3.7 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

This chapter presents a summary of the current state of climate change science and greenhouse gas (GHG) emissions sources in California; a summary of applicable regulations; quantification of project-generated GHG emissions and discussion about their potential contribution to global climate change; and analysis of the project's resiliency to climate change-related risks.

Comments received on the notice of preparation regarding greenhouse gas emissions and climate change included a request by the Sacramento Municipal Utilities District (SMUD) to address climate change.

3.7.1 Regulatory Setting

FEDERAL

Supreme Court Ruling

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA) and its amendments. The Supreme Court of the United States ruled on April 2, 2007, that carbon dioxide (CO_2) is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. The ruling in this case resulted in EPA taking steps to regulate GHG emissions and lent support for state and local agencies' efforts to reduce GHG emissions.

Regulations for Greenhouse Gas Emissions from Passenger Cars and Trucks and Corporate Average Fuel Economy Standards

In October 2012, EPA and the National Highway Traffic Safety Administration (NHSTA), on behalf of the Department of Transportation, issued final rules to further reduce GHG emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond (77 FR 62624). NHTSA's CAFE standards have been enacted under the Energy Policy and Conservation Act since 1978. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program would increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) limiting vehicle emissions to 163 grams of CO_2 per mile for the fleet of cars and light-duty trucks by model year 2025 (77 FR 62630).

In January 2017, EPA Administrator Gina McCarthy signed her determination to maintain the current GHG emissions standards for model year 2022–2025 vehicles. However, on March 15, 2017, the new EPA Administrator, Scott Pruitt, and Department of Transportation Secretary Elaine Chao announced that EPA intends to reconsider the final determination. EPA intends to make a new Final Determination regarding the appropriateness of the standards no later than April 1, 2018 (EPA 2017c).

Greenhouse Gas Permitting Requirements

EPA's New Source Review permitting program, including its Prevention of Significant Deterioration (PSD) requirements, applies to new major sources of criteria air pollutants and precursors. Title V of the federal CAA requires "major sources" of air pollutants to obtain and operate in compliance with an operating permit (EPA 2017a). Operating permits are legally-enforceable documents designed to improve compliance by clarifying what sources must do to control air pollution. A source is considered a major source if it would emit emissions of criteria air pollutants (or precursors) or hazardous air pollutants that exceed certain mass emission level criteria (e.g., 100 tons per year) depending on the ambient air quality conditions where the source is located. The PSD program is designed to make sure that a source's emissions would not cause or contribute to any applicable national ambient air quality standards (NAAQS). NAAQS are explained in more detail in Section 3.3, *Air Quality*.

In 2010, EPA issued the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailor Rule (EPA 2011). This rule set mass emission-based permitting criteria specifically for carbon dioxide-equivalent (CO_2e) emissions that define when permits under the New Source Review PSD and Title V Operating Permit programs are required for new and existing industrial facilities. This is known as Steps 1 and 2 of the Tailoring Rule for PSD and Title V permitting based on CO_2e emissions.

A new part of the GHG Tailoring Rule, known as Step 3, was issued by EPA in 2012. This step, known as Step 3, revised the regulations to require a source that emits or has the potential to emit levels of CO_2e that exceed established mass emission criteria (i.e., 100,000 tons per year [90,718 metric tons (MT) per year]) of CO_2e, but that has minor source emissions of all other regulated pollutants, to apply for an operating permit. However, in 2014, the U.S. Supreme Court issued its decision in *Utility Air Regulatory Group v. EPA*, 134 S. Ct. 2427 (2014) ("UARG"). The Court held that EPA may not treat GHGs as an air pollutant for purposes of determining whether a source is a major source required to obtain a PSD or Title V permit. The Court also held that PSD permits that are otherwise required (based on emissions of other, non-GHG pollutants) may continue to require limitations on GHG emissions. In response to the Supreme Court decision and the D.C. Circuit's amended judgment, EPA is undertaking various actions to explain the next steps in GHG permitting (EPA 2017b). This program is also currently under review by EPA, but at the time of publication of this Draft EIR had not been changed.

STATE

Executive Order S-3-05

Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established total GHG emission targets for the State. Specifically, Statewide emissions are to be reduced to 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

This EO was the subject of a California Appellate Court decision, *Cleveland National Forest Foundation v. San Diego Association of Governments* (SANDAG) (November 24, 2014) 231 Cal.App.4th 1056, which was reviewed by the California Supreme Court in January 2017. The Supreme Court decided a singular question in the case, which was released on July 13, 2017. The California Supreme Court ruled that SANDAG did not abuse its discretion by declining "to adopt the 2050 goal as a measure of significance in light of the fact that the Executive Order does not specify any plan or implementation measures to achieve its goal."

In addition to concluding that an EIR need not use this executive order's goal for determining significance, the Court described several principles relevant to CEQA review of GHG impacts, including: (1) EIRs should "reasonably evaluate" the "long-range GHG emission impacts for the year 2050;" (2) the 2050 target is "grounded in sound science" in that it is "based on the scientifically supported level of emissions reduction needed to avoid significant disruption of the climate;" (3) in the case of the SANDAG plan, the increase in long-range GHG emissions by 2050, which would be substantially greater than 2010 levels, was appropriately determined to be significant and unavoidable; (4) the reasoning that a project's role in achieving a long-range emission reduction target is "likely small" is not valid for rejecting a target; and (5) "as more and better data become available," analysis of proposed plan impacts will likely improve, such that "CEQA analysis stays in step with evolving scientific knowledge and State regulatory schemes." The Court also ruled that "an EIR's designation of a particular adverse environmental effect as 'significant' does not excuse the EIR's failure to reasonably describe the nature and magnitude of the adverse effect." The Court also recognized that the 40 percent reduction in 1990 GHG levels by 2030 is "widely acknowledged" as a "necessary interim target to ensure that California meets its longer-range goal of reducing greenhouse gas emission 80 percent below 1990 levels by the year 2050." Senate Bill (SB) 32 has since defined the 2030 goal in statute (discussed below).

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

In September 2006, Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006, Assembly Bill (AB) 32. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on Statewide GHG emissions. AB 32 requires that Statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that these reductions "…shall remain in effect unless otherwise amended or repealed. (b) It is the intent of the Legislature that the Statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020. (c) The [California Air Resources Board (CARB)] shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020." [California Health and Safety Code, Division 25.5, Part 3, Section 38551.]

Senate Bill 375 of 2008

Senate Bill (SB) 375, signed by Governor Schwarzenegger in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocation in each MPO's Regional Transportation Plan. CARB, in consultation with the MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

The Sacramento Area Council of Governments (SACOG) serves as the MPO for Sacramento, Placer, El Dorado, Yuba, Sutter, and Yolo Counties, excluding those lands located in the Lake Tahoe Basin. The project site is in Sacramento County. SACOG adopted its Metropolitan Transportation Plan/Sustainable Communities Strategy 2035 in 2012, and completed an update adopted on February 18, 2016. SACOG was tasked by CARB to achieve a 9 percent per capita reduction compared to 2012 emissions by 2020 and a 16 percent per capita reduction by 2035, which CARB confirmed the region would achieve by implementing its SCS (CARB 2013).

Advanced Clean Cars Program

In January 2012, CARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of regulatory standards for vehicle model years 2017 through 2025. The new regulations strengthen the GHG standard for 2017 models and beyond. This will be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's zero-emission vehicle regulation requires battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the State. The number of stations will grow as vehicle manufacturers sell more fuel cell vehicles. By 2025, when the rules will be fully implemented, the Statewide fleet of new cars and light trucks will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions than the Statewide fleet in 2016 (CARB 2016).

Senate Bill X1-2, the California Renewable Energy Resources Act of 2011 and Senate Bill 350, the Clean Energy and Pollution Reduction Act of 2015

SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 sets a three-stage compliance period requiring all California utilities, including independently-owned utilities, energy service providers, and community choice aggregators, to generate 20 percent of their electricity from renewables by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. SB X1-2 also requires the renewable electricity standard to be met increasingly with renewable energy that is supplied to the California grid from sources within, or directly proximate to, California. SB X1-2 mandates that renewables from these sources make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond. In October 2015, SB 350 was signed by Governor

Brown, which requires retail sellers and publicly-owned utilities to procure 50 percent of their electricity from renewable resources by 2030.

Executive Order B-30-15

On April 20, 2015 Governor Brown signed EO B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's EO aligns California's GHG reduction targets with those of leading international governments such as the 28-nation European Union, which adopted the same target in October 2014. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32, discussed above). California's new emission reduction target of 40 percent below 1990 levels by 2030 sets the next interim step in the State's continuing efforts to pursue the long-term target expressed under Executive Order S-3-05 to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius, the warming threshold at which major climate disruptions are projected, such as super droughts and rising sea levels.

Senate Bill 32 and Assembly Bill 197 of 2016

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a Statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.

California Building Efficiency Standards of 2016 (Title 24, Part 6)

Buildings in California are required to comply with California's Energy Efficiency Standards for Residential and Nonresidential Buildings established by the California Energy Commission (CEC) in Title 24, Part 6 of the California Code of Regulations. These standards were first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption and are updated on an approximately 3-year cycle to allow consideration and possible incorporation of new energy efficient technologies and methods. All buildings for which an application for a building permit is submitted on or after January 1, 2017 must follow the 2016 standards (CEC 2015). Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions.

Low Carbon Fuel Standard

In January 2007, Executive Order S-01-07 established a Low Carbon Fuel Standard (LCFS). The Order calls for a Statewide goal to be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020, and that a LCFS for transportation fuels be established for California. The LCFS applies to all refiners, blenders, producers, or importers ("Providers") of transportation fuels in California, including fuels used by off-road construction equipment (Wade, pers. comm. 2017). The LCFS is measured on a full fuels cycle basis, and may be met through market-based methods by which providers exceeding the performance required by an LCFS receive credits that may be applied to future obligations or traded to Providers not meeting LCFS.

In June 2007, CARB adopted the LCFS as a Discrete Early Action item under AB 32 pursuant to Health and Safety Code Section 38560.5, and, in April 2009, CARB approved the new rules and carbon intensity reference values with new regulatory requirements taking effect in January 2011. The standards require providers of transportation fuels to report on the mix of fuels they provide and demonstrate they meet the LCFS intensity standards annually. This is accomplished by ensuring that the number of "credits" earned by providing fuels with a lower carbon intensity than the established baseline (or obtained from another party) is equal to or greater than the "deficits" earned from selling higher intensity fuels.

After some disputes in the courts, CARB re-adopted the LCFS regulation in September 2015, and the LCFS went into effect on January 1, 2016.

Climate Change Scoping Plan and Updates

In December 2008, CARB adopted its first version of its *Climate Change Scoping Plan*, which contained the main strategies California will implement to achieve the mandate of AB 32 (2006) to reduce statewide GHG emissions to 1990 levels by 2020. In May 2014, CARB released and subsequently adopted the *First Update to the Climate Change Scoping Plan* to identify the next steps in reaching the goals of AB 32 (2006) and evaluate the progress made between 2000 and 2012 (CARB 2014a). After releasing multiple versions of proposed updates in 2017 CARB adopted the next version titled *California's 2017 Climate Change Scoping Plan* (2017 Scoping Plan) in December of that same year (CARB 2017). The 2017 Scoping Plan indicates that California is on track to achieve the 2020 statewide GHG target mandated by AB 32 of 2006 (CARB 2017:9). It also lays out the framework for achieving the mandate of SB 32 of 2016 to reduce statewide GHG emissions to at least 40 percent below 1990 levels by the end of 2030 (CARB 2017). The 2017 Scoping Plan identifies the GHG reductions needed by each emissions sector.

The 2017 Scoping Plan also identifies how GHGs associated with proposed projects could be evaluated under CEQA (CARB 2017:101-102). Specifically, it states that achieving "no net increase" in GHG emissions is an appropriate overall objective of projects evaluated under CEQA if conformity with an applicable local GHG reduction plan cannot be demonstrated. CARB recognizes that it may not be appropriate or feasible for every development project to mitigate its GHG emissions to zero and that an increase in GHG emissions due to a project may not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change.

LOCAL

The project site lies within the jurisdictional boundaries of Sacramento County; therefore, the County's policies, as well as Sacramento LAFCo's polices, would apply. Furthermore, if the SOIA and annexation are approved, the project site would be in the jurisdiction of the City of Folsom. Thus, applicable policies of the City of Folsom's General Plan are described below.

Sacramento Metropolitan Air Quality Management District

Sacramento Metropolitan Air Quality Management District (SMAQMD) is the primary agency responsible for addressing air quality concerns in all of Sacramento County—its role is discussed further in Section 3.3, *Air Quality*. SMAQMD also recommends methods for analyzing project-generated GHGs in CEQA analyses and offers multiple potential GHG reduction measures for land use development projects. SMAQMD developed thresholds of significance to provide a uniform scale to measure the significance of GHG emissions from land use and stationary source projects in compliance with CEQA and AB 32. SMAQMD's goals in developing GHG thresholds include ease of implementation; use of standard analysis tools; and emissions mitigation consistent with AB 32. However, since the passage of SB 32 and AB 197 and the associated adoption of a revised statewide emissions target of 40 percent below 1990 levels by 2030, SMAQMD has not developed new thresholds in compliance with this target.

Sacramento County General Plan

The following policies of the Sacramento County 2030 General Plan (Sacramento County 2011) are applicable to the project:

- **Policy AQ-22:** Reduce greenhouse gas emissions from County operations as well as private development.
- **Policy LU-115:** It is the goal of the County to reduce GHG emissions to 1990 levels by the year 2020. This shall be achieved through a mix of State and local action.

Sacramento County Climate Action Plan

The Sacramento County Climate Action Plan (CAP) Strategy and Framework Document was adopted on November 9, 2011 and presents a framework for reducing GHG emissions and managing water and other resources to best prepare for a changing climate.

However, the CAP does not demonstrate the County's ability to meet 2030 reduction goals (set by SB 32) and; subsequently, future target years (e.g., 2050) and does not meet all of the criteria in Section 15183.5(b)(1) as a plan for the reduction of GHG emissions. However, updates to the CAP have been initiated and the updated CAP (and associated key policies to be included in the policy document) will meet all of the criteria in Section 15183.5(b)(1) as a plan for the reduction of GHG emissions, and be consistent with new State legislation and guidance issued since the existing CAP was adopted in 2011, such as SB 32, EO B-30-15, and updates to the State's Climate Change Scoping Plan.

The existing Sacramento County CAP does not meet all of the criteria in Section 15183.5(b)(1) as a plan for the reduction of GHG emissions. The County is currently preparing an updated CAP to meet all specified criteria.

City of Folsom

The City of Folsom General Plan (1993) is currently being updated to include an integrated Climate Action Plan (CAP). The City of Folsom Draft General Plan 2035/CAP (2017) includes goals to reduce GHG emissions, including City operations (i.e., Policy NCR 3.2.2, Reduce municipal GHG emissions by 15 percent below 2005 baseline levels by 2020, and further reduce municipal emissions by 40 percent below the 2020 target by 2030; 51 percent below the 2020 target by 2040; and 80 percent below the 2020 target by 2050.), The Draft General Plan 2035/CAP has not been adopted, therefore, the analysis does not rely on the policies in the draft General Plan. The following policies of the *City of Folsom General Plan* (1993) are applicable to the project:

- **Policy 29.1:** Fire and Police Department personnel/resident population ratios shall be maintained at adequate levels as defined by the City Council.
- **Policy 29.3:** The City shall develop standards for building within the 100-year floodway to assure that the water flows above stream and downstream from a property will not be altered from existing levels.
- **Policy 29.4:** The City shall work with the U.S. Army Corp of Engineers in developing standards for development within the inundation boundary resulting from a failure of Folsom Dam or the dikes retaining Folsom Lake.

3.7.2 Environmental Setting

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

The Physical Scientific Basis

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 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. The earth has a much lower temperature than the sun; therefore, the earth 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.

Prominent GHGs contributing to the greenhouse effect are CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are found 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 forcing (Intergovernmental Panel on Climate Change [IPCC] 2014:3, 4).

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 most 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 lifetime of any GHG molecule is dependent on multiple variables and cannot be determined with any certainty, 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 estimated to be sequestered through ocean and land uptake 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 2013:467).

The quantity of GHGs in the atmosphere that ultimately result in climate change is not precisely known, but is enormous; no single project alone would measurably contribute to an incremental change in the global average temperature, or to global, local, or micro climates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative.

GREENHOUSE GAS EMISSION SOURCES

GHG emissions are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural emissions sectors (CARB 2014a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CARB 2014b). 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 CO_2 from the atmosphere.

EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature is expected to increase by 3 to 7 degrees Fahrenheit (°F) by the end of the century, depending on future GHG emission scenarios (IPCC 2007). According to the California Natural Resources Agency (CNRA), temperatures in California are projected to increase 2 to 5°F by 2050 and by 4 to 9°F by 2100 (CNRA 2009).

Other environmental resources could be indirectly affected by the accumulation of GHG emissions and resulting rise in global average temperature. In the recent years, California has been marked by extreme weather and its effects. According to CNRA's draft report, *Safeguarding California Plan: 2017 Update* (CNRA 2017), California experienced the driest four-year Statewide precipitation on record from 2012 through 2015; the warmest years on average in 2014, 2015, and 2016; and the smallest and second smallest Sierra snowpack on record in 2015 and 2014 (CNRA 2017). In contrast, the northern Sierra Nevada range experienced its wettest year on record in 2016 (CNRA 2017). The changes in precipitation exacerbate wildfires throughout California with increasing frequency, size, and devastation. As temperatures increase, the 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 snowpack of the Sierra Nevada and Cascade mountains

until spring would flow into the Central Valley concurrently with winter rainstorm events. This scenario would place more pressure on California's levee/flood control system (CNRA 2017). Furthermore, in the extreme scenario involving the rapid loss of the Antarctic ice sheet, sea level along the California's coastline could rise up to 10 feet by 2100, which is approximately 30 to 40 times faster than sea level rise experienced over the last century (CNRA 2017).

Changes in temperature, precipitation patterns, extreme weather events, and sea-level rise have the potential to effect and decrease the efficiency of thermal power plants and substations, decrease the capacity of transmission lines, disrupt electrical demand, and threaten energy infrastructure with the increased risk of flooding (CNRA 2017).

The California Department of Transportation (Caltrans) owns and operates more than 51,000 miles along 265 highways, as well as three of the busiest passenger rail lines in the nation. Sea level rise, storm surge, and coastal erosion are imminent threats to highways, roads, bridge supports, airports, transit systems and rail lines near sea level and seaports. Shifting precipitation patterns, increased temperatures, wildfires, and increased frequency in extreme weather events also threaten transportation systems across the State. Temperature extremes and increased precipitation can increase the risk of road and railroad track failure, decreased transportation safety, and increased maintenance costs (CNRA 2017).

Water availability and changing temperatures, which effects prevalence of pests, disease, and species, directly impact crop development and livestock production. Other environmental concerns include decline in water quality, groundwater security, and soil health (CNRA 2017). Vulnerabilities of water resources also include risks to degradation of watersheds, alteration of ecosystems and loss of habitat, impacts to coastal areas, and ocean acidification (CNRA 2017). The ocean absorbs approximately a third of the CO_2 released into the atmosphere every year from industrial and agricultural activities, changing the chemistry of the ocean by decreasing the pH of seawater. This ocean acidification is harmful to marine organisms especially calcifying species such as oysters, clams, sea urchins, and corals (CNRA 2017).

Cal-Adapt is a climate change scenario planning tool developed by CEC that downscales global climate model data to local and regional resolution under the Representative Concentration Pathway (RCP) 4.5 and RCP 8.5 scenarios. According to Cal-Adapt, annual average temperatures in the project site are projected to be 80°F for 2070 through 2099 under RCP 4.5 scenario and 83°F for 2070 through 2099 under RCP 8.5 (Cal-Adapt 2017c).

3.7.3 Environmental Impacts and Mitigation Measures

METHODOLOGY

While approval of the SOIA and annexation, along with changes to land use and zoning designations, would not result in physical changes to the site, approval of the SOIA/annexation would remove barriers to the development of a future corporation yard at this site. Therefore, this analysis considers the potential environmental impacts of the development of a future corporation yard.

GHG emissions associated with the project would be generated during project construction and by operation of the facility after it is built. Estimated levels of construction- and operation-related GHGs are presented below. The project is evaluated for its consistency with adopted regulations, plans, and policies aimed at reducing GHG emissions.

Construction-Related Greenhouse Gas Emissions

Short-term construction-generated GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1 computer program (CAPCOA 2016), as recommended by SCAPCD and other air districts in California. Modeling was based on project-specific information (e.g., building size, area to be graded, area to be paved, energy information) where available; assumptions based on typical

construction activities; and default values in CalEEMod that are based on the project's location and land use types. Construction would begin as early as 2022 over an estimated period of 24 months. The City currently has a wide variety of uses at the current corporation yard and locations, and these uses would be moved to the new yard. The future corporation yard would include uses by the following City departments: Parks and Recreation, Public Works, and Utilities. Table 3.7-1 shows the anticipated facility needs at project buildout. The covered and uncovered outdoor storage areas were modeled as paved areas in CalEEMod.

Table 3.7-1 Proposed Land Use (Buildout-2050)

Space Component	Modeled Land Use Type
Parks and Recreation Department	
Park Maintenance	Unrefrigerated Warehouse – No Rail
Public Works Department	
Street Maintenance	Unrefrigerated Warehouse – No Rail
Transit	Unrefrigerated Warehouse – No Rail
Fleet Management	Unrefrigerated Warehouse – No Rail
Solid Waste	
Collections	Unrefrigerated Warehouse – No Rail
Household Hazardous Waste (HHW)	Unrefrigerated Warehouse – No Rail
Transfer Station	Unrefrigerated Warehouse – No Rail
Environmental and Water Resources (Utilities) Department	
Administration	Office
Utility Maintenance	Unrefrigerated Warehouse – No Rail
Wastewater	Unrefrigerated Warehouse – No Rail
Water	Unrefrigerated Warehouse – No Rail
Water Treatment Plan - Plant Maintenance	Unrefrigerated Warehouse – No Rail
Common/Shared	
Office Support	Office
Field/Shop Support	Unrefrigerated Warehouse – No Rail
Total	

Notes: SF = square feet

Source: City of Folsom 2008

Operational Greenhouse Gas Emissions

Project-related operational emissions of GHGs were estimated for the following sources: area sources (e.g., landscaping-related fuel combustion sources), energy use (i.e., electricity and natural gas consumption), water use, solid waste, and mobile sources. Operational mobile-source GHG emissions were modeled based on the estimated level of average daily trips (ADT) by employees and fleet vehicles. It was assumed that the existing trip generation of the Leidesdorff Yard would cease and transfer to the project site. At complete buildout, the project would generate a total (i.e., additional trips plus existing) of up to 937 ADT. CalEEMod default trip distance for the County were used. Trip rate estimates were derived from data generated in the traffic impact analysis conducted for the project (see Section 3.11, *Transportation and Circulation*). Twenty-five percent of project-generated trips entering and leaving the project site are heavy-duty vehicles and 6 percent of are buses. Trip distances were derived from CalEEMod default trip distances for the region. Mobile-source emissions were calculated using CalEEMod. Indirect emissions associated with electricity and natural gas consumption were estimated using GHG emissions factors for the SMUD. Indirect GHG emissions associated with electricity consumption were calculated for 2050 based on compliance with the 50 percent RPS by 2030 and calculations can be found in Appendix B. The project's level of electricity and natural gas usage were based on default CalEEMod values for office and warehouse land use types. The

project's level of electricity and natural gas usage were based on 2016 Title 24-adjusted consumption rates provided by CalEEMod for each land use type. Adjustments were based on the CEC estimate that nonresidential buildings are 5 percent more efficient than 2013 Title 24 standards (CEC 2015). Project buildout is anticipated to be in 2050. Detailed model assumptions and inputs for these calculations can be found in Appendix B.

THRESHOLDS OF SIGNIFICANCE

The issue of global climate change is inherently a cumulative issue, as the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the project's impact to climate change is addressed only as a cumulative impact.

CEQA Guidelines Section 15064 and relevant portions of Appendix G recommend that a lead agency consider a project's consistency with relevant, adopted plans, and discuss any inconsistencies with applicable regional plans, including plans to reduce GHG emissions. In Appendix G of the State CEQA Guidelines, two questions are provided to help assess if the project would result in a potentially significant impact on climate change. These questions ask whether the project would:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or
- conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?

In California, some counties, cities, and air districts have developed guidance and thresholds of significance for determining significance of GHG emissions that occur within their jurisdiction. LAFCo and the City of Folsom are the CEQA Co-Lead Agencies for the project and is; therefore, responsible for determining whether an impact would be considered significant.

If the lead agency does not have a qualified CAP that can be used to show consistency with State GHG targets, then the local air district's thresholds may be used, if available and applicable. SMAQMD has developed thresholds of significance for development projects that occur within the jurisdiction of SMAQMD that are tied to target year 2020 and no further. Thus, with respect to SB 32 and 2030 GHG reduction goals of 40 percent below 1990 levels, SMAQMD has not developed numeric, bright-line thresholds of significance for GHG emissions generated during project construction or operation. Nonetheless, SMAQMD recommends that lead agencies quantify and disclose project-related GHG emissions and make a significance determination of these emissions. Because of the cumulative effect of GHGs, SMAQMD recommends amortizing a project's construction emissions over the operational lifetime of the project (SMAQMD 2016). The sum of estimated amortized construction emissions and annual operational emissions per year is assumed to reflect the total annual GHG emissions attributable to the project.

As discussed above, recent passage of SB 32 in September 2016 set a new State GHG emissions target for the year 2030 at 40 percent below 2020 levels. Thus, for projects that would generate emissions beyond 2020, significance would be determined based on a project's compliance with this target. An impact would be determined significant if a project were to conflict with or prevent the State from meeting 2030 GHG reduction targets.

To set the stage for how California would meet targets set forth by SB 32, CARB's 2017 Scoping Plan suggests several approaches for showing a project's consistency with State targets. The following is related to project-level CEQA analyses (CARB 2017:101):

- Absent conformity with an adequate geographically-specific GHG reduction plan, CARB recommends that projects incorporate design features and GHG reduction measures, to the degree feasible, to minimize GHG emissions. Achieving no net additional increase in GHG emissions, resulting in no contribution to

GHG impacts, is an appropriate overall objective for new development…Achieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA. Lead agencies have the discretion to develop evidence-based numeric thresholds (mass emissions, per capita, or per service population) consistent with this Scoping Plan, the State's long-term GHG goals, and climate change science.

- Neither SMAQMD nor the City of Folsom or LAFCo have developed an evidenced-based bright-line numeric threshold or performance-based metric based on an applicable CAP, consistent with the State's long-term GHG goals. Therefore, relying on consistency with a qualified GHG reduction plan or comparing project-generated emissions to a bright-line threshold are not options for this analysis. Consequently, based on the overall objective of the 2017 Scoping Plan, a "no net increase" threshold is applied for the purposes of this analysis. The intent of this analysis is not to present the use of a no net increase threshold as a generally applied threshold of significance for GHG impacts. Its use herein is related directly to the facts surrounding the project and availability of reliance on other threshold options. A project that results in no net increase in GHG emissions would not result in a substantial increase in GHGs or conflict with local or State plans adopted for the purpose of reducing GHG emissions.

ISSUES NOT DISCUSSED FURTHER

All issues applicable to climate change listed under the significance criteria above are addressed in this section.

As described in Chapter 2, *Project Description, t*he project has three potential access options. The evaluation of greenhouse gas emissions and climate change would not be affected by these options. Therefore, this is not discussed further in this section.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 3.7-1: Project-generated GHG emissions

The level of annual GHG emissions associated with the project, including amortized construction-related emissions, would be approximately 1,052 MT CO_2e/year. This level of GHG emissions has the potential to result in a considerable contribution to cumulative emissions related to global climate change and conflict with State GHG reduction targets established for 2030 and 2050. Therefore, this impact would be potentially **significant**.

GHG emissions associated with the project would be generated during project construction and operation. Estimated levels of construction- and operation-related GHG emissions are presented below, followed by a discussion of the project's consistency with applicable regulations and policies established to enable the achievement of mandated Statewide GHG reduction goals.

Construction-Generated Greenhouse Gas Emissions

Project-related construction activities would result in the generation of GHG emissions. Heavy-duty off-road construction equipment, materials transport, and worker commute during construction of the project would result in exhaust emissions of GHGs. Modeling results are shown below in Table 3.7-2.

As shown in Table 3.7-2, project construction is estimated to generate a total of 699 MT CO_2e over the duration of the construction period (2022–2023). Total construction emissions were amortized over a 25-year period, consistent with guidance from SMAQMD (SMAQMD 2016), resulting in annualized emissions of 28 MT CO_2e.

Table 3.7-2 Construction-Generated Greenhouse Gas Emissions

Year	MT CO_2e/year
2022	674
2023	25
Total Construction GHG Emissions	699
Amortized over 25 Years	28

Notes: /year = per year; CO2e = carbon dioxide equivalent, MT = metric tons
Totals may not add due to rounding.
Source: Modeled by Ascent Environmental in 2017

Operational Greenhouse Gas Emissions

Operation of the project would result in mobile-source GHG emissions associated with vehicle trips to and from the project (i.e., project-generated VMT); area-source emissions from the combustion of natural gas for space and water heating and operation of landscape maintenance equipment; energy-source emissions from the consumption of electricity; water-source emissions from water use and the conveyance and treatment of wastewater; waste-source emissions from the transport and disposal of solid waste; and mobile-source emissions. The analysis is conservative, as project-generated traffic associated with the operational phase due to the relocation and consolidation of project operations and associated staff are not considered a new source of emissions in the region, as the vehicle trips are already occurring within the City. Also, the City is planning to begin retiring combustion engine vehicles and replacing them with natural gas and/or electric vehicles. It should be noted that mobile source emissions would be expected to decrease over time due to fleet turnover and State regulations requiring reductions in carbon emissions from vehicles. Emissions generated from project operation are reported in Table 3.7-3.

Table 3.7-3 Operational Greenhouse Gas Emissions

Source	MT CO_2e/year
Area	<1
Electricity	85
Natural Gas	10
Mobile	825
Waste	82
Water	50
Amortized Construction Emissions	28
Total Operational GHG Emissions	1,052

Notes: Totals may not add due to rounding.
/year = per year; CO2e = carbon dioxide equivalent, MT = metric tons
Source: Modeled by Ascent Environmental in 2017

Thus, the level of annual GHG emissions associated with the project, including amortized construction-related emissions, is estimated to be approximately 1,052 MT CO_2e/year.

Consistency with Applicable Plans, Policies, and Regulations for the Purpose of Reducing Greenhouse Gas Emissions

Consistency with the 2017 Scoping Plan

The 2017 Scoping Plan was adopted in November 2017, supporting the Statewide compliance with emissions levels identified in SB 32 and AB 197 of 2016. Consistency with the emissions targets provided by SB 32 and AB 197 would also result in consistency with emissions targets provided by AB 32 of 2006, which are less stringent. The 2017 Scoping Plan lays out the framework for achieving the 2030 Statewide GHG reduction target of 40 percent below 1990 levels. The 2017 Scoping Plan includes an appendix that details local actions

that land use development projects and municipalities can implement to support the statewide goal. For project-level CEQA analyses, the 2017 Scoping Plan states that projects should implement feasible mitigation, preferably measures that can be implemented on site.

Consistency with Greenhouse Gas Policies in the City of Folsom General Plan

The City of Folsom General Plan (1993) does not include policies that directly reduces GHG emissions. Nonetheless, the project would be consistent with the Safety Element related to addressing flooding and wildfires and mitigating their risks, thereby, indirectly addressing effects of climate change.

Summary

The level of annual GHG emissions associated with the project, including amortized construction-related emissions, is estimated to be approximately 1,052 MT CO_2e/year. As discussed in the "Thresholds of Significance" section above, currently no bright line threshold or geographically-specific GHG reduction plan is available that could be used to evaluate project-generated GHG emissions beyond 2020- (assumed buildout date is post 2020), the year for which SMAQMD thresholds are based.

Therefore, because the project would generate 1,052 MT CO_2e/year, it could conflict with the State's ability to meet the goals of SB 32 and project-generated GHG emissions would be considered **significant**.

Mitigation Measure 3.7-1: Greenhouse gas emission reduction measures.

The City shall incorporate a combination of onsite and, if necessary offsite, GHG reduction measures to compensate the project's GHG emissions of 1,052 MT CO_2e/year, thus resulting in a no net increase in GHG emissions over conditions existing without the project. The level of annual GHG reduction necessary can be adjusted if the City can demonstrate that project-generated emissions resulting from expansion of fleet and increased operations differ from this estimated value. The City can retain a qualified professional to estimate and track the status of this measure, ensuring compliance with the necessary reductions in emissions.

To reduce GHG emissions associated with construction and operation of the project, the following onsite GHG reduction measures shall be incorporated into project design, to the extent feasible:

Onsite Construction

- Enforce idling time restrictions for construction vehicles.
- Require construction vehicles to operate with the highest tier engines commercially available.
- Increase use of electric and renewable fuel-powered construction equipment.

Onsite Operation

- Replace diesel-fueled heavy-duty fleet vehicles with renewable compressed natural gas (CNG)-fueled or renewable diesel-fueled fleet vehicles.
- Replace gasoline-fueled passenger vehicles with electric vehicles.
- Achieve reductions in onsite electricity use through use of onsite renewable energy (e.g., solar photovoltaic panels). Building design and solar installation shall take into account solar orientation to maximize solar exposure.
- Install 240-Volt electric vehicle chargers and signage in the parking areas.
- Install energy-efficient lighting for parking and outdoor area lighting
- Reduce indoor water use by installing low-flow plumping fixtures.
- Reduce outdoor water use by reducing turf area and use water-efficient irrigation systems (i.e., smart sprinkler meters) and landscaping techniques/design, and install rain water capture systems.

- Install a grey water system to irrigate outdoor landscaping and/or to use for indoor non-potable water uses.
- Incorporate site design features to reduce onsite heat island effect including wall shading.

Offsite GHG Reduction

If after incorporation of all feasible onsite GHG construction and operations reduction measures, project GHG emissions are not reduced to zero, the City shall purchase carbon credits to offset the level of project-related GHG emissions remaining after implementation of the feasible onsite measures identified above.

The quantity of carbon credits purchased by the City to offset the project's operational GHG emissions shall be based on the annual mass of GHG emissions less the reduction achieved by implementation of the onsite reductions measures described above, multiplied by an operational life of 25 years.

Significance after Mitigation

Mitigation Measure 3.7-1 provides numerous onsite measures that would reduce GHG emissions during construction and operation of the project and commits the City to reduce net increases in GHG emissions over existing conditions. Further, if onsite reduction measures do not achieve the necessary reductions, remaining GHG emissions would be reduced to zero through the purchase of carbon offsets.

Further, specific measures related to the use of alternative fuels for vehicles, included in Mitigation Measure 3.7-1 could reduce GHG emissions of medium-heavy duty vehicles from 1,152 grams CO_2e per mile (g CO_2e/mile) running on diesel fuel to zero g CO_2e/mile running on renewable CNG fuel or renewable diesel fuel (CARB 2015; Argonne National Laboratory 2017). Furthermore, GHG emissions of passenger vehicles could be reduced from 189 g CO_2e/mile for gasoline to zero g CO_2e/mile for electric (CARB 2015). Implementation of Mitigation Measure 3.7-1 would result in no net increase in GHG emissions. Thus, the project's contribution to cumulative GHG emission after mitigation would be reduced to **a less-than-significant** impact.

Impact 3.7-2: Impacts of climate change on the project.

The project is not located within an area projected to experience a substantial increase in wildland fire risk or flooding as a result of climate changes in the future. Anticipated changes in future climate patterns are not anticipated to have any substantial adverse effects on the project. Therefore, the impacts of climate change on the project would be **less than significant.**

As discussed previously in this section, human-induced increases in GHG concentrations in the atmosphere have led to increased global average temperatures (climate change) through the intensification of the greenhouse effect, and associated changes in local, regional, and global climatic conditions.

Although there is a strong scientific consensus that global climate change is occurring and is influenced by human activity, there is less certainty as to the timing, severity, and potential consequences to climate phenomena. Scientists have identified several ways in which global climate change could alter the physical environment in California (CNRA 2009, CEC 2012, California Department of Water Resources 2006, IPCC 2007). These include:

- increased average temperatures;
- modifications to the timing, amount, and form (rain vs. snow) of precipitation;
- changes in the timing and amount of runoff;
- reduced water supply;
- deterioration of water quality; and
- elevated sea level.

These changes may translate into a variety of issues and concerns that may affect the project site, including but not limited to:

- increased frequency and intensity of wildfire as a result of changing precipitation patterns and temperatures; and
- increased risk of flooding associated with changes to precipitation patterns.

Increased temperature is expected to lead to secondary climate change impacts, including increases in the frequency, intensity, and duration of extreme heat days and multi-day heat waves/events in California. Cal-Adapt defines the extreme heat day threshold for City of Folsom as 103.7°F or higher. An extreme heat day is defined as a day between April through October where the maximum temperature exceeds the 98th historical percentile of maximum temperature based on daily temperature data from 1961 to 1990 (i.e., 103.7°F). From the data collected from 1961 to 1990, City of Folsom has a historical average of four extreme heat days a year. City of Folsom is already experiencing an increase in the frequency of extreme heat days per year with a current average of five extreme heat days per year from 2000 to 2005, with seven extreme heat days in 2003 (Cal-Adapt 2017a).

Cal-Adapt data shows a range of projected increases in the number of extreme heat days by 2099, all of which exceeds the 98th-percentile of historical (1961-1990) maximum temperatures under the Representative Concentration Pathway (RCP) 4.5 and RCP 8.5 scenarios. The projected annual average number of extreme heat day under the RCP 4.5 scenario is approximately 30 days per year in 2070 through 2099. Under the RCP 8.5 scenario, Cal-Adapt predicts that the project site will experience 49 extreme heat days per year in 2070 through 2099 (Cal-Adapt 2017a).

Any future project within the project site would be required to meet the 2016 Title 24 building energy standards (or current Title 24 building energy standards), which require well-insulated buildings and high-efficiency heating, ventilation, and air conditioning units.

According to California Department of Forestry and Fire Protection (CAL FIRE), the SOIA/annexation area is a non–very high fire hazard severity zone (CAL FIRE 2008). However, wildfires within the Sierra Nevada and areas outside the County affect air quality in Sacramento County. Wildland fires produce substantial emissions of particulate matter (e.g., smoke, soot), which may cause health effects including restricted breathing and aggravation of existing respiratory and cardiovascular diseases in the short-term, and alterations to immune systems and cancer from chronic exposure. Particulate matter from wildfire dissipates throughout the Central Valley degrading air quality conditions for short or extended periods of time. The duration of wildfire-related particulate matter in the County's air is linked to wind patterns originating from the Sacramento-San Joaquin Delta. Colloquially known as the "Delta Breeze," oceanic winds are channeled through the Delta into Sacramento County, and help disperse air pollutants north of the Sacramento Valley; however, during about half of the days from July to September, a phenomenon called the "Schultz Eddy" prevents this from occurring. These natural phenomena affect the severity of wildfire-related air pollution in Sacramento County (SMAQMD 2016). For example, during the summers of 2013 through 2015, several wildfire incidents occurred in Northern California that increased levels of particulate matter within Sacramento County.

Currently, the Sacramento Metropolitan Fire District is responsible for providing fire protection services to the SOIA/annexation area. If the SOIA/annexation is approved, fire planning and preparation activities would primarily be undertaken by the City of Folsom Fire Department. The City of Folsom Fire Department provides fire suppression, rescue, prevention, public education, hazardous materials response, and emergency medical services to the City Folsom. The City of Folsom General Plan (1993) includes the policies (listed above) in the Safety Element related to addressing wildfires and mitigating their risks (City of Folsom 1993). Through the City of Folsom Fire Department fire protection services and the policies listed in the City's General Plan, the project would not be considered to be located in an area with a substantial risk to wildland fires or hazards as programs and policies are in place to address such risks.

With regards to increases in flood risk, the project is not located in a coastal zone where an increased threat of flooding may occur because of sea level rise (Cal-Adapt 2017b). However, the project site is vulnerable to flooding as a result of dam or dike failure. Dam or dike failure could occur as result of heavy and continued rains, or rainfall combined with snowmelt. Intense storms may overwhelm local waterways, as well as threaten the integrity of flood control structures.

While it is uncertain precisely how and to what extent climate change will affect flooding events near the project site, it is reasonable to expect that an increase in flooding could have serious ramifications. More rapid and earlier snowmelt, or increased potential for high-intensity storm events, compared to historical trends, could potentially place additional strain on the components of flood control systems (e.g., dikes, dams), and increase the likelihood of flooding in the City of Folsom.

The City of Folsom General Plan (1993) includes the policies (listed above) in the Safety Element related to addressing dam failure (City of Folsom 1993). Policy 29.4 states that the City shall work with the U.S. Army Corp of Engineers in developing standards for redevelopment within the inundation boundary resulting from a failure of Folsom Dam or the dikes retaining the Folsom Lake.

Based on currently-available data, the project is not located within an area projected to experience a substantial increase in wildland fire risk or flooding because of climate changes in the future. Anticipated changes in future climate patterns are not anticipated to have any substantial effects on the project. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.