4.7 GREENHOUSE GAS EMISSIONS

This section includes a discussion of existing climate conditions and greenhouse gas (GHG) emissions sources in California and Riverside County; a summary of applicable regulations; and a description of potential impacts of the Draft General Plan related to GHG emissions.

4.7.1 REGULATORY SETTING

GREENHOUSE GAS EMISSIONS

Federal Plans, Policies, Regulations, and Laws

EPA Actions

In response to the mounting issue of climate change, the Environmental Protection Agency (EPA) has taken actions to regulate, monitor, and potentially reduce GHG emissions.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement will provide EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of carbon dioxide (CO_2) per year. This publically available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective emissions reduction strategies. 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. An estimated 85% of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

State Plans, Policies, Regulations, and Laws

Statutes

Motor Vehicle Emissions Standards

To meet the requirements of Assembly Bill (AB) 1493, in 2004 the California Air Resources Board (ARB) approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year.

Renewable Energy Portfolio Standards (Senate Bills 1078, 107, and X1-2)

Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

In the ongoing effort originating in executive orders to codify a 33% by 2020 renewable portfolio standard, SB X1-2 (Chapter 1, Statutes of 2011) was signed by Governor Edmund G. Brown, Jr., in April 2011. This new standard preempts the ARB 33% percent Renewable Electricity Standard and applies to all electricity retailers in

the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must adopt the new RPS goals of 20% of retail sales from renewables by the end of 2013, 25% by the end of 2016, and the 33% requirement by the end of 2020.

Assembly Bill 32 (2006), California Global Warming Solutions Act

In September 2006, Governor Schwarzenegger signed AB 32 (Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006, which enacted Sections 38500–38599 of the California Health and Safety Code. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires reduction of statewide GHG emissions to 1990 levels by 2020 (an approximately 15% reduction from existing statewide GHG emissions). This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control GHG emissions from vehicles under the authorization of AB 32.

AB 32 requires ARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

Proposed Climate Change Scoping Plan

In December 2008, ARB adopted a *Proposed Climate Change Scoping Plan*[1] (Scoping Plan), which contains the main strategies California will implement to achieve reduction of approximately 169 million metric tons (MMT) of carbon dioxide equivalent (CO_2e), or approximately 30% from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10%, from average emissions between 2002 and 2004). The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e),
- the Low-Carbon Fuel Standard (15.0 MMT CO_2e),
- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and
- a renewable portfolio standard for electricity production (21.3 MMT CO_2e).

ARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the *Scoping Plan* does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government

[1] At time of writing, ARB is enjoined from implementing the *Climate Change Scoping Plan* as a result of the California Superior Court case *Association of Irritated Residents v. CARB*. Therefore, it is referred to as the Proposed Scoping Plan.

operations is to be determined (ARB 2008). With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e will be achieved associated with implementation of SB 375, which is discussed further below.

Senate Bill 1368 (2006)

Senate Bill (SB) 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a GHG emission performance standard for base-load generation from investor-owned utilities by February 1, 2007. Similarly, the California Energy Commission (CEC) was tasked with establishing a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a base-load, combined-cycle natural-gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, be generated from plants that meet the standards set by CPUC and CEC. In January 2007, CPUC adopted an interim GHG Emissions Performance Standard, which requires that all new long-term commitments for base-load generation entered into by investor-owned utilities have emissions no greater than a combined-cycle gas turbine plant (i.e., 1,100 pounds [lb] of CO_2 per megawatt-hour). A "new long-term commitment" refers to new plant investments (new construction), new or renewal contracts with a term of five years or more, or major investments by the utility in its existing base-load power plants.

In May 2007, CEC approved regulations that prohibit the state's publicly owned utilities from entering into long-term financial commitments with plants that exceed the standard adopted by CPUC of 1,100 lb of CO_2 per megawatt-hour.

Senate Bill 97 (2007)

SB 97, signed in August of 2007 (Chapter 185, Statutes of 2007; Public Resources Code, Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Natural Resources Agency by July 1, 2009, guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA. These guidelines were adopted on December 30, 2009, and became effective on March 18, 2010.

Senate Bill 375 (2008)

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and fair-share housing allocations under state housing law. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) to address GHG reduction targets in the context of that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

City land use policies (including General Plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA would create streamlining for certain projects that are consistent with an approved SCS or APS. Residential or mixed-use projects that are consistent with the SCS/APS and incorporate mitigation measures from relevant prior CEQA document/s are not required to reference, describe, or discuss growth-inducing impacts or impacts of cars and light-duty truck trips on climate change or on the regional transportation network. "Transit priority projects," as defined in this legislation and future RTPs would be exempt from CEQA review. Transit priority projects that do not qualify for a complete exemption could

be subject to environmental review under a Sustainable Communities Environmental Assessment (SCEA), which is envisioned to be similar to the process under CEQA for a negative declaration.

Executive Orders

Executive Order S-20-04 (2004)

Governor Schwarzenegger signed Executive Order S-20-04, the California Green Building Initiative, on December 14, 2004, establishing the state's priority for energy and resource–efficient high-performance buildings. The executive order sets a goal of reducing energy use in state-owned and private commercial buildings by 20% in 2015, using nonresidential Title 20 and Title 24 standards adopted in 2003 as the baseline. The California Green Building Initiative also encourages retrofitting, construction, and operation of private commercial buildings in compliance with the state's Green Building Action Plan.

Executive Order S-3-05 (2005)

Executive Order S-3-05 was signed by Governor Schwarzenegger on June 1, 2005. This order established targets for total GHG emissions. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80% below the 1990 level by 2050.

The Executive Order directed the secretary of the California Environmental Protection Agency to coordinate a multiagency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and legislature describing progress made toward reaching the emission targets; impacts of global warming on California's resources; and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the Secretary of the California Environmental Protection Agency created the California Climate Action Team, made up of members of various state agencies and commissions. The California Climate Action Team released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses and actions by local governments and communities, as well as through state incentive and regulatory programs.

Executive Order S-1-07 (2007)

Executive Order S-1-07, which was signed by Governor Schwarzenegger in 2007, identifies the transportation sector as the main source of GHG emissions in California, at over 40% of statewide emissions. It establishes a goal that carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10% by 2020. This order also directed ARB to determine if this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early action measure pursuant to meeting the mandates in AB 32.

Regional and Local Plans, Policies, Regulations, and Ordinances

There are currently no regional or local policies, regulations, or laws specifically pertaining to GHG emissions.

Attributing Greenhouse Gas Emissions and Land Use Linkages

Land use development projects can generate GHG emissions from several sectors (e.g., transportation, electricity, waste) described in more detail below. Therefore, land use decisions and development projects can affect the generation of GHG emission from multiple sectors that result from their implementation. Development projects can result in direct or indirect GHG emissions that would occur on- or off-site. For example, electricity consumed in structures within a project would indirectly cause GHGs to be emitted at a utility provider. The people who reside in and the visitors to a development project would drive vehicles that generate on- and off-site GHG emissions, which are associated with the transportation sector.

The following sections describe the major GHG emission sectors that can and cannot be affected by local government actions. In addition, a description of the existing state of climate change science is provided for informational purposes.

GHG Emission Sectors

The Scoping Plan identifies the main GHG emission sectors that account for the majority of GHG emissions generated within California. A brief description of each of the GHG emission sectors is provided below:

- **Transportation:** This sector represents the GHG emissions associated with on-road motor vehicles, recreational vehicles, aviation, ships, and rail.
- **Electricity:** This sector represents the GHG emissions associated with use and production of electrical energy. Approximately 25% of electricity consumed in California is imported, thus, GHG emissions associated with out-of-state electricity production are also included as part of this sector.
- **Industry:** This sector represents the GHG emissions associated with industrial land uses (e.g., manufacturing plants, refineries). Industrial sources are predominately comprised of stationary sources (e.g., boilers, engines) associated with process emissions.
- **Commercial and Residential:** Commercial and residential GHG emission sources include area sources such as landscape maintenance equipment, fireplaces, and natural gas consumption for space and water heating.
- **Agriculture:** This sector represents the GHG emissions associated with agricultural processes. Agricultural sources of GHG emissions include off-road farm equipment, irrigation pumps, residue burning, livestock, and fertilizer volatilization.
- **High Global Warming Potential:** This sector represents the generation of high global warming potential GHGs. Examples of high global warming potential GHG sources include refrigerants (e.g., HFCs and PFCs), and electrical insulation (e.g., SF_6). Although these GHGs are typically generated in much smaller quantities than CO_2, their high global warming potential results in considerable CO_2e.
- **Recycling and Waste:** This sector represents the GHG emissions associated with waste management facilities and landfills.

Statewide Reduction of Greenhouse Gas Emission Sources

The GHG emission sectors described above would experience varying degrees of state regulation and would be reduced overall on a statewide level. As discussed above, legislation already in effect will achieve statewide reductions of GHG emissions associated with electricity production, industry, vehicle miles traveled (VMT), and motor vehicles. It is anticipated that future legislation and regulations at the state and federal levels would further reduce GHG emissions, with different reduction potential available for each sector.

Local Government Reduction of GHG Emission Sources

Projects approved at the local level could generate GHG emissions associated with each of the emission sectors described above. However, the ability of local governments to reduce those GHG emissions would vary by sector. As discussed above, certain GHG emission sectors will be regulated by the implementation of statewide emission reduction programs that address standards beyond the control of local government (e.g., vehicle emissions standards, renewable energy portfolio standards).

Land use entitlement authority, which largely rests at the local government level, influences development patterns, community design, transportation facilities planning, and other factors known to influence VMT, which

in turn influences GHG emissions associated with the transportation sector (Ewing 2001). However, local government does not have control over vehicle emissions technology or fuel economy standards. Both of these parameters (i.e., land use/transportation planning and regulation of emission standards and fuel economy) are important components for achieving the emission reductions mandates set in AB 32. Similarly, local government standards can influence solar orientation of buildings and other components related to energy efficiency, while energy generation, renewable energy requirements, and other issues related to energy sources are beyond local government control.

The City will play a role in achieving the emission reduction goals mandated in AB 32. The ability to influence land use decisions and reduce VMT, provide services to its population (e.g., recycling service, waste management, waste water treatment), and provide public education and incentives (e.g., energy and water conservation) to residents are options for local governments to reduce GHG emissions generated in their jurisdictions.

4.7.2 ENVIRONMENTAL SETTING

CLIMATE

The planning area is located in the South Coast Air Basin, which includes the western portion of Riverside County, southwestern portion of San Bernardino County, the majority of Los Angeles County, and all of Orange County. The climate of the area is characterized by warm summers, mild winters, infrequent rainfall, moderate afternoon breezes, and generally fair weather. The clouds and the fog that form along the coastlines of Los Angeles County and Orange County rarely extend as far inland as the San Jacinto Valley, and if they do, they usually burn off quickly after sunrise. The most important weather pattern is associated with the warm season airflow across populated areas of the Los Angeles Basin. Temperatures in Hemet average 65ºF year-round, with warm summer afternoons (95+ degrees) and often cool winter mornings (35 degrees). Rainfall in the planning area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April with summers often completely dry. Rainfall in the area averages 12.5 inches per year, but varies markedly from one year to the next.

GREENHOUSE GASES

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. The absorbed radiation is then emitted from the earth, not as high-frequency solar radiation, but lower frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency (longer wavelength) radiation. Most solar radiation passes through GHGs; however, infrared radiation is selectively absorbed by GHGs. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on Earth.

Prominent GHGs contributing to the greenhouse effect include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds. Studies have identified that human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of the earth's climate (Intergovernmental Panel on Climate Change [IPCC] 2007).

GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants (TACs), which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the

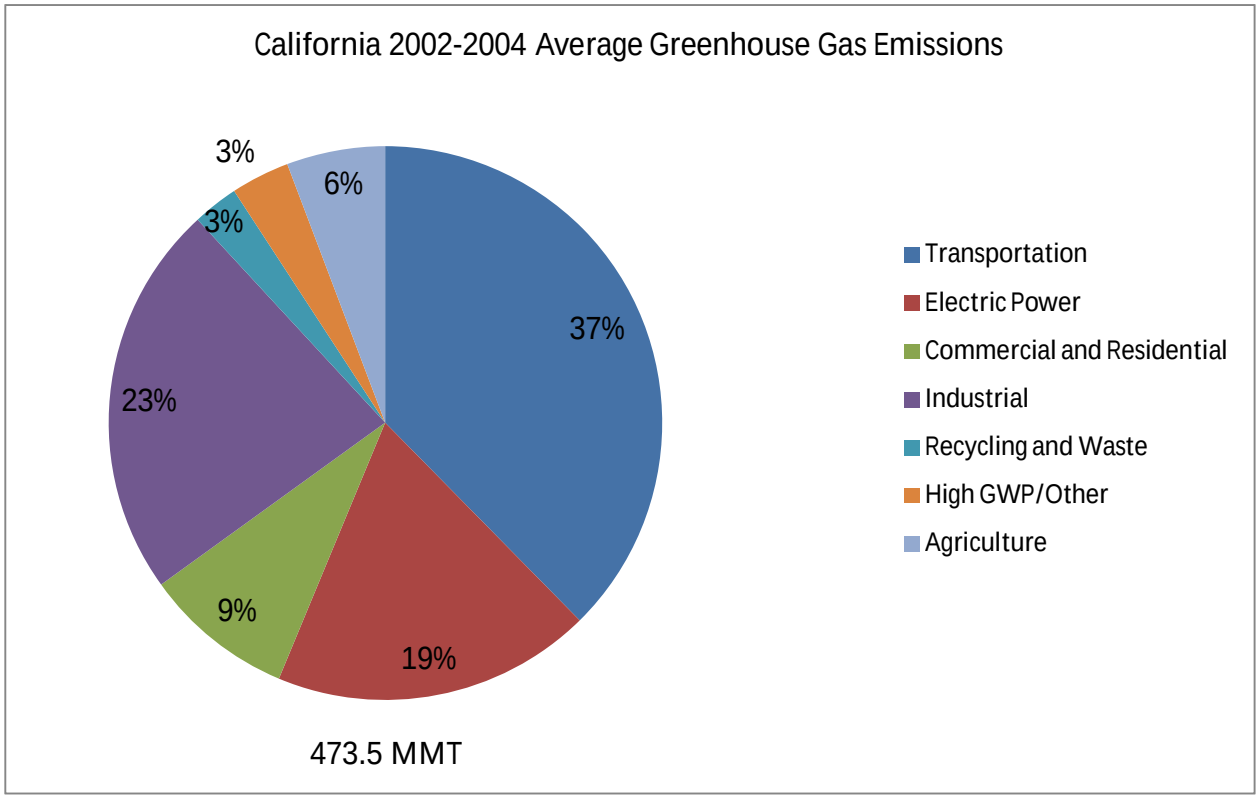
exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is currently emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54% is sequestered through ocean uptake, uptake by northern hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46% of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998).

Similarly, effects of GHGs are borne globally, as opposed to localized air quality effects of criteria air pollutants and TACs. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known, although the quantity would be enormous, and no single project or plan would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climate.

Greenhouse Gas Emission Sources and Inventory

California

GHG emissions are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial and agricultural sectors (ARB 2009f). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (ARB 2009f). See Exhibit 4.7-1 for California's GHG emissions inventory sectors.



Notes: GWP = global warming potential; MMT = Million metric tons.
Source: ARB 2008

Exhibit 4.7-1 California's Greenhouse Gas Emissions by Economic Sector (2002–2004 Average)

CO_2 emissions are byproducts of fossil fuel combustion. CH_4, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively.

California is the 12th to 16th largest emitter of CO_2 in the world (CEC 2006a). California produced 484 million gross MT CO_2e in 2004 (ARB 2009f). CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in Appendix C, "Calculation References," of the General Reporting Protocol of the California Climate Action Registry (CCAR 2009), 1 ton of CH_4 has the same contribution to the greenhouse effect as approximately 23 tons of CO_2. Therefore, CH_4 is a much more potent GHG than CO_2. Expressing emissions in CO_2e takes the contributions of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 38% of total GHG emissions in the state (ARB 2008). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (22%) and the industrial sector (20%) (ARB 2008).

City of Hemet

AECOM has developed a GHG emissions inventory (inventory) for communitywide emission sources for the 2009 base year in the City of Hemet. The inventory was compiled for the following emission sectors: transportation, area source emitters, electricity and natural gas use (i.e., energy use), solid waste, water use, and wastewater treatment. Communitywide 2009 GHG emissions were calculated using a "bottom-up" approach, which involves multiplication of an emission factor for a given process by a consumption rate for that process. Table 4.7-1 and Exhibit 4.7-2 summarize the magnitude and relative contribution of community-wide baseline emissions from each sector. Please refer to Appendix C for activity data inputs, emissions factors, and emissions calculations.

The largest sources of communitywide GHG emissions for 2008 are the following, in descending order:

1. Transportation (60%)
2. Energy use (20%)
3. Water use and wastewater generation (13%)
4. Solid waste generation (4%)
5. Area sources (3%)

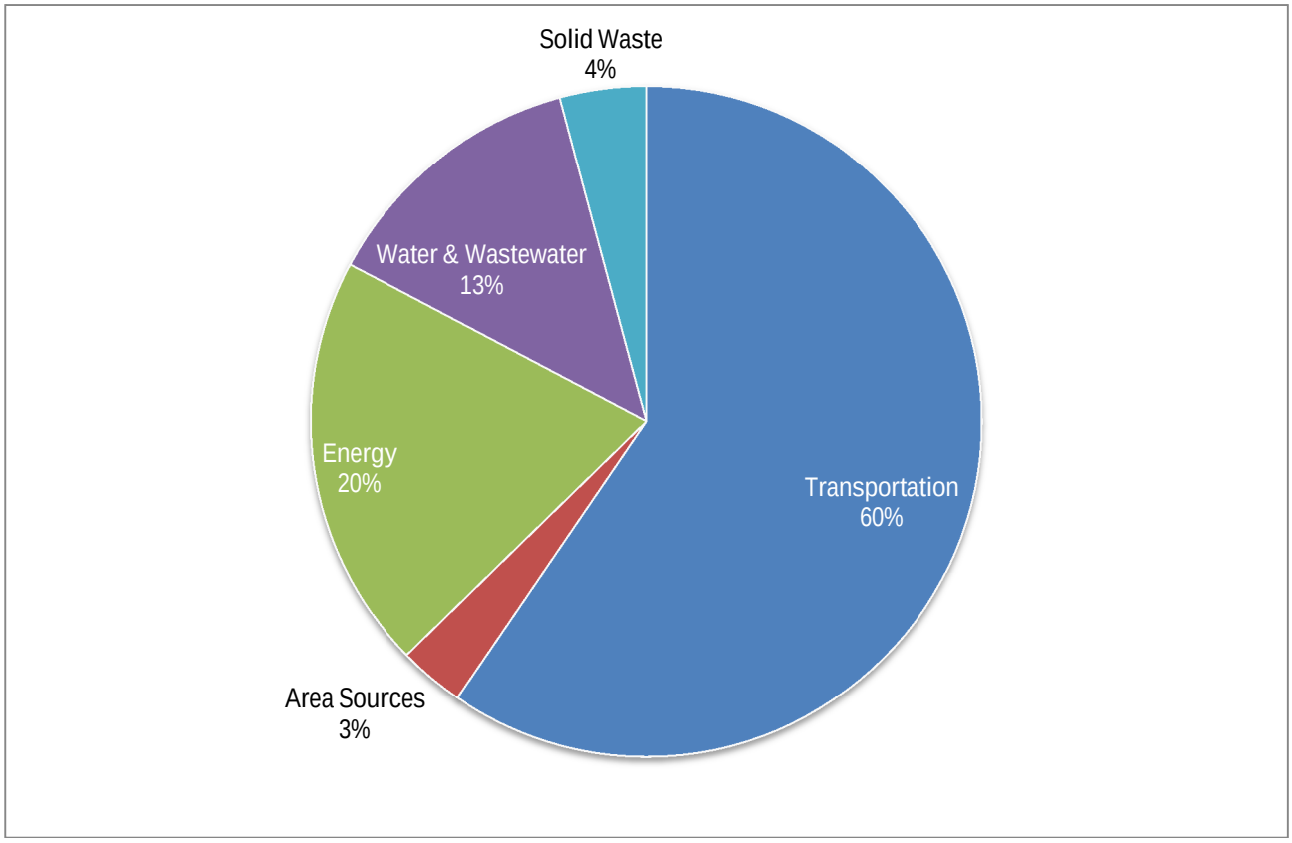
On-road mobile source emissions are the largest contributor to community-wide GHG emissions. Climate conditions in the southern California region can result in a smaller relative contribution of energy-related emissions due to less intense need for space heating/cooling as compared to other locations such as northern California.

CLIMATE CHANGE EFFECTS

Global average ambient concentrations of CO_2 have increased dramatically since preindustrial times, from approximately 280 parts per million (ppm) to approximately 353 ppm in 1990 and approximately 380 ppm in 2000. Global average temperature has risen approximately 1.37°F since 1850; if global CO_2 emissions were to be curbed today, it would continue to rise an additional 0.9°F by the end of this century. This phenomenon is caused

Table 4.7-1 City of Hemet 2009 Baseline Communitywide GHG Emissions	
Emission Source	Emissions (MT CO_2e)
Transportation	678,587
Area Source	36,106
Energy	228,531
Water & Wastewater	149,087
Solid Waste	47,531
Total	**1,139,841**
Population	95,384
Employment	25,190
Service Population (Population+Employment)	**120,574**
Efficiency Metric (MT CO_2e/SP/yr)	**9.5**

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons; SP = Service Population; yr = year.
Source: Data compiled by AECOM 2011



Source: Data compiled by AECOM 2011

Exhibit 4.7-2 **City of Hemet 2009 Baseline GHG Emissions Inventory by Sector**

by the inertia of the climate system and time scale of the main sequestration mechanism in the carbon cycle—the ocean. In other words, global climate is committed to an additional 0.9°F of warming associated with human activities that have already occurred. Because GHG emissions associated with fossil fuel combustion, population growth, technological advances, and current standards of living will continue to occur, a more likely range of scenarios for global average temperature rise would be 3.2–7.2°F by the end of the century, depending on the global emissions scenario.

Impacts associated with the incremental increase in global temperature have already begun to occur. Such impacts are projected to occur in numerous forms: sea level rise, reduction in the extent of polar and sea ice, changes to ecosystems, changes in precipitation patterns, reduced snowpack, agricultural disruption, increased intensity and frequency of storms and temperature extremes, increased risk of floods and wildfires, increased frequency and severity of drought, effects on human health from vectorborne disease, species extinction, and acidification of the ocean.

It is accepted that some level of climate change effects will occur. However, international treaties on the subject of climate change attempt to avoid "dangerous" climate change—in other words, to manage the risk of foreseeable impacts to a "tolerable" level of climate change that would avoid most catastrophic impacts. For this to occur, CO_2 concentrations should be stabilized at 350–400 ppm, with an associated global average temperature increase of no more than 3.6°F–4.3°F above preindustrial times. Timing is also a key issue, because of the very long lifetimes of GHGs. To avoid "dangerous" climate change, global CO_2 emissions would need to peak during the 2000–2015 period (IPCC 2007).

Climate change has the potential to affect environmental conditions in California through a variety of mechanisms. Resource areas other than air quality and atmospheric temperature could be indirectly affected by the accumulation of GHG emissions. For example, an increase in the global average temperature is expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. Although current forecasts are uncertain, it is evident that this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population. An increase in precipitation falling as rain rather than snow could also lead to increased potential for floods because water that would normally be held in the Sierra Nevada snowpack until spring could flow into the Central Valley concurrently with winter storm events. This scenario would place more pressure on California's levee/flood control system (DWR 2006a).

Another mechanism for indirect effects on the environment in California is sea level rise. Average sea level rose approximately 7 inches worldwide during the last century (CEC 2006b), and it is predicted to rise an additional 7–22 inches by 2100, depending on the future levels of GHG emissions (IPCC 2007).

As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available. Additional concerns associated with climate change include an increased risk of wildfire caused by changes in rainfall patterns and plant communities.

Climate Change Effects on California and Hemet

Historical Trends and Future Predictions

Temperature

Based on the results of a variety of regional climate models, it is reasonably foreseeable that some increase in annual average temperatures will occur in California during the next 100 years. Although a temperature increase is expected, the amount and timing of the increase is uncertain. In general, predictions put an increase in the range

of 3.6 to 9°F over the next 50–100 years (IPCC 2007, Kim et al. 2002, Snyder et al. 2002, Dettinger 2005). Temperature increases are expected to be greater in the summer compared to the winter and more pronounced for inland areas compared to coastal areas (Cayan et al. 2009). There are direct public-health related effects associated with increased temperatures and increased periods of temperature extremes, including heat stroke, heat exhaustion, and the exacerbation of existing medical conditions, with particular problems for the elderly, infants, those with pre-existing illnesses, and those that lack access to air conditioning or cooling spaces (California Natural Resources Agency 2009).

An increase in annual average temperature is a reasonably foreseeable effect of future climate change, but this environmental change would occur independent of the Draft General Plan. Indirect effects of increased temperature in California include changes in precipitation patterns, runoff, snowpack, sea level, water supply, agriculture, wildfire, extreme events (e.g., flooding and drought), biological resources, and public health. Effects on precipitation and snowpack would influence runoff and surface water, and would have potential to influence the physical conditions of the Delta. These indirect effects are discussed further in the following sections.

Precipitation

Former State Climatologist James Goodridge compiled an extensive collection of longer-term precipitation records from throughout California. These data sets were used to evaluate whether there has been a changing trend in precipitation in the State over the past century (DWR 2006a). Long-term runoff records in selected watersheds in the State were also examined. Based on a linear regression of the data, the long-term historical trend for statewide average annual precipitation appears to be relatively flat (no increase or decrease) over the entire record. However, it appears that there may be an upward trend in precipitation toward the latter portion of the record.

When these same precipitation data are sorted into three regions—Northern, Central, and Southern California—trends show that precipitation in the northern portion of the State appears to have increased slightly from 1890 to 2002, and precipitation in the central and southern portions of the state show slightly decreasing trends. All changes were in the range of 1 to 3 inches annually (DWR 2006a).

Increased variability in precipitation and extreme heat events in California presents increased risk of drought, which in turn, presents increased risk of wildfire hazards. Similarly, increased variability of precipitation and extreme storm events in California presents increased risk of flooding as a result of a wider seasonal variation in flow volumes, potentially affecting future flood elevations in the planning area.

Snowpack

California's annual snowpack, on average, has the greatest accumulations from November though the end of March. The snowpack typically melts from April through July. California's reservoir managers (including State Water Project [SWP] and Central Valley Project [CVP] facilities) use snowmelt to help fill reservoirs once the threat of large winter and early spring storms and related flooding risks have passed.

An analysis of the effect of rising temperatures on snowpack conducted by DWR (2006) shows that a 5.4°F rise in average annual temperature would likely cause snowlines to rise approximately 1,500 feet. This would result in an annual loss of approximately 5 million acre-feet (maf) of water storage in snowpack. Released and/or purchased waters stored in upstream reservoirs will largely depend on regional annual average precipitation accumulations. Greater management of upstream reservoirs would be required to account for seasonal variations in precipitation type and intensity, and to maintain current levels of flood protection.

Water Supply

Much uncertainty also exists with respect to how climate change will affect future demand on water supply (DWR 2006a). Still, changes in water supply are expected to occur, and several regional studies have shown that large

changes in the reliability of water yields from reservoirs could result from only small changes in reservoir inflows (Kiparsky and Gleick 2005, Cayan et al. 2006). However, there is a great deal of uncertainty regarding impacts of climate change on future water availability in California concerning whether and where effects will occur, and regarding the timing and severity of potential effects.

Agriculture

Climate change may reduce the suitability of agricultural lands in and near the planning area for traditional crop types. While effects may occur, such adaptation could allow farmers and ranchers to minimize potential negative effects on agricultural incomes by diversifying types of crops planted to match a warmer growing season.

4.7.3 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

An impact related to GHG emissions is considered significant if adoption and implementation of the Draft General Plan would:

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

For the purposes of this EIR, the net change in GHG emissions from existing conditions associated with adoption and implementation of the Draft General Plan are quantified and used as a criterion to determine whether these emissions would substantially help or hinder the state's ability to implement the ARB *Climate Change Scoping Plan*.

Efficiency-Based Threshold

By adopting AB 32, the California Legislature has indicated that GHG emissions are a serious environmental issue and has identified a statewide GHG emissions target. To meet the goals of AB 32, California would need to generate fewer GHGs than current levels. 'However, for most projects, no simple metric can determine whether an individual project would substantially increase or decrease overall GHG emission levels. There is no available adopted or widely accepted methodology for evaluating GHG emissions from new development. In the case of the Draft General Plan, short-term construction and long-term land use CO_2 emissions were modeled using the California Emissions Estimator Model (CalEEMod), Version 2011.1.1. See Appendix C for GHG calculations and inputs.

CO_2 emissions associated with future land uses consistent with the Draft General Plan are not considered "new" emissions, given that the General Plan itself does not create "new" emitters (e.g., people) of GHGs. In other words, the Draft General Plan would not create new people, and would not necessarily accommodate new activities. Rather, in most cases, the General Plan would accommodate movement in people, jobs, and activities from one location to another. Therefore, instead of reducing the total mass of community-generated GHG emissions, it is important to increase the GHG efficiency of the community, or the rate of GHG emissions per capita and per employee. The General Plan would need to accommodate population in a way that allows for a lower *rate* of GHG generation to achieve the state's goals for GHG emissions, as described in the AB 32 Scoping Plan and directed by EO S-3-05.

The legislation dealing with climate change in California (as well as international treaties and agreements on the subject) identifies goals for the rate of emissions of GHGs, relative to specific benchmark years. AB 32 requires statewide 1990 GHG emission levels to be achieved by the year 2020 (ARB 2008). Neither state legislation nor

executive order suggests that California intends to limit population growth to reduce the state's GHG emission levels. Therefore, the intent is to accommodate population growth in California, but achieve a lower *rate* of GHGs despite a larger population. In other words, California must become more GHG efficient.

When analyzing long-range plans, such as general plans, the planning horizon will often surpass the 2020 timeframe for implementation of AB 32. Executive Order S-3-05 establishes a more aggressive emissions reduction goal for the year 2050 of 80% below 1990 emissions levels. The year 2020 can be viewed as a milestone, and is the only year referred to in AB 32 with respect to an emissions target. However, communities should also plan in a way that does not preclude a trajectory toward the 2050 goal established in Executive Order S-3-05.

For the purposes of this analysis, the sum of the number of jobs and the number of residents at a point in time is termed the "service population" (SP). Per-SP emission rates can show how GHG-efficient new development and existing development must be in order to achieve AB 32 targets for land use-related sectors.

At the time of this analysis, the South Coast Air Quality Management District has not adopted thresholds of significance for general or area plans. SCAQMD's GHG CEQA Significance Threshold Stakeholder Working Group (Working Group) has been meeting to discuss proposed thresholds for GHG emissions, which are anticipated to be presented to the SCAQMD Governing Board in 2011.

The Working Group has proposed several possible thresholds for analysis of general and area plan impacts, including a 2020 service population metric of 6.6 MT CO_2e/SP/yr, which is consistent with the significance threshold for general plans adopted by the Bay Area Air Quality Management District (BAAQMD) in 2010. The working group has also proposed a 2035 service population metric of 4.1 MT CO_2e/SP/yr for general plans. These proposed significance thresholds are used within this EIR. For purposes of this analysis, a 2030 GHG efficiency threshold of 4.9 MT CO_2e/SP/yr was interpolated from the proposed 2020 and 2035 thresholds to coincide with the planning horizon of the Draft General Plan. Examining reasonable emissions reductions that may be achieved in the year 2050 is considered speculative given the scope of the analysis tools and methods available at this time.

Thus, if the Draft General Plan meets the 2020 GHG efficiency threshold of 6.6 MT CO_2e/SP/yr, it would accommodate growth in a manner that does not conflict with the Scoping Plan, and would not hinder the State's ability to achieve AB 32 emission reduction targets. If the Draft General Plan meets the 2030 GHG efficiency threshold of 4.9 MT CO_2e/SP/yr, it would not conflict with EO S-3-05.

ANALYSIS APPROACH

The analysis of impacts is based on the likely consequences of adoption and implementation of the Draft General Plan, including future land uses consistent with the Land Use Diagram, and supporting roadways, infrastructure, and public services; along with implementation of Draft General Plan policies and programs.

For GHG emission impacts, compliance with regulations presented in Section 4.7.1, "Regulatory Framework," would reduce impacts. The Draft General Plan includes a variety of strategic policies and programs that are intended to promote a sustainable pattern of development; Appendix A of the Draft General Plan includes a comprehensive list of these policies and programs.

For the purpose of this analysis, the following Draft General Plan policies and programs are considered to address GHG emissions. These programs indicate the City's intent to conserve energy and reduce emissions.

Policies

- **LU-1.4 Walkable Neighborhoods** Create walkable neighborhoods that integrate pedestrian paths and trails into a safe, cohesive and varied transportation system that provides connectivity to nearby land uses and encourages physical activity and less dependence on the automobile.

- **LU-1.7 Integrate Land Use and Transportation Networks** Provide a variety of transportation choices to serve adjacent land uses and integrate a comprehensive system of streets, transit, passenger rail, bike paths and pedestrian connections to serve the community.

- **LU-2.4 Concentrate Land Uses** Promote efficient use of land resources through compact building design, infill development, and land use patterns that reduce infrastructure costs and make more effective use of existing and planned transportation systems and public facilities, and minimize impacts to natural environmental resources.

- **LU-2.6 Alternative Modes of Transportation** Promote alternative modes of transportation and provide street systems that disperse rather than concentrate traffic congestion. Provide short, connecting blocks in residential neighborhoods and utilize traffic-calming design strategies to reduce traffic speeds.

- **LU-2.9 Sustainable Design** Require that new development be designed to minimize consumption of water, energy and other resources and provide long-term sustainable site and building design features.

- **LU-5.2 Land Use Connections** Promote employment and shopping centers in close proximity to residences in mixed use or transit-oriented development areas, and integrate with attractive and walkable pedestrian paths.

- **LU-9.11 Sustainable Infrastructure and Development** Require new infrastructure systems and site development to incorporate sustainable design and best practices including the use of recycled water, alternative and energy conserving techniques, and naturalized "conjunctive use" drainage basins to accommodate drainage, recharge the aquifer, promote water quality, and add aesthetic value as a neighborhood amenity.

- **OS-5.3: Development Design** Encourage the efficient use of water resources by residential, commercial, and industrial users by requiring development project proposals to incorporate best management practices into their designs, including the use of new technology in development design.

- **OS-5.4: Reclaimed Water** Use reclaimed water to irrigate parks, golf courses, public landscaped areas, and for other feasible applications as service becomes available from local water providers.

- **OS-5.5: Water Efficient Landscaping** Require new landscape installations or rehabilitation projects by public agencies, nonresidential developers, multi-family residential developers, and homeowners to use water efficiently, encourage water conservation, and prevent water waste.

- **OS-6.1: CALGreen Standards** Encourage the efficient use of energy resources by residential, commercial, and industrial users by requiring project proposals to incorporate energy-efficient products and techniques into their designs in accordance with adopted California Green Building Standards Code standards and other development standards.

- **OS-6.2: City Incentives** Through incentives such as expedited review of development projects, promote nonrequired alternative energy practices and Leadership in Energy and Environmental Design (LEED) certifications.

- **OS-6.3: Federal, State, Utility Company Incentives** Encourage homeowners, business owners, and other energy users to use incentives offered by federal, state, and utility companies; to identify voluntary retrofit opportunities and funding options that increase building energy performance; and to reduce energy consumption.

- **OS-6.4: Public Sector Development and Practices** Require Redevelopment Agency–funded projects, public sector projects, and publicly owned institutions and facilities to use systems, methods, and practices that promote energy conservation.

- **OS-6.5: Clean Energy** Support the use and production of clean energy resources through green technology and programs that promote wind, solar, renewable, biomass, and cogenerating energy resources, where compatible with adjacent land uses.

- **OS-6.6: Solar Energy** Encourage existing or new structures to maximize solar access by promoting passive solar energy design, natural ventilation, effective use of daylight, an on-site solar generation.

- **OS-6.7: Recycling** Promote the use of recycling and recycled materials in development projects and consumable products.

- **OS-7.1: Development Design and Practices** Reduce the amount of air pollution emissions from mobile and stationary sources, and enhance the South Coast Air Basin by using best management practices in development proposals and project implementation.

- **OS-7.2: Public Transportation** Pursue expansion of the public transportation system, as well as bicycle and pedestrian trails, that are linked to the regional transit network, to reduce vehicle trips.

- **OS-7.3: Alternative Vehicles** Promote the use of fuel-efficient and low-emissions vehicles, including neighborhood electric vehicles (NEVs).

- **OS-7.4: Municipal Fleet** Manage the municipal fleet to achieve the highest possible number of fuel-efficient and low emissions vehicles commercially available.

- **OS-7.5: Trip Reduction** Encourage a mix of housing types that are affordable to all segments of the population and are near job opportunities to further reduce vehicle trips.

- **OS-7.6: Transportation Trip Management** Encourage employers to implement transportation demand management (TDM) measures to reduce trips and vehicle miles traveled.

- **OS-7.7: Clean Technologies** Encourage businesses to use clean, innovative technologies and promote the use of alternative clean-fueled vehicles, new transportation technologies, and other alternatives to the combustion engine for City vehicles and individual use.

- **OS-7.8: Green Building Techniques** Encourage green building techniques that improve indoor air quality, energy efficiency and conservation in buildings, and utilization of renewable energy sources.

- **OS-7.9: Stationary Source Pollution** Continue to minimize stationary source pollution through the following:

    - Ensure that industrial and commercial land uses are meeting existing South Coast Air Quality Management air thresholds by adhering to established rules and regulations.

    - Encourage the use of new technology to neutralize harmful criteria pollutants from stationary sources.

    - Reduce exposure of the City's sensitive receptor s to poor air quality nodes through smart land use decisions.

- **OS-7.12: Best Management Practices** Ensure all applicable best management practices are used in accordance with South Coast Air Quality Management District (SCAQMD) to reduce emitting criteria pollutants during construction.

- **OS-7.13: Partnerships** Continue to work with the WRCOG Regional Air Quality Task Force to implement regional and local programs designed to meet federal, state, and regional air quality planning requirements.

- **OS-8.1: Comprehensive Approach** Coordinate policies and implementation measures of the various elements of the General Plan to ensure a comprehensive approach to reducing greenhouse gas emissions and to establish the basis for a sustainability plan.

- **OS-8.2: Land Use Planning** Encourage new and infill development that provides employment opportunities for Hemet residents, is located near activity centers or along transportation corridors, and incorporates off-road trails for pedestrians and cyclists to reduce the length and number of vehicle trips.

- **OS-8.3: Mixed Use Development** Support mixed-use commercial-residential development in accordance with the Land Use Element as an opportunity to improve the City's current jobs-housing ratio and work-live balance.

- **OS-8.4: Local Employment** Continue to create local employment opportunities by maintaining an adequate supply of designated commercial and industrial land, in accordance with the Land Use Element.

- **OS-8.5: Jobs/Housing Balance** Improve the City's jobs-housing balance by encouraging the development, expansion, and retention of business.

- **OS-8.6: Vehicle Miles Traveled** Cooperate with regional, state, and federal agencies to reduce vehicle miles traveled and consequent emissions through job creation.

- **OS-8.7: Innovative Practices** Encourage the efforts of utility companies, water companies, private businesses, and other persons or organizations in their efforts to institute sustainable practices in their operations.

Programs

- **OS-P-20 Energy Conservation Practices.** In response to the California Green Building Standards Code, encourage Tier 1 standards for new and remodeled construction that achieve the equivalent of Leadership in Energy and Environmental Design (LEED) Silver certification.

- **OS-P-21Techniques to Reduce Energy Use.** Train City staff to assist project applicants in designing energy-efficient projects through site planning techniques, building orientation, building design, and building materials to reduce energy use and promote the use of renewable and alternative energy generation such as fuel cells, solar energy, and other sources.

- **OS-P-22 Energy Regulation.** Update zoning and building codes to require new development to comply with the California State Energy Regulation requirements. Enforce all current residential and commercial California Energy Commission energy conservation standards during project review. Permit and encourage the use of passive solar devices and other state-of-the-art energy resources. Enforce the State Solar Shade Control Act, which promotes all feasible means of energy conservation and all feasible uses of alternative energy supply sources.

- **OS-P-24 Energy Conservation in Public Facilities.** Require Silver LEED certification and encourage Gold LEED certification or a similar level of green building achievement for all new public facilities, Redevelopment Agency projects, and Housing Division projects, where feasible. Promote the use of high-

efficiency heating and cooling systems, advanced lighting systems, and passive solar systems in public institutions to reduce energy use. Specify energy-efficient materials and systems, including shade design technologies, for government buildings.

- **OS-P-26 Minimize Water Demand.** Work with the water districts to promote water conservation and ultimately reduce demand for peak-hour water supply and wastewater capacity. Continue current conservation efforts and actively pursue water storage and source alternatives, including dry-year water transfer options and use and production of reclaimed water.

  Continue to review and update the City's adopted zoning and building codes and require the use of water conservation measures to reduce water consumption. Such measures may include the use of plumbing fixtures that reduce water use. low-flow toilets. drip irrigation systems. and xeriscape landscaping that maximizes use of drought-tolerant plant species. Continue to implement a recycled water ordinance in accordance with the Water Recycling in Landscaping Act. Where feasible, incorporate reclaimed water systems into landscape irrigation plans. Convert existing City of Hemet nondomestic water uses to recycled water use in accordance with Sections 13550-13556 of the State Water Code when feasible. Use reclaimed water for the irrigation of parks, golf courses, public landscaped areas, and other feasible applications as service becomes available from the Hemet Water Department, Lake Hemet Municipal Water District, and Eastern Municipal Water District. Encourage the installation of water-conserving systems such as dry wells and graywater systems, where feasible and environmentally sound. The installation of cisterns or infiltrators shall also be encouraged to capture rainwater from roofs for irrigation in the dry season and flood control during heavy storms.

- **OS-P-34 Climate Action Plan.** Develop and adopt a climate action plan (CAP) for the City of Hemet. The CAP will have two primary objectives, which are to reduce total greenhouse gas (GHG) emissions in the City by 2020 and create adaptation strategies to address the impacts of climate change on the City, such as increased risk of flooding and wildfires, diminished water supplies, and public health. The City intends to design the CAP to function as a Plan for the Reduction of GHG Emissions, as defined in the State CEQA Guidelines (Section 15183.5). The CAP will be adopted in a public process following environmental review (State CEQA Guidelines Section 15183.5(b)(1)(F)).

- **OS-P-35 Baseline GHG Emissions Inventory and Forecast** The City has completed a baseline GHG emissions inventory for the year 2009, and 2020 and 2030 emissions forecasts to support the General Plan EIR (State CEQA Guidelines Section 15183.5(b)(1)(A)). The CAP will use these forecasts to describe efforts necessary to achieve communitywide GHG reductions to 6.6 MT CO_2e/SP/yr by 2020 and 4.9 MT CO_2e/SP/yr by 2030 (State CEQA Guidelines Section 15183.5(b)(1)(B)).

- **OS-P-36 GHG Emissions Reduction Strategies and Measures** The CAP will describe the strategies and measures necessary to reduce GHG emissions at both the statewide level (State CEQA Guidelines Section 15183.5(b)(1)(C)) and through local actions in the planning area that on a project-by-project basis would collectively achieve the reduction target (State CEQA Guidelines Section 15183.5(b)(1)(D)). Policies and measures will be created with public input from all stakeholders. Each measure will include a timeline and assign responsibility to implementing agencies and departments. In addition to direct GHG reduction measures, the CAP will incorporate public education efforts to raise awareness on the importance of minimizing GHG emissions and methods for reducing emissions from individual's lifestyles. GHG emissions reduction General Plan policies and programs will be referenced within the CAP. Policies, benchmarks, and measures will be evaluated according to current state law and applicable guidance each time the General Plan is updated. Measures applicable to existing and new development will be identified. It is anticipated that both mandatory and voluntary measures will be recommended by the CAP. The City will establish an implementation tool that enables tiering of future development projects by making otherwise voluntary measures binding and enforceable for new projects (State CEQA Guidelines Section 15183.5(b)(2)).

- **OS-P-37 Protection and Adaptation Strategies** The CAP will describe strategies, policies, and measures that will be used to protect the City from and facilitate adaptation to the potential effects of climate change. Potential effects to be evaluated include, but are not limited to, increased frequency and magnitude of flooding, diminished water supply, habitat loss, and possible effects on public health and the local economy, including agriculture. Each measure will include a timeline and assign responsibility to implementing agencies and departments.

- **OS-P-38 Benchmarks and Next Steps** In conclusion, the CAP will identify benchmarks, monitoring procedures, and other steps needed to ensure the City achieves its GHG reduction, protection, and adaptation goals (State CEQA Guidelines Section 15183.5(b)(1)(E)). Monitoring and verifying progress of GHG emissions reduction measures will be conducted on an ongoing basis. Monitoring will provide important feedback that can be used to demonstrate overall progress toward emissions reduction targets and improve measures over time. Benchmarks will be established to serve as intermediate goals and motivate compliance with reduction targets. Benchmarks for strategic responses to climate change impacts should be based on the expected timescale of the specific impact and will be established during development of individual strategic plans. As the CAP is to be implemented over a period of several years, knowledge surrounding climate change and implementation measures are likely to evolve. The CAP will contain provisions to evaluate measures to ensure successful GHG emissions reduction and protection of the City.

Pursuant to the guidance provided in the State CEQA Guidelines, this section addresses three potential impacts of the Draft General Plan related to GHG emissions:

1. The potential for implementation of the Draft General Plan to result in construction-related GHG emissions;

2. The potential for new growth anticipated within the Draft General Plan (i.e., approximately 21,152 net new dwelling units and approximately 47,871 million net new non-residential square feet) to generate GHG emissions that may have a significant impact on the environment and thereby conflict with the ARB *Climate Change Scoping Plan*; and

3. The potential impacts of anticipated climate change effects (i.e., reduced hydroelectric energy production, increased energy demand, and decreased water supply) on the planning area.

Methods used to evaluate each impact are presented in the impact discussions.

IMPACT ANALYSIS

IMPACT 4.7-1 Generation of Construction-Related Greenhouse Gas Emissions. *Future construction of land uses consistent with the Draft General Plan would result in increased generation of GHG emissions. Although Draft General Plan policies require large projects to reduce construction-related emissions, new construction throughout the planning area would contribute considerably to cumulative GHG emissions. Therefore, this impact would be considered significant.*

This impact considers the potential for new construction envisioned in the Draft General Plan to result in GHG emissions. Heavy-duty off-road equipment, materials transport, and worker commutes associated with future land uses consistent with the Draft General Plan would result in exhaust emissions, primarily in the form of CO_2. Although emissions of other GHGs, such as CH_4 and N_2O, also occur from on- and off-road construction vehicles, they are relatively small compared with CO_2 emissions, even when factoring in the relatively larger global warming potential of CH_4 and N_2O.

Construction emissions were estimated using the CalEEMOD model. CalEEMOD estimates CO_2 emissions associated with construction sources such as off-road construction equipment, material delivery trucks, soil haul

trucks, and construction worker vehicles. CalEEMOD models project-specific construction emissions based on building size, land use and type, and disturbed acreage. Construction emissions were modeled based on general land use information provided in Table 3-1 in Chapter 3, "Project Description," and default SCAQMD-recommended settings and parameters attributable to the proposed land uses and planning area location. Refer to Appendix C for a summary of modeling assumptions, inputs, and outputs.

Future development consistent with the Draft General Plan would occur over a very large area and large portions of the planning area could undergo construction at any given time. Construction of new land uses could begin as early as 2012 and could last until approximately 2030. Given that exhaust emission rates of the construction equipment fleet in California are expected to decrease over time due to ARB and SCAQMD regulations, annual construction emissions were estimated using the earliest calendar year when construction could begin (i.e., 2012). It is anticipated, however, that in later years, advancements in engine technology, retrofits, and turnover in the equipment fleet would result in increased fuel efficiency, more alternatively-fueled equipment, and lower emissions.

Approximately 46,405 MT CO_2 emissions are anticipated between 2012 and 2030 with implementation of the Draft General Plan. This value accounts only for exhaust emissions that would be generated by heavy-duty equipment, haul trucks, and vehicle trips. Construction exhaust emissions would be temporary and short term, as they would not continue on an ongoing basis year after year throughout the operational life of the development, as is the case with large stationary-source facilities.

In addition, the regulatory environment that continues to evolve to implement AB 32 is expected to reduce some construction emissions. The Scoping Plan does not directly discuss construction emissions; however, it does recommend measures to improve the efficiency of medium- and heavy-duty on-road vehicles and expended efficiency strategies for off-road vehicles (e.g., forklifts, bulldozers). In addition, existing air quality programs in California, including the Diesel Risk Reduction Plan and the 2007 State Implementation Plan, will result in the accelerated phase-in of cleaner technology for diesel engine fleets, including construction equipment (ARB 2008). Implementation of these plans would likely result in more emissions-efficient future construction equipment than existing fleets. For these reasons, GHG emissions associated with construction activity are expected to decrease over time.

Neither ARB nor SCAQMD provide guidance or a method to evaluate construction GHG emissions. Nonetheless, due to the intensity and duration of construction of future land uses consistent with the Draft General Plan, new construction would make an incremental, cumulatively considerable contribution to GHG emissions. Construction would be temporary, but resulting GHGs would persist in the atmosphere. Although new regulations are expected to implement AB 32, and although existing regulations will help reduce construction emissions throughout the state, GHG emissions associated with construction of future land uses consistent with the Draft General Plan would result in a cumulatively considerable incremental contribution to this **significant** cumulative impact, requiring mitigation.

Mitigation Measure

Mitigation Measure 4.7-1: Reduce Construction-based GHG Emissions

To further reduce construction GHG emissions, projects consistent with the Draft General Plan seeking discretionary approval from the City shall implement all feasible measures for reducing construction GHG emissions recommended by the City and/or SCAQMD at the time individual portions of the site undergo construction.

~~Prior to releasing bid requests to contractors for projects consistent with the Draft General Plan seeking~~ At the time of project review for discretionary approval from the City, the City shall require the applicant(s) to implement ~~the project applicant(s) shall obtain~~ the most current list of GHG reduction measures recommended by the City ~~and stipulate that these measures be implemented in the respective~~

~~request for bid, as well as the subsequent construction contract~~ as conditions of approval. ~~By requiring that the~~ The list of feasible measures must be established prior to the selection of a primary contractor, ~~this measure requires~~ to require that the ability of a contractor to effectively implement the selected GHG reduction measures be inherent to the selection process.

The City's recommended measures for reducing construction GHG emissions at the time of writing this EIR are listed below. This list will be updated as new technologies or methods become available. The project applicant(s) shall, at a minimum, be required to implement the following:

- Improve fuel efficiency of construction equipment:
  - reduce unnecessary idling (modify work practices, install auxiliary power for driver comfort);
  - perform equipment maintenance (inspections, detect failures early, corrections);
  - train equipment operators in proper use of equipment;
  - use the proper size of equipment for the job; and
  - use equipment with new technologies (repowered engines, electric drive trains).
- Use alternative fuels for electricity generators and welders at construction sites such as propane or solar, or use electrical power.
- Use an ARB-approved low-carbon fuel, such as biodiesel or renewable diesel for construction equipment. Emissions of oxides of nitrogen [NO_X] from the use of low carbon fuel must be reviewed and increases mitigated. Additional information about low-carbon fuels is available from ARB's Low Carbon Fuel Standard Program (ARB 2010g).
- Encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking for construction workers.
- Reduce electricity use in the construction office by using compact fluorescent bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones.
- Recycle or salvage nonhazardous construction and demolition debris (goal of at least 75% by weight).
- Use locally sourced or recycled materials for construction materials (goal of at least 20% based on costs for building materials, and based on volume for roadway, parking lot, sidewalk, and curb materials).
- Minimize the amount of concrete used for paved surfaces or use a low carbon concrete option.
- Produce concrete on-site if determined to be less emissive than transporting ready mix.
- Use EPA-certified SmartWay trucks for deliveries and equipment transport. Additional information about the SmartWay Transport Partnership Program is available from ARB's Heavy-Duty Vehicle Greenhouse Gas Measure (ARB 2010h) and EPA (EPA 2010f).
- Develop a plan to efficiently use water for adequate dust control. This may include the use of nonpotable water from a local source.

The project applicant(s) for any particular discretionary project may submit to the City a report that substantiates why specific measures are considered infeasible for construction of that particular discretionary project and/or at that point in time.

Conclusion

Although adherence to state regulations, Draft General Plan policies and programs, and implementation of Mitigation Measure 4.7-1 would reduce incremental construction GHG emissions, the cumulatively considerable incremental contribution to construction GHG emissions from future land uses consistent with the Draft General Plan remains **significant and unavoidable.**

IMPACT 4.7-2 Increases in Greenhouse Gas Emissions From New Development. *Future land uses consistent with the Draft General Plan would allow for up to 21,152 net new dwelling units and up to 47,871 million net new non-residential square feet within the planning area. These uses would result in increased generation of GHGs, which would contribute considerably to cumulative GHG emissions, would exceed plan-level significance thresholds currently being considered by SCAQMD, and may conflict with the ARB* Climate Change Scoping Plan*. Although adherence to state regulations, Draft General Plan policies and programs and future preparation of a Climate Action Plan (CAP) would reduce both communitywide emissions and net new emissions resulting from the Draft General Plan. However, due to uncertainty regarding the degree of Draft General Plan and future CAP implementation, this impact is considered significant.*

This impact considers the potential for new growth anticipated with the Draft General Plan to generate GHG emissions that may have a significant impact on the environment. Analysis of this impact uses statewide efficiency based metrics derived from the Scoping Plan to compare emissions resulting from the increment of new growth anticipated by the Draft General Plan in 2030 to statewide emissions efficiencies required to achieve AB 32 objectives.

Land use-related emissions may be both direct and indirect emissions, and would be generated by area-, mobile-, and stationary-sources. Area-source emissions would be associated with activities, such as combustion of natural gas for hearth furnaces and maintenance of landscaping and grounds. Natural gas combustion for space and water heating is also a direct area source of GHG emissions, but is considered separately from other area-sources. Mobile-source emissions of GHGs would include vehicle trips associated with employee commutes, errands, recreation, and other trips in passenger vehicles of future residents of and visitors.[2] Indirect emissions sources include stationary-source emissions from electricity generation at off-site utility providers. Consumption of water would also result in indirect GHG emissions because of the electricity consumption associated with the off-site conveyance, distribution, and treatment of that water. Solid waste and wastewater generated by activities within the planning area would result in direct, off-site emissions of GHGs.

Analysis

This analysis employs a per-SP emissions metric that combines per-capita and per-job emissions. Table 4.7-2 shows: a) estimated total communitywide future mass emissions in 2020 and 2030, and b) net increases in emissions compared to existing (2009 on-the-ground) conditions. Both are considered in the following analysis.

As shown in Table 4.7-2, total communitywide emissions in the planning area in 2020 with implementation of the Draft General Plan would be 1,971,363 MT CO_2e/yr. The net increase in future mass emissions in 2020 compared to existing conditions would be 831,522 MT CO_2e/yr. Mobile sources (i.e., vehicle trips) and water use are the primary sources of GHG emissions associated with new growth anticipated within the Draft General Plan. Additional dwelling units and non-residential square feet anticipated within the Draft General Plan by 2020 would accommodate a total population of 135,263 and an employment base of 66,648, or a net increase of approximately

[2] ARB estimates that implementation of GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles as described in AB 1493 will achieve a 15.76% increase in vehicle performance and therefore reduce the overall GHG emissions from on-road mobile sources by 2020 (ARB 2008). Based on current available data, implementation of the Low Carbon Fuel Standard (LCFS) is projected to reduce overall statewide GHG emissions attributable to vehicle fuels by about 10%. Statewide reductions associated with AB 1493 and the LCFS are incorporated into the GHG emission estimates for new land uses within the planning area in 2035.

Table 4.7-2
GHG Emissions 2009-2030 with Implementation of the Draft General Plan

Emission Source	2009	2020		2030	
	Emissions (MT CO_2e)	Emissions (MT CO_2e)	Change from Existing	Emissions (MT CO_2e)	Change from Existing
Transportation	678,587	973,224	294,637	1,197,942	519,355
Area Source	36,106	45,421	9,315	52,076	15,970
Energy	228,531	376,331	147,800	481,893	253,362
Water & Wastewater	149,087	448,515	299,428	662,384	513,297
Solid Waste	47,531	127,872	80,341	185,255	137,724
Total	**1,139,841**	**1,971,363**	**831,522**	**2,579,550**	**1,439,709**
Population	95,384	135,263	39,879	163,748	68,364
Employment	25,190	66,648	41,458	96,260	71,070
Service Population (Population+Employment)	**120,574**	**201,911**	**81,337**	**260,008**	**139,434**
Efficiency Metric (MT CO_2e/SP/yr)	**9.5**	**9.8**	**10.2**	**9.9**	**10.3**
SCAQMD Proposed Service Population Threshold (MT CO_2e/SP/yr)	N/A	6.6		4.9	
Exceeds Threshold?	**N/A**	**YES**		**YES**	

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons; SP = Service Population; yr = year; SCAQMD = South Coast Air Quality Management District.
Population and employment estimates for 2020 were interpolated from 2006 and 2030 data.
Source: Data compiled by AECOM 2011

39,879 new residents and 41,458 new jobs. If the emissions identified in Table 4.7-2 were distributed evenly across the community as a whole, the planning area would generate GHG emissions at an average rate of 9.8 MT CO_2e/SP/yr. If the net new emissions were distributed across the net new population and employees accommodated by the Draft General Plan, the increment of new growth would generate GHG emissions at an average rate of 10.2 MT CO_2e/SP/yr. Both rates exceed the 2020 significance thresholds defined for purposes of this EIR (i.e., 6.6 MT CO_2e/SP/yr).

As shown in Table 4.7-2, total communitywide emissions in the planning area in 2030 with implementation of the Draft General Plan would be 2,579,550 MT CO_2e/yr. The net increase in future mass emissions in 2030 compared to existing conditions would be 1,439,709 MT CO_2e/yr. Mobile sources (i.e., vehicle trips) and water use are the primary sources of GHG emissions associated with new growth. Additional dwelling units and non-residential square feet anticipated within the Draft General Plan by 2030 would accommodate a total population of 163,748 and an employment base of 96,260, or a net increase of approximately 68,364 new residents and 71,070 new jobs. If the emissions identified in Table 4.7-2 were distributed evenly across the community as a whole, the planning area would generate GHG emissions at an average rate of 9.9 MT CO_2e/SP/yr. If the net new emissions were distributed across the net new population and employees accommodated by the Draft General Plan, the increment of new growth would generate GHG emissions at an average rate of 10.3 MT CO_2e/SP/yr. Both rates exceed the 2030 significance thresholds defined for purposes of this EIR (i.e., 4.9 MT CO_2e/SP/yr).

A variety of Draft General Plan policies and programs are designed to reduce GHG emissions. These include efforts to: reduce water use (OS-5.3, OS-5.4, OS-5.5, OS-P-26); increase energy efficiency of new and existing structures (OS-6.1, OS-6.2, OS-6.3, OS-6.4, OS-7.8, OS-P-20, OS-P-21, OS-P-22, OS-P-24): increase use of clean and renewable energy sources (OS-6.5, OS-6.6); increase use of recycled materials in construction (OS-6.7); employ emission reduction best management practices (OS-7.1, OS-7.9, OS-7.12, OS-7.13, OS-8.7); reduce emissions from vehicles (OS-7.2, OS-7.3, OS-7.4, OS-7.5, OS-7.6, OS-7.7); and arrange land uses to reduce vehicle trips (OS-8.1, OS-8.2, OS-8.3, OS-8.4, OS-8.5, OS-8.6).

The Draft General Plan also requires preparation of a Climate Action Plan (CAP) (OS-P-32), which will identify GHG emission reduction and adaptation strategies. including quantified GHG reduction measures. The CAP will establish a comprehensive, communitywide GHG emissions reduction strategy for Hemet, The City intends for the CAP to be a Plan for the Reduction of GHG Emissions, as defined in Section 15183.5 of the State CEQA Guidelines. However, uncertainty exists whether, when, and to what degree the emission reduction measures proposed in the Draft General Plan and future CAP would be implemented, and if the City would be able to achieve AB 32 goals by implementing them. These are new programs for the City, containing non-standard programs with which the City has limited or no implementation experience. Adherence to state regulations, Draft General Plan policies and programs, and future preparation of a CAP would reduce both communitywide GHG emissions and net emissions attributable to implementation of the Draft General Plan. However, due to uncertainty regarding the degree of Draft General Plan and future CAP implementation, implementation of the Draft General Plan would represent a cumulatively considerable incremental contribution to this **significant** cumulative impact, requiring mitigation.

Mitigation Measures

The following mitigation measures are interim measures to be enforced by the City of Hemet until the CAP is developed and adopted:

Mitigation Measure 4.7-2: Early Actions to Reduce Land Use-based GHG Emissions

Until adoption of the Climate Action Plan and b~~B~~efore granting approvals for development projects that are: 1) subject to a Specific Plan, or 2) considered projects of statewide, regional, or areawide significance (as defined by the CEQA Guidelines) ~~and any corresponding development agreements~~ ("covered development projects"), the City shall take the steps set forth below:

(a) City staff shall~~:~~

~~(1)~~ formulate proposed measures necessary for the project that demonstrate the ability to meet any applicable GHG reduction targets adopted by ARB or SCAQMD at the time of application. These measures may include but are not limited to;

(1) assess the project's VMT and formulate proposed measures that would reduce the project's VMT;

(2) assess the transit needs of the project and identify the project's proposed fair share of the cost of meeting such needs;

(3) assess the project's estimated energy consumption, and identify proposed measures to ensure that the project conserves energy and uses energy efficiently;

(4) formulate proposed measures to ensure that City services and infrastructure are in place or will be in place prior to the issuance of new entitlements for the project or will be available at the time of development; and

(5) formulate proposed measures to ensure that the project is configured to allow the entire development to be internally accessible by alternative modes of transportation.

(b) In conjunction with the public hearing on the project, the ~~The~~ City Council shall review and consider the studies and recommendations of City staff required by paragraph (a) ~~and conduct at least one public hearing thereon prior to approval of the proposed project (though this hearing may be folded into the hearing on the merits of the project itself)~~.

(c) The City Council shall consider the feasibility of imposing conditions of approval, including mitigation measures pursuant to CEQA, based on the studies and recommendations of City staff prepared pursuant to paragraph (a) for each covered development project.

(d) The City Council shall consider including in any development approvals, or development agreements, that the City grants or enters into during the time the City is developing the CAP, a requirement that all such approvals and development agreements shall be subject to ordinances and enactments adopted after the effective date of any approvals of such projects or corresponding development agreements, where such ordinances and enactments are directed by the CAP.

(e) The City shall complete the process described in paragraphs (a) through (d) above (hereinafter, "Climate Impact Study Process") prior to the first discretionary approval for a covered development project.

Conclusion

Mitigation measures[3] shall be applied to development projects throughout the planning area where feasible to reduce the cumulatively significant incremental contribution to GHG emissions. The Draft General Plan includes policies and programs that when implemented, will reduce and serve to mitigate the cumulatively significant impact resulting from implementation of the Draft General Plan. In particular, Implementation Program OS-P-34 requires the City to develop and adopt a Climate Action Plan (CAP). The CAP will contain GHG emission reduction policies and measures to achieve communitywide GHG reductions to 6.6 MT CO_2e/SP/yr by 2020 and 4.9 MT CO_2e/SP/yr by 2030. The City intends to design the CAP to function as a Plan for the Reduction of GHG Emissions, as defined in the State CEQA Guidelines (Section 15183.5).

No additional feasible mitigation measures beyond Mitigation Measure 4.7-2 and those proposed in the Draft General Plan are available to reduce GHG emissions. Implementation of state regulations, Draft General Plan policies and programs, and Mitigation Measure 4.7-2 would reduce this impact, but not to a less-than-significant level. This impact would remain **significant and unavoidable**.

~~IMPACT 4.7-3~~ ~~Impacts of Anticipated Climate Change Effects on the Planning Area. *GHG emissions are expected to result in a variety of effects on the planning area, including reduced hydroelectric energy production, increased energy demand, and decreased water supply.*~~

ANTICIPATED CLIMATE CHANGE EFFECTS ON THE PLANNING AREA

This discussion considers the potential impacts of anticipated climate change effects on the planning area. As discussed previously in this section, human-induced increases in GHG concentrations in the atmosphere have led to increased global average temperatures (global warming) through the intensification of the greenhouse effect and resulted in associated changes in local, regional, and global average climatic conditions. Although there is a strong scientific consensus that global climate change is occurring and is influenced by human activity, there is

[3] These measures are largely based on the Settlement Agreement reached between the City of Stockton, the Sierra Club, and the Attorney General of California related to adoption of the City of Stockton General Plan (October 2008).

less certainty as to the timing, severity, and potential consequences of the climate phenomena. Scientists have identified several ways in which global climate change could alter the physical environment in California (IPCC 2007, CEC 2006a, DWR 2006).

Although uncertainty exists as to the precise levels of these impacts, there is consensus regarding the range that can be expected. This analysis focuses on the effects of global climate change that might have a direct, reasonably foreseeable effect on physical conditions in the planning area. Therefore, this analysis gives greatest consideration to climate-change data with more consistency in projections of future conditions, and thus a probability for a greater likelihood of occurring within a reasonable time frame (i.e., approximately 100 years).

Temperature

An increase in average annual temperatures, by itself, would have little effect on the planning area, other than adjustments to new development anticipated under the Draft General Plan in response to warmer temperatures, such as increased evapotranspiration rates affecting both detention basin areas and landscaped areas, resulting in an increased irrigation demand, and potentially greater overall energy consumption to meet air conditioning needs.

Temperature change could result in increased energy demand within the planning area, which could increase GHG emissions and other air pollutant emissions associated with energy generation. Since both municipal and agricultural users rely on groundwater from the San Jacinto and Hemet Groundwater Basins, increased demand for irrigation could deplete groundwater supplies and require the construction of additional water storage or other types of infrastructure to serve water demands of future land uses consistent with the Draft General Plan.

Precipitation

Although global climate change models generally predict an increase in overall precipitation on a worldwide scale, there is no such consistency among the results of regional models applied to California. Given the uncertainty associated with projecting the amount of annual precipitation, any conclusion regarding significance of potential effects of climate change on precipitation volumes as they relate to reasonably foreseeable direct effects on physical conditions in the planning area would be speculative.

Based on the results of a variety of regional climate models and literature, it is reasonably foreseeable that snowpack will be reduced and/or will melt earlier or more rapidly in watersheds. Given that the magnitude and timing of the increase in winter runoff and the associated changes in reservoir use that may occur, the exact impact on the planning area would be speculative. In addition to potential effects on runoff and water supply, reduced precipitation could increase the frequency and/or severity of wildfires in some areas, including the planning area.

Although various climate change models predict some increase in variability of weather patterns and an increasing incidence of extreme weather events, there is no consistency among the model results, with some predicting increased incidents of droughts and others predicting increased frequency of severe storm events.

Sea Level

A consistent rise in sea level has been recorded worldwide over the last 100 years. Recorded rises in sea level along the California coast correlate well with the worldwide data. Based on the results of various global climate change models, sea level rise is expected to continue. Based on the consistency in past trends, the consistency of future projections, and the correlation between data collected globally and data specific to California, it is reasonably foreseeable that some amount of sea level rise will occur along the California coast over the next 100 years. While sea level rise induced by climate change is reasonably certain, the planning area is not located in an area that would be affected by sea level rise.

Water Supply

Several recent studies have shown that existing water supply systems are sensitive to climate change. Potential impacts of climate change on water supply and availability could directly and indirectly affect a wide range of institutional, economic, and societal factors. Residential, industrial, and agricultural land uses all are affected by the cost and security of water supply. Much uncertainty remains, however, with respect to the overall impact of global climate change on future water supplies.

Little work has been performed on the effects of climate change on specific groundwater basins or groundwater recharge characteristics (Kiparsky and Gleick 2005). Changes in rainfall and changes in the timing of the groundwater recharge season would result in changes in recharge. Warmer temperatures could increase the period where water is on the ground by reducing soil freeze. Conversely, warmer temperatures could lead to higher evaporation or shorter rainfall seasons, which could mean that soil deficits would persist for longer time periods, shortening recharge seasons. The specific extent to which various meteorological conditions will change and the impact of that change on groundwater are both unknown. A reduced snowpack, coupled with increased rainfall, could require a change in the operating procedures for California's existing dams and conveyance facilities (Kiparsky and Gleick 2005).

In 2003, CEC's Public Interest Energy Research (PIER) program established the California Climate Change Center (CCCC) to conduct climate change research relevant to the state. Executive Order S-3-05 called for the California Environmental Protection Agency (CalEPA) to prepare biennial science reports on the potential impact of continued climate change on certain sectors of California's economy. CalEPA entrusted PIER and its CCCC to lead this effort. The climate change analysis contained in its first biennial science report concluded that major changes in water management and allocation systems could be required in order to adapt to the change. As less winter precipitation falls as snow, and more as rain, water managers would have to balance the need to construct reservoirs for water supply with the need to maintain reservoir storage for winter flood control. Additional storage could be developed, but at high environmental and economic costs.

Climate change is expected to have a greater effect in Southern California and on agricultural users than urban users in the Central Valley. Based on the conclusions of current literature regarding California's ability to adapt to global climate change, it is reasonably expected that over time, the state's water system will be modified to be able to address the projected climate changes, e.g., under dry and/or warm climate scenarios (DWR 2006).

Although coping with climate change effects on California's water supply could come at a considerable cost, based on a thorough investigation of the issue, it is reasonably expected that statewide implementation of adaptation measures will likely enable California's water system to reliably meet future water demands. Given known projections, it is not useful to scale regional and state trends down to predict specific impacts in the planning area.

Water Quality

Although there are various ways in which climate change could affect water quality, effects could be positive or negative depending on a variety of conditions. In addition, current water quality conditions in regional surface waters depend in large part on human activities, and this would continue into the future. The effects of climate change on water quality could be alleviated by, exacerbated by, or overwhelmed by effects directly related to localized human actions.

Summary

Potential climate change effects would have environmental consequences throughout the planning area, although prediction of particular direct effects on physical conditions would be speculative. Implementation of Draft General Plan goals, policies, and actions would reduce the extent and severity of climate change–associated impacts in the planning area by proactively planning for changes in climate and conditions, creating a policy framework to coordinate with State agencies planning for climate change, and providing methods to adapt to anticipated changes.