that would achieve GHG emission reduction targets set by the CARB. SB 375 also includes provisions for streamlined CEQA review for some infill projects, such as transit-oriented development. SB 375 would be implemented over the next several years. The Metropolitan Transportation Commission (MTC) is responsible for developing RTPs for the Bay Area. MTC’s 2013 RTP will be its first plan subject to SB 375.

### ***Executive Order S-1-07***

Executive Order S-1-07, signed by then-Governor Schwarzenegger in 2007, proclaimed that the transportation sector is the main source of GHG emissions in California, at over 40 percent of statewide emissions. The order established a goal of reducing the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020. It also directed the CARB to determine whether this Low Carbon Fuel Standard could be adopted as a discrete, early-action measure after meeting the mandates in AB 32. The CARB adopted the Low Carbon Fuel Standard on April 23, 2009.

### ***Senate Bill 1078 and 107 and Executive Order S-14-08 and S-21-09***

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the CARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020. The 33 percent by 2020 goal was codified in April 2011 with Senate Bill X1-2, which was signed by Governor Edmund G. Brown, Jr. This new RPS preempts the CARB 33 percent Renewable Electricity Standard and applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement being met by the end of 2020.

### ***Senate Bill 1368***

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a GHG emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) was also required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

### ***Senate Bill 97***

SB 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue requiring analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Natural Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, no later than July 1, 2009. The California Natural Resources Agency was

required to certify or adopt those guidelines by January 1, 2010. On December 30, 2009, the Natural Resources Agency adopted the state CEQA Guidelines amendments, as required by SB 97. These state CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments were reviewed by the Office of Administrative Law and became effective March 18, 2010.

### **Senate Bill 375**

In addition to policy directly guided by AB 32, the legislature in 2008 passed SB 375, which provides for regional coordination in land use and transportation planning and funding to help meet the AB 32 GHG reduction goals. SB 375 aligns regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires RTPs developed by the state's 18 MPOs to incorporate a "sustainable communities strategy" (SCS) that will achieve GHG emission reduction targets set by the CARB.

## **Local**

### **Bay Area Air Quality Management District**

In June 2010, BAAQMD issued its *CEQA Air Quality Guidelines*, replacing former guidelines adopted in December 1999, and adopted new thresholds of significance to assist lead agencies in determining when potential air quality impacts would be considered significant under CEQA. Updated in May 2011, these guidelines include recommendations for analytical methodologies to determine air quality impacts and identify mitigation measures that can be used to avoid or reduce air quality impacts, including for GHGs (BAAQMD, 2011). Separate thresholds are established for operational emissions from stationary sources (such as generators, furnaces, and boilers) and non-stationary sources (such as on-road vehicles). As no threshold has been established for construction-related emissions, operational emissions standards apply. The threshold for stationary sources is 10,000 MT of CO<sub>2</sub>e/year. For non-stationary sources, three separate thresholds have been established:

- Compliance with Qualified Greenhouse Gas Reduction Strategy (i.e., if a project is found to be out of compliance with a Qualified Greenhouse Gas Reduction Strategy, its GHG emissions may be considered significant); or
- 1,100 MT of CO<sub>2</sub>e/yr; or
- 4.6 MT CO<sub>2</sub>e/service population/yr (service population is the sum of residents plus employees expected for a development project).<sup>1</sup>

For quantifying a project's GHG emissions, BAAQMD recommends that all GHG emissions from a project be estimated, including a project's direct and indirect GHG emissions from operations. Direct emissions refer to emissions produced from onsite combustion of energy, such as natural gas used in furnaces and boilers, emissions from industrial processes, and fuel

<sup>1</sup> For retail and mixed-use projects, this threshold counts trips from retail customers but does not include retail customers in the service population. Consequently, it overestimates the contribution of these projects to greenhouse gas emissions.

combustion from mobile sources. Indirect emissions are emissions produced offsite from energy production and water conveyance due to a project's energy use and water consumption. The District has provided guidance on detailed methods for modeling GHG emissions from proposed projects (BAAQMD, 2011).

The thresholds BAAQMD adopted were called into question by an order issued March 5, 2012 in *California Building Industry Association v. BAAQMD*, Alameda Superior Court Case No. RGI0548693. The order requires the BAAQMD thresholds to be subject to further environmental review. The claims made in the case concerned the CEQA impacts of adopting the thresholds, i.e., how the thresholds would affect land use development patterns, and petitioners argued that the thresholds for greenhouse gases favor residential projects at the expense of mixed use projects. The land use development effects of adopting the thresholds are not relevant to this Project, because the proposal to expand Broadway Plaza was not influenced by the BAAQMD guidelines. Moreover, the claims indicate that the BAAQMD thresholds are overly-conservative (i.e., overly protective of the environment) when applied to retail or mixed use projects. Accordingly, use of the BAAQMD thresholds will not understate the project's contribution towards global warming.

### ***City of Walnut Creek***

Chapter 4, Built Environment, of the *Walnut Creek General Plan 2025* (City of Walnut Creek, 2006) includes the following goals and policies that are relevant to GHGs in Walnut Creek:

- **Goal 3:** Encourage housing and commercial mixed-use development in selected locations that enhances pedestrian access and reduces traffic.
  - *Policy 3.1:* Create opportunities for mixed-use developments.
- **Goal 12:** Make more efficient use of the regional and subregional transportation system.
  - *Policy 12.1:* Promote the use of carpools and vanpools.
  - *Policy 12.2:* Support infill and redevelopment in existing urban areas.
- **Goal 27:** Promote “green” development and redevelopment.
  - *Policy 27.1:* Encourage resource-efficient building techniques, materials, and technologies in new construction and renovation.
- **Goal 28:** Promote energy conservation.
  - *Policy 28.2:* Promote energy conservation throughout the city.
- **Goal 29:** Promote water conservation.
  - *Policy 29.2:* Promote water conservation throughout the community.
- **Goal 30:** Meet or exceed State goals for source reduction and waste diversion.
  - *Policy 30.2:* Promote source reduction and recycling throughout the community.
  - *Policy 30.3:* Provide opportunities for residents and businesses to divert organic waste from landfill disposal.

- **Goal 31:** Strive to meet State and federal air-quality standards for the region.
  - *Policy 31.1:* Work with the Bay Area Air Quality Management District (BAAQMD) and the County in promoting better air quality.
  - *Policy 31.2:* Consider additional land use and development criteria, standards, and decisions that have positive impacts on air quality and quality of life in general.

The City of Walnut Creek released its draft *Climate Action Plan* in August 2011. This plan presents a number of reduction strategies that focus on municipal and community-wide energy use, transportation, land use, and solid waste GHG sources. The plan focuses primarily on steps needed to reach the 15 percent reduction below 2005 levels by 2020 (City of Walnut Creek, 2011). The plan may be adopted before this Project is considered by the Council, and the Project's consistency with the draft CAP is therefore evaluated. More specifically, the draft Climate Action Plan:

- Identifies sources of greenhouse gas emissions from sources within the City of Walnut Creek's jurisdictional/political boundary and estimates how these emissions may change over time;
- Outlines ways in which the City can prepare for and adapt to the consequences of climate change;
- Discusses the various outcomes of reduction efforts and how these reduction efforts can be implemented and advertised;
- Provides energy use, transportation, land use and solid waste strategies to reduce Walnut Creek's greenhouse gas emissions levels to 15 percent below 2005 levels by 2020;
- Mitigates Walnut Creek's impacts on climate change by reducing greenhouse gas emissions consistent with AB32, Governor's Order S-03-05, and Public Resources Code Section 21083.3;
- Provides substantial evidence that the emission reductions estimated in the Climate Change Action Plan are feasible;
- Meets the requirements of the BAAQMD criteria for a qualified greenhouse gas reduction strategy as defined in the Districts CEQA Air Quality Guidelines.

### 4.6.3 Impacts and Mitigation Measures

#### Significance Criteria

The Project would have a significant effect if it were to:

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

## Significance Thresholds

In accordance with the BAAQMD *CEQA Air Quality Guidelines*, this Project would be considered to have a significant impact if it would emit GHGs greater than 1,100 metric tons per year CO<sub>2</sub>e from sources other than permitted stationary sources or more than 4.6 metric tons of CO<sub>2</sub>e per service population annually. The BAAQMD *CEQA Guidelines* also state that a project or plan that is consistent with an adopted GHG Reduction Strategy would be considered to have a less than significant impact. As noted above, the City of Walnut Creek has released a draft Climate Action Plan (e.g., Reduction Strategy) for reducing GHG emissions from municipal and community-wide sources.

## Approach to Analysis

This analysis uses both a quantitative and a qualitative approach. The quantitative approach is used to answer the first threshold: would the Project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. The quantitative threshold discussed above is used to determine if this threshold is met.

The qualitative approach addresses the second threshold: would the Project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. If a project implements reduction strategies identified in AB 32, the Governor's E.O. S-3-05, or other strategies to help toward reducing GHGs to the level proposed by the Governor and targeted by the City of Walnut Creek, it could reasonably follow that the project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. In addition, a project could reduce a potential cumulative contribution to GHG emissions through energy efficiency features, density and locale (e.g., compact development near transit and activity nodes of work or shopping) or by contributing to available mitigation programs, such as reforestation, tree planting, or carbon trading.

## Methods

GHG emissions resulting from the Project were estimated using the California Emissions Estimator Model (CalEEMod). BAAQMD acknowledges CalEEMod as an appropriate tool for assessment of air quality impacts relative to CEQA. (Kirk, 2012.) Vehicle trips assumed default trip lengths for urban land uses, which are embedded in CalEEMod. The model makes adjustments for implementation of Pavley vehicle standards and Low Carbon Fuel Standards. Model data and additional assumptions are included in Appendix E to this Draft EIR. Construction emissions were also estimated using CalEEMod for equipment and truck exhaust and construction worker vehicles.

Area and indirect sources associated with the Project would primarily result from electrical usage, water and wastewater transport (the energy used to pump water and wastewater to and from the Project) and solid waste generation. GHG emissions from electrical usage are generated when energy consumed on the site is generated by fuel combustion. GHG emissions from water and wastewater transport are also indirect emissions resulting from the energy required to transport

water from its source, and the energy required to treat wastewater and transport it to its treated discharge point. Solid waste emissions are generated when the increased waste generated by the Project are taken to a landfill to decompose. GHG emissions from electrical usage, water and wastewater conveyance, and solid waste were estimated using the CalEEMod model.

### ***Cumulative Approach***

There is no potential for this single Project to emit enough greenhouse gases to cause global warming or climate change. The impact of greenhouse gases is by its nature only cumulative in scope because the impact of climate change is global. Therefore, there are no separate project-specific impact discussions for greenhouse gases. In addition, it is important to acknowledge that new development does not necessarily create entirely new GHG emissions. Since most of the persons who will visit or occupy new development will come from other locations where they were already causing such GHG emissions, new development tends to redistribute the location of emissions sources.

### ***Contribution Toward Cumulative Impacts by Project Scenario***

For all significance criteria relating to greenhouse gases, Project-related emissions are discussed together under a single Impact Statement for each criterion. Where appropriate, specific discussions are provided for the Maximum Commercial Scenario and the Maximum Mixed-Use Scenario under each criterion.

## **Impacts**

### ***Generation of GHG Emissions***

#### **Impact GHG-1: Construction and operation of the Project would result in a cumulatively considerable contribution towards global climate change (Criterion 1). (Significant)**

Application of BAAQMD's project-specific GHG emissions thresholds is to include both direct emissions from a project's vehicle trip generation and onsite water and space heating and other stationary sources, as well as indirect emissions from off-site electrical generation and water conveyance and treatment.

Overall, the following activities associated with the Project could contribute to the generation of GHG emissions:

- ***Construction Activities.*** The Project would involve construction. Construction equipment typically uses fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO<sub>2</sub>, methane and N<sub>2</sub>O. Furthermore, methane is emitted during the fueling of heavy equipment.
- ***Solid Waste Disposal Emissions.*** The Project would generate solid waste. Resulting emissions associated with waste generation and disposal in landfills are indirect. Landfills emit anthropogenic methane from the anaerobic breakdown of material.

- **Gas, Electric and Water Use.** The Project would utilize gas, electricity and water. Natural gas use results in the emissions of two GHGs: methane (the major component of natural gas) and CO<sub>2</sub> from the combustion of natural gas. Methane is released prior to initiation of combustion of the natural gas (as before a flame on a stove is sparked), and from the small amount of methane that is uncombusted in a natural gas flame. Electricity use can result in GHG production if the electricity is generated by combusting fossil fuel. California's water conveyance system is energy intensive.
- **Motor Vehicle Use.** The Project would generate motor vehicle trips. Transportation associated with the Project would result in GHG emissions from the combustion of fossil fuels in daily automobile and truck trips. However, these emissions would not be "new" since drivers are likely relocated from another area.
- **Stationary Sources.** The Project does not propose any new or expanded stationary sources that emit GHGs.

GHG emissions associated with the construction phase of either the Maximum Commercial Scenario or the Maximum Mixed-Use Scenario would result in a maximum annual generation of 1,937 metric tons of CO<sub>2</sub>e, as shown in Appendix E to this Draft EIR. In addition, **Tables 4.6-2** and **4.6-3** present a gross estimate of each scenario's unmitigated and mitigated operational CO<sub>2</sub>e emissions resulting from the increases in motor vehicle trips resulting from each scenario's grid electricity usage, solid waste, as well as from other sources (including area sources, natural gas combustion, and water/wastewater conveyance). Data in Tables 4.6-2 and 4.6-3 indicate that GHG emissions that would result from both Project scenarios would exceed the 1,100 metric tons per year and the 4.6 metric tons of CO<sub>2</sub>e annually per service population thresholds established by BAAQMD. This would represent a cumulatively significant impact.

**Mitigation Measure GHG-1:** The applicant shall submit for review and approval to the City of Walnut Creek a Greenhouse Gases Emissions Reduction Plan (GHG plan) containing strategies to increase energy efficiency and reduce GHG emissions from the Project to the greatest extent feasible. The applicant shall implement the approved GHG plan. The GHG plan shall include strategies that exceed those already identified in the Project Description, or required by law, and shall particularly include strategies that reduce emissions generated by motor vehicle emissions (which represent the most significant contribution to total Project GHG emissions). The following strategies were assumed in the mitigated scenario for calculation of GHG emissions after mitigation for the Maximum Commercial Scenario in Table 4.6-2:

- Provide a ride sharing program for which 50 percent of employees are eligible;
- Exceed current Title 24 energy saving requirements by 20 percent;
- Use electrically powered landscape equipment;
- Install low-flow bathroom faucets and toilets; and
- Use Water efficient irrigation systems and landscaping.

The same strategies were assumed in the mitigated scenario for the Maximum Mixed-Use Scenario in Table 4.6-3 but also included:

**TABLE 4.6-2  
 ESTIMATED EMISSIONS OF GREENHOUSE GASES  
 FROM THE MAXIMUM COMMERCIAL SCENARIO OPERATIONS**

Source	Emissions (metric tons CO <sub>2</sub> e per year)
<b>Unmitigated Emissions</b>	
Motor Vehicle Trips	6,908
Energy	1,067
Solid Waste	143
Other Sources (i.e., Area Sources, Water/Wastewater)	69
Total Unmitigated Operational GHG Emissions	8,187
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<i>BAAQMD GHG Brightline Threshold<sup>a</sup></i>	1,100
<i>Significant (Yes or No)?</i>	<b>Yes</b>
Operational GHG Emissions per Service Population (670 jobs)	12.2
<i>BAAQMD Efficiency Threshold</i>	4.6
<i>Significant (Yes or No)?</i>	<b>Yes</b>
<hr/>	
<b>Mitigated Emissions<sup>b</sup></b>	
Motor Vehicle Trips	6,366
Energy	1,000
Solid Waste	143
Other Sources (i.e., Area Sources, Water/Wastewater)	61
Total Mitigated Operational GHG Emissions	7,570
<hr/>	
<i>BAAQMD GHG Brightline Threshold<sup>a</sup></i>	1,100
<i>Significant (Yes or No)?</i>	<b>Yes</b>
Operational GHG Emissions per Service Population (670 jobs)	11.3
<i>BAAQMD Efficiency Threshold</i>	4.6
<i>Significant (Yes or No)?</i>	<b>Yes</b>
<hr/>	
<p><sup>a</sup> GHG emissions from vehicles and area sources (including natural gas combustion) associated with the Project scenarios were calculated using CalEEMod model Version 2011.1.1 and trip generation data from the Project scenario traffic analysis. Additional data and assumptions are included in Appendix E.</p> <p><sup>b</sup> Mitigation Measure GHG-1 was incorporated into CalEEMod using default model reduction percentages that factored into the GHG emissions from the respective sources of GHGs for the mitigated scenario. Mitigations were not identified that applied to solid waste. Additional assumptions are included in Appendix E.</p>	

- Install low-flow kitchen faucets and showers; and
- Install energy efficient appliances (washing machines, refrigerators, dishwashers, and fans)

The GHG plan shall also include, but is not limited to, adopting feasible and appropriate greenhouse gas emissions reductions strategies as set forth in the “Community Wide Reduction Measures” section of the City of Walnut Creek Climate Action Plan, which is anticipated to be adopted prior to Project approval.

**TABLE 4.6-3  
 ESTIMATED EMISSIONS OF GREENHOUSE GASES  
 FROM THE MAXIMUM MIXED-USE SCENARIO OPERATIONS**

Source	Emissions (metric tons CO <sub>2</sub> e per year)
<b>Unmitigated Emissions</b>	
Motor Vehicle Trips	4,258
Energy	1,214
Solid Waste	137
Other Sources (i.e., Area Sources, Water/Wastewater)	130
Total Unmitigated Operational GHG Emissions	5,740
<hr/>	
<i>BAAQMD GHG Brightline Threshold<sup>a</sup></i>	1,100
<i>Significant (Yes or No)?</i>	<b>Yes</b>
Operational GHG Emissions per Service Population (866 service population (448 jobs + 418 residents))	6.6
<i>BAAQMD Efficiency Threshold</i>	4.6
<i>Significant (Yes or No)?</i>	<b>Yes</b>
<hr/>	
<b>Mitigated Emissions<sup>b</sup></b>	
Motor Vehicle Trips	4,258
Energy	1,115
Solid Waste	137
Other Sources (i.e., Area Sources,, Water/Wastewater)	111
Total Mitigated Operational GHG Emissions	5,622
<hr/>	
<i>BAAQMD GHG Brightline Threshold<sup>a</sup></i>	1,100
<i>Significant (Yes or No)?</i>	<b>Yes</b>
Operational GHG Emissions per Service Population (866 service population (448 jobs + 418 residents))	6.5
<i>BAAQMD Efficiency Threshold</i>	4.6
<i>Significant (Yes or No)?</i>	<b>Yes</b>

<sup>a</sup> GHG emissions from vehicles and area sources (including natural gas combustion) associated with the Project scenarios were calculated using CalEEMod model Version 2011.1.1 and trip generation data from the Project scenario traffic analysis. Additional data and assumptions are included in Appendix E.

<sup>b</sup> Mitigation Measure GHG-1 was incorporated into CalEEMod using default model reduction percentages that factored into the GHG emissions from the respective sources of GHGs for the mitigated scenario. Mitigations were not identified that applied to solid waste. Additional assumptions are included in Appendix E.

**Significance after Mitigation:** While the measures in Mitigation Measure GHG-1 would reduce the cumulative GHG emissions associated with the Project, the actual reduction would depend on the combination and extent of the measures employed. As shown in **Tables 4.6-2 and 4.6-3**, although these criteria (as assumed using default reductions) would reduce GHG emissions, the Project under either scenario would still result in a cumulatively considerable contribution towards a significant cumulative impact after mitigation, that would be unavoidable.

### **Conflict with an Applicable Plan, Policy, or Regulation**

**The Project would not conflict with an applicable plan, policy, or regulation of an appropriate regulatory agency adopted for the purpose of reducing greenhouse gas emissions (Criterion 2). (Less than Significant)**

Project GHG emissions are not anticipated to conflict with the goals targeted by the City of Walnut Creek which is currently in the process of adopting a Climate Action Plan. The Climate Action Plan strives for a 15 percent reduction in GHGs in year 2020 compared to a baseline of 2005. By implementing infill uses, implementation of either scenario would be consistent with Transportation and Land Use goals within the Climate Action Plan. The plan looks to reductions targets, but does not adopt specific emissions limits. As such, assuming there are no substantial changes made to the Climate Action Plan before it is adopted by the City Council, there are no anticipated conflicts between the Project as proposed and the goals of the Climate Action Plan.

**Mitigation:** None required.

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## **4.6.4 References**

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