

This entire chapter has been updated with the current standard language used by Sacramento County, and with the current state of the regulatory environment. The additions are: a section describing the Green House Gas (GHG) inventory for Sacramento County, sections on SB 375 and 97, a section on the EPA endangerment finding, a section on the California adaptation strategy, a section on the County Climate Action Plan, and the prior section on significance thresholds has been replaced with the new County methodology. Sections on the National Association of Counties and the County Sustainability Cabinet have been deleted. The section on Project impacts and mitigation has been amended to reflect the updated significance thresholds, and the table of off-site vehicular emissions has been corrected with the appropriate emissions factors.

3.12 CLIMATE CHANGE

3.12.1 INTRODUCTION TO CLIMATE CHANGE AND GLOBAL WARMING

The average surface temperature of the Earth has risen by about one degree Fahrenheit in the past century, with most of that occurring during the past two decades (World Meteorological Organization, 2005). To the layperson, this apparently small amount of warming may appear insignificant. Correspondingly, the probable increases in average temperatures of between three to eight degrees Fahrenheit (Cayan, et al., 2006) may appear noticeable, but still insignificant. The word average is of critical importance to understanding climate change and global warming. In July, the average high temperature in Sacramento is 94 degrees Fahrenheit (The Weather Channel website, 2007). This number is created by averaging temperatures over decades, not just for one particular year. Although the average is 94 degrees Fahrenheit, residents know that the individual days and weeks making up that average are as much as 20 degrees warmer or cooler in the extreme cases and up to 10 degrees warmer or cooler on a more regular basis. Therefore, applying an average increase of eight degrees in a strictly linear way (omitting forcing effects) would mean that the average July temperature in Sacramento would be 102 degrees, and that temperatures could get as hot as 122 degrees in an extreme event (the current record is 114) and could regularly reach 112 degrees. This kind of temperature shift would have significant consequences to citizens and the environment alike.

There is evidence that most of the warming over the last 50 years is due to human activities. Human activities, such as energy production and internal combustion vehicles, have increased the amount of greenhouse gases in the atmosphere, which in turn is causing the Earth's average temperature to rise. Rises in average temperature are leading to changes in climate patterns, shrinking polar ice caps and a rise in sea level, with a host of corresponding impacts to humans and ecosystems.

Greenhouse gases are atmospheric gases that act as global insulators by reflecting visible light and infrared radiation back to Earth. Some greenhouse gases, such as water vapor, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), occur

naturally and are emitted to the atmosphere through natural processes. Although CO₂, CH₄, and N₂O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From 1750 to 2004, concentrations of CO₂, CH₄, and N₂O have increased globally by 35, 143, and 18 percent, respectively. Other greenhouse gases, such as fluorinated gases, are created and emitted solely through human activities (EPA 2006).

The principal greenhouse gases that enter the atmosphere because of human activities are CO₂, CH₄, N₂O, and fluorinated gases. Carbon dioxide, or CO₂, is the gas that is most commonly referenced when discussing climate change because it is the most commonly emitted gas. While some of the less common gases do make up less of the total greenhouse gases emitted to the atmosphere, some have a greater climate-forcing effect per molecule and/or are more toxic than carbon dioxide. The principal greenhouse gases and associated emission sources and levels are discussed in more detail below.

"In order to stabilize the concentration of GHGs in the atmosphere, emissions would need to peak and decline thereafter. The lower the stabilization level, the more quickly this peak and decline would need to occur. Mitigation efforts over the next two to three decades will have a large impact on opportunities to achieve lower stabilization levels" (IPCC 2007c).

CARBON DIOXIDE

The natural production and absorption of carbon dioxide (CO₂) is achieved through the terrestrial biosphere and the ocean. However, humankind has altered the natural carbon cycle by burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid-1700s, each of these activities has increased in scale and distribution. Carbon dioxide was the first greenhouse gas demonstrated to be increasing in atmospheric concentration, with the first conclusive measurements being made in the last half of the 20th Century. Prior to the industrial revolution, concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of well over 30% (EPA 2006). Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 535 ppm by 2100 as a direct result of anthropogenic sources (IPCC 2007a). This could result in an average global temperature rise of at least two degrees Celsius (IPCC 2007a).

Carbon dioxide emissions are mainly associated with combustion of carbon-bearing fossil fuels such as gasoline, diesel, and natural gas used in mobile sources and energy-generation-related activities. The U.S. EPA estimates that CO₂ emissions accounted for 84.6% of greenhouse gas emissions in the United States in 2004 (EPA 2006). The California Energy Commission (CEC) estimates that CO₂ emissions account for 84% of California's anthropogenic (manmade) greenhouse gas emissions, nearly all of which is associated with fossil fuel combustion (CEC 2005). Total CO₂ emissions in the United States increased by 20% from 1990 to 2004 (EPA 2006).

METHANE

Methane (CH₄) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to some other greenhouse gases (such as CO₂, N₂O, and CFCs). CH₄ has both natural and anthropogenic sources. Landfills, natural gas distribution systems, agricultural activities, fireplaces and wood stoves, stationary and mobile fuel combustion, and gas and oil production fields are the major sources of these emissions (EPA 2006).

The U.S. EPA estimates that CH₄ emissions accounted for 7.9% of total greenhouse gas emissions in the United States in 2004 (EPA 2006). The CEC estimates that CH₄ emissions from various sources represent 6.2% of California's total greenhouse gas emissions (CEC 2005). Total CH₄ emissions in the United States decreased by 10% from 1990 to 2004 (EPA 2006).

NITROUS OXIDE

Concentrations of nitrous oxide (N₂O) also began to rise at the beginning of the industrial revolution. N₂O is produced by microbial processes in soil and water, including those reactions which occur in fertilizers that contain nitrogen. Use of these fertilizers has increased over the last century. Global concentration for N₂O in 1998 was 314 ppb, and in addition to agricultural sources for the gas, some industrial processes (fossil fuel fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load (EPA 2006).

The U.S. EPA estimates that N₂O emissions accounted for 5.5% of total greenhouse gas emissions in the United States in 2004 (EPA 2006). The CEC estimates that nitrous oxide emissions from various sources represent 6.6% of California's total greenhouse gas emissions (CEC 2005). Total N₂O emissions in the United States decreased by 2% from 1990 to 2004 (EPA 2006).

FLUORINATED GASES (HFCs, PFCs, AND SF₆)

Flourinated gases, such as hydroflourocarbons (HFCs), perflourocarbons (PFCs) and sulfurhexafluoride (SF₆), are powerful greenhouse gases that are emitted from a variety of industrial processes. Flourinated gases are occasionally used as substitutes for ozone-depleting substances such as chlorflourocarbons (CFCs), hydrochlorflourocarbons (HCFCs), and halons, which have been regulated since the mid-1 980s because of their ozone destroying potential. Flourinated gases are typically emitted in smaller quantities than CO₂, CH₄, and N₂O, but each molecule can have a much greater global warming effect. Therefore, flourinated gases are sometimes referred to as High Global Warming Potential (GWP) gases (EPA 2006).

The primary sources of flourinated gas emissions in the United States include the production of HCFC-22, electrical transmission and distribution systems, semiconductor

manufacturing, aluminum production, magnesium production and processing, and substitution for ozone-depleting substances. The U.S. EPA estimates that fluorinated gas (HFC, PFC, and SF6) emissions accounted for 2.0% of total greenhouse gas emissions in the United States in 2004 (EPA 2006). The CEC estimates that fluorinated gas emissions from various sources represent 3.4% of California's total greenhouse gas emissions (CEC 2005). Total fluorinated gas emissions in the United States increased by 58% from 1990 to 2004 (EPA 2006).

3.12.2 REGULATORY CONTEXT

WORLDWIDE, NATIONAL, AND STATEWIDE EMISSIONS

Table 3.12-1, Greenhouse Gas Emissions Worldwide, United States, and California, presents estimated GHG emissions from California, the United States, and from worldwide sources. The results are presented in units of million metric tons per year of CO₂ equivalents (MMTCO₂Eq). Worldwide GHG emissions were taken from the World Resources Institute's Climate Analysis Indicators Tool (CAIT) version 4 for calendar year 2000 (the latest year for which complete data are available). The United States GHG emissions were taken from Energy Information Administration's Emissions of Greenhouse Gases in the United States 2004. While data for 2005 are available, 2004 data were used because the California data are for 2004. California GHG emissions were taken from the California Energy Commission's Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 (the latest year for which complete data are available).

SACRAMENTO COUNTY EMISSIONS

The ICLEI Clean Air and Climate Protection Model (CACCP) was used to estimate unincorporated Sacramento County emissions, along with the emissions of all of the incorporated cities in the County. This complete inventory was done to provide a regional picture, but the County does not have control over incorporated city emissions (See <http://www.climatechange.saccounty.net/default.htm>, click on the Reports and Publications link to download the full Greenhouse Gas Emissions Inventory for Sacramento County). The baseline year 2005 was chosen based on availability of information. In cases where 2005 data was unavailable, 2006 or other recent-year data was substituted. The software inventories community GHG emissions for all operations, with a separate government analysis tab that determines GHG emissions of local government operations as a subset of the community analysis. The community analysis divides GHG emissions among residential (energy usage), commercial (energy usage), industrial (energy usage), transportation (exhaust emissions), off-road vehicle use (exhaust emissions), waste (landfill emissions), wastewater treatment (energy usage), agriculture (fertilizers, enteric fermentation, etc), High GWP (high global warming potential, such as refrigerants), and airport (emissions from County buildings and fleets – does not include fleet owned by airlines) sectors. The government analysis

divides emissions among buildings, vehicle fleet, employee commute, streetlights, water/sewage, and waste sectors.

**Table 3.12-1
Greenhouse Gases Emissions Worldwide, United States, and California**

Geographic Region	CO ₂	CH ₄	N ₂ O
	MMTCO ₂ Eq ^a	MMTCO ₂ Eq ^b	MMTCO ₂ Eq ^c
Worldwide GHG Emissions for calendar year 2000 ¹	32,541.3	5,854.9	3,349.4
United States GHG Emissions for calendar year 2004 ²	5,973.0	639.5	353.7
California GHG Emissions for calendar year 2004 ³	484.4	27.9	33.3

Notes:

^a MMTCO₂Eq^a means million metric tons per year of CO₂ equivalent, using Global Warming Potential (GWP) values provided by IPCC in its Fourth Assessment Report (TAR) (IPCC 2007a). The GWP for CO₂ is 1.

^b The GWP from IPCC's TAR for CH₄ is 21.

^c The GWP from IPCC's TAR for N₂O is 310.

CO₂ = carbon dioxide; N₂O = Nitrous oxide; CH₄ = Methane.

¹ Worldwide GHG emissions taken from Climate Analysis Indicators Tool (CAIT) version 4.0. Washington, D.C.: World Resources Institute, 2007. Available at <http://cait.wri.org>.

² United States GHG emissions taken from *Emissions of Greenhouse Gases in the United States 2004*, Energy Information Administration, U.S. Department of Energy, Washington, D.C., December 2005.

³ California GHG emissions taken from *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*, California Air Resources Board, November 2007.

For the community analysis, energy use was obtained for the Sacramento Municipal Utility District (SMUD) and the Pacific Gas and Electric Company (PG&E). Community waste generation for Sacramento County was collected through the California Integrated Waste Management Board (CIWMB) web site and through consultation with staff of Sacramento County Municipal Services Agency. The SMUD reported its 2005 GHG emissions and an emissions factor for all electricity sold to customers that was verified and certified by the California Climate Action Registry. This emissions factor was input into the model as a replacement for the statewide emissions factor for electricity consumption to generate more accurate GHG emissions estimates for Sacramento County electricity consumption. The software default emissions factors for other GHGs, which is based on statewide averages, were used in all other instances. As shown in Table 3.12-2, the County 2005 emission baseline is approximately 6.5 MMT per year, with the transportation sector as the largest contributor at 55% of the total. The emissions per sector drop precipitously from there, with the residential sector emitting only a quarter of the transportation sector total. However, the residential and

commercial sectors can be combined to give a more overarching view, because though these sectors operate differently, the source of emissions are the same: private building and interior equipment energy usage. Combining these sectors, transportation accounts for 55% of emissions, and operation of residential, commercial, and industrial buildings accounts for 28% of emissions. The industrial-specific, off-road vehicle, waste, wastewater, agriculture, and high global warming potential greenhouse gases (High GWP GHG) sectors combined are responsible for only 14% of the County emissions, with the airport as an additional 3%.

Table 3.12-2
2005 Community Emissions by Sector

<u>Sector</u>	<u>CO₂e (metric tons)</u>	<u>Percent</u>
Residential	<u>1,033,142</u>	<u>15.8</u>
Commercial and Industrial	<u>791,059</u>	<u>12.1</u>
Industrial Specific	<u>2,104</u>	<u>0.0</u>
Transportation	<u>3,610,937</u>	<u>55.1</u>
Off-Road Vehicle Use	<u>236,466</u>	<u>3.6</u>
Waste	<u>201,399</u>	<u>3.1</u>
Wastewater Treatment	<u>54,391</u>	<u>0.8</u>
Agriculture	<u>197,132</u>	<u>3.0</u>
High GWP GHGs	<u>228,768</u>	<u>3.5</u>
Airport	<u>200,404</u>	<u>3.1</u>
Total	<u>6,555,802</u>	<u>100</u>

EMISSIONS THRESHOLDS

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of carbon dioxide needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of greenhouse gases at 400-450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below 2°C, which in turn is assumed to be necessary to avoid dangerous climate change (IPCC 2007a). The California Climate Change Center (CCCC) at UC Berkeley has determined that an 11 percent reduction of greenhouse gases from present levels is required by year 2010, a 25 percent reduction is required by 2020, and an 80 percent reduction by 2050 in order to stabilize greenhouse gases at 400-450 ppm carbon dioxide-equivalent concentrations and avoid potentially dangerous climate change impacts (CCCC 2006). The California Legislature required these reduction levels by enacting Assembly Bill (AB) 32.

Though reduction rates were established in California law (AB 32), as of the writing of this document there are no established CEQA thresholds for greenhouse gases. AB 32 requires ARB to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020, as specified.

EXECUTIVE ORDER S-3-05

Executive Order S-3-05 was the precursor to Assembly Bill 32 (AB 32 is described in the next section) and was signed by Governor Schwarzenegger in June 2005. This Executive Order was significant because of its clear declarative statements that climate change poses a threat to the State of California. The Executive Order states that California is "particularly vulnerable" to the impacts of climate change, and that climate change has the potential to reduce Sierra snowpack (a primary source of drinking water), exacerbate existing air quality problems, adversely impact human health, threaten coastal real estate and habitat by causing sea level rise, and impact crop production. The Executive Order also states that "mitigation efforts will be necessary to reduce greenhouse gas emissions".

To address the issues described above, the Executive Order established emission reduction targets for the state: reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020 and to 80% below 1990 levels by 2050. The Secretary of the California Environmental Protection Agency was named as coordinator for this effort, and the Executive Order required a progress report by January 2006 and biannually thereafter. As a result, the Climate Action Team was created by the California Environmental Protection Agency. The first report from the Climate Act Team was released in March of 2006, which proposed to meet the emissions targets through voluntary compliance and state incentive and regulatory programs.

ASSEMBLY BILL 32

In September 2006, AB 32 was signed by Governor Schwarzenegger. AB 32 requires that California GHG emissions be reduced to 1990 levels by the year 2020, just like Executive Order S-3-05. However, AB 32 is a comprehensive bill that requires the California Air Resources Board (ARB) to adopt regulations requiring the reporting and verification of statewide greenhouse gas emissions, and it establishes a schedule of action measures. AB 32 also requires that a list of emission reduction strategies be published to achieve emissions reduction goals.

The following is a list of critical path items incorporated into AB 32-deadlines that cannot be extended unless the Governor agrees there are "extraordinary circumstances", and then only for one year:

- **January 1, 2007:** AB 32 goes into effect;
- **June 30, 2007:** CARB must publish "a list of discrete early action GHG emission reduction measures" (Cal. Health & Safety Code § 38560.5(a)); this list is not just advisory -the measures must be implemented by regulations by 2010;
- **January 1, 2008:** ARB must establish the 1990 baseline of statewide GHG emissions that will be the cap to be implemented by 2020 (id. at § 38550);
- **January 1, 2008:** ARB must also adopt regulations requiring the monitoring and annual reporting of GHG emissions from all significant sources (id. at § 38530);
- **January 1, 2009:** ARB must prepare and approve a "scoping plan" for "achieving the maximum technologically feasible and cost-effective reductions in GHG emissions from sources or categories of sources of GHG gases by 2020" (id. at § 38561); this scoping plan will be the template for the regulations that will be adopted by 2011;
- **January 1, 2010:** ARB must "adopt regulations to implement" the list of reduction measures that it publishes by June 30, 2007 (id. at § 38560.5(b));
- **January 1, 2011:** ARB must adopt regulations establishing "GHG emission limits and emission reduction measures" (id. at § 38562(a)); and
- **January 1, 2012:** the 201 1 regulations must become operative. (Id.)

As of this writing, the first ~~four~~ five critical path items have occurred. AB 32 is in effect, ~~and~~ the list of early action measures was adopted by the ARB on June 21, 2007 (Resolution 07-25), and many other measures were added at a hearing on October 25, 2007. The Scoping Plan was adopted on December 11, 2008.

SENATE BILL 375

On September 30, 2008, Senate Bill (SB) 375 was signed by Governor Schwarzenegger of California. SB 375 combines regional transportation planning with sustainability strategies in order to reduce greenhouse gas emissions in California's urbanized areas. Existing law requires each regional transportation planning agency, with in Sacramento County's case is the Sacramento Area Council of Governments (SACOG), to adopt a Regional Transportation Plan. SB 375 requires that the Regional Transportation Plan must now include a "sustainable communities strategy". To this end, the ARB must provide SACOG and other regions with GHG emissions reduction targets by June 30, 2010. The Regional Technical Advisory Committee formed to generate recommendations published their final report on September 29, 2009. The report recommends that the Air Resources Board adopt a uniform statewide target expressed as a per capita reduction metric from 2005 levels.

SENATE BILL 97 CHAPTER 185, STATUTES OF 2007

Senate Bill 97 (SB 97) requires that Office of Planning and Research (OPR) to prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of greenhouse gas emissions or the effects of GHG emissions as required by CEQA. The California Resources Agency is required to certify and adopt these revisions to the State CEQA Guidelines by January 1, 2010. The Natural Resources Agency adopted the amendments on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.

ENDANGERMENT FINDING

On December 7, 2009, the U.S. EPA made an Endangerment Finding and a Cause or Contribute Finding related to greenhouse gases. The U.S. EPA Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases – carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) – in the atmosphere threaten the public health and welfare of current and future generations (endangerment). The Administrator also found that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare (Cause or Contribute). ~~Three early action measures were identified by the deadline: establishment of a low-carbon fuel standard, restriction on the use of refrigerants, and the establishment of statewide standards for the installation and performance of landfill methane capture.~~

~~Subsequently, the California Air Resources Board added many additional items to the early action measures list, at a hearing on October 25, 2007.~~

STATE OF CALIFORNIA GREENHOUSE GAS EMISSION REDUCTION STRATEGIES

Several strategies to reduce vehicle emissions have been identified by the California Environmental Protection Agency's Climate Action Team. These include, but are not limited to, the following:

VEHICLE CLIMATE CHANGE STANDARDS

With the passage of AB 1493, Pavley, Chapter 200, Statutes of 2002, California moved to the forefront of reducing vehicle climate change emissions. This bill required the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks. Regulations were adopted by the ARB in September 2004. The ARB analysis of this regulation indicates emissions savings of 1 million tons CO₂ equivalent (MMtCO₂e) by 2010 and 30 million tons CO₂ equivalent by 2020.

DIESEL ANTI-IDLING

Reduced idling times and the electrification of truck stops can reduce diesel use in trucks by about 4 percent, with major air quality benefits. In July 2004 the ARB adopted a measure to limit diesel-fueled commercial motor vehicle idling. AB 32 analysis indicates that anti-idling measures could reduce climate change emissions by 1.2 MMTCO₂ Eq in 2020.

OTHER NEW LIGHT DUTY VEHICLE TECHNOLOGY IMPROVEMENTS

In September 2004 the California Air Resources Board approved regulations to reduce climate change emissions from new motor vehicles. The regulations apply to new passenger vehicles and light duty trucks beginning with the 2009 model year. The standards adopted by the Board phase in during the 2009 through 2016 model years. When fully phased in, the near term (2009-2012) standards will result in about a 22 percent reduction as compared to the 2002 fleet, and the mid-term (2013-2016) standards will result in about a 30 percent reduction.

New standards would be adopted to phase in beginning in the 2017 model year (following up on the existing mid-term standards that reach maximum stringency in 2016). Assuming that the new standards call for about a 50 percent reduction, phased in beginning in 2017, this measure would achieve about a 4 MMT reduction in 2020. The reduction achieved by this measure would significantly increase in subsequent years as clean new vehicles replace older vehicles in the fleet-staff estimates a 2030 reduction of about 27 MMT.

EXECUTIVE ORDER S-01-07

This Executive Order was signed by Governor Schwarzenegger on January 18, 2007 and directed the Climate Action Team to determine whether the items in the Order could be established as an early action measure pursuant to AB 32 which the Climate Action Team has now done. The Executive Order states that the State of California relies on petroleum-based fuels for 96% of its transportation needs, there were more than 24 million motor vehicles registered in California, and statewide gasoline consumption was almost 16 billion gallons in 2005. To address the carbon emitted by this use of fuel, the Executive Order states that a statewide goal must be established to reduce the "carbon intensity of California's transportation fuels" by at least 10% by the year 2020 and that a Low Carbon Fuel Standard for transportation fuels be established. The Low Carbon Fuel Standard applies to all "refiners, blenders, producers or importers of transportation fuels in California".

CALIFORNIA CLIMATE ADAPTATION STRATEGY

In December 2009, the California Natural Resources Agency, in coordination and partnership with multiple other state agencies, released their California Climate Adaptation Strategy. This document summarizes the best known science on climate

change impacts in seven specific sectors, including: public health, biodiversity-habitat, ocean & coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure. The strategy provides recommendations on how to manage against threats to these sectors. The strategy is in direct response to Gov. Schwarzenegger's November 2008 Executive Order S-13-08 that specifically asked the Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events.

SACRAMENTO COUNTY EMISSION REDUCTION EFFORTS

CLIMATE ACTION PLAN

In May of 2009 Sacramento County published a Phase I Draft Climate Action Plan (Phase I CAP). The Phase I CAP provides a framework and overall policy strategy for reducing greenhouse gas emissions and managing our resources in order to comply with AB 32. It also highlights actions already taken to become more efficient, and targets future mitigation and adaptation strategies. This document is available at <http://www.climatechange.saccounty.net/default.htm>. The draft Phase I CAP contains policies/goals related to agriculture, energy, transportation/land use, waste, and water.

Goals in the section on agriculture focus on promoting the consumption of locally-grown produce, protection of local farmlands, educating the community about the intersection of agriculture and climate change, educating the community about the importance of open space, pursuing sequestration opportunities, and promoting water conservation in agriculture. Actions related to these goals cover topics related to urban forest management, water conservation programs, open space planning, and sustainable agriculture programs.

Goals in the section on energy focus on increasing energy efficiency and increasing the usage of renewable sources. Actions include implementing green building ordinances and programs, community outreach, renewable energy policies, and partnerships with local energy producers.

Goals in the section on transportation/land use cover a wide range of topics but are principally related to reductions in vehicle miles traveled, usage of alternative fuel types, and increases in vehicle efficiency. Actions include programs to increase the efficiency of the County vehicle fleet, and an emphasis on mixed use and higher density development, implementation of technologies and planning strategies that improve non-vehicular mobility.

Goals in the section on waste include reductions in waste generation, maximizing waste diversion, and reducing methane emissions at Kiefer landfill. Actions include solid waste reduction and recycling programs, a regional composting facility, changes in the waste vehicle fleet to use non-petroleum fuels, carbon sequestration at the landfill, and methane capture at the landfill.

Goals in the section on water include reducing water consumption, emphasizing water efficiency, reducing uncertainties in water supply by increasing the flexibility of the water allocation/distribution system, and emphasizing the importance of floodplain and open space protection as a means of providing groundwater recharge. Actions include metering, water recycling programs, water use efficiency policy, water efficiency audits, greywater programs/policies, river-friendly landscape demonstration gardens, participation in the water forum, and many other related measures.

Publication of a Phase II CAP is anticipated to occur one year from the adoption of the 2030 Sacramento County General Plan. This Phase II CAP is intended to flesh out the strategies involved in the Phase I CAP, and will include economic analysis, intensive vetting with all internal departments, community outreach/information sharing, timelines, and detailed performance measures.

CHICAGO CLIMATE EXCHANGE

In February 2007, the County joined the Chicago Climate Exchange. The Chicago Climate Exchange is the world's first and North America's only voluntary, legally binding rules-based greenhouse gas (GHG) emission reduction and trading system. Chicago Climate Exchange Phase I members commit to reduce GHG emissions 1% per year over the years 2003 through 2006 relative to a 1998 through 2001 average baseline. Phase I members agree to reduce GHG emissions by a total of 4% below the baseline by 2006. Chicago Climate Exchange Phase II members commit to reduce GHG emissions from 1¼% to ½% per year through the years 2007 through 2010 for a grand total of 6% below the baseline.

Those members that reduce their emissions annually beyond the committed level can sell surplus emission allowances on the Chicago Climate Exchange or bank them. A member that cannot achieve the annual reduction target within its organization can meet its commitment by purchasing emissions allowances through the Chicago Climate Exchange from other Chicago Climate Exchange members that reduce their emissions beyond the reduction target.

The goals of Chicago Climate Exchange are:

1. To facilitate the transaction of GHG emissions allowance trading with price transparency, design excellence and environmental transparency;
2. To build the skills and institutions needed to cost-effectively manage GHG emissions;
3. To facilitate capacity-building in both public and private sector to facilitate mitigation;

4. To strengthen the intellectual framework required for cost effective and valid reduction; and
5. To help inform the public debate on managing the risk of global climate change.

Chicago Climate Exchange members make a commitment to:

1. Measure, report, and reduce GHG emissions;
2. Establish an emission reduction schedule;
3. Implement GHG emissions management; and
4. Participate in annual emissions audits.

ENERGY CONSERVATION/ENERGY EFFICIENCY PROGRAM

For years, the County of Sacramento has taken a leadership role in implementing policies and programs to conserve energy in County facilities and reduce emissions from the County fleet of vehicles.

The Board of Supervisors approved an Energy Conservation/Energy Efficiency Program in 2001. The essence of the program is to reduce electrical energy usage during peak periods of the day. The program contains ten measures such as participating in Sacramento Municipal Utility District's Voluntary Emergency Curtailment Program, setting building temperatures to 78° F to decrease cooling demand and dual switching of lights.

The County converted 108 of 150 trucks to liquid natural gas (LNG) in the Refuse Collection Fleet. The Heavy Rental Fleet now includes 18 propane powered vehicles. The Light Fleet includes 95 hybrid vehicles and 3 Compressed Natural Gas (CNG) vehicles. Replacement vehicles to the Light Fleet will be hybrid vehicles. The Sacramento International Airport operates LNG shuttle buses.

GHG emissions from County operations are either direct emissions or indirect emissions. Direct emissions result from on-site direct combustion by the County of fossil fuels such as natural gas to heat facilities and gasoline to fuel vehicles. Therefore, increasing the number of vehicles, which use alternative fuels, reduces GHG emissions. Indirect emissions result from the purchase of energy, such as electricity, and the corresponding emissions associated with that generation. Therefore, purchasing electricity from green energy sources, or reducing energy use reduces GHG emissions. Direct and indirect emissions are the GHG emissions, expressed in metric tons of carbon dioxide (CO₂) equivalent.

The County provided Chicago Climate Exchange current and historical energy and fuel purchase data for fiscal years 2000, 2001, 2002, 2003, 2004, and 2005. The data

submitted is for County-owned facilities and vehicles. The County's commitment to join does not apply to businesses, other government agencies or residents within the County boundary, only to emissions generated by Sacramento County as an organization. Preliminary review by the Chicago Climate Exchange indicates the County could be in a position to sell surplus emission allowances for the period of 2003 through 2010. This data will be subject to an audit before a formal baseline is established and exact credits can be calculated.

It is expected, based on information available and preliminary review by the Chicago Climate Exchange, that the County will receive potential financial reward from participation in the Chicago Climate Exchange. The County may be eligible to sell excess allowances. The preliminary baseline for direct and indirect emissions for the County is 226,700 metric tons of CO₂.

SUSTAINABILITY CABINET

~~Recognizing the need to work together as a County to address climate change, the Sacramento County Sustainability Cabinet was formed in September of 2007. The cabinet will develop a County sustainability plan for County energy management, develop a County green building policy and explore legislative priorities. The intent is to gather together the various environmental initiatives that are currently underway to ensure a coordinated County effort. The Sustainability Cabinet will also facilitate the baseline reporting for the Chicago Climate Exchange, CCAR, ICLEI and conformance with AB 32.~~

NATIONAL ASSOCIATION OF COUNTIES

~~The National Association of Counties (NACo) represents county governments in the United States. NACo offers legislative, research, technical, and public affairs assistance to member counties, and facilitates conferences and meetings on issues of concern to counties throughout the country.~~

CALIFORNIA CLIMATE ACTION REGISTRY

The County joined the California Climate Action Registry (Registry) in December 2006. The Registry is non-profit public/private partnership that serves as a voluntary GHG registry to protect, encourage and promote early actions to reduce GHG emissions. Registry participants agree to calculate, certify and publicly report GHG emissions. The Registry provides a reporting tool, standards and protocol for reporting GHG emissions. AB 32 recognizes participation in the Registry in a number of ways. First, AB 32 requires the ARB to incorporate the standards and protocols developed by the Registry in the rulemaking process. Second, AB 32 provides that entities that join the Registry prior to December 31, 2006 and report their emissions according to the Registry protocols will not be required to significantly alter their reporting program.

CITIES FOR CLIMATE PROTECTION LOCAL GOVERNMENTS FOR SUSTAINABILITY (CCPICLEI)

Sacramento County joined ICLEI in 2007. The Cities for Climate Protection is administered under the International Council for Local Environmental Initiatives (ICLEI). The following is a brief description of the program from their website (www.iclei.org):

"The Cities for Climate Protection (CCP) Campaign enlists cities to adopt policies and implement measures to achieve quantifiable reductions in local greenhouse gas emissions, improve air quality, and enhance urban livability and sustainability. More than 650 local governments participate in the CCP, integrating climate change mitigation into their decision-making processes. The campaign is based on an innovative performance framework structured around five milestones that local governments commit to undertake. The milestones allow local governments to understand how municipal decisions affect energy use and how these decisions can be used to mitigate global climate change while improving community quality of life. The CCP methodology provides a simple, standardized way of acting to reduce greenhouse gas emissions and of monitoring, measuring, and reporting performance."

BENEFITS OF PARTICIPATION

Communities that participate in the CCP benefit from the actions that they take to reduce greenhouse gas emissions through:

- Financial savings in reduced utility and fuel costs to the local government, households, and businesses.
- Improved local air quality, contributing to the general health and well being of the community. Economic development and new local jobs as investments in locally produced energy products and services keep money circulating in the local economy.
- ICLEI provides regionally specific tools and technical assistance to assist local governments in reducing their greenhouse gas emissions.

Cities for Climate protection (CCP) is ICLEI's flagship campaign. The program is designed to educate and empower local governments worldwide to take action on climate change. CCP is a performance-oriented campaign that offers a framework for local governments to reduce greenhouse gas emissions and improve livability within their municipalities. This campaign would give Sacramento County a framework and tools to develop a plan for greenhouse emissions. The basic framework is called the 5 Milestones and consists of the following steps:

Conduct a baseline emissions inventory and forecast. Based on energy and waste data, the member calculates greenhouse gas emissions for a base year

(e.g., 2000) and for a forecast year (e.g., 2015). The inventory and the forecast capture emissions from all municipal operations (e.g., city owned and/or operated buildings, streetlights, transit systems, wastewater treatment facilities) and from all community-related activities (e.g., residential and commercial buildings, motor vehicles, waste streams, industry). The inventory and forecast provide a benchmark against which the city can measure progress.

1. Adopt an emissions reduction target for the forecast year. The city passes a council resolution establishing an emission reduction target for the city. The target is essential both to foster political will and to create a framework to guide the planning and implementation of measures.
2. Develop a Local Action Plan. The local government develops a Local Action Plan that describes or lists the policies and measures that the local government will take to reduce greenhouse gas emissions and achieve its emissions reduction target. Most plans include a timeline, a description of financing mechanisms, and an assignment of responsibility to departments and staff. In addition to direct greenhouse gas reduction measures, most plans also incorporate public awareness and education efforts. The development of the Local Action Plan should include strong public input and involvement in order to build the consensus among stakeholders required to implement measures.
3. Implement policies and measures. The city implements the policies and measures contained in their Local Action Plan. Typical policies and measures implemented by CCP participants include energy efficiency improvements to municipal buildings and water treatment facilities, streetlight retrofits, public transit improvements, installation of renewable power applications, and methane recovery from waste management.
4. Monitor and verify results. Monitoring and verifying progress on the implementation of measures to reduce or avoid greenhouse gas emissions is an ongoing process. Monitoring begins once measures are implemented and continues for the life of the measures, providing important feedback that can be use to improve the measures over time. ICLEI's software provides a uniform methodology for cities to report on measures.

The County has completed the emissions inventory, which is available on the Department of Environmental Review and Assessment website at www.dera.saccounty.net (see the home page under special studies).

GREEN FLEETS

The City and County of Sacramento have adopted a heavy-duty low-emission vehicle (LEV) acquisition policy. The policy goal is to reduce oxides of nitrogen (NO_x) emissions

from heavy-duty fleet vehicles to meet the year 2005 standard for ozone in the Sacramento Federal Ozone Non-attainment area.

The foundation statements for this project are:

1. We recognize that the region has an air quality problem which is related to vehicle operations, especially the operation of heavy-duty vehicles;
2. We recognize that public agencies in Sacramento County operate large vehicle fleets which have significant numbers of heavy-duty vehicles; and
3. We recognize that public agencies have a significant role to play in improving air quality by reducing the emissions from their fleet operations, especially their heavy-duty vehicles.

The commitments of this program are to show how fleets can aggressively incorporate low-emission vehicles into fleet operations, and how fleets can overcome training, facility and operational issues with resolve. The efforts will focus on the conversion of the on-road, heavy-duty equipment fleets to certified low-emission vehicles as these vehicles are replaced as part of regular systematic replacement programs. As of 2004, the County has committed to replace 50% of the fleet to low-emission vehicles.

COOL COUNTIES INITIATIVE

On July 16, 2007 at the National Association of Counties Annual Conference in Richmond, Virginia, 12 pioneering counties representing 17 million people launched "Cool Counties." The Cool Counties initiative seeks to marshal the resources of all 3,066 counties across the nation to address the challenges climate change poses to our communities. On May 27, 2008, the Sacramento County Board of Supervisors approved a resolution to become a Cool County and participate in the initiative.

Participating counties commit to four smart actions:

1. Reducing our own contributions to climate change through our internal operations;
2. Demonstrating regional leadership to achieve climate stabilization and protect our communities;
3. Helping our community become climate resilient; and
4. Urging the federal government to support our efforts.

These actions are consistent with the state requirements under AB 32 and Executive Order S-3-05, including:

- Assessing local operations that impact greenhouse gas emissions;
- Working to reduce greenhouse gas emissions 80% below current levels by 2050;
- Identifying local vulnerabilities to climate change and creating a plan to address them; and
- Working with counties nationally to urge the federal government to adopt legislation to reduce greenhouse gas emissions 80% below current levels by 2050.

3.12.3 ENVIRONMENTAL SETTING

The Project site is located in the eastern portion of rural unincorporated Sacramento County and characterized by open agricultural land primarily utilized for seasonal grazing. The Project site is bound by seasonal grazing land to the north, south, and east and grazing land and Scott Road to the west (see Figure 2.0-5). Vegetation on site consists predominately of non-native grassland with scattered oaks. Some wetland and riparian plant species are found in the areas of watercourses, seasonal wetlands, and the stock pond.

The lack of industrial or commercial use on-site limits the production of existing greenhouse gas emissions. Greenhouse gas emissions are primarily associated with the existing seasonal cattle grazing, including vehicular transport of cattle on and off the Project site, employee transport on and off the site to manage cattle grazing activities, and greenhouse gases produced by the cattle.. It is anticipated that the amount of greenhouse gases produced by this activity is minimal given the seasonal nature of cattle grazing operations, low number of vehicle trips required for cattle grazing operations, and limited amount of cattle that could graze on-site at any one time.

3.12.4 STANDARDS OF SIGNIFICANCE, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The California Office of Planning and Research, the agency responsible for development and updates to the CEQA Guidelines, has published a draft set of guidelines for climate change. The Natural Resources Agency adopted the amendments on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010. The guidelines do not include a numeric significance threshold. One could use the emissions reduction targets established through AB 32, but the measures listed in the published Scoping Plan do not clearly identify the reduction targets that will apply specifically to local government. The Scoping Plan

states that local government should set the same ultimate targets as those set forth in AB 32, but does not provide the details necessary to understand how much of the target will be achieved through State actions (such as the low-carbon fuel standard) and how much will be achieved by local action. In the absence of a clear and established method of determining the significance of climate change impacts, Sacramento County has developed its own methodology.

As previously discussed, Sacramento County prepared a GHG emissions inventory for the County, and as an offshoot of that process has published a Draft Climate Action Plan. Sacramento County has also published the Draft Environmental Impact Report for the Sacramento County General Plan Update project (02-0105), which analyzes the potential greenhouse gas emissions resulting from buildout of the proposed General Plan. The General Plan EIR also recommends the adoption of significance thresholds. Though not yet adopted, the Climate Action Plan and the thresholds published in the General Plan EIR form the basis of the significance determinations in this EIR. The significance thresholds published in the General Plan EIR are in Table 3.12-3 below.

Quarries are classified as industrial in nature. For industrial projects, the primary source of GHG emissions is typically from energy usage occurring within or associated with buildings. Even so, there are some industrial uses and other projects that are atypical, and do not fit well into the thresholds described above. A quarry is one of these atypical projects in which the majority of energy emissions are not associated with buildings. Likewise, the transportation emissions are associated primarily with truck trips and heavy equipment usage on the site, not with residents of the County using the site (either for shopping or employment purposes). For atypical projects such as this, some modifications must be made to the significance thresholds – while ensuring that the modifications are consistent with the same basic methodology used to generate the significance thresholds for typical projects.

In the case of transportation emissions, for this project and others like it the threshold can be expressed as per vehicle mile traveled (VMT) rather than as per capita, using data from the County Inventory. The exact same data is used to make this calculation as was used to calculate the per capita threshold, except that the final calculation consists of dividing emissions by the forecasted amount of VMT traveled in 2020 rather than the forecasted population. Based on this methodology, the transportation emissions threshold is 0.05 MT CO₂e, per 100 VMT. For energy usage, the final calculation consists of dividing emissions by the forecasted square footage of commercial and industrial property in 2020 rather than the forecasted square footage of the buildings. The acreage was developed by multiplying the projected 2020 square footage by the average County Floor Area Ratios (FAR, which is the ratio of land area to building square footage) for commercial and industrial properties: 0.30. This results in a threshold of 2.42 MT CO₂e per Kft² of land area.

Table 3.12-3
Sector Analysis (in MT) and Thresholds for Development

<u>Sector</u>	<u>2005 Baseline</u>	<u>Percent of Total</u>	<u>Total Minimum Reduction in CO₂e</u>	<u>2020 Target</u>	<u>Thresholds (MT)</u>
<u>Residential Energy</u>	<u>1,033,142</u>	<u>15.80%</u>	<u>155,373</u>	<u>877,769</u>	<u>1.30 per capita</u>
<u>Commercial & Industrial Energy</u>	<u>793,163</u>	<u>12.10%</u>	<u>118,988</u>	<u>674,175</u>	<u>8.08 per Kft²</u>
<u>Wastewater</u>	<u>54,391</u>	<u>0.80%</u>	<u>7,867</u>	<u>46,524</u>	<u>--</u>
<u>Transportation Use</u>	<u>3,610,937</u>	<u>55.0%</u>	<u>540,854</u>	<u>3,070,083</u>	<u>4.56 per capita</u>
<u>Waste</u>	<u>201,399</u>	<u>3.10%</u>	<u>30,484</u>	<u>170,915</u>	<u>--</u>
<u>Agriculture</u>	<u>197,132</u>	<u>3.00%</u>	<u>29,501</u>	<u>167,631</u>	<u>--</u>
<u>High GWP</u>	<u>228,768</u>	<u>3.50%</u>	<u>34,418</u>	<u>194,350</u>	<u>--</u>
<u>Off-Road Vehicle Use</u>	<u>236,466</u>	<u>3.60%</u>	<u>35,401</u>	<u>201,065</u>	<u>--</u>
<u>Airport</u>	<u>200,404</u>	<u>3.10%</u>	<u>30,484</u>	<u>169,920</u>	<u>--</u>
<u>Total</u>	<u>6,555,802</u>	<u>100%</u>	<u>983,370</u>	<u>5,572,432</u>	<u>--</u>

NOTES:

1. Population, commercial square footage, and industrial square footage data forecasts for the 2020 year provided by SACOG.
2. Baseline Year emissions from the County Inventory prepared by ICF Jones and Stokes
3. Table assumes that total County 2005 emissions must be reduced by 15%, consistent with the AB 32 Scoping Plan
4. The Total Minimum Reduction is based on the proportion that each sector contributes to emissions (e.g. Commercial/Industrial emissions are 12.1% of the total 2005 emissions, so that sector is also responsible for 12.1% of the total minimum reduction required: 12.1% x 983,370).
5. Development thresholds are not calculated for all sectors because:
Wastewater and Waste emissions will be reduced through government activities and implementation of the AB 32 Scoping Plan, not through development thresholds.
Agriculture and Airport emissions are not within the jurisdiction of the County, and must be reduced through State and Federal actions
High Global Warming Potential (High GWP) gases are not directly related to development (they come primarily from refrigerants), and must be reduced by State and Federal actions
Off-Road Vehicle Use includes construction equipment, rail, recreational watercraft and land craft, and other such combustion vehicles. Except for construction equipment, the County does not have jurisdiction over these uses. Development projects will be required to reduce emissions from construction equipment, but that will need to be determined on a per-project basis, depending on the size of the site and the number and type of equipment that will be used.

Though it is clear that emissions throughout the state must be reduced in order to meet reductions targets, none of the Air Districts in California have identified a significance threshold for GHG emissions, a methodology for making a finding, or developed a

measuring tool to determine when mitigation reduces emissions "enough". The California Office of Planning and Research (OPR), the agency responsible for development and updates to the CEQA Guidelines, is not required to have a draft set of guidelines for climate change until July 1, 2009 (pursuant to Senate Bill 97, Chapter 185, 2007). OPR has indicated publicly that thresholds will not be established as part of the new guidance. One could use the emissions reduction targets established through AB 32. However, the ARB is not set to adopt quantified reduction measures until January 1, 2009. Even after this inventory is complete, it is recognized that for most projects there is no clear or established method to determine if a particular project will negatively impact the ability of the State to meet the emissions goals. At the time of this writing, a host of white papers on the subject have been published, and many conferences and workshops are being held each month. While all conclude that actions must be taken, the subject of significance criteria is a matter of great debate.

Sacramento County has prepared a GHG emissions inventory as part of preparation of the Environmental Impact Report for the General Plan Update project (Control Number 02-GPB-0105). It is the intent of this process to identify reductions targets for the County that would mirror those of AB 32, and to recommend policies that new development must follow in order to allow achievement of the reductions. Once this is in place, a significance finding can be made based on whether the project does or does not comply with the adopted policies. Even in absence of the completion of the General Plan Update EIR, the basic premise of the above strategy can be implemented.

Sacramento County has developed both a screening criteria and a significance threshold for GHG. The screening criteria is used to determine whether a project is large enough to warrant quantitative analysis, instead of relying on qualitative analysis. If quantitative analysis is warranted, emissions are quantified using URBEMIS (or other models, as appropriate). Because traffic is a significant contributor of GHG emissions, the screening threshold is based on the number of trips a given project may generate. If a project generates less than 100 peak-hour trips and less than 1,000 total daily trips, quantitative modeling will not be required.

All GHG impacts to climate change are exclusively cumulative impacts, and all projects that result in an expansion of use also result in cumulative climate change impacts. The issue is determining which projects result in significant impacts, and which projects are *less than significant*. Sacramento County will determine that a project is *less than significant* if approval of the project without mitigation will not jeopardize the State's GHG emissions reductions goals, when considered as part of cumulative development in Sacramento County. The Air Resources Board is currently estimating that the State as a whole will need to reduce emissions by up to 33% by 2020, so Sacramento County must reduce its emissions by that same amount as its fair share contribution. This must be achieved both through requirements placed on new discretionary projects and by measures targeted at existing development and operations. As a policy decision, Sacramento County has also determined that new discretionary projects should bear a larger burden to offset emissions, because greater reductions can be achieved at lower cost from new sources than from existing sources. Based on this premise, projects

must comply with the following table¹, Table 3.12-2, Burden of Mitigation to Offset Emissions, or impacts are significant:

**Table 3.12-2
Burden of Mitigation to Offset Emissions**

Project	Criteria	Mitigation
Small/Infill	Project of < 100 peak hour or 1,000 daily trips/ Infill ¹ or redevelopment ² project	None
Medium	Project of > 100 peak-hour trips or 1,000 daily trips, unless it meets below criteria	33% offset
Large/Regional	Includes a General Plan Amendment, is a Specific Plan (or similar), or is a Project as defined by SB 221 or 610	100% offset

1. A project area must be within the Urban Policy Area, surrounded on all sides by urban development, and less than 5 acres in size to be infill.

2. A project must be within the Urban Policy Area, and must involve a change in use or development of an existing developed site.

IMPACTS AND MITIGATION MEASURES

IMPACT 3.12.-1: ADDITION OF GREENHOUSE GASES EMISSIONS

The proposed Project, through the use of fossil fuels in mobile equipment and aggregate transport and electricity for processing equipment, will increase greenhouse gas emissions locally and countywide. This impact is considered significant.

PROPOSED PROJECT GREENHOUSE GAS EMISSION SOURCES

The Project site will include a quarry, aggregate processing facility (including crushers), administration complex, parking areas, on-site haul road, and various other stockpile and processing areas. The initial mining phase will be development of the future permanent plant site, improvement of the existing County ROW, and construction of the conveyor (see Figure 2.0-8). Once a permanent plant site is established in approximately 5-10 years, the remaining portion of the Quarry will then be developed and excavated. Mining and processing operations will utilize equipment listed in Table 2.0-3. Quarry development will involve blasting of material from Quarry face followed by

¹ All project types NOT listed on the table above will be examined on a case-by-case basis, as will projects which fall into more than one category.

transportation to the processing area for screening/crushing operations, associated stockpiling, and conveyor loading and ultimately sale and distribution (see Figure 2.0-12). All mined aggregate material will be washed on site and either stockpiled for future sale or transported via conveyor to the Grant Line site.

In assessing the Project's greenhouse gas emissions, four primary greenhouse gas emission sources were identified, including:

- On-site mobile equipment – mobile equipment utilized in the removal and transport of aggregate within the active mining area and transport and loading of mined aggregate within the processing plant and into customer vehicles,
- Processing equipment – initially a portable processing plant would be used that would run on portable diesel engines. Once a permanent processing plant is constructed, it is anticipated this equipment would run off electricity generated off-site,
- Off-site aggregate transport – On-road aggregate haul trucks would transport the material off-site, and
- Administrative building and site lighting - initially power would be provided to portable administrative buildings and site lighting from portable diesel engines. Once a permanent processing plant is constructed, it is anticipated that this equipment would run off electricity generated off-site which would also be routed to permanent administrative building and site lighting.

PROPOSED PROJECT GREENHOUSE GAS EMISSIONS

The Applicant prepared an estimate of greenhouse gas emissions resulting from fossil fuel and electrical power use by on-site mobile equipment, processing facilities, and administrative facilities (see Appendix Q, Greenhouse Gas Analysis). The equipment list used to prepare these estimates is the same as Table 2.0-3 provided in the Project Description. Applicant-estimated annual greenhouse gas emissions associated with the proposed Project are provided in Table 3.12-34, Teichert Quarry Estimated Annual Greenhouse Gas Emissions, below.

Table 3.12-34
Teichert Quarry Estimated Annual GHG Emissions

Activity/Source	Quantity	Metric Tons CO₂ Equivalent/Year
Diesel/Gasoline Use CO ₂	460,486.4 gallons/year	4,586.4
Electricity Use CO ₂	40,000 MW/year	14,628.4
Aggregate Transport CO ₂	No change from present*	0
Total CO₂ Emissions Increase		19,214.8
Other GHG Sources and Non-CO ₂ GHG Emissions	Estimated at 15% of Total Diesel/Gas/Electricity Use CO ₂ Emissions	2,882.2
Total GHG Emissions Increase		22,097.0

* Material transport related GHG emissions are not anticipated to increase from baseline conditions due to the shorter haul distances between the project site and its anticipated market area when compared to existing permitted aggregate sources.

Source: Teichert Aggregates (December 2007).

As shown in Table 3.12-34, the proposed project would result in an estimated total increase in annual GHG emissions of 22,097 metric tons of CO₂ equivalent emissions per year over baseline conditions. This increase is composed of an estimated annual increase of 4,586.4 metric tons of CO₂ equivalent emissions associated with diesel/gasoline use, 14,628.4 metric tons of CO₂ equivalent emissions associated with electricity use, and 2,882.2 metric tons of CO₂ equivalent emissions associated with other GHG sources and non-CO₂ GHG emissions.

As explained in the note above, the Applicant asserts a net change approach for greenhouse gas emissions that would result from transport of aggregate offsite. The Applicant believes the existing fleet of trucks (customers) that currently buy aggregate from the Applicant's existing permitted mining areas would buy aggregate from the proposed Project site because it is closer to areas where aggregate is needed (i.e. new commercial and residential development areas and road improvements projects). The reduction in distance traveled by aggregate trucks to areas where aggregate is needed would in turn reduce the greenhouse gas emissions produced by trucks hauling aggregate, thereby resulting in a County-wide decrease in greenhouse gas emissions. This assertion may be valid, as some customers and their haul trucks would predominately buy aggregate from the proposed Project site since it is closer to future development and road improvement projects.

For several reasons outlined below, the County does not completely agree with the Applicants assertion. Proposed Project greenhouse gas emissions should be compared to the existing environmental baseline for the proposed Project site, in this situation seasonal cattle grazing. As discussed above, seasonal cattle grazing does not produce a significant amount of greenhouse gases. The proposed Project would result in a substantial change in existing land use

resulting in increased greenhouse gas emissions that would not have occurred with seasonal cattle grazing. These impacts are localized to the eastern portion of the County, as compared to current mining operations occurring in the central and southern part of the County. In addition, the proposed Project could potentially result in an increase in the amount or length of time greenhouse gas emissions would occur countywide. It is unknown when or if other mining operations would shut down as a result of the proposed Project, therefore, an increase in greenhouse emissions may occur because operations (and associated equipment) would be operating concurrently with existing operations. While this would be balanced against the aggregate demand in the region, in situations where aggregate demand increases beyond the amount Sacramento County aggregate producers were able to historically supply, but could now supply this could result in a net increase in emissions.

As a result, utilizing haul truck trips found in the Traffic Impact Study, the County calculated the amount of greenhouse gas emission that would result from aggregate trucks trips. As shown in Table 3.12-45, On-Road Vehicle Annual Greenhouse Gas Emissions, aggregate truck and employee trips would produce approximately ~~643~~17,263 metric tons a year of CO₂.

Table 3.12-45
Annual Emissions Estimate (On-Road Vehicles)

Emission Source	Daily Trips ¹	Typical Miles/Trip	Emission Factors ^{2,3}	Annual Emissions ⁴
			CO ₂	CO ₂
Haul Truck	975	20	4.217.9	16,385570.6
Employee Vehicles	200	20	1.102.89	87842.8
			Total Emissions	<u>17,263613.4</u>

Notes:

¹ Trip generation from the Fehr and Peers traffic study

² Factors taken from EMFAC 2007 v2.3

³ Emission factors are expressed in grams/pounds/mile.

⁴ Emissions in tons/yr.

In sum, adding all greenhouse gas emissions resulting from the proposed Project together would result in an annual total of ~~22,710~~39,360 metric tons of greenhouse gas emissions. As shown by Table 3.12-56, Relative CO₂ Emissions, on a singular basis the project makes only a ~~0.009830~~0.0056775 percent annual contribution to the unincorporated County's GHG emissions. The contribution at the State levels is statically insignificant and two orders of magnitude smaller. As a singular impact, this is less than significant. Nonetheless, it is obvious that climate change is a problem of cumulative consideration. Every addition of GHG to the earth's atmosphere, however small, adds to the problem. Consequently, as described above, the County has developed singular project significance thresholds that apply to this project.

applying a 100% offset standard to this project and in order to reduce this project's cumulative impacts, mitigation will be required.

Table 3.12-56
Relative CO₂ Emissions

Source	CO ₂	% of State – 2004	% of State – 1990	% of Unincorporated County
Project	<u>0.03936</u> MMT/yr <u>0.02271</u> MMT/yr	<u>0.000089</u> 0.000047	<u>0.000090</u> 0.000053	<u>0.009830</u> 0.0056775
Unincorporated County	4 MMT/yr	0.8	0.9	
State – 1990	427 MMT/yr			
State - 2004	484 MMT/yr			

The threshold for operational industrial emissions is 2.42 MT per 1,000 square feet (Kft²) of land area. In the case of most industrial uses, the land area is just big enough to accommodate the active uses on the site, but in the case of a quarry the site contains a significant acreage of land that is not part of active operational area. For this project, then, the total site size cannot reasonably be used. It was necessary to examine the proposed site operations and determine a reasonable footprint to establish as the operational area. The quarry and all appurtenant facilities will be within a 380-acre area, but the actual plant will be within a 120-acre area. Though the 380-acre area does encompass all areas of ultimate active use, the quarry itself will be excavated in phases. On this basis, it is reasonable to use a site size that is in between the minimum size of the plant area, and the maximum of the plant plus quarry. Based on discussions with the Applicant, the average phase size of active excavation will be 60 acres. This acreage was added to the plant acreage to give the total operational area used in the analysis: 180 acres. Using an operational area of 180 acres, or 7,841 Kft², and dividing it into the total operational emissions of 22,097 MT yields an emissions factor of 2.81 MT/Kft²; this exceeds the threshold of 2.42 MT/Kft².

The transportation significance threshold is 0.05 MT /100 VMT. Based on the results in Table 3.12-5 the project will emit 0.17 MT /100 VMT; this exceeds the threshold.

In the transportation sector, the Project exceeds the threshold by 0.12 MT/100 VMT; based on the VMT for the project, this is equivalent to 12,093 MT. In the operational sector, the Project exceeds the threshold by 0.39 MT/Kft²; based on the size of the operated area, this is equivalent to 3,122 MT. In total, the Project would need to mitigate 15,215 MT of emissions in order to reduce impacts to less

than significant levels. As outlined above, mitigation measures include both “soft” mitigation for qualitative benefits and “hard” mitigation based on quantitative benefits. The mitigation strategy for the proposed project will address GHG emissions from electricity usage separately from the non-electricity GHG emissions (diesel/gasoline use, aggregate transport and other GHG sources). For the GHG emissions related to electricity (14,628 metric tons CO₂-equivalent per year), 100% “hard” quantitative mitigation will be required. For the non-electricity GHG emissions (8,082 metric tons CO₂-equivalent) a 75% credit will be given for “soft” qualitative mitigation and the remaining 25% reduction (2,021 metric tons CO₂-equivalent) will be required as quantitative “hard” mitigation. At this time no generally accepted calculators exist for some of the mitigation measures comprising the “soft” mitigation and therefore, the corresponding 75% reduction credit for “soft” mitigation is only an estimate which could be considered by some as arbitrary and possibly not resulting in “enough” mitigation. Consequently, even with the described mitigation, this project’s cumulative climate change impacts are considered significant and unavoidable

Level of Significance Before Mitigation: Significant

Mitigation Measures:

Mitigation Measure 3.12-1a

To achieve a 100% reduction offset emissions of 3,122–14,628 metric tons CO₂ equivalent per year related to electricity usage, the following mitigation is required:

Either

The applicant shall enroll in the Sacramento Metropolitan Utility District’s Greenergy® 100% Option for the duration of the mining use permit

Or

The applicant shall prepare and implement a plan subject to the approval of the Department of Environmental Review and Assessment that achieves an emissions reduction or offset equal to 3,122–14,628 metric tons CO₂ annually for the duration of mining. Examples of quantifiable measures include additional land dedication, natural gas vehicles, white roofs, energy efficient upgrades and solar panels. These measures need not be applied on site but may be utilized anywhere within unincorporated Sacramento County. Partnerships with schools, non-profits, and public agencies are encouraged. First priority shall be given to land dedication in the general vicinity of the project site within the east County RCA, contiguous with the RCA or contiguous with the Deer Creek Hills preserve located south of the site.

Mitigation Measure 3.12-1b

To offset emissions of 12,093 metric tons CO₂ equivalent per year related to non-electricity GHG emissions, the following mitigation is required:

The applicant shall prepare and implement a plan subject to the approval of the Department of Environmental Review and Assessment that achieves an emissions reduction or offset equal to 12,093 metric tons CO₂ annually for the duration of mining. Examples of quantifiable measures include additional land dedication, natural gas vehicles, white roofs, energy efficient upgrades and solar panels. These measures need not be applied on site but may be utilized anywhere within unincorporated Sacramento County. Partnerships with schools, non-profits, and public agencies are encouraged. First priority shall be given to land dedication in the general vicinity of the project site within the east County RCA, contiguous with the RCA or contiguous with the Deer Creek Hills preserve located south of the site.

~~To achieve a qualitative 75% reduction of 6,062 metric tons CO₂ equivalent per year related to non-electricity GHG emissions, the following mitigation is required:~~

- ~~1. The Project shall utilize an electric conveyor, instead of mobile equipment, to transfer raw aggregate materials from the active quarry area to the processing plant.~~
- ~~2. The Project shall concurrently reclaim Quarry areas where mining is completed or have not been disturbed for 6 months or more.~~
- ~~3. Prior to building any permanent structures, the Applicant shall hire an independent consultant to help design all permanent structures in order to identify possible energy efficiency measures which may be taken at the facility. All permanent structures onsite shall be constructed at least to the 2007 California Green Building Standards Code, CCR, Title 24, Part 11 or as subsequently amended. Additional green building practices shall also be included such as Energy Star* compliant technologies (roofs, lighting, etc.)~~
- ~~4. The project Applicant shall protect 380 acres of annual grassland habitat through land dedication. This land dedication shall be provided by an in perpetuity conservation easement or in fee title and be provided to the County or third party conservation organization acceptable to the County. The land dedication shall be located in the general vicinity of the project site within the east County RCA, contiguous with the RCA or contiguous with the Deer Creek Hills preserve located south of the site. The land dedication~~

~~shall be accompanied with an applicant provided monetary endowment to cover the operations and maintenance of the dedicated land in perpetuity. The endowment shall be calculated using an industry standard, attribute based system for calculating financial endowments such as the Property Analysis Record (PAR). This land dedication may be combined with the dedication required for open space mitigation in Measures 3.2-5, 3.4-4a, and 3.9-2b.~~

- ~~5. All construction equipment shall be operated and maintained according to manufacturer's specifications. Maintenance records shall be available for inspection. The records may be inspected by either County or SMAQMD at any time.~~
- ~~6. Maintain and operate all construction equipment so that exhaust emissions do not exceed 20 percent opacity for more than three minutes in any on-hour period. Equipment that exceeds this opacity standard shall be removed from operation and repaired upon the earliest safe opportunity.~~
- ~~7. Avoid prolonged idling of equipment unless necessary to maintain a safe construction environment.~~
- ~~8. Use alternative fueled or catalyst equipped diesel construction equipment, as feasible.~~
- ~~9. If feasible, replace fossil fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).~~
- ~~10. Provide a plan, for approval by the Environmental Coordinator and the Sacramento Metropolitan Air Quality Management District (SMAQMD), demonstrating that the heavy duty (>50 horsepower) off-road vehicles to be used in the project, including owned or leased and subcontracted vehicles, will achieve a project wide fleet average 20 percent NO_x reduction and 45 percent particulate reduction compared to the most recent ARB fleet average at time of each annual report. Note that this requirement applies to the entire fleet at time of operation not just to replacement vehicles for the fleet.~~

Mitigation Measure 3.12-1c

~~To achieve a quantitative 25% reduction of 2,021 metric tons CO₂ equivalent per year related to non-electricity GHG emissions, the following mitigation is required: The Applicant shall quantify in a report to DERA for approval prior to onsite surface disturbance and implement of the measures below, if feasible, which will then be used to satisfy Mitigation Measures 3.12-1a and -1b:~~

1. The Project shall utilize an electric conveyor, instead of mobile equipment, to transfer raw aggregate materials from the primary crusher to the processing plant..
2. The Project shall concurrently reclaim Quarry areas where mining is completed.
3. Prior to building any permanent structures, the Applicant shall hire an independent consultant to help design all permanent structures in order to identify possible energy efficiency measures which may be taken at the facility. All permanent structures onsite shall be constructed at least to the 2007 California Green Building Standards Code, CCR, Title 24, Part 11 or as subsequently amended. Additional green building practices shall also be included such as Energy Star* compliant technologies (roofs, lighting, etc.)
4. The project Applicant shall protect 380 acres of annual grassland habitat through land dedication. 190-acres of this land dedication shall be provided prior to issuance of the Work Authorization Permit by the Planning and Community Development Department and the other 190 acres shall be provided prior to site disturbance of more than 190 acres or issuance of the building permit for the permanent processing plant, whichever comes first. This land shall be dedicated by an in-perpetuity conservation easement or in fee title and be provided to the County or third party conservation organization acceptable to the County Environmental Coordinator. The land dedication shall be located in the general vicinity of the project site within the east County RCA, contiguous with the RCA or contiguous with the Deer Creek Hills preserve located south of the site. The land dedication shall be accompanied with an applicant provided land management plan and monetary endowment to cover the operations and maintenance of the dedicated land in-perpetuity. The endowment shall be calculated using an industry standard, attribute based system for calculating financial endowments such as the Property Analysis Record (PAR). The endowment shall be a non-wasting fund calculated on the annual costs necessary to perform the activities outlined in the land management plan and shall also contain fixed funds for compliance monitoring and legal contingencies. The assumed net rate of return on the fund available for annual land management activities shall not exceed 4%. This land dedication may be combined with the dedication required in Mitigation Measures 3.2-1, 3.4-4a, and 3.9-1.

5. All construction equipment shall be operated and maintained according to manufacturer's specifications. Maintenance records shall be available for inspection. The records may be inspected by either County or SMAQMD at any time.
6. Maintain and operate all construction equipment so that exhaust emissions do not exceed 40 percent opacity for more than three minutes in any on-hour period. Equipment that exceeds this opacity standard shall be removed from operation and repaired upon the earliest safe opportunity.
7. Avoid prolonged idling of equipment (5 or more minutes) unless necessary to maintain a safe working environment.
8. Use alternative fueled or catalyst equipped diesel construction equipment.
9. Replace fossil-fueled equipment with electrically driven equivalents (provided they are not run via a portable generator set).
10. Provide a plan, for approval by the Environmental Coordinator and the Sacramento Metropolitan Air Quality Management District (SMAQMD), demonstrating that the heavy-duty (>50 horsepower) off-road vehicles to be used in the project, including owned or leased and subcontracted vehicles, will achieve a project wide fleet-average 20 percent NO_x reduction and 45 percent particulate reduction compared to the most recent ARB fleet average at time of each annual report. Note that this requirement applies to the entire fleet at time of operation not just to replacement vehicles for the fleet.

~~The applicant shall prepare and implement a plan subject to the approval of the Department of Environmental Review and Assessment that achieves an emissions reduction or offset equal to 2,021 metric tons CO₂ annually for the duration of mining. Examples of quantifiable measures include additional land dedication, natural gas vehicles, white roofs, energy efficient upgrades and solar panels. These measures need not be applied on site but may be utilized anywhere within unincorporated Sacramento County. Partnerships with schools, non-profits, and public agencies are encouraged. First priority shall be given to land dedication in the general vicinity of the project site within the east County RCA, contiguous with the RCA or contiguous with the Deer Creek Hills preserve located south of the site.~~

Level of Significance After Mitigation: Significant and Unavoidable