9.0 GREENHOUSE GAS EMISSIONS

This section discusses the effect of each Dollar General project on greenhouse gas (GHG) emissions and the associated effects of climate change. The reader is referred to Section 5.0, Air Quality, for a discussion of project impacts associated with air quality. All technical analyses related to this section are contained in **Appendices 5.0-A** through **5.0-C.**

9.0 GENERAL ENVIRONMENTAL CONDITIONS AND REGULATIONS

9.0.1 ENVIRONMENTAL SETTING

Climate Change and Greenhouse Gases

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic factors together (IPCC 2014).

Table 9.0-1 provides descriptions of the primary GHGs attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

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. CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e), which weigh each gas by its global warming potential (GWP). Expressing GHG emissions in CO_2e 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_2 were being emitted.

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. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long-enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptakes every year, averaged

over the last 50 years, whereas the remaining 45 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC 2013).

TABLE 9.0-1
GREENHOUSE GASES

Greenhouse Gas	Description
Carbon Dioxide (CO_2)	Carbon dioxide is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 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_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere.[1]
Methane (CH_4)	Methane is a colorless, odorless gas and 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 CH_4 to the atmosphere. Natural sources of CH_4 include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. The atmospheric lifetime of CH_4 is about12 years.[2]
Nitrous Oxide (N_2O)	Nitrous oxide is a clear, colorless gas with a slightly sweet odor. Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. Nitrous oxide 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_2O is approximately 120 years.[3]

Sources: [1] EPA 2016a, [2] EPA 2016b, [3] EPA 2016c

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimates. From the standpoint of the California Environmental Quality Act (CEQA), GHG impacts to global climate change are inherently cumulative.

Greenhouse Gas Emission Sources

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural emissions sectors (CARB 2015). California is a significant emitter of CO_2e in the world and produced 459 million gross metric tons of CO_2e in 2013; in the state, the transportation sector is the largest emitter of GHGs, followed by industrial operations such as manufacturing and oil and gas extraction (CARB 2015). Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution (CO_2 dissolving into the water), respectively, two of the most common processes for removing carbon dioxide from the atmosphere.

Effects of Climate Change on the Environment

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme to provide the world with a scientific view on climate change and its potential effects. According to the IPCC, global average temperature is expected to increase relative to the 1986–2005 period by 0.3 to 4.8 degrees Celsius (°C) (0.5–8.6 degrees Fahrenheit [°F]) by the end of the twenty-first century (2081–2100), depending on future GHG emission scenarios (IPCC 2014). According to the California Natural Resources Agency (2012), temperatures in California are projected to increase 2.7°F above 2000 averages by 2050 and, depending on emission levels, 4.1–8.6°F by 2100.

Physical conditions beyond average temperatures could be indirectly affected by the accumulation of GHG emissions. For example, changes in weather patterns resulting from increases in global average temperature are expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Based on historical data and modeling, the California Department of Water Resources projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050 (DWR 2008). An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring could flow into the Central Valley concurrently with winter storm events (CNRA 2012). This scenario would place more pressure on California's levee/flood control system.

Another outcome of global climate change is sea level rise. The sea level rose approximately 7 inches during the last century and, assuming that sea level changes along the California coast continue to track global trends, the sea level along the state's coastline in 2050 could be 10–18 inches higher than in 2000 and 31–55 inches higher by the end of this century (CNRA 2012).

As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available (CNRA 2012).

Changes in precipitation patterns and increased temperatures are expected to alter the distribution and character of natural vegetation and the associated moisture content of plants and soils. An increase in the frequency of extreme heat events and drought is also expected. These changes are expected to lead to increased frequency and intensity of large wildfires (CNRA 2012).

Cal-Adapt is a climate change scenario planning tool developed by the California Energy Commission which downscales global climate model data to local and regional resolution under two emissions scenarios: the A-2 scenario represents a business-as-usual future emissions scenario, and the B-1 scenario represents a lower GHG emissions future. According to Cal-Adapt, annual average temperatures in the project area are projected to rise by 4.0–6.8°F by 2100, with the range based on low and high emissions scenarios (California Energy Commission 2016).

9.0.2 REGULATORY FRAMEWORK

California has adopted various administrative initiatives and pieces of legislation relating to climate change, much of which has set aggressive goals for GHG emissions reductions in the state. Although lead agencies must evaluate climate change and GHG emissions of projects subject to CEQA, the CEQA Guidelines do not require or suggest specific methodologies for performing an assessment or specific thresholds of significance and do not specify GHG reduction mitigation

measures. Instead, the guidelines allow lead agencies to choose methodologies and make significance determinations based on substantial evidence, as discussed in further detail below. No state agency has promulgated binding regulations for analyzing GHG emissions, determining their significance, or mitigating significant effects in CEQA documents. Thus, lead agencies exercise their discretion in determining how to analyze greenhouse gases.

California Global Warming Solutions Act (Assembly Bill 32)

The primary act that has driven GHG regulation and analysis in California is the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599), which instructs the California Air Resources Board (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.

Assembly Bill 32 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 will 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"). The Scoping Plan evaluates opportunities for sector-specific reductions, integrates early actions and additional GHG reduction measures from CARB and the state's Climate Action Team,[1] identifies additional measures to be pursued as regulations, and outlines the adopted role of a cap-and-trade program. Additional development of these measures and adoption of the appropriate regulations occurred through the end of year 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 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.

[1] The Climate Action Team, led by the Secretary of the California Environmental Protection Agency (CalEPA), is a group of state agency secretaries and heads of agency, boards, and departments. The team members work to coordinate statewide efforts to implement global warming emissions reduction programs and the state's Climate Adaptation Strategy.

- 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 2012, CARB released revised estimates of the expected 2020 emissions reductions. The revised analysis relied on emissions projections updated in light of 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 reduced the projected 2020 emissions from 596 million metric tons (MMT) CO_2e to 545 $MMTCO_2e$. 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 21.7 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 BAU needed to achieve the goals of AB 32 is approximately 16 percent.

AB 32 requires CARB to update the Scoping Plan at least once every five years. CARB adopted the first major update to the Scoping Plan on May 22, 2014 (CARB 2014). The updated Scoping Plan summarizes the most recent science related to climate change, including anticipated impacts to California and the levels of GHG reduction 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. The Scoping Plan update also looks beyond 2020 toward the 2050 goal established in Executive Order S-3-05, though not yet adopted as state law, and observes that "a mid-term statewide emission limit will ensure that the State stays on course to meet our long-term goal." The Scoping Plan update does not establish or propose any specific post-2020 goals, but identifies such goals adopted by other governments or recommended by various scientific and policy organizations. Executive Order B-30-15 (signed April 29, 2015) endorses the effort to set interim GHG reduction targets for year 2030 (40 percent below 1990 levels).

Amendments to California Global Warming Solutions Act of 2006: Emission Limit (Senate Bill 32)

Signed into law on September 2016, SB 32 codifies the 2030 target in the recent Executive Order B-30-15 (40 percent below 1990 levels by 2030). The bill authorizes the state board to adopt an interim GHG emissions level target to be achieved by 2030. SB 32 states the intent is for the Legislature and appropriate agencies to adopt complementary policies that ensure the long-term emissions reductions advance specified criteria. At the time of writing this Draft EIR, however, no specific policies or emissions reduction mechanisms have been established.

Table 9.0-2 provides a brief overview of the other California legislation relating to climate change that may affect emissions associated with the proposed project.

TABLE 9.0-2
CALIFORNIA STATE CLIMATE CHANGE LEGISLATION

Legislation	Description
Assembly Bill 1493 and Advanced Clean Cars Program	Assembly Bill 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 2025, when all rules will be fully implemented, new automobiles will emit 34 percent fewer CO_2e emissions and 75 percent fewer smog-forming emissions.
Low Carbon Fuel Standard (LCFS)	Executive Order S-01-07 (2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California. The regulation took effect in 2010 and is codified at Title 17, California Code of Regulations, Sections 95480–95490. The LCFS will reduce greenhouse gas emissions by reducing the carbon intensity of transportation fuels used in California by at least 10 percent by 2020.
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 (SB) 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 will make other revisions to the RPS program and to certain other requirements on public utilities and publicly owned electric utilities.
Senate Bill 375*	SB 375 (codified in the Government Code and the Public Resources Code) took effect in 2008 and provides a new planning process to coordinate land use planning, regional transportation plans, and funding priorities to help California meet the GHG reduction goals established in AB 32. SB 375 requires metropolitan planning organizations to incorporate sustainable communities strategies 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.
California Building Energy Efficiency Standards	In general, the California Building Energy Efficiency Standards require the design of building shells and building components to conserve energy. The California Energy Commission adopted 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. The amended standards took effect in the summer of 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 offer builders better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in homes and businesses. Energy-efficient buildings require less electricity, and increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.
California Green Building Standards	The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, is a statewide mandatory construction code developed and adopted by the California Building Standards Commission and the Department of Housing and Community Development. The CALGreen standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency/conservation, material conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics. The most recent update to the CALGreen Code went into effect July 1, 2014.

** 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 at Public Resources Code Sections 21061.3 and 21159.28 and Chapter 4.2.*

California Executive Orders

In addition to the legislation identified in **Table 9.0-2**, two executive orders—California Executive Order S-03-05 (2005) and California Executive Order B-30-15 (2015)—highlight GHG emissions reduction targets, though such targets have not been adopted by the state and remain only a goal of the executive orders. Specifically, Executive Order S-03-05 seeks to achieve a reduction of GHG emissions of 80 percent below 1990 levels by 2050 and Executive Order B-30-15 seeks to achieve a reduction of GHG emissions of 40 percent below 1990 levels by 2030. Technically, a governor's executive order does not have the effect of new law but can only reinforce existing laws. For instance, as a result of the AB 32 legislation, the state's 2020 reduction target is backed by the adopted AB 32 Scoping Plan, which provides a specific regulatory framework of requirements for achieving the 2020 reduction target. The state-led GHG reduction measures identified in **Table 9.0-2**, such as the Low Carbon Fuel Standard and the Renewables Portfolio Standard, are largely driven by the AB 32 Scoping Plan. Executive Orders S-03-05 and B-30-15 do not have any such framework and provide no specific emissions reduction mechanisms.

Northern Sierra Air Quality Management District

The project is under the jurisdiction of the Northern Sierra Air Quality Management District (NSAQMD), which regulates air quality according to the standards established in the federal and California Clean Air Acts and amendments to those acts. The NSAQMD comprises three contiguous, mountainous, rural counties in northeastern California—Nevada, Sierra, and Plumas counties—and regulates air quality through its permitting authority and through air quality-related planning and review activities over most types of stationary emission sources. The NSAQMD has not yet established significance thresholds for GHG emissions from project operations.

9.0.3 IMPACT METHODOLOGY

Standards of Significance

The impact analysis below is based on the application of the following CEQA Guidelines Appendix G thresholds of significance. Climate change impacts are considered significant if implementation of a project would:

1) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Addressing GHG generation impacts requires an agency to make a determination as to what constitutes a significant impact. The CEQA Guidelines give authority to 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 whether 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 California Code of Regulations Section 15064.4(a)).

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 California's contribution to the cumulative

climate change problem to reach 1990 levels. AB 32 is the only legally mandated requirement for the reduction of GHGs. As such, compliance with AB 32 is the only adopted basis on which to base a significance threshold for evaluating GHG impacts. However, it is also acknowledged that Executive Orders S-03-05 and B-30-15, SB 375, and proposed legislation will ultimately result in GHG emission reduction targets for 2030, 2040, and 2050.

A number of expert agencies throughout the state have drafted or adopted varying threshold approaches and guidelines for analyzing 2020 operational GHG emissions in CEQA documents. 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. The California Supreme Court decision in the *Center for Biological Diversity et al. v. California Department of Fish and Wildlife, the Newhall Land and Farming Company* (November 30, 2015, Case No. S217763) 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."

As previously stated, the NSAQMD has not yet established significance thresholds for GHG emissions from project operations. Therefore, for the purposes of this analysis, Nevada County in its discretion is using the Placer County Air Pollution Control District's (PCAPCD) CEQA Guidelines to determine the level of impact from the projects' contribution of GHG emissions. The PCAPCD, in association with a committee of air districts, has developed GHG thresholds in order to provide a uniform scale to measure the significance of land use development projects. These thresholds are intended to evaluate a project for consistency with GHG targets established in AB 32, particularly for emissions occurring by 2020. Therefore, for the purposes of this analysis, the three proposed Dollar General projects will be individually compared to the following construction-related and operational thresholds:

- For the evaluation of construction-related emissions, a mass emission threshold of 1,100 metric tons of CO_2e/year (metric tons of carbon dioxide-equivalent per year) is used.

- For the evaluation of operational emissions, Tier I of the PCAPCD's operational emissions threshold is used, which states a project would not have a significant impact on the environment if projected GHG emissions are less than 1,100 metric tons of CO_2e per year.

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.

The California Natural Resources Agency has noted that impacts of GHG emissions should focus on the cumulative impact on climate change, and similarly the CEQA amendments continue to make clear that the significance of GHG emissions is most appropriately considered on a cumulative level. Each project's contribution to the cumulative impact on climate change is considered. In addition, even though each Dollar General store represents a separate project under CEQA, the collective GHG emissions associated with all three stores are added together and compared to the PCAPCD construction-level significance threshold of 1,100 metric tons of CO_2e per year and Tier I of the PCAPCD operational-level significance threshold of 1,100 metric tons of CO_2e per year. In addition to comparing cumulative emissions to these thresholds, the cumulative GHG emissions associated with all three stores are evaluated for compliance with post-2020 GHG reduction goals promulgated by the state. Post-2020 GHG reduction goals in California are identified in Governor's Executive Order B-30-15, which seeks to achieve a reduction of GHG emissions of 40 percent below 1990 levels by 2030, and Executive Order S-03-05, which seeks to achieve a reduction of GHG emissions of 80 percent below 1990 levels by 2050.

Methodology

GHG emissions were calculated by Kunzman Associates (2015a, 2015b, 2016) using the California Emissions Estimator Model (CalEEMod) (see **Appendices 5.0-A** through **5.0-C**). CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with construction and operations from a variety of land use projects. Because the impacts of GHG emissions are not experienced locally, the focus of the climate change analysis is on the projects' potential contributions to the cumulative impact.

The project would be required to implement energy efficiency design requirements consistent with the California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, described above. CALGreen Code standards are 30 percent more efficient than 2008 Title 24 standards. Therefore, mitigated emission totals for the projects reflect compliance with CALGreen Code standards.

9.1 ALTA SIERRA SITE

9.1.1 PROJECT-SPECIFIC SETTING

The Alta Sierra site is located in Nevada County. There are no aspects of the Alta Sierra site or surrounding area that result in GHG emission effects other than those described in Section 9.0.1 above.

9.1.2 REGULATORY FRAMEWORK

There are no additional regulations, policies, or standards that pertain to the Alta Sierra site other than those described in Section 9.0.2, above.

9.1.3 PROJECT IMPACTS AND MITIGATION MEASURES

Generate Greenhouse Gas Emissions at Levels Conflicting with AB 32 That May Have a Significant Impact on the Environment (Standards of Significance 1 & 2)

Impact 9.1.1(AS) The Alta Sierra project would generate greenhouse gas emissions. **(Less than Cumulatively Considerable)**

The Alta Sierra project's GHG emissions would be generated over the short term from construction activities, consisting primarily of emissions from equipment exhaust. There would also be long-term regional emissions associated with new vehicular trips and indirect source emissions, such as electricity usage for lighting.

Construction GHG Emissions

The approximate quantity of annual GHG emissions generated by construction equipment is shown in **Table 9.0-3.**

TABLE 9.0-3
CONSTRUCTION-RELATED GREENHOUSE GAS EMISSIONS – ALTA SIERRA SITE (METRIC TONS PER YEAR)

Construction Activities	Metric Tons of CO_2e
Alta Sierra Store	133
Potentially Significant Impact Threshold	1,100
Exceed Threshold?	**No**

*Source: Kunzman Associates 2015a; see **Appendix 5.0-A** for emission model outputs.*

As shown, construction of the Alta Sierra store would generate approximately 133 metric tons of CO_2e. These projected emissions would not exceed the construction-related significance thresholds for construction-generated GHG emissions.

Operational GHG Emissions

Long-term operational emissions associated with the Alta Sierra store are summarized in **Table 9.0-4**.

TABLE 9.0-4
OPERATIONAL GREENHOUSE GAS EMISSIONS – ALTA SIERRA SITE
(METRIC TONS PER YEAR)

Emissions Source	Alta Sierra Store
Area Source (landscaping, hearth)	0
Energy[1]	30
Mobile	481
Solid Waste Hauling & Decomposition	18
Water Conveyance	2
Total	**531**
Potentially Significant Impact Threshold	1,100
Exceed Threshold?	**No**

Notes:
1 – Mitigated emission total reflects compliance with Title 24 green building and energy efficiency standards.
*Source: Kunzman Associates 2015a; see **Appendix 5.0-A** for emission model outputs.*

As shown, the majority of the Alta Sierra project's 531 annual metric tons of GHG emissions would be generated by vehicle trips. Emissions would not exceed significance thresholds for operational GHG emissions and the Alta Sierra project's contribution to the cumulative impact on climate change is **less than cumulatively considerable**.

Mitigation Measures

None required.

9.2 PENN VALLEY SITE

9.2.1 PROJECT-SPECIFIC SETTING

The Penn Valley site is located in Nevada County. There are no aspects of the Penn Valley site or surrounding area that result in GHG emission effects other than those described in Section 9.0.1 above.

9.2.2 REGULATORY FRAMEWORK

There are no additional regulations, policies, or standards that pertain to the Penn Valley site other than those described in Section 9.0.2, above.

9.2.3 PROJECT IMPACTS AND MITIGATION MEASURES

Generate Greenhouse Gas Emissions at Levels Conflicting with AB 32 That May Have a Significant Impact on the Environment (Standards of Significance 1 & 2)

Impact 9.2.1(PV) The Penn Valley project would generate greenhouse gas emissions. **(Less than Cumulatively Considerable)**

The Penn Valley project's GHG emissions would be generated over the short term from construction activities, consisting primarily of emissions from equipment exhaust. There would also be long-term regional emissions associated with new vehicular trips and indirect source emissions, such as electricity usage for lighting.

Construction GHG Emissions

The approximate quantity of annual GHG emissions generated by construction equipment is shown in **Table 9.0-5.**

TABLE 9.0-5
CONSTRUCTION-RELATED GREENHOUSE GAS EMISSIONS – PENN VALLEY SITE
(METRIC TONS PER YEAR)

Construction Activities	Metric Tons of CO_2e
Penn Valley Store	146
Potentially Significant Impact Threshold	1,100
Exceed Threshold?	**No**

*Source: Kunzman Associates 2016; see **Appendix 5.0-B** for emission model outputs.*

The Penn Valley store would generate approximately 146 metric tons of CO_2e. These projected emissions would not exceed the construction-related significance thresholds for construction-generated GHG emissions.

Operational GHG Emissions

Long-term operational emissions associated with the Penn Valley store are summarized in **Table 9.0-6**.

TABLE 9.0-6
OPERATIONAL GREENHOUSE GAS EMISSIONS – PENN VALLEY SITE
(METRIC TONS PER YEAR)

Emissions Source	Penn Valley Store
Area Source (landscaping, hearth)	0
Energy[1]	43
Mobile	461
Solid Waste Hauling & Decomposition	18
Water Conveyance	2
Total	**525**
Potentially Significant Impact Threshold	1,100
Exceed Threshold?	**No**

Notes:
1 – Mitigated emission total reflects compliance with Title 24 green building and energy efficiency standards.
*Source: Kunzman Associates 2016; see **Appendix 5.0-B** for emission model outputs.*

As shown, the majority of the Penn Valley project's 525 annual metric tons of GHG emissions would be generated by vehicular trips. Emissions would not exceed significance thresholds for operational GHG emissions and the Penn Valley project's contribution to the cumulative impact on climate change would be **less than cumulatively considerable**.

Mitigation Measures

None required.

9.3 ROUGH AND READY HIGHWAY SITE

9.3.1 PROJECT-SPECIFIC SETTING

The Rough and Ready Highway site is located in Nevada County. There are no aspects of the project site or surrounding area that result in GHG emission effects other than those described in Section 9.0.1 above.

9.3.2 REGULATORY FRAMEWORK

There are no additional regulations, policies, or standards that pertain to the Rough and Ready Highway site other than those described in Section 9.0.2, above.

9.3.3 PROJECT IMPACTS AND MITIGATION MEASURES

Generate Greenhouse Gas Emissions at Levels Conflicting with AB 32 That May Have a Significant Impact on the Environment (Standards of Significance 1 & 2)

Impact 9.3.1(RR) The Rough and Ready Highway project would generate greenhouse gas emissions. **(Less than Cumulatively Considerable)**

The Rough and Ready Highway project's GHG emissions would be generated over the short term from construction activities, consisting primarily of emissions from equipment exhaust. There would also be long-term regional emissions associated with new vehicular trips and indirect source emissions, such as electricity usage for lighting.

Construction GHG Emissions

The approximate quantity of annual GHG emissions generated by construction equipment is shown in **Table 9.0-7.**

TABLE 9.0-7
CONSTRUCTION-RELATED GREENHOUSE GAS EMISSIONS – ROUGH AND READY HIGHWAY SITE
(METRIC TONS PER YEAR)

Construction Activities	Metric Tons of CO_2e
Rough and Ready Highway Store	86
Potentially Significant Impact Threshold	1,100
Exceed Threshold?	**No**

*Source: Kunzman Associates 2015b; see **Appendix 5.0-C** for emission model outputs.*

The Rough and Ready Highway store would generate approximately 86 metric tons of CO_2e. These projected emissions would not exceed the construction-related significance thresholds for construction-generated GHG emissions.

Operational GHG Emissions

Long-term operational emissions associated with the Rough and Ready Highway store are summarized in **Table 9.0-8**.

TABLE 9.0-8
OPERATIONAL GREENHOUSE GAS EMISSIONS – ROUGH AND READY HIGHWAY SITE
(METRIC TONS PER YEAR)

Emissions Source	Rough and Ready Highway Store
Area Source (landscaping, hearth)	0
Energy[1]	29
Mobile	472
Solid Waste Hauling & Decomposition	18
Water Conveyance	2
Total	**522**
Potentially Significant Impact Threshold	1,100
Exceed Threshold?	**No**

Notes:
1 – Mitigated emission total reflects compliance with Title 24 green building and energy efficiency standards.
*Source: Kunzman Associates 2015b; see **Appendix 5.0-C** for emission model outputs.*

As shown, the majority of the Rough and Ready Highway project's 522 annual metric tons of GHG emissions would be generated by vehicular trips. Emissions would not exceed significance thresholds for operational GHG emissions and the Rough and Ready Highway project's contribution to the cumulative impact on climate change is **less than cumulatively considerable**.

Mitigation Measures

None required.

9.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

Greenhouse gases are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimates. From the standpoint of analyzing negative impacts, GHG impacts to global climate change are inherently cumulative.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

As described previously, GHG emission impacts are inherently cumulative, as no individual project could measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimate. Thus, the project-specific impacts discussed above (Impact 9.1.1(AS), Impact 9.2.1(PV), and Impact 9.3.1(RR)) present a cumulative analysis for each project.

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