

## 5.7 GREENHOUSE GASES AND CLIMATE CHANGE

**NOTE TO READER:** This section of the Partial Recirculated Draft EIR (RDEIR) includes an updated analysis of potential greenhouse gas and climate change impacts. This section was revised to update the analysis based upon updated methods of analysis, updated thresholds in Appendix G of the State CEQA Guidelines, and to reflect new legislation and regulations regarding greenhouse gas and climate change analysis. This section is recirculated in its entirety.

This section evaluates greenhouse gas (GHG) emissions associated with the proposed project and analyzes project compliance with applicable regulations. Consideration of the project's consistency with applicable plans, policies, and regulations, as well as the introduction of new sources of GHGs, is included in this section. GHG technical data is included as Appendix RDEIR-A-1, AIR QUALITY/GREENHOUSE GAS EMISSIONS DATA.

### 5.7.1 ENVIRONMENTAL SETTING

#### CLIMATE AND METEOROLOGY

The proposed project is located five miles east of the City of Redding, between the unincorporated communities of Bella Vista and Palo Cedro, which is in Shasta County at the northern end of the Northern Sacramento Valley Air Basin (NSVAB). The environmental conditions of Shasta County are conducive to potentially adverse air quality conditions. The basin area traps pollutants between two mountain ranges to the east and the west. This problem is exacerbated by a temperature inversion layer that traps air at lower levels below an overlying layer of warmer air. Prevailing winds in the area are from the south and southwest. Sea breezes flow over the San Francisco Bay Area and into the Sacramento Valley, transporting pollutants from the large urban areas. Growth and urbanization in Shasta County have also contributed to an increase in emissions.

The valley is frequently subjected to inversions that, coupled with geographic barriers and high summer temperatures, create a high potential for air pollution problems. Generally, areas below 1,000 feet in elevation within Shasta County experience moderate to poor capability to disperse pollutants in both the horizontal and vertical wind fields. This is, in large measure, due to relatively stable atmospheric conditions which act to suppress vertical air movement. Extremely stable atmospheric conditions referred to as "inversions" act as barriers to the dispersal of pollutants. In valley locations, at or below 1,000 feet in elevation, such as the project area, inversions create a "lid" under which pollutants are trapped. Dust and other pollutants trapped within these inversion layers will not disperse until atmospheric conditions become unstable. This situation creates concentrations of pollutants at or near the ground surface, and as a result may pose significant health risks for plants, animals, and people.

#### SCOPE OF ANALYSIS FOR CLIMATE CHANGE

The study area for climate change and the analysis of GHG emissions is broad as climate change is influenced by world-wide emissions and their global effects. However, the study area is also limited by the State CEQA Guidelines [Section 15064(d)], which directs lead agencies to consider an "indirect physical change" only if that change is a reasonably foreseeable impact which may be caused by the project.

California is a substantial contributor of global GHGs, emitting over 400 million tons of carbon dioxide (CO<sub>2</sub>) per year.<sup>1</sup> Climate studies indicate that California is likely to see an increase of three to four degrees Fahrenheit (°F) over the next century. Methane is also an important GHG that potentially contributes to global climate change. GHGs are global in their effect, which is to increase the earth's ability to absorb heat in the atmosphere. As primary GHGs have a long lifetime in the atmosphere, accumulate over time, and are generally well-mixed, their impact on the atmosphere is mostly independent of the point of emission.

The impact of human activities on global climate change is apparent in the observational record. Air trapped by ice has been extracted from core samples taken from polar ice sheets to determine the global atmospheric variation of CO<sub>2</sub>, methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) from before the start of industrialization (approximately 1750), to over 650,000 years ago. For that period, it was found that CO<sub>2</sub> concentrations ranged from 180 parts per million (ppm) to 300 ppm. For the period from approximately 1750 to the present, global CO<sub>2</sub> concentrations increased from a pre-industrialization period concentration of 280 ppm to 379 ppm in 2005, with the 2005 value far exceeding the upper end of the pre-industrial period range.

## GLOBAL CLIMATE CHANGE – GREENHOUSE GASES

The natural process through which heat is retained in the troposphere is called the “greenhouse effect.”<sup>2</sup> The greenhouse effect traps heat in the troposphere through a threefold process as follows: short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long wave radiation and emit it into space and toward the Earth. This “trapping” of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide (CO<sub>2</sub>). Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long wave radiation. Typical GHGs include the following:<sup>3</sup>

### Water Vapor (H<sub>2</sub>O)

Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively. The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

---

<sup>1</sup> California Energy Commission. *California Greenhouse Gas Inventory for 2000-2012 – Trends of Emissions and Other Indicators*. May 2014.

<sup>2</sup> The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

<sup>3</sup> All Global Warming Potentials are given as 100-year Global Warming Potential. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. ([IPCC] Intergovernmental Panel on Climate Change. 1996. *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*.).

### **Carbon Dioxide (CO<sub>2</sub>)**

Carbon dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, CO<sub>2</sub> emissions from fossil fuel combustion increased by 8.8 percent between 1990 and 2013.<sup>4</sup> Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

### **Methane (CH<sub>4</sub>)**

Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation. Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 25.<sup>5</sup>

### **Nitrous Oxide (N<sub>2</sub>O)**

Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 298.<sup>6</sup>

### **Hydrofluorocarbons (HFCs)**

HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 124 for HFC-152a to 14,800 for HFC-23.<sup>7</sup>

### **Perfluorocarbons (PFCs)**

PFCs are compounds produced as a by-product of various industrial processes associated with aluminum production and the manufacturing of semiconductors. Like HFCs, PFCs generally have long atmospheric lifetimes and high GWPs of approximately 7,390 and 12,200.<sup>8</sup>

### **Sulfur hexafluoride (SF<sub>6</sub>)**

Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the IPCC with a GWP of 22,800. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm], respectively).<sup>9</sup>

---

<sup>4</sup> EPA (U.S. Environmental Protection Agency). 2015. *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2013*. April 15, 2015.

<sup>5</sup> Intergovernmental Panel on Climate Change, *Climate Change 2007: Working Group I: The Physical Science Basis, 2.10.2, Direct Global Warming Potentials*, [https://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch2s2-10-2.html](https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html), accessed on January 20, 2020.

<sup>6</sup> Ibid

<sup>7</sup> Ibid

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

## OTHER GREENHOUSE GAS COMPOUNDS

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone (O<sub>3</sub>) depleters; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

### Hydrochlorofluorocarbons (HCFCs)

HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 77 for HCFC-123 to 2,310 for HCFC-142b.<sup>10</sup>

### 1,1,1 trichloroethane

1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 146 times that of carbon dioxide.<sup>11</sup>

### Chlorofluorocarbons (CFCs)

CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the U.S. Environmental Protection Agency's (EPA) Final Rule (57 FR 3374) for the phase out of O<sub>3</sub> depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,750 for CFC 11 to 14,400 for CFC 13.<sup>12</sup>

## 5.7.2 REGULATORY SETTING

### FEDERAL

#### U.S. Environmental Protection Agency Endangerment Finding

The EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, the EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs (carbon dioxide [CO<sub>2</sub>], methane [CH<sub>4</sub>], nitrous oxide [N<sub>2</sub>O], hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF<sub>6</sub>]) constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and the EPA's assessment of the scientific evidence that form the basis for the EPA's regulatory actions.

---

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

## STATE

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation would be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, instructs the CARB to develop and enforce regulations for the reporting and verification of statewide GHG emissions. AB 32 also directed CARB to set a GHG emissions limit based on 1990 levels, to be achieved by 2020. It set a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner.

### California Air Resource Board Scoping Plan

CARB adopted the Scoping Plan to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that would be adopted to reduce California's GHG emissions. CARB determined that achieving the 1990 emissions level would require a reduction of GHG emissions of approximately 29 percent below what would otherwise occur in 2020 in the absence of new laws and regulations (referred to as "business-as-usual")<sup>13</sup>. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates early actions and additional GHG reduction measures by both CARB and the State's Climate Action Team, identifies additional measures to be pursued as regulations, and outlines the adopted role of a cap-and-trade program<sup>14</sup>. Additional development of these measures and adoption of the appropriate regulations occurred through the end of 2013. Key elements of the Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs, as well as building and appliance standards.
- Achieving a statewide renewables energy mix of 33 percent by 2020.
- Developing a California Cap-and-Trade program that links with other programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions (adopted in 2011).
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets (several sustainable community strategies have been adopted).
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, heavy-duty truck measures, the Low Carbon Fuel Standard

---

<sup>13</sup> CARB defines business-as-usual (BAU) in its Scoping Plan as emissions levels that would occur if California continued to grow and add new GHG emissions but did not adopt any measures to reduce emissions. Projections for each emission-generating sector were compiled and used to estimate emissions for 2020 based on 2002–2004 emissions intensities. Under CARB's definition of BAU, new growth is assumed to have the same carbon intensities as was typical from 2002 through 2004.

<sup>14</sup> The Climate Action Team, led by the secretary of the California Environmental Protection Agency, is a group of State agency secretaries and heads of agencies, boards, and departments. Team members work to coordinate statewide efforts to implement global warming emissions reduction programs and the State's Climate Adaptation Strategy.

---

(amendments to the Pavley Standard adopted 2009; Advanced Clean Car standard adopted 2012), goods movement measures, and the Low Carbon Fuel Standard (adopted 2009).

- Creating targeted fees, including a public goods charge on water use, fees on gasses with high global warming potential, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

In 2012, CARB released revised estimates of the expected 2020 emissions reductions. The revised analysis relied on emissions projections updated in light of current economic forecasts that accounted for the economic downturn since 2008, reduction measures already approved and put in place relating to future fuel and energy demand, and other factors. This update reduced the projected 2020 emissions from 596 million metric tons of CO<sub>2</sub>e<sup>15</sup> (MMTCO<sub>2</sub>e) to 545 MMTCO<sub>2</sub>e. The reduction in forecasted 2020 emissions means that the revised business-as-usual reduction necessary to achieve AB 32's goal of reaching 1990 levels by 2020 is now 21.7 percent, down from 29 percent. CARB also provided a lower 2020 inventory forecast that incorporated State-led GHG emissions reduction measures already in place. When this lower forecast is considered, the necessary reduction from business-as-usual needed to achieve the goals of AB 32 is approximately 16 percent.

CARB adopted the first major update to the Scoping Plan on May 22, 2014. The updated Scoping Plan summarizes the most recent science related to climate change, including anticipated impacts to California and the levels of GHG emissions reductions necessary to likely avoid risking irreparable damage. It identifies the actions California has already taken to reduce GHG emissions and focuses on areas where further reductions could be achieved to help meet the 2020 target established by AB 32.

In 2016, the Legislature passed Senate Bill (SB) 32, which codifies a 2030 GHG emissions reduction target of 40 percent below 1990 levels. With SB 32, the Legislature passed companion legislation, AB 197, which provides additional direction for developing the Scoping Plan. On December 14, 2017 CARB adopted a second update to the Scoping Plan<sup>16</sup>. The 2017 Scoping Plan details how the State will reduce GHG emissions to meet the 2030 target set by Executive Order B-30-15 and codified by SB 32. Other objectives listed in the 2017 Scoping plan are to provide direct GHG emissions reductions; support climate investment in disadvantaged communities; and, support the Clean Power Plan and other Federal actions.

### **Senate Bill 32 and Assembly Bill 197**

SB 32 extended the goals of AB 32 and codified the GHG reduction target of 40 percent below 1990 levels by year 2030, consistent with EO B-30-15. The companion bill to SB 32, AB 197 provides additional direction to CARB for developing the Updated Scoping Plan.

### **Senate Bill 375**

SB 375, known as the Sustainable Communities Strategy and Climate Protection Act, was signed into law in September 2008. SB 375 builds upon AB 32 by requiring CARB to develop regional GHG reduction targets for automobile and light truck sectors for 2020 and 2035, as compared to 2005 emissions levels. SB 375 provides a new planning process to coordinate land use planning, regional transportation plans, and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB

---

<sup>15</sup> Carbon dioxide equivalent or CO<sub>2</sub>e means the number of metric tons of CO<sub>2</sub> emissions with the same global warming potential as one metric ton of another greenhouse gas. "CO<sub>2</sub>e" is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO<sub>2</sub>e signifies the amount of CO<sub>2</sub> which would have the equivalent global warming impact.

<sup>16</sup> California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, [https://www.arb.ca.gov/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf). Accessed January 30, 2020.

375 requires metropolitan planning organizations (MPOs) to incorporate a Sustainable Communities Strategy in their Regional Transportation Plans that will achieve GHG emissions reduction targets by reducing vehicle miles traveled from light-duty vehicles through the development of more compact, complete, and efficient communities.

Pursuant to SB 375, on March 22, 2018 the CARB established emission reduction targets for California's eighteen MPO regions for the year 2020 and 2035. Shasta County was assigned a 0 percent per capita change when compared to the 2005 baseline year.<sup>17</sup>

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

Executive Order (EO) S-3-05 in 2005 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- 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.

This Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary would also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of Cal/EPA created the California Climate Action Team (CAT), made up of members from various State agencies and commissions. The team released its first report in March 2006, with its most recent S-3-05-mandated CAT Report released in 2010. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs.

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

EO S-01-07 (2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California. CARB approved the regulation in 2009 and began implementation on January 1, 2011. The low carbon fuel standard (LCFS) will reduce greenhouse gas emissions by reducing the carbon intensity of transportation fuels used in California by at least 10 percent by 2020. In September 2015, CARB approved the re-adoption of the LCFS, which became effective on January 1, 2016.

### **Executive Order S-14-08**

Issued on November 17, 2008, EO S-14-08 expands the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, EO S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. CARB adopted the Renewable Electricity Standard on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

---

<sup>17</sup> Shasta Regional Transportation Agency, Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region, page 32. <https://www.srta.ca.gov/DocumentCenter/View/4285/2018-Regional-Transportation-Plan--Sustainable-Communities-Strategy-adopted-Oct-9-2018?bidId=> Accessed October 5, 2020.

### **Executive Order S-21-09**

Issued on July 17, 2009, EO S-21-09 directs CARB to adopt regulations to increase California's RPS to 33 percent by 2020. This Executive Order builds upon SB 1078 (2002), which established the California RPS program, requiring 20 percent renewable energy by 2017, and SB 107 (2006), which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II.

### **Executive Order B-30-15**

California Governor Jerry Brown signed EO B-30-15 on April 29, 2015. EO B-30-15 established a medium-term goal for 2030 of reducing GHG emissions by 40% below 1990 levels and requires ARB to update its current AB 32 Scoping Plan to identify the measures to meet the 2030 target. This Executive Order supports EO S-03-05, described above, but is currently only binding on state agencies. On September 8, 2016, Governor Jerry Brown signed SB 32, which codified the 2030 reduction target called for in Executive Order B-30-15. CARB's 2017 Scoping Plan update addressed the 2030 target, as discussed above.

### **Executive Order B-55-18**

On September 10, 2018, California Governor Jerry Brown issued EO B-55-18, which establishes the following GHG emissions target:

- By 2045, California shall achieve carbon net neutrality

EO B-55-18 identifies that new statewide goal is to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. This emissions goal is in addition to the existing targets established by EO B-30-15 and SB 32, and EO S-3-05. This Executive Order also directs the CARB to work with other state agencies to identify and recommend measures to achieve this goal.

### **Assembly Bill 1493**

AB 1493 ("the Pavley Standard") (Health and Safety Code Sections 42823 and 43018.5) aims to reduce GHG emissions from noncommercial passenger vehicles and light-duty trucks of model years 2009–2016 by achieving "the maximum feasible reduction of GHG 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, CARB approved amendments to the California Code of Regulations (CCR) in 2004 by adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 and adoption of 13 CCR Section 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 weight classes for passenger vehicles (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily to transport people), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. By 2025, when all rules will be fully implemented, new automobiles will emit 34 percent fewer CO<sub>2</sub>e emissions and 75 percent fewer smog-forming emissions.



## **Renewables Portfolio Standard (Senate Bill X1-2 & Senate Bill 350)**

California's Renewables Portfolio Standard (RPS) requires retail sellers of electric services to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020. The 33 percent standard is consistent with the RPS goal established in the Scoping Plan. The passage of Senate Bill 350 in 2015 updates the RPS to require the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources to be increased to 50 percent by December 31, 2030. The bill would make other revisions to the RPS program and to certain other requirements on public utilities and publicly owned electric utilities.

### **Senate Bill 100**

SB 100, the 100 Percent Clean Energy Act of 2018, sets a state policy that eligible renewable energy and zero-carbon energy resources supply 100 percent of all retail sales of electricity in California by 2045. The bill accelerates the existing RPS goals to:

- 50 percent renewable by 2025
- 60 percent renewable by 2030

The bill became effective January 1, 2019.

## **California Energy and Green Building Standards Codes**

Title 24 of the California Code of Regulations regulates how each new home and business is built or altered in California. It includes requirements for the structural, plumbing, electrical, and mechanical systems of buildings, and for fire and life safety, energy conservation, green design, and accessibility in and about buildings. Two sections of Title 24 – Part 6, the California Energy Code, and Part 11, the California Green Building Standards Code or CalGreen Code – contain standards that address GHG emissions related to construction.

The CalGreen Code became a mandatory code beginning January 1, 2011. The Code takes a holistic approach to green building by including minimum requirements in the areas of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. The Code has minimum mandatory standards and two additional tiers of voluntary measures intended to achieve greater levels of efficiency that result in lower levels of GHG emissions. Local governments must enforce the minimum standards and can choose to adopt either Tier 1 or Tier 2 standards to achieve greater positive environmental impacts. The current 2019 Title 24 standards became effective January 1, 2020. Residential and nonresidential buildings constructed under the 2019 Title 24 standards are estimated to use about 53 and 30 percent less energy than those constructed under the 2016 Title 24 standards, respectively.

## **LOCAL**

### **Shasta County Air Quality Management District**

The Shasta County Air Quality Management District (SCAQMD) does not have an adopted Climate Action Plan, greenhouse gas threshold of significance, or guidance document for assessing project-level greenhouse gas impacts under CEQA. In 2010, the SCAQMD initiated the regional climate action planning

(RCAP) process. The primary objectives of the RCAP process are to contribute to the State's climate protection efforts and reduction measures. Chapter 2 of the RCAP serves as the Climate Action Plan (CAP) for the unincorporated areas within the County, including the project Site.

Unincorporated Shasta County's GHG reduction targets are as follows:

1. Reduce community emissions to 15 percent below 2008 levels by 2020 (i.e., 485,567 MTCO<sub>2</sub>e/yr).
2. Reduce community emissions to 49 percent below 2008 levels by 2035 (i.e., 291,340 MTCO<sub>2</sub>e/yr).
3. Reduce community emissions to 83 percent below 2008 levels by 2050 (i.e., 97,113 MTCO<sub>2</sub>e/yr).

The RCAP describes measures that achieve the 2020 reduction target and work toward the 2035 target. Focus on the 2050 reduction target was reserved for future reevaluation of long-term GHG reduction efforts to reflect future conditions and adjustment of emission reduction measures accordingly. The RCAP relies on the State RPS goals that will lead to an increase in renewable electricity, reduce the community energy-related emissions in unincorporated Shasta County, and make it easier for the community to achieve 2020 and 2035 emission reduction goals (Shasta County, 2012). While the RCAP was not ultimately adopted by the Shasta County AQMD Board, it was designed to set GHG emissions reduction targets consistent with AB 32 and CARB's adopted Scoping Plan. However, the RCAP has not been adopted and is not considered a qualified GHG reduction plan under CEQA Guidelines Section 15183.5 as a formal CEQA document was also not prepared.

## 5.7.3 THRESHOLDS OF SIGNIFICANCE

### SIGNIFICANCE CRITERIA

#### CEQA Thresholds

The environmental analysis in this section is patterned after the Initial Study Checklist recommended by Appendix G of the State CEQA Guidelines, as amended, and used by Shasta County in its environmental review process. The Initial Study Checklist includes questions relating to GHG emissions. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant adverse environmental impact if it would:

- *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.* Refer to Impact 5.7-1, below.
- *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.* Refer to Impact 5.7-1 and Impact 5.7-2, below.

### METHODOLOGY

Global climate change is, by definition, a cumulative impact of GHG emissions.<sup>18</sup> Therefore, there is no project-level analysis. The baseline against which to compare potential impacts of the project includes the natural and anthropogenic drivers of global climate change, including world-wide GHG emissions from

---

<sup>18</sup> California Air Pollution Control Officers Association (CAPCOA), 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, January 2008, and the California Natural Resources Agency, Final Statement of Reasons for Regulatory Action, *Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97*, 2009.

human activities which almost doubled between 1970 and 2010 from approximately 27 gigatonnes (Gt) of CO<sub>2</sub>/year to nearly 49 GtCO<sub>2</sub>/year.<sup>19</sup> As such, the geographic extent of climate change and GHG emissions cumulative impact discussion is worldwide.

Addressing GHG generation impacts requires an agency to make a determination as to what constitutes a significant impact. The amendments to the State CEQA Guidelines specifically allow lead agencies to determine thresholds of significance that illustrate the extent of an impact and are a basis from which mitigation measures to apply. Thus, each agency is left to determine whether a project's GHG emissions will have a "significant" impact on the environment. The State CEQA Guidelines direct that agencies are to use "careful judgment" and "make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" the project's GHG emissions (14 California Code of Regulations Section 15064.4(a)).

The SCAQMD has primary responsibility for developing and implementing rules and regulations to maintain the national ambient air quality standards and attain the California ambient air quality standards, permitting new or modified sources, developing air quality management plans, and adopting and enforcing air pollution regulations for all projects in their portion of the Northern Sacramento Valley Air Basin. The CARB AB 32 Scoping Plan does not specify an explicit role for local air districts with respect to implementing AB 32, but it does state that CARB will work actively with air districts in coordinating emissions reporting, encouraging and coordinating GHG reductions, and providing technical assistance in quantifying reductions. The ability of air districts to control emissions (both criteria pollutants and GHGs) is provided primarily through permitting, but also via their role as a CEQA lead or commenting agency, the establishment of CEQA thresholds, and the development of analytical requirements for CEQA documents.

In the absence of quantitative significance thresholds in SCAQMD CEQA guidance, this analysis considers other adopted thresholds adopted in nearby jurisdictions. For example, the CARB Mandatory Reporting program requirements are triggered for sources of GHG emissions exceeding 2,500 MTCO<sub>2</sub>e per year. Other prominent air districts in northern California, such as the Bay Area Air Quality Management District and the Sacramento Metropolitan Air Quality Management District, have established project-level thresholds of 1,100 MTCO<sub>2</sub>e per year.<sup>20,21</sup> In addition, the California Air Pollution Control Officers Association (CAPCOA) recommended an interim 900 MTCO<sub>2</sub>e per year screening level as a theoretical approach to identify projects that require further analysis and potential mitigation.<sup>22</sup> The different thresholds include (1) compliance with a qualified GHG reduction strategy, (2) performance-based reductions, (3) numeric "bright-line" thresholds, and (4) efficiency-based thresholds.

### **Compliance with a Qualified GHG Reduction Strategy**

As noted in the Regulatory Setting above, the RCAP includes a GHG emission inventory and forecast, emission reduction measures, and an implementation and monitoring program for unincorporated Shasta County, and was finalized in 2012. However, the RCAP was not ultimately adopted by the Shasta County AQMD Board and is not considered a qualified GHG reduction plan. The RCAP also does not provide

---

<sup>19</sup> Intergovernmental Panel on Climate Change, *Climate Change 2014 Mitigation of Climate Change Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 2014.

<sup>20</sup> Bay Area Air Quality Management District (BAAQMD), 2017. California Environmental Quality Act Air Quality Guidelines, May 2017. Available online at: [https://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa\\_guidelines\\_may2017-pdf.pdf?la=en](https://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en) Accessed October 6, 2020.

<sup>21</sup> Sacramento Metropolitan Air Quality Management District (SMAQMD), 2018. Guide to Air Quality Assessment in Sacramento County, Chapter 6, Greenhouse Gas Emissions, May 2018. Available online at: <http://www.airquality.org/LandUseTransportation/Documents/Ch6GHG4-25-2020.pdf> Accessed October, 6, 2020

<sup>22</sup> California Air Pollution Control Officers Association (CAPCOA), 2008. CEQA & Climate Change Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, January 2008. Available online at: <http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA-White-Paper.pdf>. Accessed October 6, 2020.

---

specific reduction targets or CEQA significance thresholds for individual development projects. Therefore, the RCAP is not used to determine the impact of Project GHG emissions.

### **Performance Based Reductions**

As noted above, the state has established state-wide GHG emission reduction goals. It is noted that the state-wide emission reduction goals do not equate to an equal project-level emission reduction goal for all land uses or economic sectors. Statewide and regional planning documents were reviewed to identify the most-appropriate emission reduction goal for the proposed project. Available planning documents that may be used as the source of project-level emission reduction goals include the state-wide applicable 2017 Scoping Plan, and the county-specific 2015 RTP/SCS. The County of Shasta does not have an adopted Climate Action Plan, GHG threshold of significance, adopted emissions reduction goal, or guidance document for assessing project-level GHG impacts under CEQA. In addition, the SCAQMD does not have adopted GHG emissions thresholds, targets, or goals.

Although the county-specific 2015 RTP/SCS contains region-specific emission reduction targets set by CARB under the purview of SB 375, CARB has identified that the adopted SCS targets are not enough to achieve the statewide per capita reductions necessary to meet adopted climate goals.<sup>23</sup> Additionally, the emission reduction targets of the 2015 RTP/SCS applied only to mobile emissions. Therefore, it was determined that the 2015 RTP/SCS was not appropriate to determine the project-level emissions thresholds for the proposed project. Therefore, the best available and most-applicable source of emissions reduction goals are the state-wide goals set by AB 32, SB 32, EO B-30-15, EO S-03-05, and EO B-55-18. At the time of analysis, there is no known documentation or substantiated analysis available to guide or support an adjustment the state-wide average GHG emission reduction goals for specific land uses, development types, or regions. Therefore, this threshold is not recommended for the proposed project.

### **Numeric “Bright-Line” Thresholds**

A Bright Line threshold is generally a numeric threshold that indicates whether a land use project would have a significant effect on the environment based on its GHG emissions relative to broader GHG targets. This approach is generally more useful for screening out smaller projects that are not likely to cause a considerable contribution to climate change.

The numeric bright line thresholds were developed to be consistent with CEQA requirements for developing significance thresholds, are supported by substantial evidence, and provide guidance to CEQA practitioners and lead agencies with regard to determining whether GHG emissions from a proposed project are significant. In *Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal. 4th 2014, 213, 221, 227 (hereafter Newhall Ranch), following its review of various potential GHG thresholds proposed in an academic study, [Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203], the California Supreme Court identified the use of numeric bright-line thresholds as a potential pathway for compliance with CEQA GHG requirements. The study found numeric bright-line thresholds designed to determine when small projects were so small as to not cause a cumulatively considerable impact on global climate change was consistent with CEQA. Specifically, PRC Section 21003(f) provides it is a policy of the State that “[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the

---

<sup>23</sup> CARB, 2017. The 2017 Climate Change Scoping Plan Update, January 20, 2017. Available online at: [https://www.arb.ca.gov/cc/scopingplan/2030sp\\_pp\\_final.pdf](https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf). Accessed October 6, 2020.

environment." The California Supreme Court-reviewed study noted, "[s]ubjecting the smallest projects to the full panoply of CEQA requirements, even though the public benefit would be minimal, would not be consistent with implementing the statute in the most efficient, expeditious manner. Nor would it be consistent with applying lead agencies' scarce resources toward mitigating actual significant climate change impacts." (Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Env'tl. L. J. 203, 221, 227.)

### Efficiency Based Thresholds

Efficiency-based thresholds represent the rate of emission reductions needed to achieve a fair share of California's GHG emissions reduction target established under AB 32, SB 32, EO B-30-15, and EO S-03-05. As noted earlier, the state has the following GHG emissions reductions goals:

- By 2020, achieve 1990 levels emissions (AB 32)
- By 2030, 40 percent below 1990 levels by 2030 (EO B-30-15, SB 32)
- By 2045, net carbon neutrality (EO B-55-18)
- By 2050, 80 percent below 1990 levels by 2050 (EO S-03-05)

Efficiency-based thresholds are typically calculated by dividing emissions associated with residential and commercial uses within the state by the sum of jobs and residents. The sum of jobs and residents is called the "service population," and a project's service population is defined as the people that work, study, live and congregate within the project site. Therefore, for the purposes of this analysis, the proposed project is compared to an efficiency-based significance threshold.

The California Supreme Court decision in the Newhall Ranch case confirmed that when an "agency chooses to rely completely on a single quantitative method to justify a no-significance finding, CEQA demands the agency research and document the quantitative parameters essential to that method."

The Newhall Ranch decision did not comment on use of an efficiency-based threshold for analyzing project-level GHG emissions. However, U.S. Supreme Court rulings establish that the U.S. Constitution limits exactions on new development to those having a "nexus" and "rough proportionality" to the impact actually caused by the new development. While there is a nexus for requiring GHG reductions for new development that results in new GHG emissions, the reductions mandated must be proportional to the impact caused by new development. Requiring new development to meet the average statewide GHG efficiency is a proportional measure but requiring more than average levels of efficiency would be mitigating the effects of existing development by imposing requirements beyond the fair share of new development's effect.

Given the recent legislative attention and case law regarding post-2020 goals and the scientific evidence that additional GHG reductions are needed through 2050 to stabilize CO<sub>2</sub> concentrations, the Association of Environmental Professionals' (AEP) Climate Change Committee (2015) recommended in its *Beyond 2020: The Challenges of Greenhouse Gas Reduction Planning by Local Governments in California* (Beyond 2020) white paper that CEQA analyses for most land use development projects can continue to rely on current thresholds for the immediate future, but that long-term projects should consider "post-2020 emissions consistent with 'substantial progress' along a post-2020 reduction trajectory toward meeting the 2050 target." The Beyond 2020 white paper further recommends that the "significance determination...should be based on consistency with 'substantial progress' along a post-2020 trajectory."

While the Newhall Ranch decision did not specifically recommend the efficiency-based approach, the ruling did note that numerical threshold approaches may be appropriate for determining significance of GHG emissions and to emphasize the consideration of GHG efficiency provided that the thresholds were based on local or regional, not statewide, data. Additionally, recent California court decisions highlight the importance of using local or regional emissions data that reflect the unique sources and relative reduction commitment for the project area and surrounding planning context, to inform project-level efficiency thresholds (see *Golden Door Properties/Sierra Club vs. County of San Diego*, 27 Cal.App.5<sup>th</sup> 892). This has made efficiency-based thresholds infeasible for most development projects unless based on local or regional information.

### Project Threshold Summary

As discussed above, compliance with a qualified GHG reduction strategy, performance-based reductions, and efficiency-based thresholds would not be appropriate to evaluate the proposed project. A numerical bright-line value based solely on Shasta County emissions sources does not exist. However, development conditions in Sacramento County are similar to Shasta County. Sacramento Metropolitan Air Quality Management District (SMAQMD) has established recommended thresholds that ensure that 90 percent of emissions from projects in the region are reviewed to determine the need for additional mitigation. According to SMAQMD's methodology, a land use development project with operational emissions that are less than 1,100 MTCO<sub>2e</sub> per year will not result in a significant impact and will not require additional mitigation. SMAQMD assumes that projects with operational emissions below 1,100 MTCO<sub>2e</sub> /year will not exceed their construction GHG threshold of significance.

Therefore, SMAQMD's land use development threshold of 1,100 MTCO<sub>2e</sub> will be applied to the proposed project to support the determination of GHG impacts. SMAQMD's threshold represents a level that would result in sufficiently low GHG emission to be less than cumulatively considerable without mitigation. The SMAQMD thresholds are appropriate to use for the proposed project as both the project site and the SMAQMD are located within the Sacramento Valley Air Basin<sup>24</sup>. Additionally, the SMAQMD is the closest air quality management district with adopted thresholds to the project site.

SCAQMD does not provide specific guidance regarding construction emissions. Therefore, total construction-generated GHG emissions were conservatively amortized over the estimated life of the development and included with operational emissions for comparison to the significance thresholds. A life of 30 years was assumed for the proposed project based on a standard 30-year project lifetime assumption developed by the South Coast Air Quality Management District (South Coast AQMD 2009).<sup>25</sup>

Based on these standards, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a "significant and unavoidable impact."

---

<sup>24</sup> California Air Resources Board, [https://ww3.arb.ca.gov/aqd/oldozone\\_isa/bsn1sv.htm](https://ww3.arb.ca.gov/aqd/oldozone_isa/bsn1sv.htm) Accessed October 21, 2020

<sup>25</sup> The project lifetime is based on the standard 30-year assumption of the South Coast Air Quality Management District (South Coast Air Quality Management District, *Minutes for the GHG CEQA Significance Threshold Stakeholder Working Group #13*, August 26, 2009). The Shasta County Air Quality Management District does not provide specific guidance regarding construction emissions. Therefore, the South Coast Air Quality Management District approach was conservatively used.

---

## 5.7.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

### METHODOLOGY

GHG emissions of the proposed project were calculated using the California Emissions Estimator Model (CalEEMod). CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for the use of government agencies, land use planners, and environmental professionals. This model was developed in coordination with the South Coast Air Quality Management District and is the most current emissions model approved for use in California by various other air districts. Greenhouse gas and climate change impacts are analyzed below according to topic. Mitigation measures directly correspond with an identified impact.

---

<b>IMPACT</b> 5.7-1	<b><i>Greenhouse gas emissions, either directly or indirectly, generated by the proposed project may have a significant impact on the environment.</i></b>
------------------------	--

---

#### **Significance: Potentially Significant Impact.**

**Impact Analysis:** The proposed project would result in direct and indirect emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, and would not result in other GHGs that would facilitate a meaningful analysis. Therefore, this analysis focuses on these three forms of GHG emissions. Direct project-related GHG emissions include emissions from construction activities, area sources, and mobile sources, while indirect sources include emissions from electricity consumption, water demand, and solid waste generation. Operational GHG estimations are based on energy emissions from natural gas usage and automobile emissions. Project related GHG emissions were quantified with the California Emissions Estimator Model (CalEEMod). CalEEMod relies upon vehicle trip rates and project specific land use data to calculate emissions.

#### ***Construction Emissions***

The proposed project has been divided into six phases. Construction of the project would involve the following activities:

- Phase 1: Clearing of approximately 33.3 acres of oak woodland; site grading; and the construction of 46 single-family homes, 4 secondary units, and approximately 190,800 square-feet of pavement.
- Phase 2: Clearing of approximately 12.1 acres of oak woodland; site grading; and the construction of 19 single-family homes, 2 secondary units, and approximately 101,600 square-feet of pavement.
- Phase 3: Clearing of approximately 8.3 acres of oak woodland; site grading; and the construction of 24 single-family homes, 2 secondary units, and approximately 101,100 square-feet of pavement.
- Phase 4: Clearing of approximately 31.4 acres of oak woodland; site grading; and the construction of 20 single-family homes, 2 secondary units, and approximately 147,000 square-feet of pavement.

- Phase 5: Clearing of approximately 42.4 acres of oak woodland; site grading; and the construction of 43 single-family homes, 4 secondary units, and approximately 119,000 square-feet of pavement.
- Phase 6: Clearing of approximately 18.7 acres of oak woodland; site grading; and the construction of 14 single-family homes, 1 secondary units, and approximately 91,200 square-feet of pavement.

Project construction activities would result in a temporary increase in GHG emissions. Construction of the project would result in direct emissions of CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub> from the operation of construction equipment and the transport of materials and construction workers to and from the project site. Project construction emissions have been converted to carbon dioxide equivalent (CO<sub>2</sub>e) values and provided in Table 5.7-1, PROJECT CONSTRUCTION GREENHOUSE GAS EMISSIONS. As shown in Table 5.7-1, construction activities are estimated to generate approximately 5,524.44 MTCO<sub>2</sub>e. As noted above, SCAQMD does not have thresholds for construction emissions of greenhouse gases. Additionally, construction emissions are temporary and cease upon the completion of construction. To capture construction GHG emissions as part of the total project emissions, an approach recommended by the South Coast AQMD construction emissions typically summed and amortized over the lifetime of the project (assumed to be 30 years), then added to the operational emissions<sup>26</sup>. When amortized over an assumed 30-year project lifespan, project construction would generate approximately 184.14 MTCO<sub>2</sub>e per year. The CalEEMod outputs are contained within the Greenhouse Gas Report; refer to Appendix RDEIR-A-1.

**Table 5.7-1  
 PROJECT CONSTRUCTION GREENHOUSE GAS EMISSIONS**

Parameter	Emissions MTCO <sub>2</sub> e
Phase 1 Construction	1,198.29
Phase 2 Construction	741.49
Phase 3 Construction	995.96
Phase 4 Construction	776.28
Phase 5 Construction	1,025.27
Phase 6 Construction	787.15
<b>Total Project Emissions</b>	<b>5,524.44</b>
30-year Amortized Emissions (per year)	184.14
Refer to Appendix RDEIR-A-1, AIR QUALITY/GREENHOUSE GAS EMISSIONS DATA, for model input/output data.	

***Operational Emissions***

Operational or long-term emissions would occur annually over the life of the project. GHG emissions would result from direct emissions such as project generated vehicular traffic, on-site combustion of natural gas, operation of any landscaping equipment. Operational GHG emissions would also result from indirect sources, such as off-site generation of electrical power over the life of the project, the energy required to convey water to, and wastewater from the project site, the emissions associated with solid waste generated from the project site, and any fugitive refrigerants from air conditioning or refrigerators. The project’s operational emissions for the year 2030 are shown in Table 5.7-2, ANNUAL PROJECT GREENHOUSE GAS EMISSIONS. The project’s annualized construction emissions are also provided in the tables.

<sup>26</sup> For purposes of comparison, the Sacramento Metropolitan AQMD suggests amortization over 40 years for residential projects, however the 30-year approach was used because it spreads the emissions over a fewer number of years and is considered more conservative approach between the two recommendations.



**Table 5.7-2  
 ANNUAL PROJECT GREENHOUSE GAS EMISSIONS**

Emissions Category	Total Unmitigated MTCO <sub>2</sub> e 2030	Total Mitigated MTCO <sub>2</sub> e 2030 <sup>1</sup>
<b>Direct Emissions</b>		
Construction amortized over 30 years	184.14	184.14
Project	131.31	2.24
Mobile	2,904.06	2,904.06
<b>Total Direct Emissions</b>	<b>3,219.51</b>	<b>3,090.44</b>
<b>Indirect Emissions</b>		
Energy	326.52	310.19
Waste	22.11	22.11
Water	22.99	22.99
Sequestration Loss	811.41	811.41
<b>Total Indirect Emissions</b>	<b>1,183.03</b>	<b>1,166.70</b>
<b>Total Project-Related Emissions</b>	<b>4,402.54</b>	<b>4,257.14</b>
<i>Threshold of Significance</i>	1,100	1,100
<i>Significant Impact?</i>	Yes	Yes

1. Incorporates the following quantifiable measures in MM 5.7-1: the prohibition of natural gas hearths and wood burning hearths and requiring houses to exceed Title 24 standards by a minimum of 20 percent.  
 Refer to Appendix RDEIR-A-1, AIR QUALITY/GREENHOUSE GAS EMISSIONS DATA, for model input/output data

**Direct Proposed Project-Related Sources of Greenhouse Gases**

*Construction Emissions.* As depicted in Table 5.7-2, the proposed project would result in 184.14 MTCO<sub>2</sub>e/yr (amortized over 30 years which is the expected lifecycle of the project), which represents a total of approximately 5,524.44 MTCO<sub>2</sub>e from construction activities.

*Project Source Area source emissions* were calculated using CalEEMod and project-specific land use data. The primary GHG emission sources calculated by CalEEMod include hearths and landscape equipment. As noted in Table 5.7-2, the proposed project would result in 131.31 MTCO<sub>2</sub>e/yr of area source GHG emissions.

*Mobile Source.* CalEEMod relies upon trip data within the project Traffic Study and project specific land use data to calculate mobile source emissions. The proposed project is anticipated to generate 1,774 daily trips and would directly result in approximately 2,904.06 MTCO<sub>2</sub>e/yr of mobile source-generated GHG emissions; refer to Table 5.7-2.

**Indirect Proposed Project-Related Sources of Greenhouse Gases**

*Energy Consumption.* Energy consumption emissions were calculated using CalEEMod and project-specific land use data. Electricity would be provided to the project site via Pacific Gas & Electric Company. The proposed project would indirectly result in approximately 326.52 MTCO<sub>2</sub>e/yr due to energy consumption; refer to Table 5.7-2.

*Solid Waste.* GHG emissions would be generated from the decomposition of solid waste generated by the project. The CalEEMod default waste generation values were used for this analysis. Solid waste associated with operations of the proposed project would result in an approximately 22.11 MTCO<sub>2</sub>e/yr; refer to Table 5.7-2.

*Water Demand.* There would be GHG emissions from the use of electricity to pump water to the project and to treat wastewater. It is assumed that the project-specific water consumption incorporates

reductions for -flow interior water fixtures and a water-efficient irrigation system, as required under the Green Building Standards. Emissions from indirect energy impacts due to water supply would result in approximately 22.99 MTCO<sub>2</sub>e/yr; refer to Table 5.7-2.

*Vegetation Land Use Change (Loss of Sequestration)*. Sequestration refers to the process of vegetation storing CO<sub>2</sub> (resulting in a carbon sink and reducing CO<sub>2</sub> emissions). As the project would develop natural land with vegetation that is currently sequestering CO<sub>2</sub>, loss of the existing vegetation would result in approximately 16,228.20 MTCO<sub>2</sub>e that would not be sequestered, which is approximately 811.41 MTCO<sub>2</sub>e/yr over a 20-year growing period.

### **Project Design Features**

The project includes project design features that would further reduce project-related GHG emissions. These design features were incorporated into the greenhouse gas emissions model and are reflected in the results shown in Table 5.7-2 in the column titled *Total Unmitigated MTCO<sub>2</sub>e 2030*. The project design features include: grey water diverter system; inclusion of passive solar design in new homes to reduce annual energy usage; class 1 public bikeways within the project site; and pedestrian trails located along project roadways. Individual homes would be required to be constructed with a grey water system that complies with Chapter 16 of the California Plumbing Code. This would allow diversion of flow from washing machines, showers, and bathtubs to a manual diverter valve. Typical operations would direct flow to provide subsurface irrigation for appropriate drought tolerant trees and shrubs within the individual yard, reducing domestic water demand. Design criteria for landscaping selection, dispersal system criteria, as well as for operation and maintenance of the system would be included in the Covenants, Conditions, and Restrictions (CC&Rs) for the proposed project.

The passive solar design of the project would be required as a Condition of Approval for each single-family home built onsite would include green building design components and use a combination of photovoltaic cells, solar water heating, and other construction design techniques to reduce energy usage by 15 percent or more. Additionally, the Class 1 bikeways and pedestrian trails would provide non-motorized transit opportunities and connections surrounding neighborhoods and land uses.

The project would also include electric vehicle charging infrastructure to allow for the future installation of electric vehicle chargers, as this is required by the California Building Standards Code (Title 24). The project is required to minimize energy consumption and exceed Title 24 standards. The 2019 version of Title 24 will use approximately 53 percent less energy than those under the 2016 standards.

California's Building Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6) contains requirements for the thermal emittance, three-year aged reflectance, and Solar Reflectance Index (SRI) of roofing materials used in new construction and re-roofing projects. Additionally, outdoor electrical outlets are required by the California Electrical Code (Title 24, Part 3), which would reduce area source GHG emissions.

The Renewable Portfolio Standard (RPS) requires the state's electricity providers are to procure a minimum of 33 percent of their energy portfolio from renewable sources by 2020 and 50 percent by 2030 and would continue to implement programs consistent with the requirements of SB 350. Furthermore, SB 100 (September 2018) increased California's renewable electricity portfolio from 50 to 60 percent by 2030. SB 100 also established a further goal to have an electric grid that is entirely powered by clean energy by 2045. RPS is not accounted for in the current version of CalEEMod or the modeling conducted for the project. Energy savings from water conservation resulting from the Green Building Code Standards

for indoor water use and California Model Water Efficient Landscape Ordinance for outdoor water use are also not included in CalEEMod. The Water Conservation Act of 2009 mandates a 20 percent reduction in urban water use that is implemented with these regulations. In addition to increasing renewable energy use goals, the 2017 CARB Scoping Plan also identifies additional reduction measures such as imposing tighter limits on the carbon content of gasoline and diesel fuel, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries.

Additionally, **MM 5.7-1** would be required to further reduce GHG emissions to the extent feasible. GHG reductions were applied using CalEEMod and are reflected in the results shown in Table 5.7-2 in the column titled *Total Mitigated MTCO<sub>2e</sub> 2030*. Reduction measures applied in CalEEMod required as mitigation by **MM 5.7-1** include the following:

- Natural gas hearths;
- Use low VOC paint;
- Exceed Title 24 energy standards by 15 percent;
- Include onsite renewable energy;
- Use grey water diverter system;
- Install low-flow faucets, toilets, and showers;
- Install water-efficient irrigation systems;
- Institute recycling and composting services to reduce solid waste by at least 65 percent.

## Conclusion

As depicted in Table 5.7-2, the project, with the implementation of proposed energy efficiency measures, water conservation measures, and **MM 5.7-1** would generate approximately 4,257.14 MTCO<sub>2e</sub> per year in 2030, which is greater than the significance threshold of 1,100 MTCO<sub>2e</sub>. It should be noted that the Project Design Features and **MM 5.7-1** represent all feasible mitigation measures available to reduce project related GHG emissions. Therefore, the impacts from greenhouse gas emissions would remain *significant and unavoidable*.

## Mitigation Measures

Comments submitted on the 2017 Draft EIR provided suggestions for mitigation measures to be incorporated into the project. Some of the mitigation measures were found to be feasible (or partially feasible) and have been incorporated into Mitigation Measure 5.7-1 below. Other suggested mitigation measures were found to be infeasible (or partially infeasible) as proposed for the reasons discussed below.

### Infeasible Mitigation Measures

- *Design and install an approved rainwater catchment system to use rainwater generated by at least 65 percent of the available roof area. Rainwater catchment systems shall be designed and installed in accordance with the California Plumbing Code.*

The Applicant has determined that the potential implementation of this measure would require installation of the suggested rainwater catchment system underground to reduce visual impacts. This additional ground disturbance could result in additional environmental impacts to biological resources from potential tree removal, buried previously undiscovered cultural resources, and buried previously undiscovered tribal cultural resources, and is not a standard mitigation measure for the reduction of GHG emissions. Additionally, the project already includes the diversion of grey water for landscape irrigation,

which reduces the total water consumption of the project. As described in Section 5.17, Utilities and Service Systems, of the October 2017 Draft EIR, the grey water diversion would meet the water demand of proposed landscaping; therefore, the additional capture of rainwater would result in water supplies that exceed the project's demand for recycled water. Furthermore, this suggested measure would be more appropriate when addressing potential groundwater recharge impacts as it would not result in substantial GHG reductions.

- *Reduce the use of pavement and impermeable surfaces.*

The project is already designed with minimal impervious surface area. While low-impact development (LID) measures such as this suggested measure can reduce the energy needs of a project, stormwater runoff from impervious would be conveyed and collected in detention basins and not treated through a wastewater treatment system. Because stormwater would not be treated at the wastewater treatment facility, energy reductions (and the associated GHG emission reductions) would not be achieved by reducing the stormwater runoff through a reduction in impervious surfaces. Therefore, this measure would not appreciably reduce GHG emissions from energy use during stormwater treatment. Additionally, it is unclear how this measure is intended to reduce construction or operational emissions because the amount of impervious surfaces is not an input or calculated in the emissions modeling (CalEEMod version 2016.3.2).

- *Purchase and retire carbon offsets.*

The County also considered the potential of carbon offsets (also known as carbon credits) as a mitigation measure to reduce potential greenhouse gas emissions. However, the County determined carbon offsets to be infeasible as a mitigation measure and rejected the use of carbon offsets for each of the following separate and independent grounds:

1. Neither the County nor the local air district has an adopted an offset program. There is no available functioning program that the County can rely upon to assure that over the offset period (30 years), mitigation can be appropriately tracked and confirmed. No such local program is proposed for adoption or has been budgeted for adoption. The State of California, through the expertise of the California Air Resources Board (CARB), has adopted robust regulations for state approved registries. However, the County and local air district lack the professional staff resources to independently develop a local program capable of tracking and verifying compliance with regulations comparable to the State's Cap-and-Trade program and apply it to this single project.
2. Lead agency reliance upon a yet to be developed offset program violates CEQA requirements prohibiting deferred mitigation. (CEQA Guidelines §15126.4(a)(1)(B).)
3. The CARB (state) approved registries are approved for the State's Cap-and-Trade Regulations and are not approved for voluntary mitigation. Thus, the fact that a registry is approved by CARB is insufficient assurance that offsets purchased through the voluntary markets will achieve the desired offset targets over the offset period. Information regarding CARB's approved program can be found here:

<https://ww2.arb.ca.gov/our-work/programs/compliance-offset-program>

4. CARB does not approve or regulate the voluntary GHG reduction marketplace. The County lacks the staffing and training to independently assess the long-term viability and trustworthiness of registries

operating in the voluntary markets or track and verify compliance with regulations comparable to the State's Cap-and-Trade program. Thus, there is no assurance that offsets purchased through the voluntary markets will achieve the desired offset targets over the offset period.

The application of an offset requirement on this single development project results in inequitable treatment of similarly-situated property owners. In future years, the primary sources of GHG emissions for projects similar to Tierra Robles will be from the energy and transportation sectors. Single family homes constructed on existing parcels located elsewhere within the County will not be subject to an offset requirement, even though those homes could have similar or greater energy and transportation impacts. The County determines that it is infeasible on policy grounds to impose an offset mitigation requirement for impacts associated with a development project which are indistinguishable from identical impacts generated throughout the County which are not subject to similar mitigation.

#### Partially Infeasible Mitigation Measure

- *Require use of alternative fuel, hybrid, or electric construction equipment.*

It is standard practice for grading and excavation contractors to rent or lease heavy construction equipment on an as-needed basis rather than purchasing such equipment. Based upon County staff's personal communication with a representative of I-5 Rentals in Redding, alternative fuel, hybrid, and electric construction equipment is currently unavailable in the Shasta County region and the future availability of such equipment in the region is purely speculative at this point in time. Therefore, prohibiting the utilization of standard diesel and gasoline powered heavy construction equipment is infeasible. However, when electric service from PG&E is available it is feasible to prohibit the use of non-electric construction equipment, such as air compressors and generators, at building construction sites; this requirement is included in **MM 5.7-1**.

The following mitigation measures are required to reduce potential impacts.

MM 5.7-1: The project shall include the following improvements, which shall be incorporated into project improvement plans where applicable, to ensure consistency with adopted statewide plans and programs. The project applicant shall demonstrate compliance with this measure prior to issuance of building and occupancy permits as specified below:

#### *Transportation*

- Pedestrian connections to the offsite circulation network shall be provided on improvement/grading plans and implemented concurrent with subdivision backbone infrastructure improvements. (Building Permit)
- During formation of the HOA, the HOA bylaws shall be drafted to include a ride-sharing program and mechanism for coordination and communication between residents regarding ride-sharing. The HOA bylaws shall also include a requirement that monthly newsletters published by the HOA promote ride-sharing programs through the monthly newsletter and association meetings. (Occupancy Permit)

#### *Project Sources*

- Natural gas hearths and wood burning hearths shall be prohibited. (Building Permit).

- Requirements for use of low VOC interior and exterior paints shall be included in the project Covenants, Conditions, and Restrictions (CC&Rs) (Building Permit).
- Power tools utilized in the course of building construction shall be electric powered. Temporary electric service shall be established at building construction sites as soon as it is available from PG&E; generators, air compressors, and other non-electric construction equipment shall not be utilized for building construction after temporary electric service is established. (Building Permit)
- During formation of the HOA, the HOA Covenants, Conditions, and Restrictions (CC&Rs) shall be drafted to require the use of Use 100 percent electric lawnmowers and leaf blowers. The HOA shall provide an electric lawnmower to homeowners by request (Building Permit).
- During formation of the HOA, the HOA bylaws shall be drafted to include a requirement that monthly newsletters published by the HOA provide GHG emissions reduction education to the residents. (Occupancy Permit)
- Final project design shall include, in all residential buildings, a “utility” room or space for recharging batteries, whether for use in a car, electric lawnmower, other electric landscaping equipment, or batteries for small items such as flashlights. (Building Permit)
- Electrical wiring and infrastructure to support a 240-volt EV charger shall be installed in the proposed garage(s) for off-street EV charging. (Building Permit)
- Bicycle lockers and bicycle parking shall be installed at a bus stop at the southern entrance of the project site. (Building Permit)
- Building electrification shall be incorporated into project design with no natural gas connections. (Building Permit)
- During formation of the HOA, the HOA bylaws shall be drafted to include provision of a bike share program and mechanism for coordinating shared bicycle use between residents. (Occupancy Permit)

#### *Energy Efficiency*

- All houses shall be designed to exceed the Title 24 standards by a minimum of 20 to 30 percent. Title 24 regulates energy uses including space heating and cooling, hot water heating, and ventilation. Therefore, potential options to meet the improvement goal could include, but not be limited to, high-efficiency HVAC systems, efficient hot water heaters (e.g., tankless), and insulation requirements that exceed Title 24 standards. (Building Permit).
- High efficiency lighting shall be installed and achieve at least a 20 percent reduction in power rating by using either high efficiency fixtures and/or bulbs (Building Permit).
- Energy efficient appliances shall be installed and shall comply with EPA Energy Star requirements (Occupancy Permit).
- PG&E Smart Meters shall be installed in all lots/dwelling units (Occupancy Permit).
- Onsite renewable energy (photovoltaic cells, solar water heating, or other design techniques) shall be installed to reduce energy use by 15 percent, in addition to State required reductions (Building Permit).
- Low-carbon construction materials (such as materials that are locally-harvested, sustainably grown, made from rapidly renewable materials, biodegradable, or free of toxins) shall be used. (Building Permit)

- Energy Star Roof materials shall be used. (Building Permit)
- Electrical outlets shall be installed on building exteriors. (Building Permit)
- Bicycle lockers and bicycle parking shall be installed at a bus stop at the southern entrance of the project site. (Building Permit)

#### *Water Conservation and Efficiency*

- Individual homes shall be constructed with an engineered grey water system that complies with Chapter 16 of the California Plumbing Code (Building Permit).
- Water-efficient irrigation systems shall be installed (Building Permit).
- Water-efficient fixtures shall be installed (e.g., low-flow faucets, toilets, showers) (Building Permit).

#### *Solid Waste*

- At least 65 percent of solid waste shall be diverted to be recycled. Requirements for recycling shall be included in the project Covenants, Conditions, and Restrictions (CC&Rs) to ensure the project's solid waste collection contractor provides containers for recyclables (Building Permit).

Implementation of applicable regulatory requirements, design features, and mitigation measures would reduce the Project's operational emissions of GHGs; however, these measures would not substantially reduce the Project mobile source emissions (i.e., emissions from construction equipment, passenger cars, and trucks), which comprise more than 65 percent of the Project's anticipated GHG emissions. Mobile source GHG emissions are regulated by State and federal fuel standards and tailpipe emissions standards, and are outside of the control of the County, the Project Applicant, and future Project occupants. CEQA Guidelines Sections 15040(b), 15041, and 15091 collectively provide that mitigation measures must be within the responsibility and jurisdiction of the Lead Agency (i.e., Shasta County) in order to be implemented. No other mitigation measures are available that are feasible for Shasta County to enforce that have a proportional nexus to the Project's level of impact. Accordingly, the County finds that the Project's GHG emissions represent a significant and unavoidable cumulatively-considerable impact for which no feasible mitigation is available to substantially lessen or avoid a significant impact.

**Level of Significance After Mitigation:** Significant and unavoidable. For those mitigation measures whose emissions reductions are quantifiable, the estimated total emissions reduction in 2030 is 145.4 MTCO<sub>2e</sub> per year, resulting in an estimated project-related emissions level of 4,257.14 MTCO<sub>2e</sub> per year as shown in Table 5.7-2. Therefore, after mitigation project-related emissions would exceed the threshold of 1,100 MTCO<sub>2e</sub> per year.

---

<b>IMPACT</b> 5.7-2	<b><i>Implementation of the proposed project could potentially conflict with an applicable greenhouse gas reduction plan, policy, or regulation.</i></b>
------------------------	--

---

**Significance: Potentially Significant Impact.**

**Impact Analysis:** As described above, the SCAQMD prepared their RCAP in 2012. The RCAP establishes a community-wide emissions reduction target of 15 percent below 2008 levels by 2020, 49 percent below 2008 levels by 2035, and 83 percent below 2008 levels by 2050 following guidance from CARB and the

Governor's Office of Planning and Research<sup>27</sup>. CARB has noted that local governments can calculate GHG emissions to 1990 levels by the year 2020, thresholds by applying the percent reductions necessary to reach 2030 and the SB 32 goal of reducing 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to their community-wide GHG emissions target<sup>28</sup>. As noted above, the RCAP has not been adopted and is not considered a qualified GHG reduction plan under CEQA Guidelines Section 15183.5 as a formal CEQA document was also not prepared. The RCAP also does not provide specific reduction targets or CEQA significance thresholds for individual development projects. Therefore, the RCAP cannot be used to determine the impact of Project GHG emissions.

As previously described, statewide emissions reduction programs have been developed to implement AB 32 and SB 32. Local reduction measures and actions are included to address the remaining gap between the reduction targets and statewide actions. These local actions are organized into reduction categories according to the source of emissions that they address. Reduction categories include energy, solid waste, transportation, water, and carbon sequestration.

Shasta County is also subject to compliance with AB 32 and SB 32, which is a legal mandate requiring that statewide GHG emissions be reduced to 1990 levels by 2020, and 40 percent below 1990 levels by 2030, respectively. In adopting the AB 32 and SB 32 reduction targets, the legislature determined the necessary GHG reductions for the state to make in order to sufficiently offset its contribution to the cumulative climate change problem to reach 1990 levels by 2020 and be 40 percent below 1990 levels by 2030. As identified above, the proposed project would remain significant and unavoidable despite the incorporation of Mitigation Measure 5.7-1. Therefore, the proposed project would potentially conflict with the AB 32, and SB 32 reductions goals despite the implementation of the Project Design Features and **Mitigation Measure 5.7-1** described above. Impacts would be *significant and unavoidable*.

**Mitigation Measures:** Implement **Mitigation Measure 5.7-1**.

**Level of Significance After Mitigation:** Impacts would remain *significant and unavoidable* for both 2020 and 2030.

## 5.7.5 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

---

<b>IMPACT</b> 5.7-3	<b><i>Greenhouse gas emissions generated by the project could potentially have a significant impact on global climate change.</i></b>
------------------------	---

---

**Significance:** Potentially Significant Impact.

**Cumulative Setting:** Under AB 32, CARB, the agency in charge of regulating sources of emissions of GHGs in California, has been tasked with adopting regulations for reduction of GHG emissions. The effects of this project are evaluated based not upon the quantity of emissions, but rather on whether the project implements reduction strategies identified in AB 32, the Governor's Executive Order S-3-05, or other strategies to help toward reducing GHGs to the level proposed by the governor. If so, it could reasonably follow that the project would not result in a significant contribution to the cumulative impact of global climate change.

---

<sup>27</sup> OPR Technical Advisory CEQA AND CLIMATE CHANGE. <https://opr.ca.gov/docs/june08-ceqa.pdf>

<sup>28</sup> CARB Scoping Plan, page 100, 2017, [https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf)



**Impact Analysis:** It is generally the case that an individual project of this size and nature is of insufficient magnitude by itself to influence climate change or result in a substantial contribution to the global GHG inventory.<sup>29</sup> GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective.<sup>30</sup> The additive effect of project-related GHGs would not result in a reasonably foreseeable cumulatively considerable contribution to global climate change. In addition, the proposed project as well as other cumulative related projects would also be subject to all applicable regulatory requirements, which would further reduce GHG emissions. As previously discussed, regulatory requirements that pertain to mobile- and energy-related emissions would have the most substantial effect on reducing the project's future emissions. Cleaner burning fuel, vehicle fuel efficiency improvements over time, and increases in the use of zero emission vehicles, would result in mobile emissions decreases per vehicle mile traveled. As utility providers are mandated to meet more stringent emission standards and incorporate a greater percentage of renewable energy sources in the power grid, emissions from electricity decline per unit of energy. As stated above, the proposed project would exceed the applicable bright line threshold despite the implementation of Project Design Features and **Mitigation Measure 5.7-1**. Therefore, the project's cumulative GHG impacts would remain *significant and unavoidable*.

**Mitigation Measures:** Implement **MM 5.7-1**.

**Level of Significance After Mitigation:** Cumulative GHG impacts would *be significant and unavoidable for both 2020 and 2030*.

---

<sup>29</sup> CAPCOA (California Air Pollution Control Officers Association). 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*.

<sup>30</sup> Ibid.

**This Page Intentionally Left Blank**