4.7 Greenhouse Gases

4.7.1 Environmental Setting

Climate change refers to any significant change in measures of climate (i.e., temperature, precipitation, or wind) that lasts for an extended period (e.g., decades or longer). Climate change may be affected by a number of factors including natural cycles (e.g., changes in the sun's intensity or Earth's orbit around the sun); natural processes within the climate system (e.g., changes in ocean circulation); and human activities that change the atmosphere's composition (e.g., burning fossil fuels) or land surface (e.g., deforestation, reforestation, urbanization, and desertification). As defined in Assembly Bill (AB) 32, greenhouse gases (GHGs) include but are not limited to: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_x), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6). CARB notes that California is a substantial contributor to global GHG emissions as it is the second largest contributor in the United States and the sixteenth largest in the world (CARB 2009).

According to the Intergovernmental Panel on Climate Change (IPCC) 3rd assessment report, increased atmospheric levels of CO_2 are correlated with rising temperatures. Concentrations of CO_2 have increased by 31 percent above preindustrial levels since 1750. Climate models show that temperatures are predicted to increase by 1.4°C – 5.8°C between 1990 and 2100. Much of the uncertainty in this increase results from unknown future CO_2 emissions, but there is also some uncertainty about the accuracy of climate models. Global warming potential (GWP) is a measure of how much a given mass of GHG is estimated to contribute to global warming and is devised to enable comparison of the warming effects of different gases. It is a relative scale which compares the gas in question to that of the same mass of carbon dioxide. Carbon dioxide equivalency (CO_2e) is a quantity that describes, for a given GHG, the amount of CO_2 that would have the same GWP, when measured over a specified timescale (generally, 100 years). The carbon dioxide equivalency for a gas is obtained by multiplying the mass and the GWP of the gas. For example, the GWP for CH_4 over 100 years is 25. This means that the emission of 1 million metric tons of methane is equivalent to the emission of 25 million metric tons of carbon dioxide.

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) issued a "white paper" on evaluating GHG emissions under CEQA (CAPCOA 2008). The CAPCOA white paper includes GHG reduction strategies and guidelines. These strategies and guidelines have not been adopted by Kern County, San Bernardino County, or any other regulatory agency. The white paper is intended to serve as a resource to assist lead agencies in evaluating GHGs in environmental information documents. The methodologies used in this GHG analysis are consistent with the CAPCOA guidelines.

The CAPCOA document suggests a threshold approach that would require a project to meet a percent reduction target based on the average reductions needed from business-as-usual emissions from all GHG sources. Using the current 2020 target, this approach would require all discretionary projects to achieve a 33 percent reduction from the projected business-as-usual emission from all GHG sources in order to be considered less than significant.

Since the publication of this CAPCOA White Paper in January 2008, the AB 32 Scoping Plan has refined that percentage to 28.6 percent, which Kern County has rounded up to 29 percent for mitigation purposes.

The CAPCOA guidance also suggests a list of approved Best Performance Standards to help in the determination as to whether a proposed project has reduced its GHG emissions by 29 percent. This Guidance is not applicable to the Proposed Project because this Proposed Project does not include any sources of stationary combustion. The type of development and minor project-related operational emissions do not warrant implementation of Best Performance Standards. This information, therefore, is included for informational purposes.

4.7.2 Regulatory Setting

4.7.2.1 Federal

Federal Mandatory Reporting of Greenhouse Gases (40 CFR Parts 86, 87, 89 et. al)—The USEPA promulgated this rule in 2009 to require mandatory reporting of GHG from large GHG emissions sources within 31 source categories in the United States. In general, the threshold for reporting is 25,000 metric tons or more of CO_2e. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. Facilities and suppliers began collecting data on January 1, 2010. The first emissions report is due on March 31, 2011, for emissions during 2010. Manufacturers of vehicles and engines outside of the light-duty sector will begin reporting CO_2 for model year 2011 and other GHGs in subsequent model years as part of existing USEPA certification programs. This rule does not currently require reporting SF_6 emissions from electrical equipment.

4.7.2.2 State

California Global Warming Solutions Act of 2006 (AB 32)—The California Global Warming Solutions Act of 2006 (AB 32) charges the California Air Resources Board (CARB) with the responsibility to monitor and regulate sources of GHG emissions in order to reduce those emissions. CARB established a scoping plan in December 2008 for achieving reductions in GHG

emissions and must develop regulations by January 1, 2011 for reducing those emissions by the year 2020. AB 32 also directs CARB to recommend a *de minimis* threshold of GHG emissions below which emission reduction requirements will not apply. The scoping plan requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. At this time, no mandatory GHG regulations or finalized agency guidelines would apply to this project.

California Mandatory Greenhouse Gas Reporting Regulation (17 California Code of Regulations Sections 95100 - 95133)—Pursuant to AB 32, CARB adopted the Mandatory Greenhouse Gas Reporting Regulation. The facilities required to annually report their GHG emissions include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and industrial sources that emit over 25,000 metric tons per year of CO_2 from stationary source combustion. In particular, retail providers of electricity are required to report fugitive emissions of SF_6 related to transmission and distribution systems, substations, and circuit breakers located inside California that the retail provider or marketer is responsible to maintain in proper working order.

4.7.2.3 Local

Neither Kern County nor San Bernardino County has developed a quantified threshold of significance for GHG emissions, but a project found to contribute to a minimal increase in GHG emissions and found to be consistent with the adopted implementation of the CARB AB 32 Scoping Plan (CARB 2008b) is presumed to have less than significant GHG impacts.

The South Coast Air Quality Management District (SCAQMD) has developed an approach to tiered thresholds of significance for GHG emissions. Their approach considers CEQA exemptions, consistency with a GHG reduction plan, a quantitative threshold based on source analysis and a 90 percent capture rate, and several performance standard approaches for mitigation. SCAQMD has adopted a tiered threshold for industrial projects with a quantitative threshold of 10,000 metric tons/year using this general approach.

4.7.3 Significance Criteria for Greenhouse Gas Emissions

CEQA Section 15064.4 and the Kern County CEQA Implementation Document and Kern County Environmental Checklist, as amended by the California Natural Resources Agency and adopted by the Office of Administrative Law on February 16, 2010, state that a project would have significant impacts on GHG gas emissions if it would:

- Generate greenhouse gas 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 greenhouse gases.

Kern County has not developed a quantified threshold of significance for GHG emissions, but a project found to contribute only a minimal increase in GHG emissions and found to be consistent with the adopted implementation of the CARB AB 32 Scoping Plan (CARB 2008b) is presumed to have less than significant GHG impacts. San Bernardino County and the Mojave Desert AQMD (MDAMD) have also not yet developed significance thresholds for GHGs, and assess construction project impacts in a similar manner as Kern County.

Even though the Proposed Project is not located within the boundaries of the SCAQMD (which tends to pioneer the development of significance thresholds), SCAQMD's interim CEQA thresholds were used as a threshold for greenhouse gas emissions (as measured in CO_2e). The Proposed Project falls within the category termed "industrial projects." For such projects, SCAQMD has identified a threshold of 10,000 metric tons/year of CO_2e for cumulative impact analysis.

4.7.4 Impact Assessment

Low levels of temporary GHG emissions would be generated during the construction phase from engine exhaust of on-site construction equipment and on-road vehicles. After construction, there would be some minor operational GHG emissions associated with periodic system inspection and maintenance.

Maximum daily and total GHG emissions were estimated for the construction phase using SCAQMD-derived mobile source emission factors from CARB's EMFAC 2007 (v2.3) BURDEN Model for both on-road and off-road sources. The emission estimates reflect a conservative calculation based on estimated total use of each type of equipment anticipated for construction. Full calculations and assumptions for the estimated project GHG emissions are included in Appendix C.

Would the Proposed Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant Impact. At this time, no mandatory GHG regulations or finalized agency thresholds of significance apply to the project. The Proposed Project would cause a very small short-term increase in GHG emission (less than 500 metric tons CO_2e). These emissions of GHG result from mobile sources associated with construction equipment and other vehicles.

There are no stationary combustion sources associated with the construction or operation of the Proposed Project. Fuel combustion in motor vehicles used during routine inspection, maintenance and testing of Downs Substation, 115 kV subtransmission lines and fiber optic telecommunication cable would be a source of GHG emissions during operation of the Proposed Project. New circuit breakers installed at the Proposed Substation would be insulated with SF_6. Leakage of SF_6 from the circuit breakers during operation of the Proposed Project would also generate GHG emissions. GHG emissions from SF_6 leakage were calculated by multiplying the amount of SF_6 contained in new circuit breakers by the estimated annual leakage rate. The estimated annual emissions of greenhouse gases from the operational activities are 21 metric tons CO_2e, primarily from SF_6 leakage (see Appendix C, Air Quality Calculations, for details).

Even though the Proposed Project is not located within the boundaries of the SCAQMD, SCAQMD's interim CEQA thresholds were used as a threshold for greenhouse gas emissions (as measured in CO_2e). The Proposed Project falls within the category termed "industrial projects." For such projects, SCAQMD has identified a threshold of 10,000 metric tons/year of CO_2e for cumulative impact analysis. Modeling for the Proposed Project indicates that the GHG emissions would not exceed 450 metric tons/year CO_2e and would therefore be well below the SCAQMD threshold.

As with other individual small projects (e.g., projects that are not within the identified AB 32 mandatory GHG reporting sectors, or other stationary combustion sources that emit more than 25,000 metric tons CO_2e per year), and given the fact that emissions are below the SCAQMD interim thresholds, the emissions increases that would result under the Proposed Project would not be expected to individually have a significant impact on global climate change. Therefore, less than significant impacts would occur under this criterion as a result of the Proposed Project.

Would the Proposed Project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

No Impact. At present, no formally adopted GHG emissions threshold applies to the Proposed Project. However, under implementation of AB 32, CARB has developed proposed regulations for SF_6 in gas insulated switchgear.

The Proposed Project would use sulfur hexaflouride (SF_6) in gas insulated switchgear (GIS) at the proposed Downs Substation expansion area. SF_6 is a potent GHG that has the potential to contribute to climate change. CARB adopted a Climate Change Scoping Plan in 2008. The Plan calls for development and implementation of measures to meet the general goals set forth in the Scoping Plan. While some measures have been formally adopted, others are still in development and are not currently effective. In February 2010, CARB adopted proposed regulations to address

SF_6 emissions from GIS (the proposed regulations have not been finalized by CARB or submitted to the Office of Administrative Law [OAL] for approval). The proposed regulations would require owners of GIS to comply with maximum annual SF_6 emission rates. The maximum emission rate would initially be 10 percent in 2011, but would decrease by a percent each year until 2020, when the maximum annual SF_6 emission rate would be one percent. Although the proposed regulations have not been finalized and approved by OAL and are not yet effective, SCE has already initiated efforts to address SF_6 emissions from GIS. SCE has established Gas Management Guidelines, described below, that allow for rapid location and repair of equipment leaking SF_6 gas. These efforts have resulted in reductions of overall SF_6 emissions over time. SCE would apply its Gas Management Guidelines at the proposed Downs Substation. With implementation of SCE's existing SF_6 Gas Management Guidelines, SF_6 emissions from the Proposed Project would be expected to meet the proposed CARB regulatory requirements.

SF_6 Gas Management Guidelines. SCE's SF_6 Gas Management Guidelines require proper documentation and control of SF_6 gas inventories, whether in equipment or in cylinders. Inventories are documented on both a quarterly and a yearly basis. SCE assumes that any SF_6 gas that is purchased and not used to fill new equipment is needed to replace SF_6 gas that has inadvertently leaked from equipment already in service. This assumption forms the basis for SCE to track and manage SF_6 gas emissions. Currently, SCE voluntarily reports these emissions to the California Climate Action Registry, which was created by the California legislature to help companies track and reduce GHG emissions.

SCE has taken proactive steps in the effort to minimize GHG emissions since 1997. In 1997, SCE established an SF_6 Gas Resource Team to address issues pertaining to the environmental impacts of SF_6. The team developed the Gas Management Guidelines that allow for rapid location and repair of equipment leaking SF_6 gas. In addition, in 2001, SCE's parent organization, Edison International, joined the USEPA's voluntary SF_6 gas management program, committing SCE to join the national effort to minimize emissions of this GHG. Importantly, SCE's SF_6 emissions in 2006 were 41 percent less than in 1999, while the inventory of equipment containing SF_6 gas actually increased by 27 percent during the same time period.

SCE has made a significant investment in not only improving its SF_6 gas management practices, but also in purchasing state-of-the-art gas handling equipment that minimizes SF_6 leakage. The new equipment has improved sealing designs that virtually eliminate possible sources of leakage. SCE has also addressed SF_6 leakage on older equipment by performing repairs and replacing antiquated equipment through its infrastructure replacement program. It is expected that the Proposed Project would have a minimal amount of SF_6 leakage as a result of the installation of state-of-the-art equipment and SCE's SF_6 gas management practices. Pursuant to its existing practices, SCE would reduce potential GHG impacts resulting from the Proposed Project to the

greatest extent practicable. Until CARB finalizes its proposed SF_6 emissions reductions rules, SCE will continue to follow its internal company policy.

Low Emission Fleet. The Climate Action Team, which consists of representatives from various state boards and departments, including the CPUC, has issued various reports outlining strategies to reduce climate change-related emissions in California. Among Climate Action Team strategies is a recommendation that low emission vehicles be used in vehicle fleets. The SCE fleet incorporates a significant number of clean diesel, electric, and hybrid-electric service vehicles. In addition to meeting CARB emission standards for air quality criteria pollutants, SCE is aggressively lowering GHG emissions from SCE fleet operations.

Since SCE complies with all applicable regulations, the Proposed Project would have no impact under this criterion.

4.7.5 Applicant Proposed Measures

Because the Proposed Project would not result in significant impacts to greenhouse gas emissions or global climate change, no APMs are offered.

REFERENCES

Kern County. 2004. Kern County CEQA Implementation Document. June.

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