

**16.0**

**GREENHOUSE GASES AND CLIMATE CHANGE**

### 16.0 GREENHOUSE GASES AND CLIMATE CHANGE

This section provides a discussion of the project's effect on greenhouse gas emissions and the associated effects of climate change. The reader is referred to Section 10.0, Air Quality, for a discussion of project impacts associated with air quality.

#### 16.1 EXISTING SETTING

##### 16.1.1 EXISTING CLIMATE SETTING

Since the early 1990s, scientific consensus holds that the world's population is releasing greenhouse gases (GHGs) faster than the earth's natural systems can absorb them. These gases are released as byproducts of fossil fuel combustion, waste disposal, energy use, land use changes, and other human activities. This release of gases, such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O), creates a blanket around the earth that allows light to pass through but traps heat at the surface, preventing its escape into space. While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of greenhouse gases beyond natural levels. The overabundance of greenhouse gases in the atmosphere has led to a warming of the earth and has the potential to severely impact the earth's climate system.

While often used interchangeably, there is a difference between the terms "climate change" and "global warming." According to the National Academy of Sciences, climate change refers to any significant, measurable change of climate lasting for an extended period of time that can be caused by both natural factors and human activities. Global warming, on the other hand, is an average increase in the temperature of the atmosphere caused by increased greenhouse gas emissions. The use of the term climate change is becoming more prevalent because it encompasses all changes to the climate, not just temperature.

To fully understand global climate change, it is important to recognize the naturally occurring greenhouse effect and to define the greenhouse gases that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

**Table 16-1** provides descriptions of the primary greenhouse gases attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

**TABLE 16-1  
GREENHOUSE GASES**

| Greenhouse Gas                         | Description  |
|--|--|
| Carbon Dioxide (CO <sub>2</sub> )      | Carbon dioxide is a colorless, odorless gas. CO <sub>2</sub> is emitted in a number of ways, both naturally and through human activities. The largest source of CO <sub>2</sub> emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO <sub>2</sub> emissions. The atmospheric lifetime of CO <sub>2</sub> is variable because it is so readily exchanged in the atmosphere. <sup>1</sup>  |
| Methane (CH <sub>4</sub> )             | Methane is a colorless, odorless gas that is not flammable under most circumstances. CH <sub>4</sub> is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years. <sup>2</sup>            |
| Nitrous Oxide (N <sub>2</sub> O)       | Nitrous oxide is a clear, colorless gas with a slightly sweet odor. N <sub>2</sub> O is produced by both natural and human-related sources. Primary human-related sources of N <sub>2</sub> O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N <sub>2</sub> O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N <sub>2</sub> O is approximately 120 years. <sup>3</sup>  |
| Hydrofluorocarbons (HFCs)              | Hydrofluorocarbons are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 260 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years). <sup>4</sup>   |
| Perfluorocarbons (PFCs)                | Perfluorocarbons are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF <sub>4</sub> ), perfluoroethane (C <sub>2</sub> F <sub>6</sub> ), perfluoropropane (C <sub>3</sub> F <sub>8</sub> ), perfluorobutane (C <sub>4</sub> F <sub>10</sub> ), perfluorocyclobutane (C <sub>4</sub> F <sub>8</sub> ), perfluoropentane (C <sub>5</sub> F <sub>12</sub> ), and perfluorohexane (C <sub>6</sub> F <sub>14</sub> ). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF <sub>4</sub> and C <sub>2</sub> F <sub>6</sub> as byproducts. The estimated atmospheric lifetimes for CF <sub>4</sub> and C <sub>2</sub> F <sub>6</sub> are 50,000 and 10,000 years, respectively. <sup>4,5</sup> |
| Sulfur Hexafluoride (SF <sub>6</sub> ) | Sulfur hexafluoride is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF <sub>6</sub> is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF <sub>6</sub> produced worldwide. Significant leaks occur from aging equipment and during equipment maintenance and servicing. SF <sub>6</sub> has an atmospheric life of 3,200 years. <sup>4</sup>   |

Sources: <sup>1</sup>EPA 2011a, <sup>2</sup>EPA 2011b, <sup>3</sup>EPA 2010a, <sup>4</sup>EPA 2010b, <sup>5</sup>EFCTC 2003

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Gases with high global warming potential, such as HFCs, PFCs, and SF<sub>6</sub>, are the most heat-absorbent. Methane traps over 21 times more heat per molecule than CO<sub>2</sub>, and N<sub>2</sub>O absorbs 310 times more heat per

## 16.0 Greenhouse Gases and Climate Change

molecule than CO<sub>2</sub>. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO<sub>2</sub>e), which weighs each gas by its global warming potential (GWP). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO<sub>2</sub> were being emitted. **Table 16-2** shows the GWPs for different greenhouse gases for a 100-year time horizon.

**TABLE 16-2**  
**GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES**

| Greenhouse Gas                                     | Global Warming Potential |
|--|--------------------------|
| Carbon Dioxide (CO <sub>2</sub> )                  | 1                        |
| Methane (CH <sub>4</sub> )                         | 21                       |
| Nitrous Oxide (N <sub>2</sub> O)                   | 310                      |
| Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) | 6,500                    |
| Sulfur Hexafluoride (SF <sub>6</sub> )             | 23,900                   |

*Source: California Climate Action Registry 2009*

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is a significant emitter of CO<sub>2</sub> in the world and produced 452 million gross metric tons of CO<sub>2</sub>e in 2010 (CARB 2013). Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2010, accounting for 38.3 percent of total GHG emissions in the state (CARB 2013). This category was followed by the electric power sector (including both in-state and out-of-state sources) (20.7 percent) and the industrial sector (19.0 percent) (CARB 2013).

### Effects of Global Climate Change

California can draw on substantial scientific research conducted by experts at various state universities and research institutions. With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state—as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea level rise, and ecological shifts.

Many of these changes are accelerating—locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California will face intensifying climate changes in coming decades (CNRA 2009a). Generally, research indicates that California should expect overall hotter and drier conditions with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased average temperatures and accelerating sea-level rise. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA 2009a).

# Northstar Mountain Master Plan EIR

Climate change temperature projections identified in the 2009 California Climate Adaptation Strategy suggest the following (CNRA 2009a):

- Average temperature increase is expected to be more pronounced in the summer than in the winter season.
- Inland areas are likely to experience more pronounced warming than coastal regions.
- Heat waves are expected to increase in frequency, with individual heat waves also showing a tendency toward becoming longer and extending over a larger area, thus more likely to encompass multiple population centers in California at the same time.
- As GHGs remain in the atmosphere for decades, temperature changes over the next 30 to 40 years are already largely determined by past emissions. By 2050, temperatures are projected to increase by an additional 1.8 to 5.4°F (an increase one to three times as large as that which occurred over the entire twentieth century).
- By 2100, the models project temperature increases between 3.6 and 9°F.

According to the 2009 California Climate Adaptation Strategy, the impacts of climate change in California have the potential to include, but are not limited to, the areas discussed in **Table 16-3**.

**TABLE 16-3  
POTENTIAL STATEWIDE IMPACTS FROM CLIMATE CHANGE**

| Potential Statewide Impact | Description  |
|----------------------------|--|
| Public Health              | Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer than in winter months. Larger temperature increases are anticipated in inland communities as compared to the California coast. The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Numerous studies have indicated that there are generally more deaths during periods of sustained higher temperatures, and these are due to cardiovascular causes and other chronic diseases. The elderly, infants, and socially isolated people with pre-existing illnesses who lack access to air conditioning or cooling spaces are among the most at risk during heat waves.  |
| Floods and Droughts        | The impacts of flooding can be significant. Results may include population displacement, severe psychosocial stress with resulting mental health impacts, exacerbation of pre-existing chronic conditions, and infectious disease. Additionally, impacts can range from a loss of personal belongings, and the emotional ramifications from such loss, to direct injury and/or mortality.<br><br>Drinking water contamination outbreaks in the United States are associated with extreme precipitation events. Runoff from rainfall is also associated with coastal contamination that can lead to contamination of shellfish and contribute to food-borne illness. Floodwaters may contain household, industrial, and agricultural chemicals as well as sewage and animal waste. Flooding and heavy rainfall events can wash pathogens and chemicals from contaminated soils, farms, and streets into drinking water supplies. Flooding may also overload storm and wastewater systems, or flood septic systems, also |

## 16.0 Greenhouse Gases and Climate Change

| Potential Statewide Impact | Description  |
|----------------------------|--|
|                            | <p>leading to possible contamination of drinking water systems.</p> <p>Drought impacts develop more slowly over time. Risks to public health that Californians may face from drought include impacts on water supply and quality, food production (both agricultural and commercial fisheries), and risks of waterborne illness. As surface water supplies are reduced as a result of drought conditions, the amount of groundwater pumping is expected to increase to make up for the water shortfall. The increase in groundwater pumping has the potential to lower the water tables and cause land subsidence. Communities that utilize well water will be adversely affected by drops in water tables or through changes in water quality. Groundwater supplies have higher levels of total dissolved solids compared to surface waters. This introduces a set of effects for consumers, such as repair and maintenance costs associated with mineral deposits in water heaters and other plumbing fixtures, and on public water system infrastructure designed for lower salinity surface water supplies. Drought may also lead to increased concentration of contaminants in drinking water supplies.</p> |
| Water Resources            | <p>The state's water supply system already faces challenges to provide water for California's growing population. Climate change is expected to exacerbate these challenges through increased temperatures and possible changes in precipitation patterns. The trends of the last century—especially increases in hydrologic variability—will likely intensify in this century. The state can expect to experience more frequent and larger floods and deeper droughts. Rising sea level will threaten the Delta water conveyance system and increase salinity in near-coastal groundwater supplies. Planning for and adapting to these simultaneous changes, particularly their impacts on public safety and long-term water supply reliability, will be among the most significant challenges facing water and flood managers this century.</p>  |
| Forests and Landscapes     | <p>Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, wildfire occurrence statewide could increase from 57 percent to 169 percent by 2085. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state.</p>   |

Source: CNRA 2009a

### 16.2 REGULATORY FRAMEWORK

The adoption of recent legislation has provided a clear mandate that climate change must be included in an environmental review for a project subject to the California Environmental Quality Act (CEQA). Several GHG emission-related laws and regulations are discussed below.

#### 16.2.1 FEDERAL

##### Federal Regulation and the Clean Air Act

In the past, the US Environmental Protection Agency (EPA) has not regulated greenhouse gases under the Clean Air Act (CAA) because it asserted that the act did not authorize the 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 US Supreme Court held that the 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 EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438

[2007]). The US Supreme Court held that the EPA was authorized by the Clean Air Act to regulate CO<sub>2</sub> emissions from new motor vehicles. The court did not mandate that the EPA enact regulations to reduce GHG emissions, but found that the only instances in which the EPA could avoid taking action were if it found that GHG emissions do not contribute to climate change or if it offered a “reasonable explanation” for not determining that GHG emissions contribute to climate change.

On December 7, 2009, the EPA issued an “endangerment finding” under the Clean Air Act, concluding that GHG emissions threaten the public health and welfare of current and future generations and that motor vehicles contribute to GHG pollution (EPA 2009). These findings provide the basis for adopting new national regulations to mandate GHG emission reductions under the federal Clean Air Act. The EPA’s endangerment finding paves the way for federal regulation of GHG emissions.

It was expected that Congress would enact GHG legislation, primarily for a cap-and-trade system. However, proposals circulated in both the House of Representatives and the Senate were controversial, and it may be some time before Congress adopts major climate change legislation. Under the Consolidated Appropriations Act of 2008 (HR 2764), Congress established mandatory GHG reporting requirements for some emitters of greenhouse gases. In addition, on September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. The rule requires annual reporting to the EPA of greenhouse gases emissions from large sources and suppliers of greenhouse gases, including facilities that emit 25,000 metric tons or more a year of GHGs.

The following discussion summarizes the EPA’s recent regulatory activities with respect to various types of GHG sources.

### **EPA and National Highway Traffic Safety Administration Joint Rulemaking for Vehicle Standards**

In response to the *Massachusetts v. EPA* ruling discussed above, the Bush Administration issued an Executive Order on May 14, 2007, directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008.

On October 10, 2008, the National Highway Traffic Safety Administration (NHTSA) released a final environmental impact statement analyzing proposed interim standards for passenger cars and light trucks in model years 2011 through 2015. The NHTSA issued a final rule for model year 2011 on March 30, 2009 (NHTSA 2009).

On May 7, 2010, the EPA and the NHTSA issued a final rule regulating fuel efficiency and GHG pollution from motor vehicles for cars and light-duty trucks for model years 2012–2016 (EPA 2010c). On May 21, 2010, President Obama issued a memorandum to the Secretaries of Transportation and Energy, and to the Administrators of the EPA and the NHTSA, calling for the establishment of additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the EPA and the NHTSA issued a Supplemental Notice of Intent announcing plans to propose stringent, coordinated federal greenhouse gas and fuel economy standards for model year 2017–2025 light-duty vehicles. The agencies proposed standards projected to achieve 163 grams per mile of CO<sub>2</sub> in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level

---

## 16.0 Greenhouse Gases and Climate Change

were achieved solely through fuel efficiency. California has announced its support of this national program. The final rule was adopted in October 2012, and the NHTSA intends to set standards for model years 2022–2025 in a future rulemaking.

### 16.2.2 STATE

California has adopted various administrative initiatives and also enacted a variety of legislation relating to climate change, much of which sets aggressive goals for GHG emissions reductions in the state. However, none of this legislation provides definitive direction regarding the treatment of climate change in the environmental review documents prepared under CEQA. In particular, the amendments to the CEQA Guidelines do not require or suggest specific methodologies for performing an assessment or thresholds of significance and do not specify greenhouse gas reduction mitigation measures. Instead, the CEQA amendments continue to rely on lead agencies to choose methodologies and make significance determinations based on substantial evidence, as discussed in further detail below. In addition, no state agency has promulgated binding regulations for analyzing GHG emissions, determining their significance, or mitigating any significant effects in CEQA documents. Thus, lead agencies exercise their discretion determining how to analyze greenhouse gases.

The discussion below provides a brief overview of California Air Resources Board (CARB) and Office of Planning and Research (OPR) documents and of the primary legislation relating to climate change that may affect the emissions associated with the proposed project. It begins with an overview of the primary regulatory acts that have driven GHG regulation and analysis in California.

#### **Executive Order S-3-05 (Statewide GHG Targets)**

California Executive Order S-03-05 (June 1, 2005) mandates a reduction of GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. Although the 2020 target has been incorporated into legislation (AB 32), the 2050 target remains only a goal of the Executive Order.

#### **Assembly Bill 32, the California Global Warming Solutions Act of 2006**

The California Global Warming Solutions Act of 2006 (AB 32) 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) was signed into law in September 2006 after considerable study and expert testimony before the legislature. The law instructs CARB to develop and enforce regulations for the reporting and verifying of statewide GHG emissions. The act directed CARB to set a GHG emissions limit based on 1990 levels, to be achieved by 2020. The bill set a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner.

The heart of the bill is the requirement that statewide GHG emissions be reduced to 1990 levels by 2020 (1990 levels have been estimated to equate to 15 percent below 2005 emission levels). Based on CARB's calculation of 1990 baseline emissions levels, California must reduce GHG emissions by approximately 29 percent below "business-as-usual" predictions of year 2020 GHG emissions to achieve this goal.

The bill required CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. CARB accomplished the key milestones set forth in AB 32, including the following:

- June 30, 2007. Identification of discrete early action GHG emissions reduction measures. On June 21, 2007, CARB satisfied this requirement by approving three early action measures. These were later supplemented by adding six other discrete early action measures.
- January 1, 2008. Identification of the 1990 baseline GHG emissions level, approval of a statewide limit equivalent to that level, and adoption of reporting and verification requirements concerning GHG emissions. On December 6, 2007, CARB approved a statewide limit on GHG emissions levels for the year 2020 consistent with the determined 1990 baseline.
- January 1, 2009. Adoption of a scoping plan for achieving GHG emission reductions. On December 11, 2008, CARB adopted the Climate Change Scoping Plan: A Framework for Change (Scoping Plan), discussed in more detail below.
- January 1, 2010. Adoption and enforcement of regulations to implement the “discrete” actions. Several early action measures have been adopted and became effective on January 1, 2010.
- January 1, 2011. Adoption of GHG emissions limits and reduction measures by regulation. On October 28, 2010, CARB released its proposed cap-and-trade regulations, which would cover sources of approximately 85 percent of California’s GHG emissions (CARB 2010). CARB’s board ordered CARB’s executive director to prepare a final regulatory package for cap and trade on December 16, 2010.
- January 1, 2012. GHG emissions limits and reduction measures adopted in 2011 become enforceable.

### **AB 32 Scoping Plan**

As noted above, on December 11, 2008, CARB adopted the Scoping Plan to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California’s GHG emissions. CARB determined that achieving the 1990 emission 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”). The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. Additional development of these measures and adoption of the appropriate regulations will occur through the end of year 2013. The 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.

## 16.0 Greenhouse Gases and Climate Change

---

- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California’s GHG emissions.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California’s clean car standards, heavy-duty truck measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State of California’s long-term commitment to AB 32 implementation. (CARB 2008)

In 2009, a coalition of special interest groups brought a challenge to the Scoping Plan alleging that it violated AB 32 and that the environmental review document (called a “Functional Equivalent Document”) violated CEQA by failing to appropriately analyze alternatives to the proposed cap-and-trade program. On May 20, 2011, the San Francisco Superior Court entered a final judgment ordering that CARB take no further action with respect to cap-and-trade rulemaking until it complies with CEQA. While CARB disagrees with the trial court finding and appealed the decision on May 23, 2011, in order to remove any doubt about the matter and in keeping with CARB’s interest in public participation and informed decision-making, CARB revisited the alternatives. The revised analysis includes the five alternatives included in the original environmental analysis: a “no project” alternative (that is, taking no action at all); a plan relying on a cap-and-trade program for the sectors included in a cap; a plan relying more on source-specific regulatory requirements with no cap-and-trade component; a plan relying on a carbon fee or tax; and a plan relying on a variety of proposed strategies and measures. The public hearing to consider approval of the AB 32 Scoping Plan Functional Equivalent Document and the AB 32 Scoping Plan was held on August 24, 2011. On this date, CARB re-approved the Scoping Plan.

In August 2012, CARB released revised estimates of the expected 2020 emissions reductions. The revised analysis relies on emissions projections updated in light of current economic forecasts which account for the economic downturn since 2008 as well as reduction measures already approved and put in place. This reduced the projected 2020 emissions from 596 million metric tons (MMT) CO<sub>2</sub>e to 545 MMTCO<sub>2</sub>e. The reduction in projected 2020 emissions means that the revised business-as-usual (BAU) reduction necessary to achieve AB 32’s goal of reaching 1990 levels by 2020 is now only 21 percent.

### **Assembly Bill 1493**

Assembly Bill 1493 (“the Pavley Standard,” or AB 1493) (Health and Safety Code Sections 42823 and 43018.5) required CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from noncommercial passenger vehicles and light-duty trucks of model years 2009–2016. The bill also required the California Climate Action Registry to develop and adopt protocols for the reporting and certification of GHG emissions

reductions from mobile sources for use by CARB in granting emissions reduction credits. The bill authorizes CARB to grant emissions reduction credits for reductions in GHG emissions prior to the date of enforcement of regulations, using model year 2000 as the baseline for reduction.

In 2004, CARB applied to the EPA for a waiver under the federal Clean Air Act to authorize implementation of these regulations. The waiver request was formally denied by the EPA in December 2007 after California filed suit to prompt federal action. In January 2008, the California Attorney General filed a new lawsuit against the EPA for denying California's request for a waiver to regulate and limit GHG emissions from these vehicles. In January 2009, President Barack Obama issued a directive to the EPA to reconsider California's request for a waiver. On June 30, 2009, the EPA granted the waiver to California for its GHG emission standards for motor vehicles. As part of this waiver, the EPA specified the provision that CARB may not hold a manufacturer liable or responsible for any noncompliance caused by emission debits generated by a manufacturer for the 2009 model year. CARB has adopted a new approach to passenger vehicles—cars and light trucks—by combining the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards. The new approach also includes efforts to support and accelerate the numbers of plug-in hybrids and zero-emission vehicles in California. These standards will apply to all passenger and light-duty trucks used in the state.

### **Low Carbon Fuel Standard**

Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by CARB. CARB identified the Low Carbon Fuel Standard (LCFS) as a discrete early action item under AB 32, and the final resolution (09-31) was issued on April 23, 2009. In 2009, CARB approved for adoption of the LCFS regulation, which became fully effective in April 2010 and is codified at Title 17, California Code of Regulations, Sections 95480–95490. The Low Carbon Fuel Standard will reduce greenhouse gas emissions by reducing the carbon intensity of transportation fuels used in California by at least 10 percent by 2020. Carbon intensity is a measure of the GHG emissions associated with the various production, distribution, and use steps in the “life cycle” of a transportation fuel.

On December 29, 2011, the US District Court for the Eastern District of California issued several rulings in the federal lawsuits challenging the LCFS. One of the district court's rulings preliminarily enjoined CARB from enforcing the regulation. In January 2012, CARB appealed that decision to the Ninth Circuit Court of Appeals and then moved to stay the injunction pending resolution of the appeal. On April 23, 2012, the Ninth Circuit granted CARB's motion for a stay of the injunction while it continues to consider CARB's appeal of the lower court's decision.

### **Clean Cars**

In January 2012, CARB approved the Advanced Clean Cars Program, a new emissions-control program for model years 2017–2025. The program combines the control of smog, soot, and GHG emissions with requirements for greater numbers of zero-emission vehicles. By 2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

### **Renewables Portfolio Standard (Senate Bill 1078, Senate Bill 107, and Senate Bill X1-2)**

Established in 2002 under Senate Bill (SB) 1078, and accelerated in 2006 under SB 107 and again in 2011 under SBX1-2, 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. As interim measures, the RPS requires 20 percent of retail sales to be sourced from renewable energy by 2013, and 25 percent by 2016. Initially, the RPS provisions applied to investor-owned utilities, community choice aggregators, and electric service providers. SBX1-2 added, for the first time, publicly owned utilities to the entities subject to the RPS. The expected growth in the RPS to meet the standards in effect in 2008 is not reflected in the BAU calculation in the AB 32 Scoping Plan. In other words, the Scoping Plan's 2020 business as usual does not take credit for implementation of the RPS that occurred after its adoption.

### **Senate Bill 375**

SB 375 (codified at Government Code and Public Resources Code<sup>1</sup>), signed in September 2008, provides for 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 375 will be implemented over the next several years and includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development. SB 375 also requires Metropolitan Planning Organizations (MPOs) to incorporate a "sustainable communities strategy" (SCS) in their regional transportation plans (RTPs) that will achieve GHG emission reduction targets by reducing vehicle miles traveled from light-duty vehicles through the development of more compact, complete, and efficient communities.

SB 375 is similar to the Regional Blueprint Planning Program, established by the California Department of Transportation (Caltrans), which provides discretionary grants to fund regional transportation and land use plans voluntarily developed by MPOs working in cooperation with councils of governments. The Scoping Plan relies on the requirements of SB 375 to implement the carbon emissions reductions anticipated from land use decisions.

On September 23, 2010, CARB adopted regional targets for the reduction of greenhouse gases applying to the years 2020 and 2035 (CARB 2011a). The project site is located in an area that is not represented by a MPO due to the rural nature of the region and therefore is not in an area that received CARB-adopted regional targets for reduction of GHG emissions (CARB 2011b).

### **California Building Energy Efficiency Standards**

Energy conservation standards for new residential and commercial buildings were originally adopted by the California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2008 (Title 24, Part 6 of the California Code of Regulations (CCR)). In general, Title 24 requires the design of

---

<sup>1</sup> Senate Bill 375 is codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588, 14522.1, 14522.2, and 65080.01 as well as Public Resources Code Sections 21061.3 and 21159.28 and Chapter 4.2.

building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24, California Code of Regulations). Part 11 establishes voluntary standards on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. Some of these standards became mandatory in the 2010 edition of the Part 11 code. Current mandatory standards include:

- Twenty (20) percent mandatory reduction in indoor water use, with voluntary goal standards for 30, 35, and 40 percent reductions
- Separate water meters for nonresidential buildings' indoor and outdoor water use, with a requirement for moisture-sensing irrigation systems for larger landscape projects
- Diversion of 50 percent of construction waste from landfills, increasing voluntarily to 65 and 75 percent for new homes and 80 percent for commercial projects
- Mandatory inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies
- Low-pollutant-emitting interior finish materials such as paints, carpet, vinyl flooring, and particleboard

The California Energy Commission has opened a public process and rulemaking proceeding for the adoption of changes to the 2013 Building Energy Efficiency Standards contained in the California Code of Regulations, Title 24, Part 6 (also known as the California Energy Code) and associated administrative regulations in Part 1 (collectively referred to here as the standards). The proposed amended standards will be adopted in 2014. The 2013 Building Energy Efficiency Standards are 25 percent more efficient than previous standards for residential construction and 30 percent better for nonresidential construction. The standards, which take effect on January 1, 2014, will offer builders better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in homes and businesses.

### **16.2.3 LOCAL**

#### **Placer County Air Pollution Control District**

The project is under the jurisdiction of the Placer County Air Pollution Control District (PCAPCD), which regulates air quality according to the standards established in the federal and California Clean Air Acts and amendments to those acts. The PCAPCD

## 16.0 Greenhouse Gases and Climate Change

---

regulates air quality through its permitting authority and through air quality-related planning and review activities over most types of stationary emission sources.

The PCAPCD has not yet established significance thresholds for GHG emissions from project operations.

### 16.3 IMPACTS

#### 16.3.1 STANDARDS OF SIGNIFICANCE

Per Appendix G of the State CEQA Guidelines, the County considers impacts related to climate change significant if implementation of the proposed project would result in any of the following:

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

Implementation of the proposed project would result in the generation of GHG emissions associated with construction activities, consisting primarily of emissions from equipment exhaust, as well as long-term operations, consisting primarily of new vehicular trips and indirect source emissions from electricity usage.

Addressing GHG generation impacts requires an agency to make a determination as to what constitutes a significant impact. The amendments to the CEQA Guidelines specifically allow lead agencies to determine thresholds of significance that illustrate the extent of an impact and are a basis from which to apply mitigation measures. This means that each agency is left to determine if a project's GHG emissions will have a "significant" impact on the environment. The 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 CCR Section 15064.4(a)).

In its Final Statement of Reasons for Regulatory Action accompanying the CEQA Amendments (FSOR), the California Natural Resources Agency (2009b) explains that quantification of GHG emissions "is reasonably necessary to ensure an adequate analysis of GHG emissions using available data and tools" and that "quantification will, in many cases, assist in the determination of significance." However, as explained in the FSOR, the revised Section 15064.4(b) assigns lead agencies the discretion to determine the methodology to quantify GHG emissions. The FSOR also notes that CEQA case law has long stated that "there is no iron-clad definition of 'significance.' Accordingly, lead agencies must use their best efforts to investigate and disclose all that they reasonably can concerning a project's potential adverse impacts."

Determining a threshold of significance for a project's climate change impacts poses a special difficulty for lead agencies. Much of the science in this area is new and is evolving constantly. At the same time, neither the state nor local agencies are specialized in this area, and there are currently no local, regional, or state thresholds for determining whether a proposed project has a significant impact on climate change. The CEQA

Amendments do not prescribe specific significance thresholds but instead leave considerable discretion to lead agencies to develop appropriate thresholds to apply to projects within their jurisdiction.

As noted earlier, AB 32 is a legal mandate requiring that statewide GHG emissions be reduced to 1990 levels by 2020. In adopting AB 32, 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. AB 32 is the only legally mandated requirement for the reduction of greenhouse gases. As such, compliance with AB 32 is the adopted basis upon which the agency can base its significance threshold for evaluating the project's GHG impacts.

As previously stated, significance thresholds for GHG emission increases resulting from land use development projects have not been established in Placer County (as previously mentioned, the PCAPCD has not yet established significance thresholds for GHG emissions from project operations). In April 2012, the San Luis Obispo County Air Pollution Control District (SLOAPCD) published its greenhouse gas threshold (1,150 metric tons of CO<sub>2</sub>e annually) in its CEQA Handbook. If the proposed project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact and the impact would be considered significant. The SLOAPCD thresholds were chosen based on the substantial evidence that such thresholds represent quantitative and/or qualitative levels of GHG emissions, compliance with which means that the environmental impact of the GHG emissions will normally not be cumulatively considerable under CEQA. Compliance with such thresholds will be part of the solution to the cumulative GHG emissions problem, rather than hinder the State's ability to meet its goals of reduced statewide GHG emissions under AB 32 by attributing an appropriate share of the GHG reductions needed from new land use projects subject to CEQA. This approach is a conservative method that focuses on a limited set of state mandates that are currently expected to have the greatest potential to reduce land use-related GHG emissions. This approach is predicated on the premise that there is a shortfall, or "gap" between the current emissions trajectory (projected emissions with existing control measures) and the desired emissions trajectory needed to reach a defined emissions level.

Thus, 1,150 metric tons of CO<sub>2</sub>e annually was used to determine if the project would generate new GHG emissions that may have a significant impact on the environment (standard of significance 1 above).

The proposed project would also be considered to have a significant impact if it would be in conflict with the AB 32 goals for reducing GHG emissions (standard of significance 2 above). As shown under the impact analysis below, the proposed project would contribute to the generation of GHG emissions primarily from electricity consumption and tree removal activities. Therefore, this DEIR assesses the project's potential to result in a significant GHG impact by determining its consistency with the AB 32 Scoping Plan and Senate Bill X-2 (Renewables Portfolio Standard), which both require 33 percent of supply from renewable energy sources by 2020, and its consistency with AB 32 Scoping Plan GHG reduction measure F-1, Sustainable Forest Target. As stated previously, the AB 32 Scoping Plan contains the main strategies California is implementing to achieve a reduction of 169 MMT of CO<sub>2</sub>e, or approximately 30 percent from the State's projected 2020 emissions level of 596 MMT of CO<sub>2</sub>e under a business-as-usual scenario. Thus, the impact analysis evaluates whether the project's electrical provider would meet the

## 16.0 Greenhouse Gases and Climate Change

---

Renewables Portfolio Standard or if project features would conflict with AB 32 greenhouse gas reduction measures.

### 16.3.2 METHODOLOGY

The resultant GHG emissions of the proposed project were calculated using the California Emissions Estimator Model (CalEEMod), version 2013.2, computer program (see **Appendix 16**). 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 (SCAQMD) and is the most current emissions model approved for use in California by various other air districts.

As stated in Section 3.0, Project Description, construction phasing of the proposed improvements is unknown at this time; however, construction is anticipated to occur in 5.5-month segments starting on May 1 of each year over a buildout period of 20 years. For the purposes of this analysis, a construction timeline of 4.5 months per year for 10 consecutive years is assumed in order to provide a conservative analysis to factor variations in snow conditions in the late spring months. The specific equipment used to construct the proposed features of the project was obtained from **Table 3-4** in Section 3.0, Project Description. As shown in **Table 3-4**, lift construction will include the operation of a helicopter. Helicopter emissions modeling for lift construction-related helicopter flights is based on the assumption of 4 hours of use per constructed lift as anticipated by the project applicant. The anticipated area of disturbance from tree removal activities was obtained from **Table 3-5** in Section 3.0, and the anticipated area of disturbance from all other construction activities was obtained by **Table 3-6** in Section 3.0.

The proposed project would result in a substantial increase of electricity consumption as a result of new ski lifts and snowmaking facilities. GHG emissions generated by increased electricity consumption are projected based on anticipated energy consumption in kilowatt-hours provided by the project applicant. The increase of traffic over existing conditions as a result of the project was obtained from LSC Transportation Consultants, Inc. (see **Appendix 9**).

The California Natural Resources Agency CNRA has noted that impacts of GHG emissions should focus on the cumulative impact on climate change. The public notice states (CNRA 2009c):

*While the Proposed Amendments do not foreclose the possibility that a single project may result in greenhouse gas emissions with a direct impact on the environment, the evidence before [CNRA] indicates that in most cases, the impact will be cumulative. Therefore, the Proposed Amendments emphasize that the analysis of greenhouse gas emissions should center on whether a project's incremental contribution of greenhouse gas emissions is cumulatively considerable.*

Thus, the CEQA Amendments continue to make clear that the significance of GHG emissions is most appropriately considered on a cumulative level. Therefore, for the purposes of evaluating the proposed project's GHG impacts, construction-generated GHG emissions will be quantified, amortized over the life of the project (30 years), and added to the annual operational emissions.

**16.3.3 IMPACTS AND MITIGATION MEASURES**

**IMPACT 16.1: Greenhouse Gas Emissions**

GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. No single land use project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contributes substantially to the phenomenon of global climate change and its associated environmental impacts and as such is addressed only as a cumulative impact.

**Construction GHG Emissions**

Subsequent development proposed under the proposed project would result in direct emissions of GHGs from construction.

As stated in Section 3.0, Project Description, construction phasing of the proposed improvements is unknown at this time; however, construction is anticipated to occur in 5.5-month segments starting on May 1 of each year over a buildout period of 20 years. For the purposes of this analysis, a construction timeline of 4.5 months per year for 10 consecutive years is assumed in order to provide a conservative analysis to factor variations in snow conditions in the late spring months. Construction-generated emissions associated with each of the anticipated project components as shown and ordered in **Table 3-6** in Section 3.0, Project Description, were calculated using the CARB-approved CalEEMod computer program, which is designed to model emissions for land use development projects, based on typical construction requirements. Construction equipment used in the model was based on **Table 3-4** in Section 3.0. Predicted maximum daily construction-generated emissions for the proposed development project are summarized in **Table 16-4**.

**TABLE 16-4  
UNCONTROLLED CONSTRUCTION-GENERATED EMISSIONS**

| Project Components  | Maximum Emissions (metric tons/year) |                 |                  |                   |
|---|--------------------------------------|-----------------|------------------|-------------------|
|   | CO <sub>2</sub>                      | CH <sub>4</sub> | N <sub>2</sub> O | CO <sub>2</sub> e |
| <b><u>Project-Level Components</u></b>                                    |                                      |                 |                  |                   |
| <b><u>Year 1</u></b>  |                                      |                 |                  |                   |
| Tree Removal (30.7 acres disturbed)                                       | 65                                   | 0               | 0                | 65                |
| Grading for C Lift (2.7 acres disturbed)                                  | 84                                   | 0               | 0                | 84                |
| Snowmaking Line Trench for C Lift and Challenger Run (28 acres disturbed) | 11                                   | 0               | 0                | 11                |
| C Lift Construction <sup>1</sup>  | 31                                   | 0               | 0                | 31                |
| Revegetation  | 24                                   | 0               | 0                | 24                |
| <i>Year 1 Subtotal</i>  | <i>215</i>                           | <i>0</i>        | <i>0</i>         | <i>215</i>        |
| <b><u>Year 2</u></b>  |                                      |                 |                  |                   |
| Tree Removal (19.1 acres disturbed)                                       | 64                                   | 0               | 0                | 64                |
| Grading for J Lift (3.7 acres disturbed)                                  | 187                                  | 0               | 0                | 187               |

## 16.0 Greenhouse Gases and Climate Change

| Project Components  | Maximum Emissions (metric tons/year) |                 |                  |                   |
|---|--------------------------------------|-----------------|------------------|-------------------|
|   | CO <sub>2</sub>                      | CH <sub>4</sub> | N <sub>2</sub> O | CO <sub>2</sub> e |
| Snowmaking Line Trench for J Lift (14 acres disturbed)          | 11                                   | 0               | 0                | 11                |
| J Lift Construction <sup>1</sup>                                | 35                                   | 0               | 0                | 35                |
| Revegetation  | 22                                   | 0               | 0                | 22                |
| <i><u>Year 2 Subtotal</u></i>                                   | <i>319</i>                           | <i>0</i>        | <i>0</i>         | <i>319</i>        |
| <b><u>Year 3</u></b>  |                                      |                 |                  |                   |
| Tree Removal (16.1 acres disturbed)                             | 64                                   | 0               | 0                | 64                |
| Grading for V Lift (2.1 acres disturbed)                        | 69                                   | 0               | 0                | 69                |
| Snowmaking Line Trench for V Lift (14 acres disturbed)          | 11                                   | 0               | 0                | 11                |
| V Lift Construction <sup>1</sup>                                | 34                                   | 0               | 0                | 34                |
| Revegetation  | 21                                   | 0               | 0                | 21                |
| <i><u>Year 3 Subtotal</u></i>                                   | <i>199</i>                           | <i>0</i>        | <i>0</i>         | <i>199</i>        |
| <b><u>Year 4</u></b>  |                                      |                 |                  |                   |
| Tree Removal (4 acres disturbed)                                | 63                                   | 0               | 0                | 63                |
| Grading for W & Z Lifts (4 acres disturbed)                     | 80                                   | 0               | 0                | 80                |
| Lifts W & Z Lift Construction <sup>1</sup>                      | 65                                   | 0               | 0                | 65                |
| Revegetation  | 20                                   | 0               | 0                | 20                |
| <i><u>Year 4 Subtotal</u></i>                                   | <i>228</i>                           | <i>0</i>        | <i>0</i>         | <i>228</i>        |
| <b><u>Year 5</u></b>  |                                      |                 |                  |                   |
| Tree Removal (74.3 acres disturbed)                             | 61                                   | 0               | 0                | 61                |
| Grading for Ski Trails <sup>2</sup> (16.7 acres disturbed)      | 182                                  | 0               | 0                | 182               |
| Snowmaking Line Trench for New Ski Trails (4.6 acres disturbed) | 8                                    | 0               | 0                | 8                 |
| Revegetation  | 25                                   | 0               | 0                | 25                |
| <i><u>Year 5 Subtotal</u></i>                                   | <i>279</i>                           | <i>0</i>        | <i>0</i>         | <i>279</i>        |
| <b><u>Year 6</u></b>  |                                      |                 |                  |                   |
| Tree Removal (74.3 acres disturbed)                             | 61                                   | 0               | 0                | 61                |
| Grading for Ski Trails <sup>2</sup> (16.7 acres disturbed)      | 179                                  | 0               | 0                | 179               |
| Snowmaking Line Trench for New Ski Trails (4.6 acres disturbed) | 8                                    | 0               | 0                | 8                 |
| Revegetation  | 24                                   | 0               | 0                | 24                |
| <i><u>Year 6 Subtotal</u></i>                                   | <i>272</i>                           | <i>0</i>        | <i>0</i>         | <i>272</i>        |
| <b><u>Year 7</u></b>  |                                      |                 |                  |                   |
| Tree Removal (74.3 acres disturbed)                             | 60                                   | 0               | 0                | 60                |
| Grading for Ski Trails <sup>2</sup> (16.7 acres disturbed)      | 183                                  | 0               | 0                | 183               |
| Snowmaking Line Trench for New Ski Trails (4.6 acres disturbed) | 10                                   | 0               | 0                | 10                |
| Revegetation  | 21                                   | 0               | 0                | 21                |
| <i><u>Year 7 Subtotal</u></i>                                   | <i>274</i>                           | <i>0</i>        | <i>0</i>         | <i>274</i>        |

# Northstar Mountain Master Plan EIR

| Project Components  | Maximum Emissions (metric tons/year) |                 |                  |                     |
|---|--------------------------------------|-----------------|------------------|---------------------|
|   | CO <sub>2</sub>                      | CH <sub>4</sub> | N <sub>2</sub> O | CO <sub>2</sub> e   |
| <b><u>Year 8</u></b>  |                                      |                 |                  |                     |
| Grading for Skier Bridges <sup>3</sup> (2 acres disturbed)  | 57                                   | 0               | 0                | 57                  |
| Skier Bridges Construction  | 40                                   | 0               | 0                | 40                  |
| Road Spur to Top of J Lift (0.3 acres disturbed)  | 112                                  | 0               | 0                | 112                 |
| <i>Year 8 Subtotal</i>  | <i>209</i>                           | <i>0</i>        | <i>0</i>         | <i>209</i>          |
| <b><u>Year 9</u></b>  |                                      |                 |                  |                     |
| Grading for Summit Deck & Grille Expansion, Backside Warming Hut, & Cross Country Ski Trail (1.5 acres disturbed) | 7                                    | 0               | 0                | 7                   |
| Construction of Summit Deck & Grille Expansion and Backside Warming Hut   | 91                                   | 0               | 0                | 91                  |
| Paving for Summit Deck & Grille Expansion and Backside Warming Hut  | 7                                    | 0               | 0                | 7                   |
| Painting of Summit Deck & Grille Expansion, Backside Warming Hut  | 1                                    | 0               | 0                | 0                   |
| <i>Year 9 Subtotal</i>  | <i>106</i>                           | <i>0</i>        | <i>0</i>         | <i>106</i>          |
| <b><u>Year 10</u></b>   |                                      |                 |                  |                     |
| Tree Removal (6 acres disturbed)  | 42                                   | 0               | 0                | 42                  |
| Grading for Six Road Spurs (1.35 acres disturbed)   | 142                                  | 0               | 0                | 142                 |
| <i>Year 10 Subtotal</i>   | <i>184</i>                           | <i>0</i>        | <i>0</i>         | <i>184</i>          |
| <b><u>Project-Level Components Subtotal (Years 1–10)</u></b>  | <b><i>2,285</i></b>                  | <b><i>0</i></b> | <b><i>0</i></b>  | <b><i>2,285</i></b> |
| <b><u>Program-Level Components</u></b>  |                                      |                 |                  |                     |
| Tree Removal for Q Pod (80 acres disturbed)   | 60                                   | 0               | 0                | 60                  |
| Grading for Q Pod (2.9 acres disturbed)   | 57                                   | 0               | 0                | 57                  |
| Q Pod Construction <sup>1</sup>   | 63                                   | 0               | 0                | 63                  |
| Revegetation for Q Pod  | 26                                   | 0               | 0                | 26                  |
| Tree Removal for Castle Peak Parking Lot Transport Gondola Improvements (10 acres disturbed)                      | 60                                   | 0               | 0                | 60                  |
| Grading for Castle Peak Parking Lot Transport Gondola Improvements (4.2 acres disturbed)                          | 77                                   | 0               | 0                | 77                  |
| Castle Peak Parking Lot Transport Gondola Improvements Construction <sup>1</sup>                                  | 75                                   | 0               | 0                | 75                  |
| Revegetation for Castle Peak Parking Lot Transport Gondola Improvements   | 11                                   | 0               | 0                | 11                  |
| Tree Removal for Ski Trails (12.5 acres disturbed)  | 60                                   | 0               | 0                | 60                  |
| Grading for Ski Trails (13.1 acres disturbed)   | 73                                   | 0               | 0                | 73                  |
| Revegetation for Ski Trails   | 22                                   | 0               | 0                | 22                  |
| Tree Removal for Skier Service Sites (3 acres disturbed)  | 61                                   | 0               | 0                | 61                  |
| Grading for Skier Service Sites (3 acres disturbed)   | 84                                   | 0               | 0                | 84                  |
| Revegetation for Skier Service Sites  | 22                                   | 0               | 0                | 22                  |

## 16.0 Greenhouse Gases and Climate Change

| Project Components  | Maximum Emissions (metric tons/year) |                 |                  |                   |
|---|--------------------------------------|-----------------|------------------|-------------------|
|   | CO <sub>2</sub>                      | CH <sub>4</sub> | N <sub>2</sub> O | CO <sub>2</sub> e |
| Tree Removal for Cross-Country Center and Backside Camp (3 acres disturbed) | 45                                   | 0               | 0                | 45                |
| Revegetation for Cross-Country Center and Backside Camp                     | 24                                   | 0               | 0                | 24                |
| <b><i>Program-Level Components Subtotal</i></b>                             | <b>820</b>                           | <b>0</b>        | <b>0</b>         | <b>820</b>        |
| <b>Project- and Program-Level Total</b>                                     | <b>3,105</b>                         | <b>0</b>        | <b>0</b>         | <b>3,105</b>      |
| <b>Project- and Program-Level Total Amortized over 30 years</b>             | <b>103.5</b>                         | <b>0</b>        | <b>0</b>         | <b>103.5</b>      |

Source: CalEEMod Model v. 2013.2 (see Appendix 16.0)

Note: Ground disturbance acreages noted above include in some cases disturbance occurring twice (grading and clearing and later grading/trenching of snowmaking lines).

1. Accounts for the use of one rotocraft turbine engine-powered helicopter for 4 hours per lift construction activity consuming 61 gallons of aviation fuel per hour and emitting 2 metric tons of CO<sub>2</sub> (see Appendix 16.0 for calculations). Year 4 includes 2 lift construction components.
2. Accounts for the import of 7,636 cubic yards of fill with heavy-duty hauling trucks.
3. Accounts for the export of 1,104 cubic yards of cut with heavy-duty hauling trucks.

As shown, the construction of project-level components would result in the generation of approximately 2,285 metric tons of CO<sub>2</sub>e over the course of 10 years of construction. Additionally, construction of the proposed program-level components would result in the generation of approximately 820 metric tons of CO<sub>2</sub>e. Combined, the construction of both project- and program-level components would result in approximately 3,105 metric tons of CO<sub>2</sub>e, which equates to 103.5 metric tons amortized over 30 years. Once construction is complete, the generation of these construction-related GHG emissions would cease.

In addition to generating GHG emissions from construction activities, the proposed project would result in a substantial land change from tree removal activities. According to **Table 3-6** in Section 3.0, Project Description, approximately 299 acres of forestland would be disturbed through tree removal activities under the proposed project-level components and another 121.5 acres of forestland disturbed under the proposed program-level components. **Table 16-5** identifies the one-time release of CO<sub>2</sub> as a result of project proposed deforestation.

**TABLE 16-5  
GREENHOUSE GAS EMISSIONS RELEASED FROM REMOVED TREES**

| Forestland Change   | Maximum Emissions (metric tons/year) |                            |                                  |                   |
|---|--------------------------------------|----------------------------|----------------------------------|-------------------|
|   | Carbon Dioxide (CO <sub>2</sub> )    | Methane (CH <sub>4</sub> ) | Nitrous Oxide (N <sub>2</sub> O) | CO <sub>2</sub> e |
| Project-Level Components  | 35,087                               | 0                          | 0                                | 35,087            |
| Program-Level Components  | 12,821                               | 0                          | 0                                | 12,821            |
| <b>Project- and Program-Level Total</b>                         | <b>47,908</b>                        | <b>0</b>                   | <b>0</b>                         | <b>47,908</b>     |
| <b>Project- and Program-Level Total Amortized over 30 years</b> | <b>1,597</b>                         | <b>0</b>                   | <b>0</b>                         | <b>1,597</b>      |

Source: CalEEMod Model v. 2013.2 (see Appendix 16.0)

As shown in **Table 16-5**, a total of 35,087 metric tons of CO<sub>2</sub>e would be emitted from the loss of trees under proposed project-level components and another 12,821 metric tons

would be emitted from the loss of trees under the proposed program-level components. When amortized over 30 years, the result is 1,597 metric tons of CO<sub>2</sub>e.

**Operational GHG Emissions**

In addition to construction and deforestation activities the proposed project would result in operational emissions from increased electricity consumption, as a result of new ski lifts and snowmaking facilities, as well as from increased traffic trips. As shown in **Table 16-6**, the unmitigated long-term operations of full realization of the proposed project, including both project and program-level components, would produce 10,711 metric tons of CO<sub>2</sub>e annually.

**TABLE 16-6  
UNMITIGATED OPERATIONAL EMISSIONS**

| Emissions Source                          | Maximum Emissions (metric tons/year) |                            |                                  |                   |
|---|--------------------------------------|----------------------------|----------------------------------|-------------------|
|   | Carbon Dioxide (CO <sub>2</sub> )    | Methane (CH <sub>4</sub> ) | Nitrous Oxide (N <sub>2</sub> O) | CO <sub>2</sub> e |
| <b>Project-Level Components</b>           |                                      |                            |                                  |                   |
| Construction Amortized over 30 Years      | 76                                   | 0                          | 0                                | 76                |
| Forestland Change Amortized over 30 Years | 1,169                                | 0                          | 0                                | 1,169             |
| Energy <sup>1</sup>                       | 6,448                                | 0.1                        | 0                                | 6,460             |
| Mobile (440 new trips)                    | 291                                  | 0                          | 0                                | 291               |
| <b>Total</b>                              | <b>6,739</b>                         | <b>0.1</b>                 | <b>0</b>                         | <b>7,996</b>      |
| <b>GHG Significance Threshold</b>         |                                      |                            |                                  | <b>1,150</b>      |
| <b>Program-Level Components</b>           |                                      |                            |                                  |                   |
| Construction Amortized over 30 Years      | 27                                   | 0                          | 0                                | 27                |
| Forestland Change Amortized over 30 Years | 427                                  | 0                          | 0                                | 427               |
| Energy <sup>2</sup>                       | 2,063                                | 0.04                       | 0                                | 2,067             |
| Mobile (292 new trips)                    | 194                                  | 0                          | 0                                | 194               |
| <b>Total</b>                              | <b>2,711</b>                         | <b>0.04</b>                | <b>0</b>                         | <b>2,715</b>      |
| <b>GHG Significance Threshold</b>         |                                      |                            |                                  | <b>1,150</b>      |
| <b>Project- and Program-Level Total</b>   |                                      |                            |                                  |                   |
| Construction Amortized over 30 Years      | 103                                  | 0                          | 0                                | 103               |
| Forestland Change Amortized over 30 Years | 1,596                                | 0                          | 0                                | 1,596             |
| Energy <sup>3</sup>                       | 8,511                                | 0.14                       | 0                                | 8,527             |
| Mobile (732 new trips)                    | 485                                  | 0                          | 0                                | 485               |
| <b>Total</b>                              | <b>10,695</b>                        | <b>0.14</b>                | <b>0</b>                         | <b>10,711</b>     |
| <b>GHG Significance Threshold</b>         |                                      |                            |                                  | <b>1,150</b>      |

Source: CalEEMod Model v. 2013.2 (see Appendix 16.0)

1. Accounts for an increase in electricity consumption of 5,349,777 kilowatt hours/year.

2. Accounts for an increase in electricity consumption of 1,712,414 kilowatt hours/year.

3. Accounts for an increase in electricity consumption of 7,062,191 kilowatt hours/year.

## 16.0 Greenhouse Gases and Climate Change

---

As shown, the GHG significance threshold would be surpassed under the operation of project- and program-level components. Therefore, the following mitigation is required.

### **MITIGATION MEASURE 16-1** Mitigate for Greenhouse Gas Impacts from Project Operation

The project applicant shall implement one or more of the following measures to reduce total new greenhouse gas (GHG) emissions associated with the project below 1,150 metric tons annually. To ensure this mitigation remains proportional to the individual impacts of the project, each phase of the development must demonstrate appropriate GHG reduction measures to offset the incremental increase in GHG production prior to approval of Improvement/Grading Plans for that phase. During review of Improvement/Grading Plans for each phase, the project applicant shall provide a report to the Placer County Planning Services Division that describes the suite of options selected to reduce GHG emissions and quantifies the specific reductions according to the California Emissions Estimator Model (CalEEMod) or other model accepted by the California Air Resources Board.

- a. Measures to mitigate GHG emissions associated with the project may include the following:
  - o Plant trees in areas appropriate for restoration or reforestation, such as reclaimed land or sites previously impacted by wildfires. In the Sierra Nevada, conifer species can sequester approximately 0.0367 metric tons of CO<sub>2</sub>e annually. As an example, the planting of 1,000 trees would sequester 734 metric tons of CO<sub>2</sub>e over a 20-year period. Assuming a construction time frame of 10 years and 1,000 trees planted annually, the result would be a total sequestration of 7,340 metric tons of CO<sub>2</sub>e over a 20-year period. In this manner, planting trees annually with each phase of development can offset some or all of the production of GHG emissions by the project. Since climate change is a global issue, not limited to a specific area or air basin, planting may occur on- or off-site provided the planting location is deemed appropriate by the US Forest Service (if forests are on federal lands), by the California Department of Forestry and Fire Protection (Cal Fire) (if forests are on state lands), or by a registered forester. A monitoring, maintenance and reporting plan shall be submitted for review and approval by the Planning Services Division and Placer County Air Pollution Control District prior to approval of Improvement/Grading Plans for each phase.
  - o Replace existing resort equipment and/or vehicles with newer or more efficient models to reduce water and/or energy consumption.
  - o Implement emission offsets as new technology becomes available and as determined acceptable by the Placer County Air Pollution Control District and Placer County.
  - o Increase usage of renewable energy sources.

- Implement transportation management demand measures that decrease the number of vehicle trips to the site, including incentives for employee and guest carpooling, improved public transport, and increased employee housing
  - Exceed California minimum energy and water efficiency standards (Title 24, Part 6) in project facilities.
  - Demonstrate increased carbon sequestration from implementation of forest management or habitat conservation/enhancement using practices such as those identified in the Northstar Habitat Management Plan and mitigation measure 6-9.
- b. Should the project applicant not demonstrate GHG emissions below 1,150 metric tons annually, as required, through item (a) above, prior to approval of the Improvement/Grading Plans for each phase of development, the project applicant shall purchase carbon offset credits that are (1) from the Climate Action Reserve (CAR) registry or other similar entity as determined acceptable by the Placer County Air Pollution Control District (PCAPCD) and Placer County, and (2) quantified through an approved protocol by either the State of California or other similar entity and verified by a qualified verification body accredited by either the Climate Action Reserve or the State of California, or other similar entity as determined acceptable.

These carbon credits would be used to offset both construction and operational GHG emissions of the project. Prior to purchase, the project applicant shall provide an analysis to Placer County and the PCAPCD for review and approval. This analysis shall include the project's estimated emissions, calculation methodology, and proposed offset purchase. The applicant shall submit either the purchase certification from CAR registry or verification certification issued by a qualified verification body for all carbon offset credits purchased. In either case, the certification received for payment of credit shall indicate that the emissions are "retired."

Emissions and required offsets associated with specific NMMP project components will utilize emission estimates provided in Draft EIR Tables 16-4 and 16-5. The project applicant will provide documentation of compliance for review and approval by Placer County and the PCAPCD as a condition of final approval.

### **SIGNIFICANCE AFTER MITIGATION**

Mitigation measures 10-2b through 10-2d in Section 10.0, Air Quality, would substantially reduce GHG emissions during construction. These items include the requirement to reduce the project-wide fleet average by 20 percent for nitrous oxide (NOx) as compared to CARB statewide fleet average emissions which would also reduce GHG emissions. Mitigation measure 6-9 implements habitat mitigation measures identified in Section 6.0, Biological Resources, which would mandate forest enhancement plans and conservation areas, as identified in the Northstar Habitat Management Plan (HMP), that lead to the sequestration of GHG emissions from the atmosphere and reduction of the risk for catastrophic wildfire. The purpose of the HMP is to achieve habitat management goals and provide a programmatic framework for long-

## 16.0 Greenhouse Gases and Climate Change

---

term management, conservation, and monitoring of biological resources at Northstar while allowing for reasonable economic uses for development and recreational activities. Biological mitigation measure 6-9 requires 1:1 forest enhancement treatments for the project site for late-seral forest, riparian, and conifer forest habitat. Mitigation measure 16-1 above would require the project to demonstrate reduction of its GHG emissions to below 1,150 metric tons annually through various mitigation measures and/or the purchase of carbon offsets. The Climate Action Reserve utilizes a standardized approach for the independent and rigorous verification of GHG emissions reductions reported by project developers into its offset registry. This standardized approach defines a verification process that promotes the relevance, completeness, consistency, accuracy, transparency and conservativeness of emissions reductions data reported in the CAR. The CAR has approval from the California Air Resources Board (CARB) to serve as an Offset Project Registry for the Compliance Offset Program under the State's Cap-and-Trade Program. Thus, implementation of these mitigation measures would reduce the project's increase in GHG emissions to **less than significant**.

### **IMPACT 16.2:** AB 32 Compliance

The project is considered to have a significant impact if it would be in conflict with the AB 32 goals for reducing GHG emissions. In December 2008, CARB approved the AB 32 Scoping Plan outlining the State's strategy to achieve the 2020 GHG emissions limit. This Scoping Plan, developed by CARB, proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify California's energy sources, save energy, create new jobs, and enhance public health. As shown under the impact analysis below, the proposed project would contribute to the generation of GHG emissions, primarily from electricity consumption and tree removal activities. Therefore, this DEIR assesses the project's potential to result in a significant GHG impact by determining its consistency with the AB 32 Scoping Plan and Senate Bill 2X (Renewables Portfolio Standard), which both require 33 percent of supply from renewable energy sources by 2020, and its consistency with AB 32 Scoping Plan GHG reduction measure F-1, Sustainable Forest Target, which sets the goal of planting 5 million trees statewide by the year 2020. The Northstar Habitat Management Plan and mitigation measure 6-9 (habitat mitigation) are consistent with reduction measure F-1.

In terms of electric service, the project site is currently within the service area of the energy provider Liberty Utilities CalPeco. Therefore, for the purposes of this analysis, project-estimated electrical use consumption is compared to Liberty Utilities CalPeco's ability to comply with AB 32 Scoping Plan Strategy E-3, Renewables Portfolio Standard.

According to the California Public Utilities Commission (2012), Liberty Utility CalPeco currently serves approximately 49,000 customers in California. **Table 16-7** identifies the most recently available electric energy information for Liberty Utilities CalPeco as well as the current renewable energy mix.

**TABLE 16-7  
TOTAL ELECTRIC ENERGY CONSUMPTION AND RENEWABLE ENERGY MIX –  
LIBERTY UTILITIES CALPECO**

| Electric Service Provider                    | Total Energy Consumption (Annual KWh) | Renewable Energy Mix Percentage | Renewable KWh Annually |
|--|---------------------------------------|---------------------------------|------------------------|
| Liberty Utilities CalPeco (current provider) | 6,433,570,000                         | 20%                             | 1,286,714,000          |

Source: Smart 2013

As shown in **Table 16-7**, Liberty Utilities CalPeco delivered 6,433,570,000 kilowatt-hours (kWh) over the course of one year, of which 20 percent was supplied from renewable energy sources. As noted under **Table 16-6**, full implementation of both project- and program-level components would result in an increase in electricity consumption of 7,062,191 kilowatt-hours per year. Adding this total to the amount Liberty Utilities CalPeco delivered in 2012 (6,433,570,000 kWh) would equal 6,440,632,191 kWh. Such an immediate addition of energy consumption would reduce Liberty Utilities CalPeco’s current renewable energy mix percentage to 19.9 percent. However, such a scenario is not likely, if not impossible, since the project-level components alone would take at least 10 years to construct.

The Renewables Portfolio Standard program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020. The purchase power contract involving Liberty Utilities CalPeco’s supply of electricity to its California customers guarantees the delivery of a specific and minimum verifiable amount of renewable energy (Smart 2012). The amount of guaranteed renewable energy for 2012 and 2013 is 20 percent (Smart 2012). The amount of renewable energy mix supplied to Liberty Utilities CalPeco’s California customers in 2014 is set at 21.7 percent, and in 2015 the renewable mix percentage is contractually set at 23.3 percent (Smart 2012). A new renewable energy mix requirements contract has yet to be established for years beyond 2015. While Liberty Utilities CalPeco has yet to execute any contracts relating to its procurement of Renewables Portfolio Standard–eligible energy for the years beyond 2015, Liberty Utilities CalPeco is actively exploring its options and is confident that it will be able to enter the necessary commercial arrangements to satisfy its requirements under the Renewables Portfolio Standard program in 2016 and in the ensuing years (Smart 2013).

The California Public Utilities Commission (CPUC) implements and administers the Renewables Portfolio Standard program in collaboration and cooperation with the California Energy Commission (CEC) and other agencies. The CPUC and the CEC monitor Renewables Portfolio Standard goals and results, including compliance reviews and enforcement, as necessary (CPUC 2011). These entities also require that electrical service providers prepare a renewable energy procurement plan and update that plan when necessary (CPUC 2011). The CPUC and the CEC review Renewables Portfolio Standard procurement plans for each electric utility provider and accept, reject, or modify the plans. Also, the CPUC and the CEC oversee electrical utility providers’ Renewables Portfolio Standard solicitations for renewable energy, review the results of solicitations submitted for approval by an electrical utility, and accept or reject proposed contracts based on consistency with the approved procurement plan.

## 16.0 Greenhouse Gases and Climate Change

---

The Liberty Utilities CalPeco electric service provider is overseen, through the requirement of submitting renewable energy procurement plans, by the CPUC and the CEC, which accept, reject, or modify these procurement plans as needed and review the results of solicitations submitted for approval by an electrical utility, such as Liberty Utilities CalPeco, and accept or reject proposed contracts based on consistency with the approved procurement plan.

For the reasons above, the proposed project would not conflict with AB 32 goals for reducing GHG emissions from electricity consumption. Liberty Utilities CalPeco is expected to achieve the mandated requirements of the Renewables Portfolio Standard program regardless of the additional electricity consumption proposed by the project due to CPUC and CEC oversight.

AB 32 Scoping Plan GHG reduction measure F-1, Sustainable Forest Target, sets the goal of planting 5 million trees statewide by the year 2020. While the project proposes to ultimately remove trees on up to 420 acres of forest lands, mitigation measure 6-9 requires forest enhancement treatments and a conservation area effort, to ensure no net loss of the habitat in Northstar. These measures have a benefit to GHG through forest enhancement treatments that would result in increased timber growth rates, healthier forest stands and carbon sequestration as well as the reduction of the likelihood of catastrophic fire. Additionally, these lands would be protected from future development thus the benefit would remain in perpetuity. The purpose of the Northstar HMP is to achieve habitat management goals and provide a programmatic framework for long-term management, conservation, and monitoring of biological resources at Northstar while allowing for reasonable economic uses for development and recreational activities.

The proposed project would not conflict with AB 32 goals for reducing GHG emissions, since Liberty Utilities CalPeco is expected to achieve the mandated requirements of the Renewables Portfolio Standard program due to CPUC and CEC oversight. This impact is therefore **less than cumulatively considerable**.