3.6 GREENHOUSE GAS EMISSIONS

An Air Quality Technical Report was prepared for the Proposed Project which includes an analysis of the Proposed Project's impacts related to global climate change and greenhouse gas emissions. This report is summarized below and is included in Appendix B.

3.6.1 Environmental Setting

The project area includes existing operational wells on cleared and graded areas, as well as the site of Well 35, which is currently undeveloped and includes native vegetation and soils. Operation of the existing wells involves indirect emissions of greenhouse gasses (GHGs) through the use of energy in pumping. These emissions are minor. Natural vegetation and soils temporarily store carbon as part of the terrestrial carbon cycle. Carbon is assimilated into plants and animals as they grow and then dispersed back into the environment when they die.

Natural Vegetation. Living vegetation stores carbon. The key issue is the balance between the loss of natural vegetation and future carbon storage associated with development. Carbon in natural vegetation is likely to be released into the atmosphere through wildfire every 20 to 150 years. Carbon in landscaped areas will be protected from wildfire. The balance between these factors will influence the long-term carbon budget on the site.

Soils. The majority of carbon within the site is stored in the soil. Soil carbon accumulates from inputs of plant and animal matter, roots, and other living components of the soil ecosystem (e.g., bacteria, worms, etc.). Soil carbon is lost through biological respiration, erosion, and other forms of disturbance. Overall, soil carbon moves more slowly through the carbon cycle, and it offers greater potential for long-term carbon storage. Urban soils can sequester relatively large amounts of carbon. Observations from across the United States suggest that cities in warmer and drier climates (such as Eastern Kern County) may have slightly higher soil organic matter levels when compared to equivalent areas before development.

3.6.2 Thresholds of Significance

Due to the global nature of GHG emissions and their potential effects, GHG emissions will typically be addressed in a cumulative impacts analysis (California Natural Resources Agency 2009). According to Appendix G of the CEQA Guidelines, the following criteria may be considered to establish the significance of Global Climate Change (GCC) emissions:

Would the project:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

As discussed in Section 15064.4 of the CEQA Guidelines, the determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency, consistent with the provisions in Section 15064. Section 15064.4 further provides that a lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or

2) Rely on a qualitative analysis or performance based standards.

Section 15064.4 also advises a lead agency to consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and

3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.

The EKAPCD has not adopted specific CEQA significance thresholds that apply to its jurisdiction. Kern County also has not adopted any plan related to GHG emissions. The South Coast Air Quality Management District (SCAQMD) has proposed utilizing a tiered approach to evaluating significance of impacts from GHG emissions. At their September 28, 2010 board meeting, the SCAQMD proposed to adopt an interim significance threshold of 10,000 metric tons of CO_2e emissions as a significance threshold for all industrial projects. While the Proposed Project is not technically an industrial project, the threshold of 10,000 metric tons proposed by the SCAQMD was used to evaluate potential significance of impacts for the project, because thresholds have not been identified by EKAPD or Kern County. The SCAQMD also recommends amortization of construction emissions over a 30-year period to account for their contribution over the lifetime of the project (SCAQMD 2008).

3.6.3 Environmental Impacts

This analysis provides a calculation of Project-specific emissions, but those emissions are not significant on a project-specific level because no single project will affect climate change. Accordingly, this analysis focuses on the Project's cumulative impact on global climate change, as discussed in the new State CEQA Guidelines confirming that the focus of a GHG analysis is the cumulative impact. GHG emissions associated with the project include emissions from construction of the Proposed Project and emissions from project operations. The following subsections discuss the emissions inventory.

Construction Emissions. When accounting for GHGs, all types of GHG emissions are expressed in terms of CO_2 equivalents (CO_2e) and are typically quantified in metric tons. State law defines greenhouse gases as any of the following compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety Code Section 38505(g)). CO_2, followed by CH_4 and N_2O, are the most common GHGs that result from human activity.

GHG emissions associated with the Proposed Project's construction were estimated using the CalEEMod, which estimates emissions of CO_2, N_2O, and CH_4. Based on emission factors from the CalEEMod for heavy construction equipment and on-road vehicles, total greenhouse gases associated with construction are summarized in Table 3.6-1. CalEEMod outputs are provided in air quality assessment (SRA 2011, Appendix B).

Table 3.6-1
Greenhouse Gas Emissions – Construction

CO_2 Emissions, metric tons	CH_4 Emissions, metric tons	N_2O Emissions, metric tons	CO_2e Emissions, metric tons
342	0.04	0.00	343

Source: CalEEMod Model

The total emissions are estimated at 342 metric tons of CO_2 total for the duration of construction. Amortized over 30 years, the annual CO_2 emissions would be 11 metric tons per year.

Operational Emissions. Operational emissions of GHGs would be associated with inspection and maintenance activities and indirect emissions from electricity use for pumping, and would be well below the construction emissions. Emissions were calculated using emission factors from the EMFAC2007 model for worker trips, and from emission factors from the California Climate Action Protocol (SRA 2011) for energy use, conservatively assuming that Wells 18, 34, and 35 would operate with 400-hp electric pumps for 8,760 hours per year. Emissions are summarized in Table 3.6-2, including amortized construction emissions.

Table 3.6-2
GHG Emissions from the Project (metric tons)
Business as Usual Scenario

Emission Source	Annual Emissions (metric tons/year)			
	CO_2	CH_4	N_2O	CO_2e
Operational Emissions				
Energy Use - Pumping	2,572	0.107	0.029	2,583
Vehicle Emissions	4.19	0.0004	0.0002	4.25
Amortized Construction Emissions	11	-	-	11
Total	**2,587**	**0.11**	**0.03**	**2,598**
Global Warming Potential Factor	**1**	**21**	**310**	
CO_2 Equivalent Emissions	2,587	2	9	2,598
TOTAL CO_2 Equivalent Emissions	**2,598**			

As shown in Table 3.6-2, emissions from the Proposed Project are 2,598 CO_2e. The main contributor to emissions from the project is energy use from pumping. Emissions would be below the SCAQMD's proposed interim threshold of 10,000 metric tons, and impacts would be less than significant.

Conclusions. Global climate change impacts associated with the Proposed Project were evaluated to assess whether the project would result in a significant impact. The main impact is associated with construction activities for the Proposed Project. Emissions of GHGs were also evaluated for energy use and inspection and maintenance activities. Based on the evaluation, the project would not:

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

Impacts are therefore less than significant**.**

3.6.4 Mitigation Measures

No mitigation measures are required.

3.6.5 Residual Impacts After Mitigation

The Proposed Project would not result in residual impacts.