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ACRONYMS AND ABBREVIATIONS

µg	micrograms
µm	micrometer
ACM	asbestos containing material
ADT	average daily trips
AADT	annual average daily trips
AG	Attorney General
AIA	Air Impact Assessment
APS	Alternative Planning Strategy
AQAP	Air Quality Attainment Plan
ARB	California Air Resources Board
ATCM	Airborne Toxic Control Measure
BAU	Business-as-Usual
CAA	Federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
CAS	Climate Adaptation Strategy
CAT	Climate Action Team
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CHAPIS	Community Health Air Pollution Information System
CMAQ	Congestion Mitigation and Air Quality
CO	carbon monoxide
CO_2	carbon dioxide

$CO2_e$	carbon dioxide equivalent
COG	Council of Governments
CTC	California Transportation Commission
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
EPA	Environmental Protection Agency
FTIP	Federal Transportation Improvement Program
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GHG	Greenhouse Gas
GWP	Global Warming Potential
HOV	High Occupancy Vehicles
ISR	Indirect Source Review
KCAG	Kings County Association of Governments
LTF	Local Transportation Fund
MACT	Maximum Achievable Control Technology
MPO	Metropolitan Planning Organization
$MMTCO_{2e}$	Million Metric Tons of Carbon Dioxide equivalent
NAAQS	National Ambient Air Quality Standards
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NOA	naturally occurring asbestos
NO_x	oxides of nitrogen
OPR	Governor's Office of Planning and Research
PAH	polycyclic aromatic hydrocarbons
PVC	polyvinyl chloride
PM	particulate matter
ppm	parts per million

RF	radiative forcing
RHNA	Regional Housing Needs Allocation
ROG	reactive organic gases
RTAC	Regional Targets Advisory Committee
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy or Users
SCS	Sustainable Communities Strategy
SIP	State Implementation Plans
SJVAB	San Joaquin Valley Air Basin
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SJVRR	San Joaquin Valley Rail Road
STA	State Transit Assistance Fund
STIP	State Transportation Improvement Program
TAC	toxic air contaminant
TCM	transportation control measure
VOC	volatile organic compounds
VMT	vehicle miles traveled

CHAPTER TWELVE – AIR QUALITY

12.1 Introduction

This report describes the air quality in Corcoran, California and is produced in support of the Air Quality Element of the City of Corcoran General Plan. Corcoran, located in Kings County, is within the San Joaquin Valley Air Basin (SJVAB) (Exhibit 12-1) and is bordered by Fresno, Tulare, Monterey, San Luis Obispo , and Kern counties (Exhibit 12-2). Air quality affects many important aspects of everyday life. Poor air quality is detrimental to our health, environment, economy, and well-being. Securing and preserving healthy air quality is a priority of federal, state, and local agencies. In recognition that the San Joaquin Valley has a serious air pollution problem that will take the cooperation of land use and transportation planning agencies, transit operators, the development community, the San Joaquin Valley Air Pollution Control District (SJVUAPCD) and the public to solve, the California Legislature in 2003, passed Assembly Bill 170 (AB170). AB 170 requires all cities and counties in the San Joaquin Valley, as the ultimate land use authorities, to include an air quality element or address air quality in other elements of their general plans. The legislation requires the general plan to provide air quality data and analysis, goals, policies, and objectives, and feasible implementation strategies to improve air quality.

This report also provides information regarding Corcoran's contribution of greenhouse gases that contribute to global climate change. With the passage of Assembly Bill 32 (AB 32) the Global Warming Solution Act of 2006, local governments throughout California are now implementing actions to address greenhouse gas emissions. Many of the actions that help reduce emissions harmful to health such as ozone and particulate matter also reduce green house gas emissions. The Air Quality Element and this Air Quality Report provide a venue for addressing both problems in a single location in a coordinated manner. Supplementing AB 32 was the enactment of SB 375 that requires a process to set regional GHG emissions reduction targets for 2020 for each region of California.

The report is intended to comply with the information requirements of AB 170 and to provide decision makers and the public with Corcoran specific air quality information and data that will provide a context for the policies and implementation strategies being pursued in the Air Quality Element. AB 170 requires the following information to support the Air Quality Element:

- Local air quality conditions
- Attainment status
- Applicable state and federal air quality plans and transportation plans
- Air quality monitoring data
- Emissions inventories
- Lists of significant pollution sources categories

- A summary of local, Air District, state, and federal policies, programs, and regulations that improve air quality in the City.

Given the serious impacts of poor air quality in the San Joaquin Valley, Corcoran is committed to doing its part to accelerate progress toward achieving clean air. The Air Quality Element fulfills a number of objectives toward this end. Most importantly, the Air Quality Element will ensure that growth occurs in ways that protect and enhance the health of City residents. Secondly, the Air Quality Element ensures that Corcoran complies with state regulation requiring air quality elements. Finally, the Air Quality Element creates an air quality strategy that promotes a land use pattern and transportation system that provides a healthy living environment and increased opportunities for residents to engage in lifestyle changes that are beneficial to air quality.

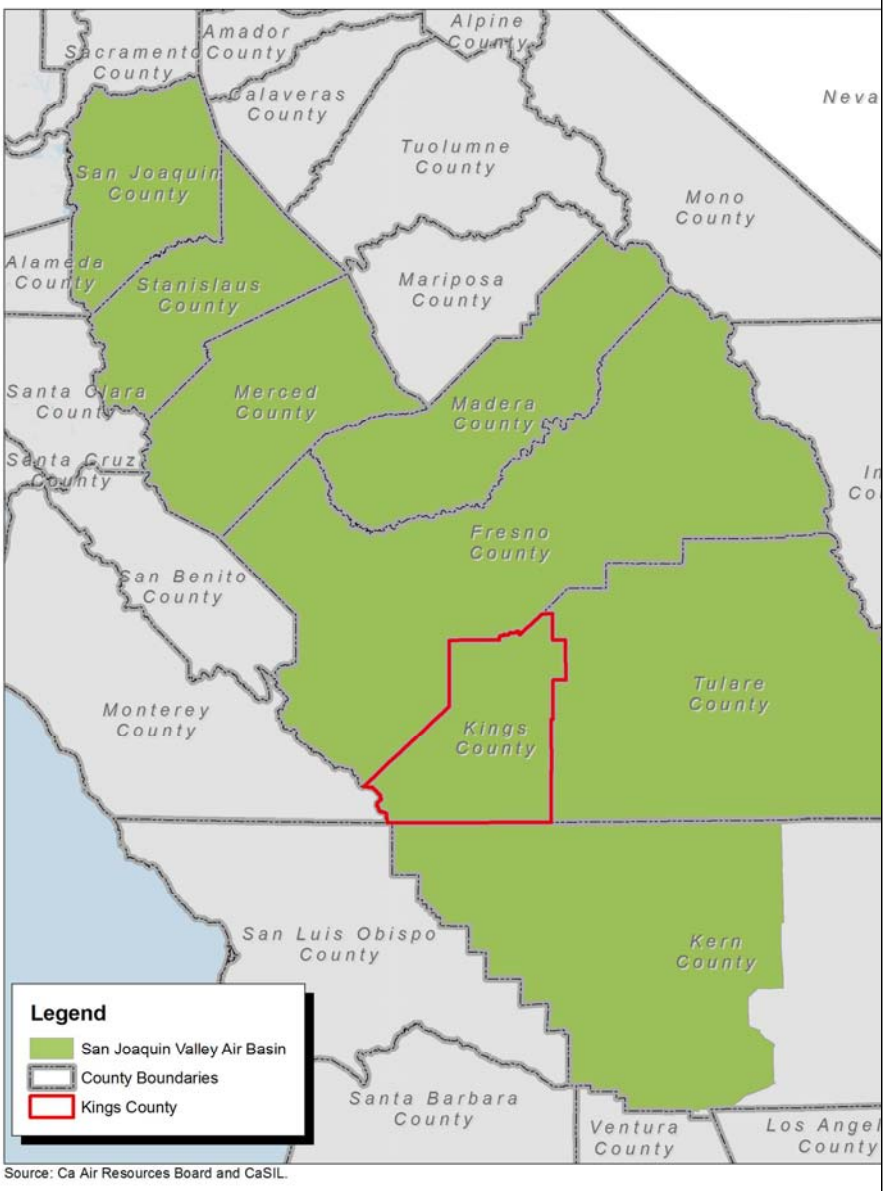


Exhibit 12-1
San Joaquin Valley Air Basin

Source: Ca Air Resources Board and CaSIL.

Exhibit 12-2
Kings County Air Monitoring Stations

12.2 Regulatory Background

Air pollutants are regulated at the national, state, air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (EPA) regulates air quality at the national level. The California Air Resources Board (CARB) regulates at the state level and the SJVUAPCD regulates at the air basin level. EPA, CARB, and the SJVUAPCD work collaboratively with Kings County Association of Governments (KCAG) for transportation related air quality regulations affecting Kings County and its communities.

12.2.1 – Federal and State Programs

The EPA handles global, international, national, and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIP), provides research and guidance in air pollution programs, and sets National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified resulting from provisions of the Clean Air Act of 1970 (CAA). The six criteria pollutants are:

- Ozone
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Nitrogen dioxide
- Carbon monoxide (CO)
- Lead
- Sulfur dioxide

The primary NAAQS were set to protect public health, including that of sensitive individuals; thus the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants. There are also secondary NAAQS to prevent environmental and property damage. The American Lung Association provides estimates of populations at-risk from exposure to air pollutants in each County in their annual State of the Air report. Table 12-1 provides data for Kings County. Health effects of air pollutants are described in Section 12.3.

Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	CV Disease	Diabetes
149,875	40,715	11,487	3,833	8,930	4,349	1,308	32,288	7,759

Notes:
CV = Cardiovascular
Source: American Lung Association, State of the Air 2010

12.2.1.1 – Air Quality Standards

The SIP for the State of California is administered by the CARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. A SIP is prepared by each state describing existing air quality conditions and measures that will be

followed to attain and maintain NAAQS. The SIP incorporates individual federal attainment plans for regional air districts. Federal attainment plans prepared by each air district and transmitted to the CARB to be approved and incorporated in the California SIP. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

The CARB also administers California Ambient Air Quality Standards (CAAQS) for the 10 air pollutants designated in the California Clean Air Act (CCAA). The 10 state air pollutants are the six criteria pollutants listed above as well as visibility reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The federal and state ambient air quality standards are listed in Table 12-2.

Table 12-2: Ambient Air Quality Standards

Air Pollutant	Average Time	California Standard	National Standard
Ozone (O_3)	1 Hour	0.09 ppm	---
	8 Hour	0.070 ppm	0.075 ppm
Carbon Monoxide (CO)	1 Hour	20 ppm	35 ppm
	8 Hour	9.0 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm	---
	Mean	0.030 ppm	0.053 ppm
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm	---
	24 Hour	0.04 ppm	0.14 ppm
	Mean	---	0.030 ppm
Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	150 µg/m^3
	Mean	20 µg/m^3	---
Particulate Matter ($PM_{2.5}$)	24 Hour	---	35 µg/m^3
	Mean	12 µg/m^3	15 µg/m^3
Sulfates	24 Hour	25 µg/m^3	---
Lead[1]	30-day	1.5 µg/m^3	---
	Quarter	---	1.5 µg/m^3

Abbreviations:
ppm = parts per million (concentration) µg/m^3 = micrograms per cubic meter

Mean = Annual Arithmetic Mean 30-day = 30-day average Quarter – Calendar quarter

Notes:
[1] EPA recently revised the federal lead standard. However, the current standard will be retained until final designations for the new standard are in effect, expected to occur by 2012.
Source: CARB 2010a

Attaining these health-based standards would help avoid substantial economic costs. In "the Health and Related Economic Benefits of Attaining Healthful Air in the San Joaquin Valley, "researchers Jane V. Hall, Victor Brajer, and Frederick Lurmann report that the economic benefits of meeting the federal standards for both PM 2.5 and ozone in the valley could save an average of nearly $1,000 per person per year valley-wide for a total of more than $3 billion annually (2005 dollars). They report that attaining both standards may result in fewer premature deaths, fewer asthma attacks, fewer cases of bronchitis, and few hospital admissions.

Recent Air Quality Standard Actions

In 2006, EPA changed the 24-hour $PM_{2.5}$ standard from 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$ and retained the existing annual standard of 15.0 $\mu g/m^3$. The EPA promulgated a new 8-hour standard for ozone of 0.75 ppm on March 12, 2008, effective March 27, 2008. In February 2007, the CARB established a new annual average nitrogen dioxide standard of 0.030 parts per million (ppm) and lowered the 1-hour nitrogen dioxide standard to 0.18 ppm. These changes became effective March 20, 2008. On October 15, 2008, the EPA reduced the federal lead standard from 1.5 $\mu g/m^3$ to 0.15 $\mu g/m^3$. In addition, EPA revised the averaging time and form of the lead standard. The EPA will retain the existing 1978 lead standard until 1 year after designations for the new 2008 standard. The CARB is required to make recommendations for areas to be designated attainment, nonattainment, or unclassifiable by October 2009. Final designations will be effective no later than 2012.

Climate Change

Federal

The EPA currently does not regulate greenhouse gas emissions from motor vehicles. *Massachusetts v. EPA* (Supreme Court Case 05-1120) was argued before the United States Supreme Court on November 29, 2006, in which it was petitioned that EPA regulate four greenhouse gases, including carbon dioxide, under Section 202(a)(1) of the Clean Air Act. A decision occurred on April 2, 2007, in which the Court held that petitioners have a standing to challenge the EPA and that the EPA has statutory authority to regulate emissions of greenhouse gases from new motor vehicles. The new Administration has strongly indicated its intention to pass legislation to implement the reduction of CO_2.

State

There has been significant regulatory activity regarding global climate change and greenhouse gases in California. Governor Schwarzenegger gave Executive Order S 3-05, which places greenhouse gas targets for the state. The Secretary of the California Environmental Protection Agency (Cal EPA) assembled a Climate Action Team (CAT) to recommend strategies to ensure those targets are met. Assembly Bill 32 (AB 32) charged CARB to develop regulations to cut greenhouse gas emissions from the state. The Office of Planning and Research (OPR) has issued technical advisories for climate change to be analyzed in the California Environmental Quality Act (CEQA) process. Senate Bill 97 obligates OPR to make guidelines for greenhouse gas mitigation. More information on climate change programs is provided in Section 12.2.5.10 -

Climate Change. In addition to California's statewide initiatives on Climate Change, the Western Climate Initiative, launched in February 2007 as a collaboration of seven U.S. governors and four Canadian Premiers was created to identify, evaluate, and implement collective and cooperative ways to reduce greenhouse gases in the region, focusing on a market-based cap-and-trade system. On January 10, 2008, the California Transportation Commission (CTC) adopted guidelines to assist Metropolitan Planning Organizations (MPOs) in addressing new climate change requirements in Regional Transportation Plans (RTPs) as a result of passage of the Global Warming Solutions Act (AB32) and Executive Order S-3-05. Finally, a major player in the implementation of AB 32 at the local level has become the State Attorney General's Office. In 2007-2008, the Attorney General (AG) reviewed many city and county plans to determine if they included measures to address AB 32. Several areas in the San Joaquin Valley, including Kern, Merced, San Joaquin, and Fresno counties, received critical letters from the AG noting that they had recently revised their General and/or Regional Transportation Plans without addressing specific measures to limit the increase in GHGs. To assist local governments in responding to his concerns, the AG identified an extensive list of measures to consider. See: http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf. Included in this document are various measures that may reduce the global warming related impacts of a project. As appropriate, the measures can be included as design features of a project, required as changes to the project, or imposed as mitigation (whether undertaken directly by the project proponent or funded by mitigation fees).

12.2.2 – San Joaquin Valley Air Pollution Control District

The local air pollution control agency for the SJVAB is the SJVUAPCD. The SJVUAPCD is responsible for controlling emissions primarily from stationary sources and certain area wide sources. The SJVUAPCD maintains air quality monitoring stations throughout the basin. The SJVUAPCD, in coordination with the eight countywide transportation agencies, is also responsible for developing, updating, and implementing the Air Quality Attainment Plans (AQAPs) for the SJVAB. In addition, the SJVUAPCD has prepared the Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI), which sets forth recommended thresholds of significance, analysis methodologies, and provides guidance on mitigating significant impacts (SJVUAPCD 2002). Under AB 170, the SJVUAPCD is responsible for reviewing Air Quality Elements and associated air quality reports for adequacy.

12.2.2.1 - Attainment Status

Three terms are used to describe if an air basin is exceeding or meeting federal and state standards: Attainment, Nonattainment, and Unclassified. Air basins are assessed for each air pollutant and receive a designation for the pollutant based on that assessment. Each standard has a different definition, or "form" of what constitutes attainment, based on specific air quality statistics. For example, the new federal 8-hour Ozone standard of 0.075 ppm is not to be exceeded more than once per year; therefore, an area is in attainment of the ozone standard if no more than one 8-hour period the ambient air monitoring value during the year exceeds that threshold. The federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to standard. Some pollutants have more than one averaging time. For example, California currently has a 1-hour and an 8-hour ozone standard. In addition to the "attainment" status, areas are also classified by the degree they exceed the standard. For ozone, there are five classification levels under the CAA. They range for just over the standard (marginal) to the level of greatest Exceedance (extreme).

Areas are designated attainment or nonattainment on a per pollutant basis. If an air basin exceeds the "form" of a federal or state standard, the air basin is designated as "nonattainment" for that air pollutant. An air basin is designated as "attainment" for pollutant where the standards are met. If there is inadequate or inconclusive data to make a definitive attainment designation for an air quality standard, the air basin is considered "unclassified." Note that when there are multiple standards for an air pollutant, an area must attain both standards to be designated attainment for the pollutant. It is important to note that any monitoring station that is in violation of one of the standards will result in the entire air basin being designated nonattainment for that pollutant. This means that City of Corcoran may be considered nonattainment even if no exceedances of standards occurred there. Currently, Corcoran would be designated nonattainment for ozone and particulate matter based on its own exceedances; however, in the future, areas of the air basin with worse air quality could result in retention of a nonattainment designation even though Corcoran meets the standards. The current attainment designations for the SJVAB are shown in Table 3, below.

The SJVAB is designated nonattainment of state and federal health based air quality standards for ozone and respirable particulate matter with aerodynamic diameter of 2.5 micrograms or less ($PM_{2.5}$). Under the federal classification scheme, the SJVAB is classified serious nonattainment for the 8-hour ozone standard.

State ozone standards do not have an attainment deadline but require implementation of all feasible measures to achieve attainment at the earliest date possible. State PM_{10} standards have no attainment planning requirements, but air districts must demonstrate that all measures feasible for the area have been adopted.

Table 12-3: Attainment Status

Pollutant	Designation	
	Federal	State
Ozone	Non attainment/Serious	Nonattainment
PM10	Attainment	Nonattainment
PM 2.5	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standards	Unclassified
Sulfates		Attainment
Visibility Reducing Particles		Unclassified

Vinyl Chloride		Attainment
Source: SJVUAPCD 2010		

12.2.2.2 - Air Quality Plans

Federal Air Quality Attainment Plans

To meet CAA requirements for 1-hour ozone and PM_{10}, the SJVUAPCD adopted an Extreme Ozone Attainment Demonstration Plan (2004) and a PM_{10} attainment demonstration plan (Amended 2003 PM_{10} Plan and 2006 PM_{10} Plan), which have 2010 attainment dates. However, the federal 1-hour ozone standard was revoked by EPA and replaced with an 8-hour standard. The planning requirements for the 1-hour plan remain in effect until replaced by a federal 8-hour ozone attainment plan.

The SJVAB is classified as serious nonattainment for the federal 8-hour ozone standard with an attainment date of 2013. On April 30, 2007, the SJVUAPCD's Governing Board adopted the 2007 Ozone Plan, which contained analysis showing a 2013 attainment target to be unfeasible. The 2007 Ozone Plan details the plan for achieving attainment on schedule with an "extreme non-attainment" deadline of 2026. At adoption of the 2007 Ozone Plan, the SJVUAPCD also requested a reclassification to extreme non-attainment. The CARB approved the 2007 Ozone Plan in June 2007, and transmitted the plan to the EPA November 16, 2007. On October 7, 2008, EPA proposed to approve the San Joaquin Valley's 2004 Extreme Ozone Attainment Plan, though final action has not yet occurred.

For PM_{10}, the SJVAB air monitors showed that the SJVAB had not exceeded the 24-hour federal PM_{10} standard from 2003 to 2005 (a 3-year period). The SJVUAPCD submitted a request to be designated attainment for the federal PM_{10} standard. The SJVUAPCD adopted the 2007 PM_{10} Maintenance Plan and Request for Redesignation (2007 PM_{10} Plan) on September 20, 2007. The 2007 PM_{10} Plan contains modeling demonstrations that show the SJVAB will not exceed the federal PM_{10} standard for 10 years after the expected EPA redesignation, monitoring and verification measures, and a contingency plan. Even though EPA revoked the federal annual PM_{10} standard, the 2007 PM_{10} Maintenance Plan addresses both the annual and 24-hour standards because both standards were included in the EPA-approved SIP. On September 25, 2008, the EPA redesignated the SJVAB as attainment for the federal PM_{10} standards, and approved the SJVUAPCD's PM_{10} Maintenance Plan. The redesignation and approved motor vehicle emission budget for conformity purposes formally occurred on November 12, 2008.

The SJVAB is also designated nonattainment for the new federal $PM_{2.5}$ (particulate matter less than 2.5 micrometers in diameter) annual standard. The SJVUAPCD adopted the 2008 $PM_{2.5}$ Plan in April 2008. Measures contained in the 2003 PM_{10} Plan will also help reduce $PM_{2.5}$ levels and will provide progress toward attainment.

State Air Quality Attainment Plans

The CCAA does not contain planning requirements for areas in nonattainment of the State PM_{10} standards, but air districts must demonstrate to the CARB that all feasible measures for their district have been adopted.

However, State ozone standards do have planning requirements. The CCAA requires air districts that are nonattainment of the State ozone standards to adopt air quality attainment plans and to review and revise their plans to address deficiencies in interim measures of progress once every 3 years.

The 2004 revisions to the Carbon Monoxide Maintenance Plan is the latest plan for carbon monoxide. The plan will maintain healthy levels of CO in the state air as it was redesignated to attainment status for the Kings County area in 1996.

Ozone Plans

As noted earlier, the 2004 Extreme Ozone \Plan for 1 Hour Ozone was submitted to the EPA and was proposed to be approved on October 16, 2008. The CARB and the SJVUAPCD had the responsibility of submitting the plan, despite the EPA revoking the 1-hour ozone standard in 2005. This plan will help SJVUAPCD achieve the 8-hour National Ambient Air Quality Standard.

The 8-Hour Ozone Plan was adopted by the SJVUAPCD governing board in April of 2007 and was submitted to the EPA by June of the same year. This plan was designed with a "dual path" strategy to achieve attainment status.

PM Plans

The 2007 PM_{10} Maintenance and Request for Redesignation Plan was adopted by the SJVUAPCD, CARB and, since November 12, 2008, the EPA. The plan's designed to keep PM_{10} emissions low and maintain the area's new designation as "attainment."

The 2008 $PM_{2.5}$ Plan was adopted on April 30, 2008. This plan includes measures to control the emissions of $PM_{2.5}$ to ensure the attainment of $PM_{2.5}$ to the 1997 and 2006 federal standards, and the state standard as soon as possible.

12.2.3 – Kings County Association of Governments

The Kings County Association of Governments (KCAG) is a Council of Governments with the responsibility to address public policy matters, which span across multiple jurisdictions. The volunteer members of the KCAG are the cities of Avenal, Corcoran, Hanford and Lemoore and the County of Kings. KCAG is also a state-designated regional transportation planning agency (RTPA) recognized by the State's Business, Transportation, and Housing Agency. The RTPA is responsible for administering the Regional Transportation Plan (RTP), preparing a Regional Transportation Improvement Program (RTIP), the Federal Transportation Improvement Program (FTIP), reviewing the State Transportation Improvement Program (STIP) and other state transportation programs, monitoring local public transit operations, overseeing federal transportation grant proposals, and administering the Local Transportation Fund (LTF) and State Transit Assistance (STA) funds. KCAG provides transportation control measures, adapted by its member agencies, to the SJVUAPCD for inclusion in the SIP.

Other objectives of the KCAG are to facilitate planning on a regional scale with an emphasis on transportation, finding and researching problems in urban growth and considering common concerns of its constituent agencies. KCAG aims to provide the framework for its members to tackle the issues which the members have in common but which the members could not otherwise handle individually.

12.2.3.1 - Blueprint Planning Process

The San Joaquin Valley Blueprint Process is modeled after a highly successful "blueprint" for future growth that was developed and is now being implemented in the Sacramento Region. It will develop a cohesive regional framework that defines and offers alternative solutions to growth related issues for the Valley. The process involves the integration of transportation, housing, land

use, economic development, and the environment to produce a preferred growth scenario to the year 2050.

The final product will include growth strategies at the County level and for the San Joaquin Valley as a whole. The outcomes of the planning process will not supersede a local jurisdiction's land use authority, but will provide tools for local agencies' smart growth efforts. Elected officials throughout the valley will determine how their jurisdiction will implement the principles developed during the SJV Blueprint Process. Since its inception, the goal of the Blueprint has been to have elected officials, representatives from various interest groups and the public at large be fully engaged during all stages of the planning process.

The KCAG has provided a forum for residents and stakeholders to provide input on how Kings County should grow. Five different growth scenarios were developed with the help of KCAG. Each plan provided an idea of how Kings County and its communities could look in 2050. These growth scenarios were the focus of five public workshops held in May of 2008. The preferred scenario was that of focusing future growth in Kings County along transportation corridors, and preserving agricultural and environmentally-sensitive lands. Through the refinement of these efforts, KCAG defined "Blueprint Urban Growth Boundaries" for each city and unincorporated community within the county. The boundaries have been outlined to tailor growth according to existing and potential outward growth needs of the County's four Cities (Avenal, Corcoran, Hanford, and Lemoore) and four unincorporated communities (Armona, Home Garden, Kettleman City, and Stratford). Environmental constraints were a critical component in determining future urban growth areas beyond existing land use plans and sphere of influence boundaries. The Blueprint Urban Growth Boundaries allow future growth to be concentrated around existing urban areas, and an analysis of urban land uses within the County illustrate that Corcoran has enough land designated to accommodate the growth expected by 2050. The Preferred Growth Scenario was approved by the KCAG Commission in July 2008. The results of these workshops were provided to the overall SJV Blueprint process.

A major public workshop on January 26, 2009 elicited 600 participants and a draft recommendation for the final plan. The majority of the participants favored more dense settlement patterns. The next steps will be approval by each county before final adoption. The Blueprint was completed in 2009.

12.2.3.2 - Regional Bike Plan

KCAG has adopted the 2005 Kings County Regional Bicycle Plan to promote and facilitate bike transportation. KCAG and its constituents have made regional bike transportation and safety a priority for the future, for the sake of children, commuters, and recreational cyclists. The region will also have an air quality benefit from the use of non-motorized transportation. The 2005 Kings County Regional Plan outlines goals and policies, infrastructure improvements, public input, and funding for bicycle transportation related improvements. Among the plans are city, intercity, and inter-county connection improvements.

12.2.3.3 - Regional Transportation Plan

KCAG, the authority for regional transportation, has adopted the 2007 Regional Transportation Plan (RTP). Within the RTP, the KCAG has incorporated Transportation Control Measures (TCMs) which directly apply to the air quality through reductions in personal vehicle emissions. Included within the TCMs are measures that increase public transportation, ridesharing, bicycle riding and the use of alternative fuels, park and ride lots and light rail transportation systems. Selected TCMs are provided to the SJVUAPCD for inclusion in the SIP updates, and the

implementation of these TCMs are reported to the SJVUAPCD for SIP tracking. Chapter 10 of the RTP lists the TCMs in detail.

12.2.3.4 - Transportation Conformity

KCAG is responsible for ensuring that transportation plans and projects comply with the Federal Transportation Conformity regulation. Under the Clean Air Act, areas that have not attained one or more of the six National Ambient Air Quality Standards must develop State Implementation Plans (SIPs) demonstrating how they will attain the standards and, once they have attained them, how they will maintain air quality. The Act requires that, in these areas, federal agencies not engage in, approve, permit, or provide financial support for activities that do not "conform" to the area's SIP.

Transportation planning and ultimately highway funding is most commonly affected by Transportation Conformity. Before a new transportation plan can be approved or a new project can receive federal funding in a nonattainment area, a regional emissions analysis must demonstrate that the projected emissions are consistent with the emissions ceiling established by the SIP. The process obligates the federal government to support rather than undermine the legally adopted state plans for achieving air quality targets (CRS 2004).

12.2.4 – Corcoran

Corcoran is the land use authority for all incorporated lands within its borders. Corcoran is required by the state to develop long term comprehensive planning for these lands. To satisfy this requirement Corcoran originally adopted the Corcoran General Plan. Within the General Plan, there are requirements for planned projects, which specifically address air quality. There are multiple components of the City's planning and development process that affect air quality generation by development in the City, including (but not limited to): the actions by the Planning Department, Public Works Department, Planning Commission, and City Council. In addition, the City promulgates and enacts standards and ordinances that regulate land use and operational activities within the City.

12.2.5 – Regulations and Programs

This section describes regulations and programs, which are applicable to air pollution sources within Corcoran. The regulations presented here are a snapshot of the applicable regulations and may not represent every air pollution regulation to which sources of air pollution within Corcoran may be subject. Programs described here may be formally adopted by government bodies or may be informal in nature.

12.2.5.1 - New and Modified Source Review

All new sources of air pollution within Corcoran are subject to applicable rules for new and modified sources set by the federal and state governments and the SJVUAPCD. SJVUAPCD Rule 2201 outlines the process by which new and modified stationary sources are reviewed and permitted. Rule 2201 is applicable to all new sources and modification to sources, of state and federal criteria pollutants above the applicability thresholds. Stationary sources of air pollutants that are categorized as 'major sources', as defined by the rule, are subject to Title V federal permitting requirements and are considered federally enforceable. Rule 2201 contains emission thresholds that, if exceeded, require the applicant to provide offsets.

12.2.5.2 - Toxic Air Contaminants/Hazardous Air Pollutants

Toxic Air Contaminants (TAC) are chemicals that have the potential to cause adverse health effects, such as cancer, birth defects, and organ damage. TAC are regulated at the federal, state, and regional (SJVUAPCD), levels. At the federal level the Clean Air Act (CAA) and the Federal Toxics Rules – National Emissions Standards for Hazardous Air Pollutants (NESHAP) Maximum Achievable Control Technology (MACT) Standards regulate toxics. At the state level the California Air Toxic Contaminant Act (AB 1807), the Airborne Toxic Control Measures promulgated by the CARB, and the California Air Toxic "Hot Spot" Program (AB 2588) regulate and monitor TAC emissions. The SJVUAPCD also has Rules in place to regulate toxics. The SJVUAPCD rules that apply to toxics are:

- Rule 7011 Chromium Plating and Chromic Acid Anodizing Facilities-Chrome ATCM
- Rule 7012 Hexavalent Chromium-Cooling Towers
- Rule 7021 Ethylene Oxide-Sterilizers and Aerators
- Rule 7031 Dioxin-Medical Waste Incinerators
- Rule 7041 Fluorides-Phosphoric Acid Plants
- Rule 7050 Asbestos-Containing Material for Surface Applications
- Rule 7060 Toxic Metals from Non-Ferrous Metal Melting
- Rule 7070 Perchloroethylene from Dry Cleaning Operations

CHAPIS Emission Maps

The California Air Resources Board developed the Community Health Air Pollution Information System (CHAPIS), which is an internet-based mapping tool that displays sources of air pollution for local regions. CARB, with help and information from the 35 local air districts, has made these maps of sources of toxic air contaminants available to the public. Understanding the location of toxic emission into the air can give indications about the level of pollution but the health affects of the pollutants are also related to exposure. CHAPIS does not map exposure or health risks, only toxic emissions from stationary sources.

Sensitive Receptors

Certain populations are particularly sensitive to the health impacts of air pollution, such as children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the SJVUAPCD considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools.

CARB's Land Use Handbook

The CARB in April 2005 the Air Quality and Land Use Handbook: A Community Health Perspective (Land Use Handbook). The Land Use Handbook provides information and guidance on siting sensitive receptors in relation to sources of air pollution. The sources of air pollution identified in the Land Use Handbook are high traffic freeways and roads, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and large gas dispensing facilities.

Diesel Particulate Matter

The CARB approved a regulatory measure to reduce emissions of toxics and criteria pollutants by limiting idling of heavy-duty diesel vehicles (CARB 2005). The driver of any vehicle subject to this section: (1) shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location; and (2) shall not idle a diesel-fueled auxiliary power system for more than 5 minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle if it has a sleeper berth and the truck is located within 100 feet of a restricted area (homes and schools).

CARB Regulation to Reduce Emissions from In-Use On-Road Diesel Vehicles

The CARB approved the In-Use On-Road Diesel Vehicle Rule on December 12, 2008. The regulation would require fleets to install exhaust retrofits that capture pollutants before they are emitted to the air, and to accelerate vehicle replacements to those with cleaner engines. The regulation does not require any vehicles be replaced before 2012, and it never requires all the vehicles within a fleet to be replaced in a single year. In general, the regulation would require owners to reduce emissions in their fleet by upgrading existing vehicles by using one of three compliance options. The first option would be to install PM retrofits and replace vehicles (or engines) according to a prescribed schedule based on the existing engine model year. The second option would be to retrofit a minimum number of engines each year with a high level PM exhaust retrofit and to replace a minimum number of engines meeting the 2010 new engine standards. Finally, the third option would be to meet a fleet average. With this option, a fleet operator could use PM and NO_x emission factors established by the regulation to calculate the average emissions of the fleet. Then, by the applicable compliance date each year, the owner would have to demonstrate that the fleet average emissions for PM or NO_x did not exceed the PM and NO_x fleet average emission rate targets set by the regulation. For most fleets, the first performance requirements for PM would not begin until January 1, 2011, followed by the NO_x requirements in 2013. For fleets with 3 or fewer affected vehicles, none of the performance requirements would begin January 1, 2013. The regulation would be phased in through January 1, 2023.

Asbestos

SJVUAPCD Rule 4002 – National Environmental Standards for Hazardous Air Pollutants (NESHAPs).The NESHAPs regulation applies primarily to projects involving the demolition of existing structures. If there are asbestos-containing materials (ACM) to be removed from the structures, the removal may be subject to Rule 4002. The applicant is required to determine if the structures are considered 'regulated facilities' under NESHAP by contacting the SJVUAPCD. If there are regulated facilities to be demolished, the facilities must be inspected to determine if any ACM is present. If ACM is present, the project must follow the SJVUAPCD requirements, and potentially, Cal-OSHA and Cal-EPA regulations.

Rock formations containing Naturally Occurring Asbestos (NOA) are known to be present in southwestern Kings County. In July 2001, the CARB approved an Air Toxic Control Measure for construction, grading, quarrying and surface mining operations to minimize Naturally Occurring Asbestos (NOA) emissions. The regulation requires application of best management practices to control fugitive dust in areas known to have NOA, as well as requiring notification to the local air district prior to commencement of ground-disturbing activities.

Valley Fever

Valley Fever, or *coccidioidomycosis*, is a pulmonary infection of human and other mammals caused by inhalation of the spores of the fungus *Coccidioides immitis,* which grows in the soil of the Southwestern United States. The fungus is very prevalent in the soils of California's San Joaquin Valley including Kings County. Transmission of Valley Fever occurs mostly through naturally occurring winds, as well as dust storms blowing "infected" dust (dust containing Valley Fever fungus spores) from the surrounding foothills into cities. *Coccidioides immitis* is most prevalent in undisturbed soils. Since Kings County is preponderantly disturbed agricultural land, the risk of infection due to developments on agricultural land is considered low. Identification of spores in the soil is very difficult. Most research to identify areas with Valley Fever spores rely on identifying suitable habitat conducive the life cycle of the organism. Portions of western Kings County are thought to contain such habitat. The Kings County Public Health Laboratory provides specialized diagnostics and testing for Valley Fever.

12.2.5.3 - Odor

While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the SJVUAPCD. Odor impacts on residential areas and other sensitive receptors such as hospitals, day-care centers, and schools warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas. Common odor sources include sewage treatment plants, rendering plants, food processing facilities, chemical plants, and dairies. The public is protected from frequent exposure to objectionable odors by SJVUAPCD Rule 4102 - Nuisance. The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials. Rule 4102 is enforced on a complaint basis. SJVUAPCD Compliance staff investigates complaints and can cite businesses creating objectionable odors; however, agricultural operations are exempt from Rule 4102.

12.2.5.4 - Fugitive Dust

Fugitive dust is a type of nonpoint source air pollution - small airborne particles that do not originate from a specific point such as a gravel quarry or grain mill. Fugitive dust originates in small quantities over large areas. Significant sources include unpaved roads, agricultural cropland, and construction sites. A small amount of fugitive dust occurs naturally. Wind erosion occurs continuously, especially in arid, open areas with sparse vegetation. Human activity coupled with unfavorable weather conditions can dramatically increase fugitive dust levels. Improved agricultural practices and increased paving of rural roads have resulted in a decrease in the total amount of fugitive dust. To limit the occurrence of fugitive dust emissions from human activities the SJVUAPCD has enacted Regulation VIII Fugitive Dust Prohibitions.

• SJVUAPCD Regulation VIII – Fugitive PM10 Prohibitions. Rule 8011-8081 are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and trackout, etc. Among the Regulation VIII Rules applicable to the project are the following:

- Rule 8021 – Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities. The purpose of this rule is to limit fugitive dust emissions from earthmoving activities through a combination of opacity limits, equipment and activity prohibitions, and dust-suppressing requirements.
- Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas. The purpose of this rule is to limit dust emissions from travel on unpaved parking areas. If the project exceeds the applicability threshold of 25 daily vehicle trips by vehicles with three or more axles, control requirements listed in the rule must be met.

12.2.5.5 - Agricultural Sources

Agricultural activities are also sources of air contaminants. The pollutants from agricultural activities include smoke byproducts, fugitive dust, and volatile organic compounds. Examples of agricultural activities that create these pollutants are agricultural burning, excessive exposed soil on agricultural sites, and the use of animal biosolids. This industry has been recently regulated by the SJVUAPCD. The agricultural industry is now subject to the following SJVUAPCD rules:

• SJVUAPCD Rule 4103 – Open Burning. The purpose of this rule is to regulate the burning of agricultural waste to minimize or eliminate the impact of agricultural burning on the SJVAB. Per Rule 4103 Section 5.5.10, open burning of any agricultural matter resulting from the conversion of the land to non-agricultural uses is prohibited.

- SJVUAPCD Rule 4550 – Conservation Management Practices (CMP). The purpose of this rule is to regulate the fugitive dust from agricultural operation sites. The SJVUAPCD has published a list of CMPs to practice at the agricultural operations site. This regulation requires agricultural operation sites to implement applicable CMPs from the list.
- SJVUAPCD Rule 4565 – Biosolids, Animal Manure, and Poultry Litter Operations. The purpose of this rule is to limit the Volatile Organic Compounds (VOC) emissions from biosolids, animal manure and poultry operations
- SJAPCD Rule 4570 – Confined Animal Facilities. The purpose of this rule is to limit the VOC emissions from confined animal facilities.

12.2.5.6 - Transportation Conformity

Under the Federal Clean Air Act (CAA) transportation authorities are required to demonstrate and ensure that air pollution emissions from transportation sources are consistent with air quality goals outlined in a state's air quality plan for meeting the federal air quality standards. Conformity is determined by comparing the most recent, EPA-approved mobile source emission budget in the SIP with the emission impact of the proposed project. If the project's emission conform" to the approved SIP budget, then it can meet the transportation conformity mandate in the CAA. In January 2009, EPA revised its transportation conformity guidance – see http://www.epa.gov/otaq/stateresources/transconf/policy/420b09001.pdf .

Federal funding and approval is given only to transportation activities that conform to a state's air quality goals found in the SIP. The KCAG as the regional authority for transportation is responsible for ensuring transportation plans, programs and projects conform to California's SIP. Each new transportation analysis must use the most recent planning assumptions as prescribed by the Federal Highway Administration (FHWA) to ensure transportation plans develop emission calculations to the state of current understanding.

12.2.5.7 - Indirect Sources

The EPA defines indirect sources as any facility or building, property, road, or parking area that attracts motor vehicle traffic and, indirectly, causes pollution. Development projects that cause an increase in vehicle trips and miles traveled are indirect sources. State and federal regulations authorize air districts with severe air quality problems to implement indirect source programs. In California, most local agencies require analysis of emissions from development projects and mitigation measures to reduce the indirect impacts through the California Environmental Quality Act (CEQA) review. SB 709 by Senator Florez, enacted in 2003, contains a special mandate for the SJVUAPCD to develop and implement an Indirect Source Review (ISR) program. In December 2005, the SJVUAPCD adopted Rule 9510 to implement the SB 709 ISR mandate and an indirect source control measure contained in the SJVUAPCD 2003 PM10 Plan. Additionally, it adopted Rule 3180 to provide for administrative fees to pay for the operation of the program... CEQA air quality considerations and indirect source programs are described in the next several sections.

12.2.5.8 - CEQA Review

In California, the ultimate guidance on the review of new development and land use activities is the CEQA. CEQA laid down a process in which to evaluate activities which may pose a threat to the environment including air quality and climate change. The CEQA Guidelines provide guidance for Lead Agencies in implementing CEQA. The Guidelines include an environmental checklist that provides a series of questions, including those regarding air quality impacts that help Lead Agencies determine if a project has significant environmental impacts. CEQA requires all projects subject to a discretionary approval to go through the CEQA process and provides

statutory and categorical exemptions from CEQA for certain projects. If a development is found to have significant impact on air quality those impacts must be mitigated to the fullest extent feasible. Should a project still have significant impacts after mitigation, it is up to the lead agency, to approve the project and adopt a Statement of Overriding Considerations or to deny the project.

The SJVUAPCD adopted and maintains the GAMAQI to provide guidance to local agencies in addressing air quality impacts in CEQA documents for projects within the San Joaquin Valley Air Basin. The GAMAQI provides guidance on air quality analysis and modeling of air quality impacts, thresholds for determining significant impacts, and mitigation measures and strategies to reduce air quality impacts.

12.2.5.9 - SJVUAPCD

In addition to the CEQA review process; there are also other air quality regulations that limit the effects of activities associated with development. The following SJVUAPCD rules and regulations apply to construction and development projects within Kings County and Corcoran.

. • SJVUAPCD Rule 4601 – Architectural Coatings. The purpose of this rule is to limit VOC emissions from architectural coatings. Emissions are reduced by limits on VOC content and providing requirements on coatings storage, cleanup, and labeling.
- SJVUAPCD Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations. The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations.
- SJVUAPCD Rule 4901 – Wood Burning Fireplaces and Wood Burning Heaters. This rule regulates the emissions produced from wood burning.
- SJVUAPCD Rule 9510 – Indirect Source Review (ISR). This rule reduces the oxides of Nitrogen (NO_x) and PM_{10} emissions from growth and new development on the SJVAB. The rule places application and emission reduction requirements on applicable development projects in order to reduce emissions through on-site mitigation, off-site SJVUAPCD administered projects, or a combination of the two.

Compliance with Rule 9510 (ISR)

Compliance with the SJVUAPCD Rule 9510 reduces the emissions impact of the project through incorporation of onsite measures as well as payment of an offsite fee that funds emission reduction projects in the SJVAB. The emissions analysis for Rule 9510 is highly detailed and dependant on the exact project design and local attributes that affect travel options. Emission reductions that will be achieved from onsite measures consider the project's density, proximity to transit and frequency of service, sidewalk and pedestrian access, and bicycle infrastructure among other factors. The combination of onsite measures and offsite fees from compliance with Rule 9510 will achieve the following percentage reductions:

Construction Exhaust:	20 percent of the total NO_x emissions, and 45 percent of the total PM_{10} emissions.
Operational Emissions:	33 percent of NO_x emissions over the first 10 years, and 50 percent of the PM_{10} emissions over the first 10 years.

The offsite mitigation fee program affects local jurisdictions as it may provide funding for local projects to offset pollution caused by new development.

12.2.5.10 - Climate Change

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following greenhouse gas emission reduction targets:

1) by 2010, reduce greenhouse gas emissions to 2000 levels;
2) by 2020, reduce greenhouse gas emissions to 1990 levels; and
3) by 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

Climate Action Team

To meet these targets, the Governor directed the Secretary of the California EPA to lead a Climate Action Team (CAT) made up of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the Air Resources Board; the Energy Commission; and the Public Utilities Commission. The CAT's Report to the Governor in 2006 (2006 CAT Report) contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

AB 32

Also in 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006, which charged the CARB to develop regulations on how the state would address global climate change. AB 32 focuses on reducing greenhouse gas (GHG) emissions in California. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, HFCs, PFCs, and SF_6. AB 32 requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020. The CARB is the state agency charged with monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to reduce emissions of greenhouse gases. AB 32 requires that by January 1, 2008, the CARB determine what the statewide greenhouse gas emissions level was in 1990, and it must approve a statewide greenhouse gas emissions limit so it may be applied to the 2020 benchmark. The CARB adopted the 1990 greenhouse gas emission inventory/2020 emissions limit of 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) on December 6, 2007.

The key implementing program for AB 32 is the Scoping Plan, somewhat analogous to the State Implementation Plan under the Federal Clean Air Act. On December 11, the CARB adopted the final Scoping Plan. The adopted Scoping Plan includes proposed GHG reductions from direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. The AB 32 Scoping Plan contains numerous references to the Blueprint planning process as playing an important role in implementing both the Scoping Plan and the closely connected SB 375 regional targets.

Under AB 32, local governments also are asked to play a key, partnership role in implementing the Scoping Plan. It notes that often local government has broad or exclusive authority over GHG contributing activities through planning and permitting processes. Land use planning and urban growth decisions will have very large impacts on future GHG emissions, particularly in the years after 2020 as California has the very challenging goal of reducing GHGs by 80% below 1990 levels. Regional GHG emission targets for transportation will be assigned to each region of the State. In the final Scoping Plan, CARB has adjusted the projected 2020 Regional Transportation-Related Greenhouse Gas Targets from 2 to 5 million metric tons of CO_2 equivalent ($MMTCO_2E$).

SB 375

Senate Bill (SB) 375 –Steinberg was signed by the Governor on September 30, 2008. The legislation addresses implementation of the 2006 Global Warming Act. The bill assures that the decisions about how to achieve greenhouse gas emissions from cars and light trucks will remain in the hands of locally elected officials. SB 375 aligns what could have been three separate planning processes – one for transportation, one for housing, and one for reducing greenhouse gas emissions - into a single process. This will provide more certainty for General Plans and assures better coordination between state agencies.

SB 375 provides relief from CEQA for residential projects that are consistent with the regional plan to achieve greenhouse gas reductions. The bill also amends the housing element law, extending the amount of time that the state must approve most local housing elements from five-to-eight years. It lays a solid foundation for a comprehensive approach to reducing greenhouse gas emissions from the land use and transportation sector. SB 375 harnesses funding and regulatory incentives, without mandates, to align transportation, housing, and land use planning.

Especially important for local government are the Sustainable Communities Strategy (SCS) and the Alternative Planning Scenario (APS) requirements of the legislation. CARB must certify that the SCS will achieve the region's GHG emission reduction targets. Projects outside the approved SCS would not qualify for federal transportation funding. If CARB determines that a region's SCS will not achieve the GHG emission reduction targets, a metropolitan planning organization (MPO) or RTPA must prepare an Alternative Planning Strategy (APS), separate from the RTP, identifying further measures needed to achieve the targets. Although these measures directly impact RTPs prepared by KCAG, the success of the SCS and APS, if needed, hinge on the land use decisions by Kings County and the cities within it.

SB 375 enhances the CARB's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. CARB recently appointed a Regional Targets Advisory Committee (RTAC) under SB 375 that will play a major role in implementing the Scoping Plan by recommending factors and methodologies to CARB to adopt regional GHG emission allocations. The SJV has two representatives on the RTAC. CARB will also work with California's 18 MPOs/RTPAs to align their regional transportation, housing and land-use plans and prepare a "sustainable communities strategy" to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its greenhouse gas reduction targets. Spending less time on the road is the single-most powerful way for California to reduce its carbon footprint.

Additionally, SB 375 provides incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The bill also allows homebuilders to get relief from certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. It will also encourage the development of more alternative transportation options, which will promote healthy lifestyles and reduce traffic congestion.

CARB

Under AB 32, the CARB published its Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California. Discrete early action measures are currently underway were enforceable January 1, 2010. Early action measures are regulatory or non-regulatory and are

currently underway or to be initiated by the CARB in the 2007 to 2012 timeframe. The CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of the 44 early action measures, nine are considered discrete early action measures, as they are regulatory and enforceable by January 1, 2010. The CARB estimates that implementation of all 44 recommendations will result in reductions of at least 42 $MMTCO_2e$ by 2020, representing approximately 25 percent of the 2020 target. Note that the CARB currently defers measures involving General Plans and CEQA.

Under AB 32, the CARB has the primary responsibility for reducing GHG emissions. However, the CAT Report contains strategies that many other California agencies can take. The CAT published a public review draft of Proposed Early Actions to Mitigate Climate Change in California. Most of the strategies were in the 2006 CAT Report or are similar to the 2006 CAT strategies.

CARB adopted a Local Government Operations Protocol in September 2008. It includes a tool to quantify and report GHG emissions inventories for landfills. Other protocols are under development.

California is also exploring the possibility of cap and trade systems for greenhouse gases. The Market Advisory Committee to the CARB published draft recommendations for designing a greenhouse gas cap and trade system for California.

SB 97

SB 97 was passed in August 2007. SB 97 requires that "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption.; (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)"

OPR

The OPR published a technical advisory on CEQA and Climate Change, as required under SB 97, on June 19, 2008. The guidance did not include a suggested threshold, but stated that OPR has asked CARB to "recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of greenhouse gas emissions throughout the state." OPR does recommend that CEQA analyses include the following components:

- Identify greenhouse gas emissions
- Determine Significance
- Mitigate Impacts

OPR now tracks environmental documents that contain greenhouse gas analysis and mitigation measures. The website "www.ceqamap.com" contains the list of documents in electronic form and is maintained by CEQAdocs.com.

In accordance with its charge under Public Resource Code section 21083.05 (added to CEQA by SB 97); the OPR released its "Preliminary Draft CEQA Guideline Amendments for Greenhouse

Gas Emissions" on January 8, 2009. The Draft GHG Guidelines fit within the existing CEQA framework by amending existing Guidelines to reference climate change. The following is a brief summary of the important points of the Draft Guidelines:

• **Significance Determination**. The Draft GHG Guidelines discuss qualitative standards for determining significance, such as the extent to which the project (1) could help or hinder the goals of AB 32, (2) increase fossil fuel consumption, (3) improve energy efficiency, or (4) exceeds any threshold of significance that applies to the project.

• **Quantifying emissions**. The lead agency must make a "good-faith effort" to "describe, calculate or estimate" the amount of GHG emissions associated with the project. The Draft GHG Guidelines recognizes that no established methodologies for quantifying climate change emissions exists, as a consequence, lead agencies have the discretion to choose among methodologies, including choosing between quantifying a project's GHG emissions or taking a more qualitative approach.

• **Conformity to SB 375 or a climate change action plan may offer CEQA relief**. Lead Agencies may determine that climate change impacts of a project conform to a Sustainable Communities Strategy, the new regional plan document mandated by SB 375. Projects found to be in conformance with SB 375, or a climate change action plan, the project may be considered not to have a cumulatively considerable effect. Alternatively, projects consistent with a regional or local plan that adequately addresses GHG emissions may also be exempt from project-level emissions analysis or mitigation.

• **Wide-ranging mitigation measures**. The Draft GHG Guidelines suggest that lead agencies should consider "all feasible means" of mitigating GHG emissions. These measures include green building features and design, sequestering carbon, offsite mitigation, the purchase of offsets, or compliance with a previously approved plan that requires the project to avoid or offset emissions.

• **Forthcoming Thresholds of Significance**. The Draft GHG Guidelines add a new "Greenhouse Gas Emissions" section to CEQA Appendix G. This addition provides that a project would have a significant climate change impact "based on any applicable threshold of significance."

• **Cumulative Impacts**. The Draft GHG Guidelines suggest that the traditional cumulative impacts analysis applies to climate change, although it is unclear how the standard can be achieved. The draft language states that an EIR, "should" evaluate whether the GHG emissions of the project, when viewed in connection with the effects of past, current, and probable future projects, may result in a cumulatively considerable impact to the environment.

California Transportation Commission

On January 10, 2008, the California Transportation Commission (CTC) adopted guidelines to assist Metropolitan Planning Organizations (MPOs) in addressing new climate change requirements in Regional Transportation Plans (RTPs) as a result of passage of the Global Warming Solutions Act (AB32) and Executive Order S-3-05. The revised guidelines were developed during the fall of 2007 by an RTP Guidelines Work Group that included legislative members, MPOs and Regional Transportation Planning Agencies (RTPAs), state and federal agencies, environmental interest groups, building industry, and city and county associations. The

workgroup had three sub-work groups: Climate Change, Smart Growth/Land Use, and Transportation Modeling and Analysis.

The group pointed out the "disconnect" between State and MPO responsibilities for transportation planning, and the prerogative of local governments to address land use planning and zoning. They recommended several statutory changes for the Legislature to consider helping resolve this problem. These include (1) all RTPs adopted after January 1, 2011 to require a GHG reduction strategy and a GHG analysis; and, (2) funding to develop and/or update regional blueprints for local general plans. The guidelines suggest consideration numerous options for the GHG reduction strategy. They generally fall under policy elements, transportation planning and investment strategies, pricing strategies, land use strategies, and performance measures.

Executive Order S-01-07

The Governor enacted executive Order S-01-07 on January 18, 2007. The order mandates that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established by CARB. A draft Low Carbon Fuel Standard regulation was released by CARB in October 2008 and went into effect in January 2010.

Executive Order S-13-08

Executive Order S-13-08, the California Climate Adaptation Strategy (CAS), was enacted by the Governor on November 14, 2008. To prepare for the expected impacts of climate change, California will develop a statewide CAS in coordination with existing efforts targeting GHG mitigation policies. The CAS will synthesize the most up-to-date information on expected climate change impacts to California for policy-makers and resource managers, provide strategies to promote resiliency to these impacts and develop implementation plans for short and long-term actions. The CAS will have six different Climate Adaptation Working Groups that will identify and prioritize climate adaptation strategies. Adaptation promises to offer solutions to climate impacts because of past and current emissions. Consequently, California's efforts to adapt to expected climate change impacts through careful planning and preparation must occur in parallel to ongoing mitigation efforts.

California Air Pollution Control Officers Association White Paper

The California Air Pollution Control Officers Association has released a white paper entitled "CEQA & Climate Change," which discussed three alternative thresholds, including a no significance threshold, a zero increase threshold, and a non-zero threshold, as well as multiple analysis options. The white paper is a resource guide developed to support local governments, and details tools for greenhouse gas assessment, emission models, and mitigation strategies to reduce potentially significant greenhouse gas emissions from a project.

Local Governments for Sustainability (ICLEI)

An international organization to promote climate change programs is the ICLEI-Local Governments for Sustainability organization. For its members, ICLEI provides regionally specific tools and technical assistance to assist local governments in reducing their greenhouse gas emissions. Many California cities have developed their own GHG emission inventories using the ICLEI tools.

Local Public Agencies

The SJVUAPCD adopted a Climate Change Action Plan in August 2008. It contains a proposal for a carbon exchange, though it would likely be voluntary and of limited quantity due to other

programs under State and Federal jurisdiction. Committees were formed and meet regularly to implement a Climate Change Action Plan for the SJV.

At this time, regional agencies such as the Kings County and KCAG, and the water and power agencies do not have formal greenhouse gas reduction plans or recommended emission thresholds for determining significance associated with greenhouse gases generated by development projects.

12.2.6 - Environmental Justice

State law defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies (Solis, 1999). According to the California Department of Finance, Corcoran has an ethnically diverse population with 44.6 percent White, 13.3 percent Black, 1.9 percent American Indian, 2 percent Asian, 3.5 percent multiracial, and 62.6 percent Hispanic. Additionally, Corcoran has a substantial number of residents who are considered low income. The 2000 Census stated approximately 16.3 percent of the City population was below the federal poverty level. According to the California Department of Finance, the City had an unemployment rate of 15.2 percent in 2009 compared to the statewide average of 11.4 in 2009. These statistics provide ample evidence of a significant environmental justice population in Corcoran. As the local land use agency, Corcoran is directly responsible for the siting of new air pollution sources and should coordinate with the SJVUAPCD and CARB for guidance on the appropriate technical tools to consider the cumulative impacts of local sources of air pollution. The SJVUAPCD has an Environmental Justice policy, and supports an Environmental Justice Advisory Group. A member at-large, Andre Booker, a Home Healthcare Provider, represents the communities of Kings County.

12.2.7 - Other Air Quality Improvement Programs

A number of air quality improvement programs are available through the SJVUAPCD, which may enhance air quality in Corcoran. These programs include the following:

12.2.7.1 - Heavy Duty Engine Program

The SJVUAPCD Heavy-Duty Engine Program provides incentive funds for the implementation of new reduced emission technology. Funds for the program are obtained through Department of Motor Vehicles (DMV) registration fees, Rule 9510 – Indirect Source mitigation fees, Voluntary Emission Reduction Agreements (VERA) with developers, the state's Carl Moyer Program, and other state and federal sources. Funds are provided on a first come, first serve basis. Applicants must obtain approval and have a signed, executed contract from the SJVUAPCD prior to purchase and installation of an engine. Any engine purchased and installed prior to contract execution is ineligible. The SJVUAPCD Heavy-Duty Engine Program is not a rebate program. All projects must be under contract with the SJVUAPCD prior to purchase.

Eligible funding categories include heavy-duty on-road vehicles, off-road vehicles, locomotives, marine vessels, electric forklifts, electric airport ground support equipment and stationary agricultural irrigation pump engines. Except for agricultural engines that pump irrigation water, only self-propelled vehicles are eligible for funding. All other stationary and "mobile" engines/equipment are ineligible.

12.2.7.2 - Proposition 1B: Goods Movement Emission Reduction Program

The Proposition 1B: Goods Movement Emission Reduction Program provides incentives to quickly reduce air pollution emissions and health risk from freight movement along California's trade corridors. Financial incentives will be provided to owners of equipment used in freight movement to upgrade to cleaner technologies through truck replacement, engine replacement, or retrofit. Projects funded under this program must achieve emission reductions not required by law or regulation. Applicants must obtain approval and have a signed, executed contract from the SJVUAPCD prior to new truck, new engine, or retrofit device purchase/installation. Only heavy-duty (Class 8) on-road diesel trucks used to move goods are eligible under this program. Any truck subject to CARB's public and utility fleet rule, solid waste collection rule, or diesel cargo handling equipment rule are ineligible to participate in this program. In 2008-09, the SJVUAPCD budgeted $38.5 million under the Proposition 1B funding program.

12.2.7.3 - REMOVE II Program

The Reduce Motor Vehicle Emissions (REMOVE) II Program provided incentives for specific projects that will reduce motor vehicle emissions within the SJVAB. The purpose of the REMOVE II Program was to assist the SJVUAPCD in attaining the requirements of the California Clean Air Act. This is accomplished by allocating funds to cost-effective projects that have the greatest motor vehicle emission reductions resulting in long-term impacts on air pollution problems in the San Joaquin Valley. All projects must have a direct air quality benefit to the District. Any portion of a project that does not directly benefit the SJVUAPCD within its boundaries was not eligible for funding or in calculating emission reductions.

REMOVE II Program Components include:

- Light- and Medium-Duty Vehicle Component. This component provides incentives for the purchase of low-emission passenger vehicles, light trucks, small buses, and trucks less than 14,000 pounds gross vehicle weight (GVW).
- E-Mobility (Telecommunications) Component. This component provides incentives for telecommunication projects such as video teleconferencing, Internet business transactions, telework sites, etc.
- Bicycle Infrastructure Component. This component provides incentives for Class I or Class II bicycle path construction.
- Public Transportation and Commuter Vanpool Subsidy Component. This component provides incentives for public transportation pass subsidies, such as transit and rail and vanpool subsidies.
- Alternative Fuel Vehicle Mechanic Training Component. This component provides incentives/subsidies for the education of personnel on the mechanics, operation safety and maintenance of alternative fuel vehicles, equipment structures, refueling stations, and tools involved in the implementation of alternative fuel emission reducing technologies.
- Gross Polluting Vehicle Replacement Program. The District invites individuals to participate in this component. The owner of an invited vehicle may choose to have their vehicle retired for an incentive.
- Mobile Source Incentive Program Resources.

12.2.7.4 - Lower Emission School Bus Program

The purpose of the Lower-Emission School Bus Program (LESBP) is to assist the air district in attaining federal and state air quality standards. This program provides incentive funds for the replacement of pre-1977 and the oldest of the 1977-1986 school buses and for the retrofit of 1987 and newer school buses with a CARB Level 3 verified emission control device. Applicants must obtain approval and have a signed, executed contract from the SJVUAPCD prior to purchase and installation of a retrofit/vehicle. Any retrofit/vehicle purchased and installed prior to contract execution is ineligible. In 2008-09, the SJVUAPCD budgeted $19.2 million under Lower-Emission School Bus program.

12.2.7.5 – Congestion Mitigation and Air Quality (CMAQ)

CMAQ is a special funding program for State and local government under the 2005 enacted SAFETEA-LU, the latest Federal transportation legislation. The CMAQ program provides over $8.6 billion dollars in funds to State DOTs, MPOs, and transit agencies to invest in projects that reduce criteria air pollutants regulated from transportation-related sources over a period of five years (2005-2009). The CMAQ program funds transportation projects or programs that will contribute to attainment or maintenance of the national ambient air quality standards. While all CMAQ funding must go to transportation-related projects that demonstrate an air quality benefit, MPOs and local governments are to give priority in distributing CMAQ funds to diesel engine retrofits, and other cost effective emission reduction and congestion mitigation activities that provide air quality benefits. In addition, all eight SJV MPOs have adopted a CMAQ policy as part of the 8-hour SJV Ozone SIP that includes developing a standardized process across the Valley for distributing 20 percent of all CMAQ funds to projects that meet a minimum cost-effectiveness beginning in FY2011. CMAQ is a source of funding that can be used to implement projects within the Air Quality Element of Corcoran.

12.3: AIR POLLUTANT DESCRIPTIONS AND HEALTH EFFECTS

The criteria pollutants of greatest concern for Corcoran are ozone, and fine particulate matter ($PM_{2.5}$). The standards for the other criteria pollutants are either being met or are unclassified in Corcoran, and the latest pollutant trends suggest that these standards would not be exceeded in the near future. Other pollutants of concern are toxic air contaminants, CO and GHGs.

12.3.1 - Criteria Pollutants

Criteria pollutants include particle pollution (often-referred to as particulate matter), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. These pollutants can harm human health and the environment, and cause property damage. Of the six pollutants, particle pollution and ground-level ozone are the most widespread health threats. EPA calls these pollutants “criteria” air pollutants because it regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called primary standards. Another set of limits intended to prevent environmental and property damage is called secondary standards.

A brief summary of the pollutants of concern and associated health and secondary effects follows:

12.3.1.1 – Ozone

Description and Physical Properties: Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between Reactive Organic Gases (ROG), NO_x, and sunlight. ROG and NO_x, also called "ozone precursors," are emitted from automobiles, solvents and fuel combustion. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind. In order to reduce ozone, it is necessary to control emissions of ozone precursors. Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. These conditions are prevalent during the summer when thermal inversions are most likely to occur. As a result, summertime conditions of long periods of daylight and hot temperatures form ozone in the greatest quantities. During the summer, thermal inversions trap ozone from dispersing vertically, and high concentrations of this pollutant are prevalent.

Health Effects: Health effects of ozone can include the following: respiratory system irritation, reduction of lung capacity, asthma aggravation, inflammation, and damage to lung cells, aggravated cardiovascular disease, chronic lung disease aggravation, and permanent lung damage (EPA 1999a). The greatest health risk is to those who are active outdoors during smoggy periods, such as children, athletes, and outdoor workers. The human health impacts of ozone include chest pain, coughing, throat irritation, and congestion. Breathing ozone can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. Other symptoms triggered by ozone include wheezing, coughing, pain when taking a deep breath and breathing difficulties during exercise or outdoor activities. Studies have linked rising hospital admissions and emergency room visits to higher ozone levels. Children are most at risk from exposure to ozone. Children breathe more air per pound of body weight than adults do. Because children's respiratory systems are still developing, they are more susceptible to environmental threats.

Ozone also damages natural ecosystems such as forests and foothill communities, and damages agricultural crops and materials such as rubber, paint, and plastics. High ozone levels can damage plant cells and deteriorate leaf tissue, which reduces the plants' ability to photosynthesize causing weakened plants that are more susceptible to disease, pests, cold, and drought. Ozone can cause substantial damage to a variety of materials such as rubber, plastics, fabrics, paint, and metals.

Sources: Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The sources of ozone precursors (ROG and NO_x) are discussed above in the description of ozone as well as the discussions concerning ROG and NO_x.

12.3.1.2 - Nitrogen Oxides

Description and Physical Properties: During combustion of fossil fuels, oxygen reacts with nitrogen to produce NO_x (NO, NO_2, NO_3, N_2O_3, N_2O_4, and N_2O_5). This occurs primarily in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. As discussed previously, NO_x is an ozone precursor, which means that when it is emitted into the atmosphere, it forms or may cause ozone to be formed. When NO_x and ROG/VOC are released in the atmosphere, they can chemically react with one another in the presence of sunlight to form ozone. NO_x can also be a precursor to PM_{10} and $PM_{2.5}$. NO_x can react with moisture, ammonia, and other compounds to form nitric acid and related particles. This deposition can harm natural resources and materials.

Health Effects: The EPA has concluded that the only form of NO_x that exists at a level high enough to cause public health concerns is nitrogen dioxide (NO_2) (EPA 1997). Nitrogen dioxide is a brown gas with a strong odor. The main human health concerns of nitrogen dioxide include lung damage, increased incidence of chronic bronchitis, eye and mucus membrane damage, negative effects on the respiratory system, pulmonary dysfunction, and premature death. Small particles can penetrate deeply into the sensitive tissue of the lungs; can cause or worsen respiratory disease such as emphysema, asthma, and bronchitis; and can aggravate existing heart disease (EPA 2010a).

Because NO_x is an ozone precursor, the health effects associated with ozone (as discussed above) are also indirect health effects associated with unhealthful levels of NO_x emissions.

Sources: Natural sources of oxides of nitrogen (NO_x) include lightning, soils, wildfires, stratospheric intrusion, and the oceans. Natural sources accounted for approximately 7 percent of 1990 emissions of NO_x for the United States. Combustion emissions and other human activities account for the balance of NO_x introduced to the atmosphere.

12.3.1.3 - Reactive Organic Gases and Volatile Organic Compounds

Description and Physical Properties: ROG, also referred to as VOCs, are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROG and VOC, the two terms are often used interchangeably. ROG consist of non-methane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Non-methane hydrocarbons are hydrocarbons that do not contain the unreactive hydrocarbon, methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

There are no state or national ambient air quality standards for ROGs because they are not classified as criteria pollutants. They are regulated, however, because ROG is an ozone precursor. As such, a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROGs are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.

Health Effects: Although health-based standards have not been established for ROG, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of ROG are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, kidneys, and the central nervous system (EPA 2010b).

Sources: Natural sources of ROG are animal waste, decomposition, and plant transpiration. Solvent evaporation, production of petroleum products, and motor vehicle operation are heavy contributors to the man-made ROG budget.

12.3.1.4 - Particulate Matter (PM_{10} and $PM_{2.5}$)

Description and Physical Properties: Particulate matter is a generic term that defines a broad group of chemically and physically different particles (either liquid droplets or solids) that can exist over a wide range of sizes. Examples of atmospheric particles include those produced from

combustion (diesel soot or fly ash), light-produced (urban haze), sea spray-produced (salt particles), and soil-like particles from re-suspended dust. In discussions of air pollution, particulate matter is typically divided into two size categories, PM_{10} and $PM_{2.5}$, because of the adverse health effects associated with the smaller particles. PM_{10} refers to particulate matter that is 10 microns or less in diameter (1 micron is one-millionth of a meter, also known as micrometer [μm]). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter. Soil dust consists of the minerals and organic material found in soil being lifted up into the air by winds. Fugitive dust is entrained particulate matter caused by anthropogenic activities (grading, road dust) or natural occurrences (windblown dust). EPA continues to examine health data from particulate matter size categories smaller than 2.5 microns for potentially establishing new NAAQS.

Health Effects: Particulate matter can be inhaled into the lungs where it can be absorbed into the bloodstream. It is a respiratory irritant and can cause direct pulmonary effects such as coughing, bronchitis, lung disease, respiratory illnesses, increased airway reactivity, and exacerbation of asthma. Particulate matter is also thought to have direct effects on the heart (EPA 2010c). Relatively recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Numerous studies link PM to a variety of health effects, including aggravated asthma, increased respiratory symptoms (irritation of the airways, coughing, difficulty breathing), decreased lung function in children, development of chronic bronchitis, irregular heartbeat, nonfatal heart attacks, increased respiratory and cardiovascular hospitalizations, lung cancer, and premature death in people with heart or lung disease. Children, older adults, and individuals with heart or lung diseases are the most likely to be affected by PM.

Non-health effects include reduced visibility and soiling of property. Particulate matter can be transported long distances to create regional haze. As PM settles out of the air, it can make lakes and streams acidic, change an ecosystem's balance, and affect ecosystem diversity. PM can affect vegetation by damaging foliage, disrupting the chemical processes within plants, reducing light adsorption and disrupting photosynthesis. PM can stain and damage stone and other materials.

Sources: Particulate matter originates from a variety of stationary and mobile sources. Stationary sources include fuel combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal; and recycling. Mobile or transportation-related sources include particulate matter from highway vehicles and non-road vehicles and fugitive dust from paved and unpaved roads.

12.3.1.5 - Carbon Monoxide

Description and Properties: Carbon monoxide (CO) is a colorless, odorless, toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). CO is a primary pollutant, which means that it is emitted directly into the air (unlike secondary pollutants such as ozone that are formed by the reactions of other pollutants). CO levels tend to be highest during the winter months when the meteorological conditions favor the accumulation of pollutants. This occurs when relatively low inversion levels trap pollutants near the ground and concentrate the CO (EPA 2010d). However, because CO is somewhat soluble in water, rainfall and fog can suppress CO conditions.

Health Effects: CO is essentially inert to plants and materials but can have significant effects on human health. CO gas enters the body through the lungs, dissolves in the blood, and replaces oxygen as an attachment to hemoglobin. This binding reduces available oxygen in the blood and,

therefore, reduces oxygen delivery to the body's organs and tissues. Effects on humans range from slight headaches, to nausea, to death. Elevated levels of CO can also cause visual impairments, reduced manual dexterity, poor learning ability, reduced work capacity, and trouble performing complex tasks. For people with heart disease, exposure to CO at low levels may cause chest pain and reduced ability to exercise; repeated exposures may contribute to other cardiovascular effects (EPA 2010d).

Sources: CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). The primary source of CO is from on-road motor vehicles. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about 22 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO concentrations indoors.

12.3.1.6 - Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor. SO_2 is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. Although SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions are needed because SO_2 is a precursor to sulfate and PM_{10}. Sulfates are a particulate formed through the photochemical oxidation of SO_2.

Sulfur dioxide is a soluble gas; therefore, it can be absorbed in the mucous membranes of the respiratory tract and nose. Sensitive populations are those with heart or lung disease, the elderly, and children. Long-term exposure to high levels of SO_2 can cause irritation of existing cardiovascular disease, respiratory illness, and changes in the defenses in the lungs. When people with asthma are exposed to high levels of SO_2 for a short time during moderate activity, effects may include wheezing, chest tightness, or shortness of breath. At levels greater than 1.5 ppm, respiratory infections and bronchiolar constrictions can occur.

12.3.1.7 – Lead

Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. An aerosol is a collection of solid, liquid, or mixed-phase particles suspended in the air. It was first regulated as an air pollutant in 1976. Lead can accumulate in bones, soft tissue, and blood and can affect the kidneys, the liver, and the nervous system. The more serious effects of lead poisoning include behavior disorders, mental retardation, and neurological impairment. Low levels of lead in fetuses and young children can result in nervous system damage, which can cause learning deficiencies and low intelligence quotients. Lead may also contribute to high blood pressure and heart disease.

Lead concentrations once exceeded the state and federal air quality standards by a wide margin but have not exceeded the standards at any regular monitoring station since 1982. Lead is no longer an additive to normal gasoline, which is the main reason the concentration of lead in the air is low.

12.3.2 - Non Criteria Pollutants

The CARB administers California Ambient Air Quality Standards (CAAQS) for the 10 air pollutants designated in the California Clean Air Act (CCAA). The 10 state air pollutants are the six criteria pollutants listed above as well as visibility reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

12.3.2.1 - Remaining California Air Pollutants with CAAQS

Visibility-Reducing Particles

Visibility-reducing particles are suspended particulates that reduce visibility and are not considered a health risk but are regulated by the EPA. The distance that can be seen is limited by the amount of gases and aerosol particles in the way. Without pollution effects in the western United States, a natural visual range is 140 miles, and in the eastern United States, the range would be 90 miles (EPA 1999b). In 1999, the visibility range in the west was 33 to 90 miles and 14 to 24 miles in the east. The EPA implemented a Regional Haze Rule in 1999 to attempt to protect visibility in 156 Class I national parks and wilderness areas in the United States. The regulation requires states to establish goals for improving their areas and work together with other states, as the pollution is often transported over long distances.

Sulfates

Sulfates (SO_4) are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide (SO_2) during the combustion process and subsequently is converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California, which is due to regional meteorological features. The CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility and, because they are usually acidic, can harm ecosystems and damage materials and property.

Vinyl Chloride

Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, resulting from microbial breakdown of chlorinated solvents. In 1978, the CARB established the state ambient air quality standard for vinyl chloride because it is a known carcinogen. The standard was set at 0.01 ppm for a 24-hour duration. In 1990, the CARB identified vinyl chloride as a TAC. Vinyl chloride is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene are broken down. This can occur when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride is also formed in manufacturing of PVC, which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

Hydrogen Sulfide

Hydrogen sulfide is a flammable, colorless, poisonous gas that smells like rotten eggs. Hydrogen sulfide and other reduced sulfur compounds form by the anaerobic decomposition of manure. Some types of bacteria found in animal and human by-products produce hydrogen sulfide during reduction of sulfur-containing compounds, such as proteins. Manure storage tanks, ponds, anaerobic lagoons, and land application sites are the primary sources of hydrogen sulfide emissions where sulfur is present in manure. The combustion of sulfur-containing fuels (oil and coal) and organic matter that undergoes putrefaction are also sources. High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause symptoms like headache, nausea, vomiting, and cough. Long exposure to hydrogen sulfide can cause pulmonary edema.

12.3.2.2 - Toxic Air Contaminants

A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity may pose a threat to public health even at very low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts are not expected to occur. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

The CARB's TAC program traces its beginning to the criteria pollutant program in the 1960s. For many years, the criteria pollutant control program has been effective at reducing TACs, since many volatile organic compounds and PM constituents are also TACs. During the 1980s, the public's concern over toxic chemicals heightened. As a result, citizens demanded protection and control over the release of toxic chemicals into the air. In response to public concerns, the California legislature enacted the Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983) governing the release of TACs into the air. This law charges the CARB with the responsibility for identifying substances as TACs, setting priorities for control, adopting control strategies, and promoting alternative processes. The CARB has designated almost 200 compounds as TACs. Additionally, the CARB has implemented control strategies for a number of compounds that pose high health risk and show potential for effective control.

Diesel Particulate Matter

The CARB identified the PM emissions from diesel-fueled engines as a TAC in August 1998 under California's TAC program. In California, diesel engine exhaust has been identified as a carcinogen. Most researchers believe that diesel exhaust particles contribute the majority of the risk.

Description and Physical Properties: Diesel particulate matter (DPM) is a subset of $PM_{2.5}$—diesel particles are typically 2.5 microns and smaller. In 1998, DPM made up about 6 percent of the total $PM_{2.5}$ inventory nationwide (EPA 2002). Diesel exhaust is a complex mixture of thousands of particles and gases that are produced when an engine burns diesel fuel. Organic compounds account for 80 percent of the total particulate matter mass, which consists of compounds such as hydrocarbons and their derivatives, and polycyclic aromatic hydrocarbons (PAHs) and their derivatives. Fifteen PAHs are confirmed carcinogens, a number of which are

found in diesel exhaust (NTP 2005). The chemical composition and particle sizes of DPM vary among different engine types (heavy-duty, light-duty), engine operating conditions (idling, accelerating, decelerating), expected load, engine emission controls, fuel formulations (high/low sulfur fuel), and engine year (EPA 2002).

Non-Cancer Health Effects: Some short-term (acute) effects of diesel exhaust exposure include eye, nose, throat, and lung irritation, and exposure can cause coughs, headaches, light-headedness, and nausea. Diesel exhaust is a major source of ambient particulate matter pollution in urban environments. Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems (OEHHA 2002).

Cancer Health Effects: Human studies on the carcinogenicity of DPM demonstrate an increased risk of lung cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure (NTP 2005).

Sources: Sources of DPM include mobile and stationary diesel-fueled engines.

Naturally Occurring Asbestos

Description and Properties: Naturally occurring asbestos (NOA) is present in certain rock formations such as serpentinite or ultramafic rocks. Rock formations that contain NOA are known to be present in 44 of California's 58 counties, including portions of southwestern Kings County. Crushing or breaking these rocks, through construction or other means, can release asbestoform fibers into the air.

Health Effects: Exposure to asbestos fibers may result in health issues such as lung cancer, mesotheliomia (a rare cancer of the thin membranes lining the lungs, chest, and abdominal cavity), and asbestosis (a non-cancerous lung disease that causes scarring of the lungs).

Sources: Sources of NOA emissions include unpaved roads or driveways surfaced with source rock, construction activities in source rock deposits, or rock quarrying activities where asbestos form rock is present.

12.3.3 - Greenhouse Gas Pollutants

Gases that trap heat in the atmosphere are called greenhouse gases, analogous to the way a greenhouse retains heat. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. However, human activities have increased the amount of greenhouse gases in the atmosphere. Some greenhouse gases can remain in the atmosphere for hundreds of years. AB 32, California's greenhouse gas regulation, calls out six greenhouse gas categories to be regulated: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Another category of greenhouse gases, chlorofluorocarbons, has already undergone strict regulation to control stratospheric ozone depletion. Other man-made greenhouse gases have yet to be recognized for regulatory control, such as nitrogen trifluoride.

The term "global warming potential" (GWP) is the potential of a gas to contribute to global warming; it is based on a reference scale, with carbon dioxide at 1. Some pollutants are more potent than carbon dioxide, which is reflected by a higher global warming potential. The following is a brief description of the most common greenhouse gases that may be emitted by sources within Corcoran.

Aerosols. Aerosols are particulate matter suspended in the air. They are short-lived and remain in the atmosphere for about a week. Aerosols warm the atmosphere by absorbing heat and cool the atmosphere by reflecting light, with radiative forcing (RF) cooling effects. There is a low scientific understanding of the RF of individual aerosols, such as black carbon. Black carbon can cause warming from deposition on snow and from suspensions in air. Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during biomass burning and incomplete combustion of fossil fuels (such as diesel fuel).

Carbon Dioxide. Carbon dioxide (CO_2) is an odorless, colorless natural greenhouse gas. CO_2 is emitted from natural and anthropogenic sources. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, gasoline, and wood. CO_2 has a GWP of one.

Methane. Methane is a flammable greenhouse gas. A natural source of methane is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and ruminants such as cattle. Methane has a GWP of 21 (21 times more potent than CO_2).

Nitrous Oxide. Nitrous oxide, also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizers containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) contribute to its atmospheric load. Nitrous oxide is a highly potent greenhouse gas with a GWP of 310.

Ozone. Ozone is a short-lived local greenhouse gas and photochemical pollutant. Tropospheric ozone changes contribute to radioactive forcing on global scale. Ozone is formed from reactions of ozone precursors (NO_x and ROG/VOCs) and sunlight in the atmosphere. Ozone precursors are emitted from automobiles, solvents, and fuel combustion.

12.4: EXISTING AIR QUALITY

12.4.1 - San Joaquin Valley Air Basin

Corcoran is located in the west central portion of the SJVAB. Regional and local air quality is impacted by topography, dominant airflows, atmospheric inversions, location, and season. The combination of topography and inversion layers generally prevents dispersion of air pollutants.

The SJVAB has an “inland Mediterranean” climate and is characterized by long, hot, dry summers and short, foggy winters. Sunlight can be a catalyst in the formation of some air pollutants (such as ozone); the SJVAB averages over 260 sunny days per year.

12.4.1.1 – Topography

The SJVAB is generally shaped like a bowl. It is open in the north and is surrounded by mountain ranges on all other sides. The Sierra Nevada Mountains are along the eastern boundary (8,000 to

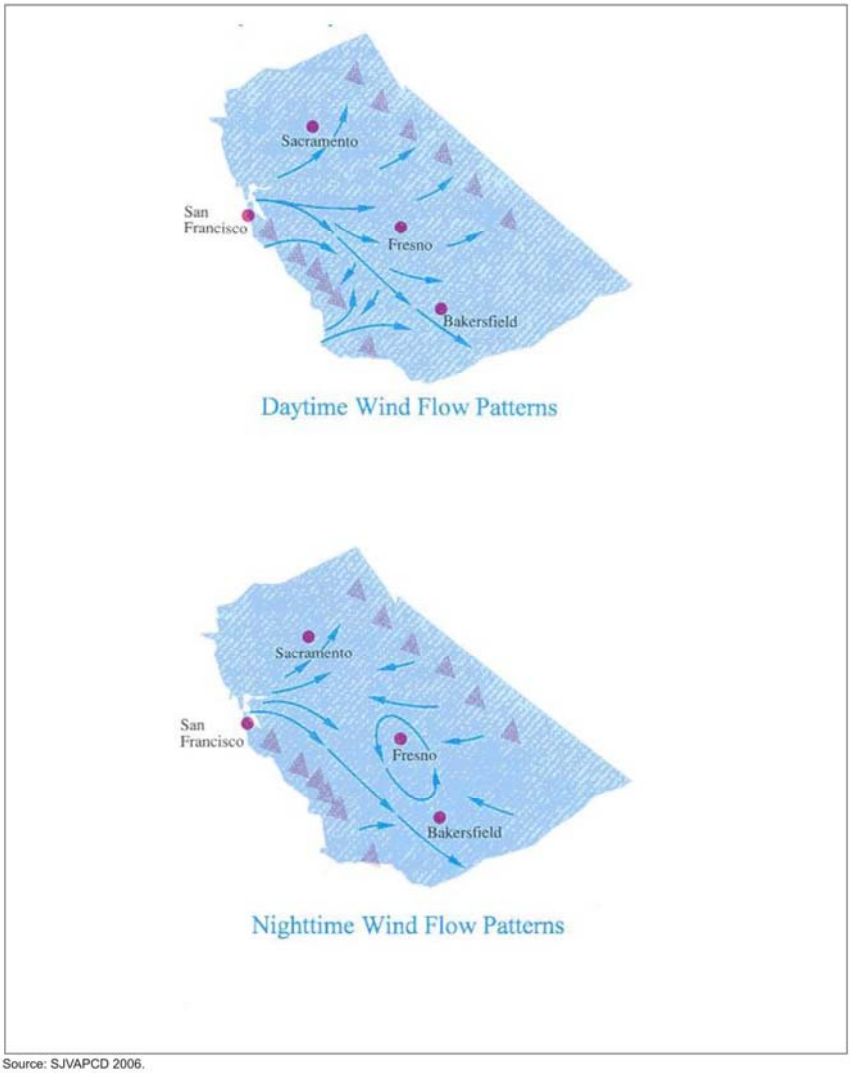
14,000 feet in elevation), the Coast Ranges are along the western boundary (3,000 feet in elevation), and the Tehachapi Mountains are along the southern boundary (6,000 to 8,000 feet in elevation) (SJVUAPCD 2002).

Dominant Airflow

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. Exhibit 3 illustrates the wind flow patterns for the SJVAB. Marine air moves into the SJVAB from the San Joaquin River Delta. The wind generally flows south-southeast through the valley, through the Tehachapi Pass and into the Southeast Desert Air Basin portion of Kern County (SJVUAPCD 2006). As the wind moves through the SJVAB, it mixes with the air pollution generated locally; transporting air pollutants generally from north to south in the summer and in a reverse flow in the winter, due to these influences (SJVUAPCD 2006).

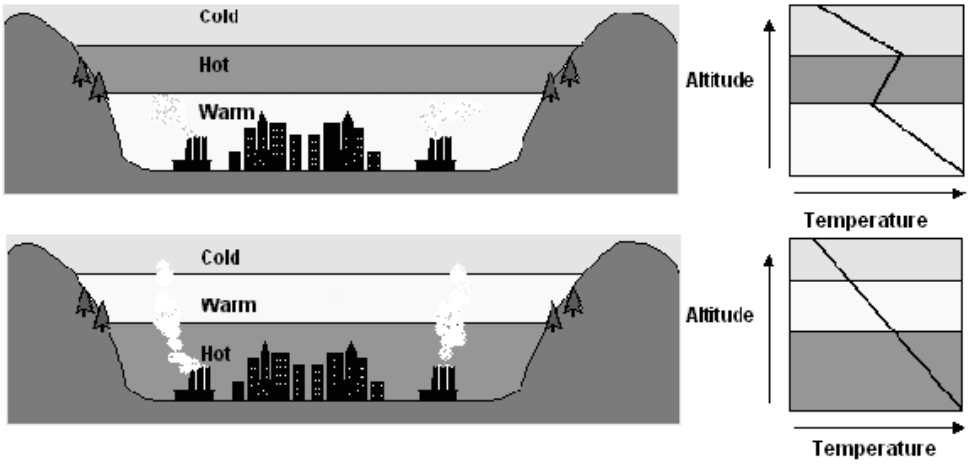
Inversions

Generally, the temperature of air decreases with height, creating a gradient from warmer air near the ground to cooler air at elevation. This gradient of cooler air over warm air is known as the environmental lapse rate. Inversions occur when warm air sits over cooler air, trapping the cooler air near the ground (see Exhibit 4). These inversions trap pollutants from dispersing vertically and the mountains surrounding the San Joaquin Valley trap the pollutants from dispersing horizontally. Strong temperature inversions occur throughout the SJVAB in the summer, fall, and winter (SJVUAPCD 2006). Daytime temperature inversions occur at elevations of 2,000 to 2,500 feet above the San Joaquin Valley floor during the summer and at 500 to 1,000 feet during the winter. The result is a relatively high concentration of air pollution in the valley during inversion episodes. These inversions cause haziness, which in addition to moisture may include suspended dust, a variety of chemical aerosols emitted from vehicles, particulates from wood stoves, and other pollutants.



Source: SJVAPCD 2006.

Exhibit 12-3
San Joaquin Valley Air Flow



Source: SJVUAPCD 2006

Exhibit 12-4
Temperature Inversion

Location and Season

Because of the prevailing daytime winds and time-delayed nature of ozone formation, concentrations are highest in the southern portion of the SJVAB, such as around Bakersfield and around Fresno. However, for the eight-hour average, ozone concentrations can be highest in the foothills and mountains downwind from the cities. Summers are often periods of hazy visibility and frequent ozone exceedances, while winter air quality impacts tend to be localized and can consist of (but are not exclusive to) secondary nitrate and sulfate particulates, soot or smoke around residential areas, agricultural and hazard reduction wood burning, dust near areas where soil is actively disturbed, and odors from agricultural operations.

12.4.2 – Local Climate

Weather stations are located throughout Kings County, including meteorological stations in Avenal, Corcoran, Hanford, and Kettleman City. Average maximum summer temperatures in Kings County are uniformly high, ranging from 103 degrees Fahrenheit (ºF) in Avenal to 91ºF in Hanford. The range of daily temperature in the summer can vary 30ºF or more, routinely swinging from the high 90s during the day to the mid 60s at night. Average wintertime highs in the County are in the upper 50s, while wintertime lows average approximately 35ºF.

The County receives between 6.5 to 8.3 inches of rain annually, with less rain falling in Avenal and more at Hanford. The majority of rainfall occurs between November and April (WRCC 2009).

The wind in Kings blows predominantly from the north and west. There are two main strong wind patterns. One of the patterns is wind blowing into the County from the north. This wind blows into the SJVAB through the Sacramento River delta. The other wind pattern is wind coming over the Coast Range from the Pacific Ocean.

12.4.3 - Ambient Air Pollutant Monitoring

12.4.3.1 - Monitoring Stations

Existing local air quality, historical trends, and projections of air quality are best evaluated by reviewing relevant air pollutant concentrations from near the project area. The SJVUAPCD operates two air monitoring stations within Kings County. One site, CARB site 16719, is located in the City of Corcoran at 1520 Patterson Avenue. It measures ozone, PM_{10} and $PM_{2.5}$. The other site, CARB site 16716, is located in Hanford at 820 South Irwin Street. This site measures NO_x, ozone and PM_{10}. Table 4 summarizes 2006 through 2008 published monitoring data from the CARB's Aerometric Data Analysis and Management System (ADAM).

Table 12-4: Air Quality Monitoring Summary

Air Pollutant, Average Time (Units)	2006	2007	2008
Corcoran – Patterson Avenue			
Ozone			
Max 1 Hour (ppm)	.127	.102	ND
Days >CAAQS (0.09 ppm)	7	2	ND
Max 8 Hour (ppm)	.101	.091	ND
Days >CAAQS (0.070 ppm)	57	20	ND
Days > NAAQS (0.08 ppm) (1997 standard)	ND	ND	ND
Days >NAAQS (0.075 ppm) (2008 standard)	37	8	ND
Particulate Matter (PM_{10})			
Annual Average (µg/m3)	51.4	46.6	59.5
24 Hour (µg/m3)	254	123	351
Estimated Days > CAAQS (50 µg/m3)	123	134	182
Estimated Days > NAAQS (150 µg/m3)	13.3	0	7
Particulate Matter ($PM_{2.5}$)			
National Annual Average (µg/m3)	16.9	18.4	15.8
Max 24 Hour (µg/m3)	74.2	75.0	51.0
Estimated Days > NAAQS (65 µg/m3) (1997 standard)	3	4	ND
Estimated Days > NAAQS (35 µg/m3) (2006 standard)	30	55	34
Hanford-S. Irwin St.			
Ozone			
Max 1 Hour (ppm)	ND	ND	.132
Days >CAAQS (0.09 ppm)	ND	ND	28
Max 8 Hour (ppm)	ND	ND	.124
Days >CAAQS (0.070 ppm)	ND	ND	66
Days > NAAQS (0.08 ppm) (1997 standard)	ND	ND	ND
Days >NAAQS (0.075 ppm) (2008 standard)	ND	ND	3
NO_2			

Mean (ppm)	.012	.011	ND
Max 1 Hour (ppm) Days > CAAQS	.73 0	.58 0	ND ND
Particulate Matter (PM_{10})			
Annual Average (µg/m3)	46.3	43.9	50.9
24 Hour (µg/m3) Estimated Days > CAAQS ((50 µg/m3) Estimated Days > NAAQS (150 µg/m3)	142 125 0	100 145 0	230 ID 11

Notes:
> = exceed ppm = parts per million µg/m3 = micrograms per cubic meter
ID = insufficient data ND = no data max = maximum
CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard
Mean = Annual Arithmetic Mean
The "Estimated Day Over the State and National 24-Hour Standard" mathematically estimates how may days concentrations would have been than the level of the standard had each day been monitored. Monitoring occurs every 6 days.
The "Estimated Days Over the National 24-Hour PM2.5 Standard" is the estimated number of days in the year that the national 2006 24-hour PM2.5 standard would have been exceeded had sampling occurred everyday of the year. Sampling can occur everyday, once every 3 days, once every 6 days, or any combination of these frequencies.
Source: CARB, 2009b

12.4.3.2 - Air Quality Data

While air quality has significantly improved with regard to ozone and particulate matter, the SJVAB does not yet meet all of the applicable federal health-based standards. Exhibits 5, 6, and 7 provide a trend analysis of the current state of air quality for Kings County for the Hanford-S. Irwin and Corcoran-Paterson site.

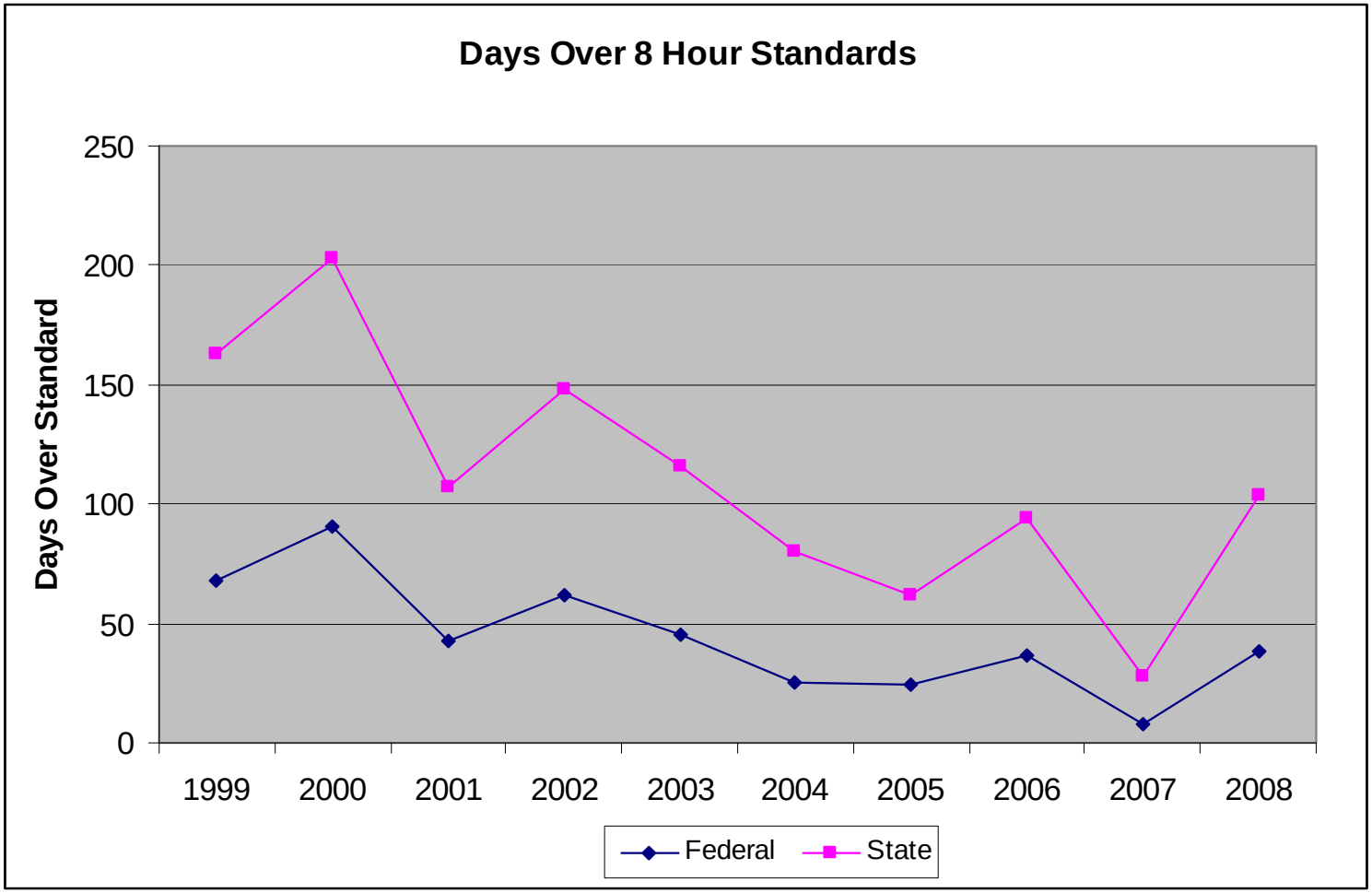


Exhibit 12-5
Local Ozone Trends

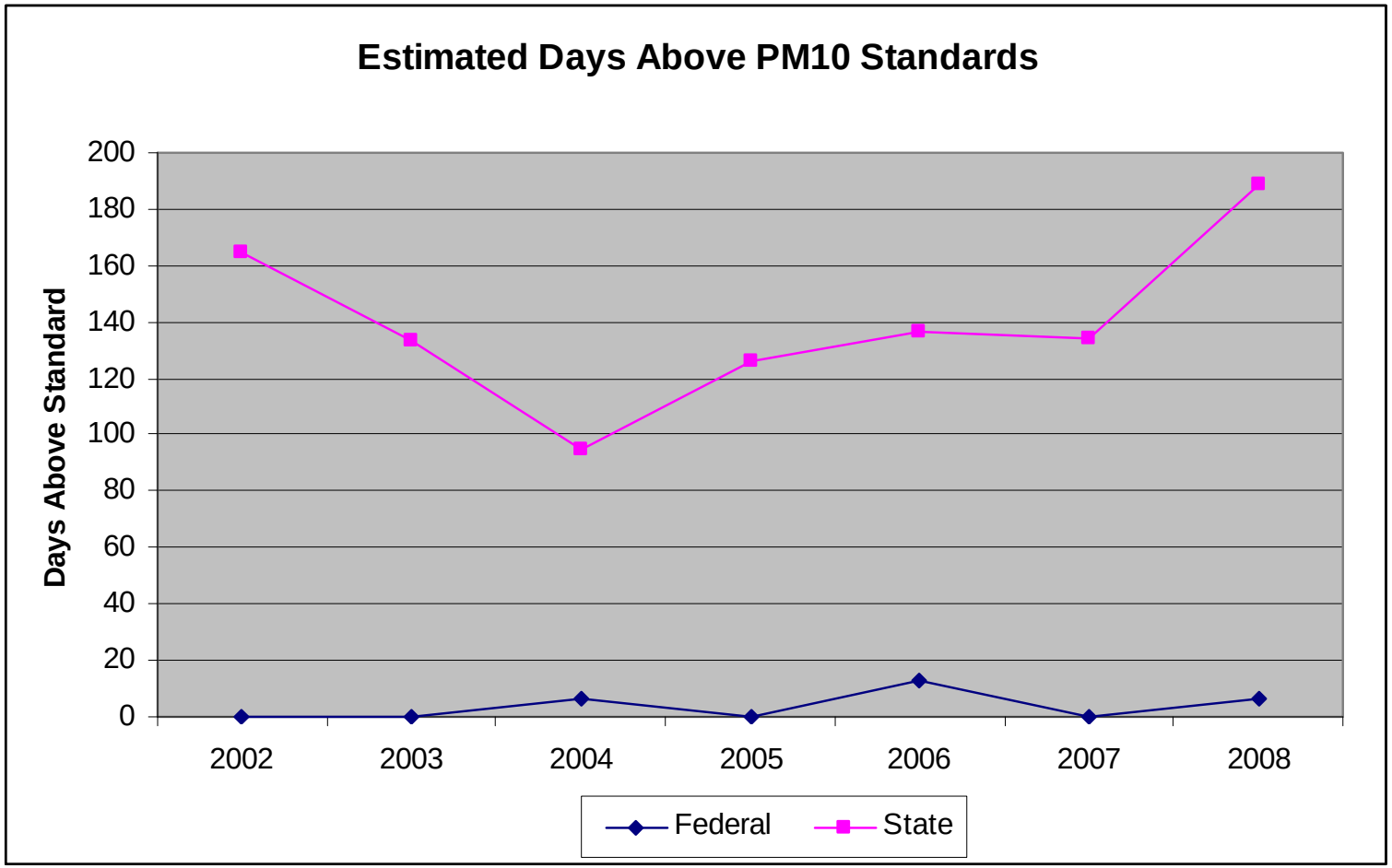


Exhibit 12-6
Local PM10 Trends

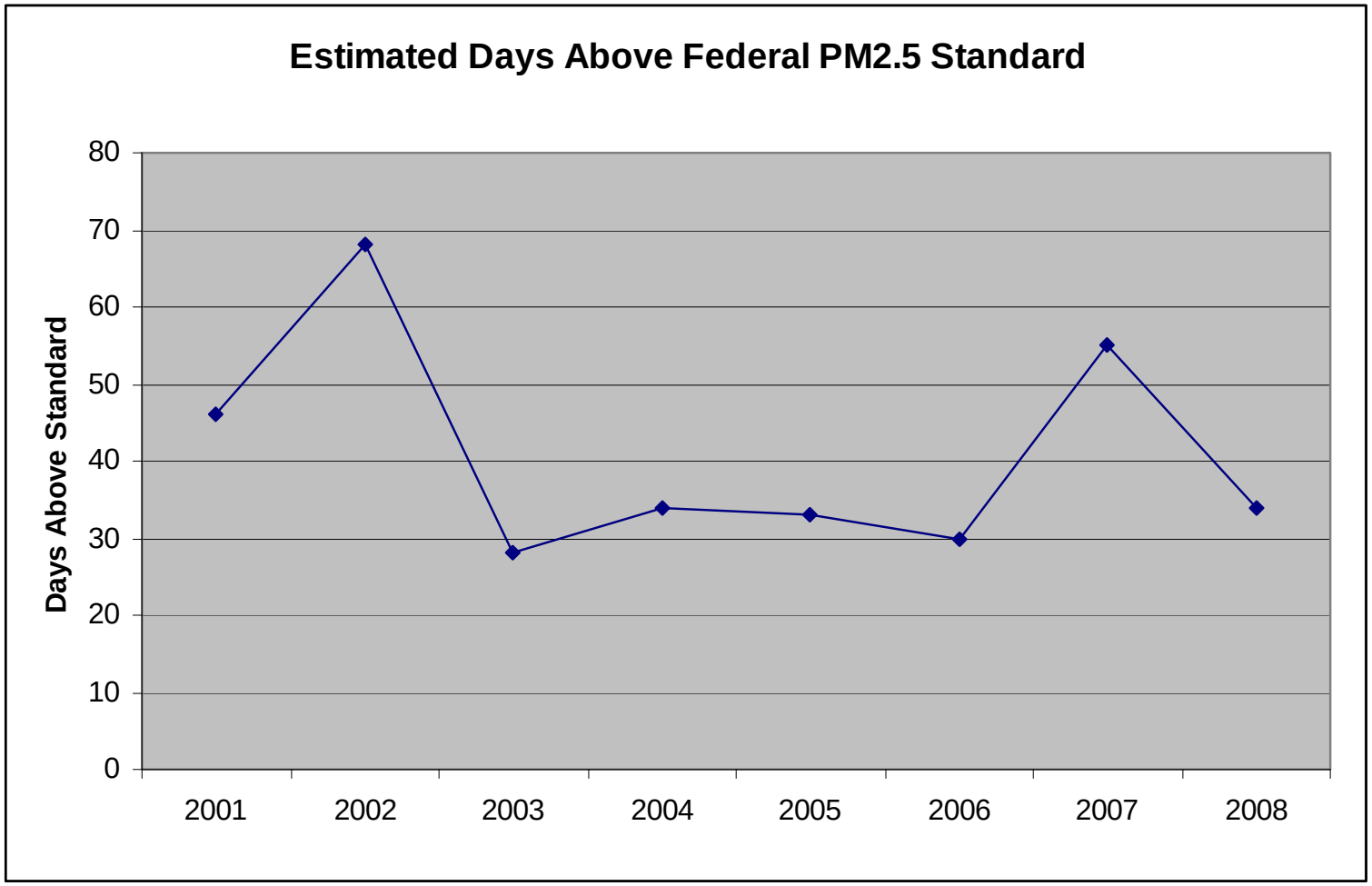


Exhibit 12-7
Local PM2.5 Trends

12.4.4 - Air Pollution Sources

Air pollution sources include a variety of natural processes and man-made activities. An emissions inventory is an account of the amount of air pollution generated by various emissions sources. To estimate the sources and quantities of pollution, CARB, in cooperation with local air districts and industry, maintains an inventory of California emission sources. Sources are subdivided into four major emission categories: mobile, stationary, area-wide, and natural sources.

Mobile sources include on-road sources and off-road mobile sources. The on-road emissions inventory, which includes automobiles, motorcycles, and trucks, is an estimation of population, activity, and emissions of the on-road motor vehicles used in California. The off-road emissions inventory is an estimate of the population, activity, and emissions of various off-road equipment, including recreational vehicles, farm and construction equipment, lawn and garden equipment, forklifts, locomotives, commercial marine ships, and marine pleasure craft. CARB staff estimates mobile source emissions with assistance from districts and other government agencies.

Stationary sources are large, fixed sources of air pollution, such as power plants, refineries, and manufacturing facilities. Stationary sources also include aggregated point sources. These include many small point sources, or facilities, that are not inventoried individually but are estimated as a group and reported as a single-source category. Examples include gas stations and dry cleaners.
Each of the local air districts estimates the emissions for the majority of stationary sources within its jurisdiction. Stationary source emissions are based on estimates made by facility operators and local air districts. Emissions from specific facilities can be identified by name and location.

Area-wide sources include source categories associated with human activity, and these emissions take place over a wide geographic area. Consumer products, fireplaces, farming operations (such as tilling), and unpaved road dust are examples of area-wide sources. CARB and local air district staffs estimate area-wide emissions. Emissions from area-wide sources may be either from small, individual sources, such as residential fireplaces, or from widely distributed sources that cannot be tied to a single location, such as consumer products and dust from unpaved roads.

Natural, or non-anthropogenic, sources include source categories with naturally occurring emissions such as geogenic (e.g., petroleum seeps), wildfires, and biogenic emissions from plants. CARB staff and the air districts also estimate natural sources.

12.4.4.1 - SJVAB Emissions Inventory

The area of territory within the San Joaquin Valley Air Basin is 25,000 square miles. Eight counties make up the SJVAB. The basin is up to 300 miles long in some places. Air pollution sources are scattered throughout the basin.

The 2008 emissions inventory for the SJVAB is available in the CARB's 2009 Almanac Emission Projection Data. Table 5 summarizes the estimated 2008 emissions for the main pollutants of concern in the SJVAB.

Table 12-5: 2008 SJVAB Emissions Inventory

Emission Category	Tons per Day			
	ROG	NOx	PM_{10}	$PM_{2.5}$
Stationary Sources	83.7	80.0	25.1	17.5
Area-wide Sources	149.5	17.9	250.9	67.7
Mobile Sources	136.1	468.2	23.7	20.2
Natural Sources	235.2	10.6	35.2	29.8
Total SJVAB	604.5	576.7	334.9	135.2
Source: CARB 2010c.				

ROG: Natural sources are the highest contributors to the SJVAB inventory, at 40 percent. Mobile and area-wide sources contribute significantly to the inventory, at 23 percent and 25 percent, respectively.

NO_x: Mobile sources dominate the NO_x inventory at 81 percent. On-road mobile sources contribute 70 percent of the mobile source inventory.

PM_{10}: Area-wide sources are an order of magnitude larger than the other three emission-source categories and makes up 75 percent of the inventory.

$PM_{2.5}$: Similar to PM_{10}, area-wide sources make up a significant portion of the inventory at 50 percent.

12.4.4.2 - Nonattainment Pollutant Emissions Inventory

The main sources of air pollutants in Kings County are mobile sources, and agricultural operations. Natural sources contribute a considerable amount of air contaminants as well. Kings County also receives air pollution blown in by the prevailing winds from the northern parts of the San Joaquin Valley (Valley) and the Bay Area and pollutants recirculated by wind eddies in the southern part of the Valley.

Kings County is only one subsection of the SJVAB, accounting for 5.6 percent of the SJVAB's 25,000 square miles. Accordingly, the emission inventory for Kings County is about the same percentage of the emissions of the SJVAB.

The 2008 emissions inventory for the Kings County portion of SJVAB is available in the CARB's 2009 Almanac Emission Projection Data. Table 6 summarizes the estimated 2008 emissions for the main pollutants of concern in Kings County.

Table 12-6: 2008 Kings County Nonattainment Pollutant Emissions Inventory

Emission Category	Tons per Day			
	ROG	NOx	PM_{10}	$PM_{2.5}$
Stationary Sources	2.6	2.3	1.2	0.7
Area-wide Sources	8.1	0.4	19.7	4.0
Mobile Sources	7.9	26.6	2.4	2.2
Natural Sources	4.2	0.0	0.1	0.1
Total SJVAB	22.8	29.3	23.4	7.0

Source: CARB 2010d.

ROG. Mobile sources contributed approximately 35 percent of the 2008 ROG emissions. Area-wide sources accounted for approximately 36 percent of the 2008 emissions inventory.

NO_x. Mobile sources generated the majority of NO_x emissions in Kings County at approximately 91 percent of the total NO_x inventory.

PM_{10}. For PM_{10}, Area-wide sources contributed approximately 84 percent of the 2008 inventory.

$PM_{2.5}$. For $PM_{2.5}$, Area-wide sources contributed 57 percent of the 2008 inventory.

Table 12-7: 2008 Kings County Significant Source Categories

Pollutant	Major Source Categories	Percent Contribution*
PM_{10}	Area-wide Sources	88
$PM_{2.5}$	Area-wide Sources	57
ROG	Mobile Sources	35
NOx	Mobile Sources	91
Notes: * Contribution to total Kings County Emission Inventory for the pollutant.		

12.4.4.3 - Significant Sources of Air Pollutants

Area-wide Sources contribute to the majority of PM_{10} and $PM_{2.5}$. The majority of the emissions within the Area-wide Source come from fugitive dust and farm operations. Mobile Sources contribute most significantly to the NO_x and ROG in the air.

Major Sources

Under the Clean Air Act, a stationary source in an Extreme nonattainment area such as the SJVUAPCD, whose annual emissions equal or exceed any one of the following thresholds; 10 tons of NOx, 10 tons VOC, 100 tons of CO, 70 tons of PM_{10}, or 70 tons of SOx , commonly known as "Criteria pollutants", is regulated as a federal "Major Source" of air pollution, and is subject to a federal Title V air permit. Separately, but no associated with the attainment classification of a region are major sources of hazardous air pollutants. A facility is a "Major Source" producer of Hazardous Air Pollutants (HAP's) if 10 tons or more per year of one of the 187 hazardous air pollutants are emitted, or 25 or more tons per year of any combination of the 187 identified are emitted. Table 12-8 below list major sources within Kings County requiring Title V air permits and the criteria pollutants of concern as identified by the California Air Resource Board's Facility Search Results.

Table 12-8: Major Air Pollution Stationary Sources in Kings County

Company	Industrial Classification Code	Address	Facility ID	Pollutant of Concern
CDR Systems Corp	30 – Rubber and Miscellaneous Plastic Products.	745 North Avenue Corcoran, CA	246	ROG
Chemical Waste Management, Inc	49- Electric, Gas, Sanitary Services	35251 Old Skyline Road Kettleman City, CA	283	ROG
Hanford LP	49- Electric, Gas, Sanitary Services	10596 Idaho Avenue Hanford, CA	603	NO_x,
JG Boswell Company Oil Mill	20 – Food and kindred Products	710 Bainum Avenue Corcoran, CA	1555	ROG
NAS Lemoore	97 – National Security, International Affairs	Naval Air Station Lemoore, CA	2106	NOx
Pacific Gas & Electric Co	49- Electric, Gas, Sanitary Services	34453 Plymouth Avenue Avenal, CA		NO_x,
Source CARB 2010f				

Linear Sources

Linear sources are sources of air pollution that emit along a fixed path. Roadways and railways are the two dominant types of linear sources. Interstate Highway 5 (I-5) runs from the Kern County line in the south to the Fresno County line in the north through the center of the County. The annual average daily trips (AADT) on I-5 is about 35,000 in 2007. State Highway 198 (SR-198) travels from the Tulare County line in the east to the Fresno County line in the west. The AADT on SR-198 is about 32,000 in 2007. The CARB Air Quality Land Use Handbook recommends that new sensitive land use types such as residences, schools, daycare centers, playgrounds and medical centers should not be planned within 500 feet of the a freeway or high traffic road with 100,000 vehicles per day for highways and urban roads and 50,000 vehicles per day on rural roads. Although neither I-5 nor SR-198 meets these thresholds, future growth could cause the AADT to breach the thresholds.

Railways also travel through Kings County. The Burlington Northern & Santa Fe Railroad connects Kings County to the mainline rail system. It runs generally north and south through Corcoran and Hanford and connects Kings County to major markets in northern and southern California. This rail line also provides AMTRAK passenger rail service to Kings County. The San Joaquin Valley Railroad (SJVRR) provides east and west freight rail service in Kings County. The SJVRR runs from Huron at the west end of the line to Visalia at the east end. The railway serves Lemoore to Hanford and has a railroad spur out to Stratford from Lemoore. The voter-approved California High Speed Rail will also traverse portions of King County, including a potential station in Hanford. The CARB Air Quality Land Use Handbook does not make recommendations for sensitive receptors near railways but does recommend a 1,000-foot buffer between major rail service and maintenance yards sensitive land use types and a 1-mile barrier for rail yards.

Sources of Odor

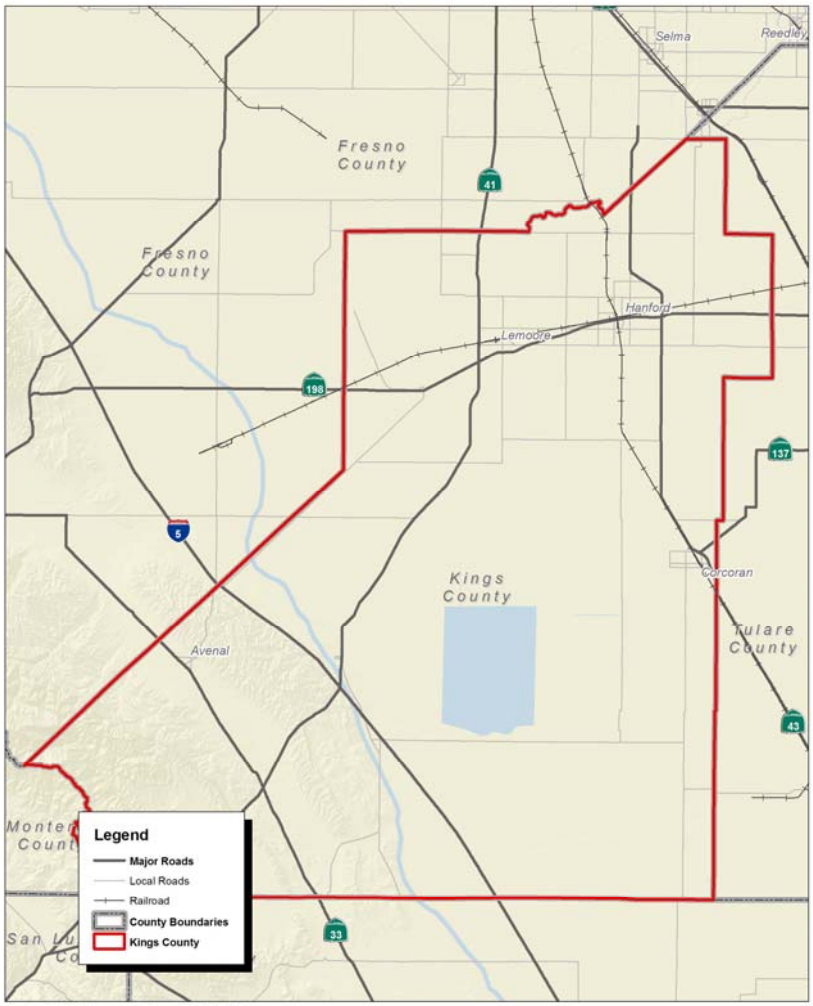
The SJVUAPCD has designated some land use types to potentially cause significant odor impacts to sensitive receptors. These land use types include wastewater treatment plants, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical and fiberglass manufacturing, painting and coating operations, food processing facilities, feed lots/dairies, and rendering

plants. The list of these land use types and their respective recommended distance from sensitive receptors can be found in the SJVUAPCD's GAMAQI.

Dairy farming is an integral part of Kings County as evidenced by the adoption of the Dairy Element of the Kings County General Plan in 2002. The Dairy Element designated 394 square miles to zoning for development and expansion of dairy facilities. In addition, 642 square miles are designated for dairy waste nutrient spreading. These zoning types have the potential to create significant odor impacts. The GAMAQI recommends that projects proposing sensitive land uses within 1 mile from a dairy farming operation provide an assessment of potential odor impacts. The Kings County Dairy Element contains several policies requiring buffers between dairies and sensitive land uses. Policy DE 1.2g states that new dairies facilities are prohibited from locating within a one-half (½) mile buffer zone around all existing public or private school sites. The Dairy Element Policy DE 1.2i states that facilities for new dairies, including corrals, barns, feed and manure storage areas, lagoons, etc., are prohibited from locating within a one-half (½) mile buffer zone around any residential zone (land zoned or designated for residential uses by Kings County or any city General Plan or zoning ordinance).
Wastewater treatment facilities are located throughout the County. Projects with sensitive uses within 2 miles of a wastewater treatment plant also are recommended for additional review and analysis to avoid potential odor impact. Other odorous activities may occur within the boundaries of Kings County, which are not mentioned here but which are discussed in the GAMAQI.

Airplane Emissions

Air pollution from airplanes occurs at the site of every airport. Lemoore Naval Air Station (LNAS) is located in the northwest portion of the county. Military jet aircraft emissions from LNAS is one of the county's largest sources with approximately 3.74 tons per day of reactive organic gases (ROG), 1.81 tons per day of oxides of nitrogen (NOx) 1.22 tons per day of PM10 and 1.21 tons per day of PM2.5. Numerous private airports and airstrips are scattered throughout the County, mainly supporting agricultural operations such as crop dusting. Private airports within the County support private charter businesses in some instances. Aircraft emissions are regulated by the EPA. Corcoran has two private airstrips. One located on the Northwest corner of town that is primarily used for crop dusting agriculture operation and the second located on the Southeast corner of town, which is primarily used for private charter plans.



Source: Ca Air Resources Board and CaSIL.

Exhibit 12-8
Major Linear Sources

12.4.4.4 - Greenhouse Gas Emissions Inventory

Given the current regulatory requirements and developing guidance concerning climate change, a clear and understandable inventory of GHG emissions will be an essential component of developing an effective GHG emission reduction strategy to meet the AB 32 targets and to provide the foundation for developing effective and measurable mitigation measures.

As part of the AB 32 Scoping Plan, CARB prepared the current California GHG Inventory (see Exhibit 10), which covers years 1990 to 2004 (CARB 2009e). CARB forecasted the amount of emissions that would occur in 2020 if no actions were taken (business-as-usual [BAU]) to assess the scope of the reductions needed to return California GHG emissions to the 1990 level by 2020. BAU GHG emissions represent the emissions that would be expected to occur in the absence of any GHG reduction actions. CARB estimated 1990 emission levels to be emissions 427 $MMTCO2_e$ and the 2020 emission levels to be 600 $MMTCO2_e$. A 29 percent reduction from BAU GHG emissions is necessary in order for California to meet the goals of AB 32.

For purposes of this background report, an inventory of GHG emissions was prepared for Kings County (See Table 9). It is important to note that this inventory is for information purposes only and is not the official GHG inventory from which emission reduction targets will be set. The emissions also represent an estimate of BAU GHG emissions. Additionally, various assumptions and methodologies were used to generate the GHG emissions inventory. Below is the list of assumptions and methodologies used in preparing the emissions inventory:

- Electricity and natural gas data from California Energy Consumption Database by the California Energy Commission. Vehicular data from EMFAC2007 model produced by the CARB.

- Solid waste data from Integrated Waste Management Board "Countywide Profile for Kings County.

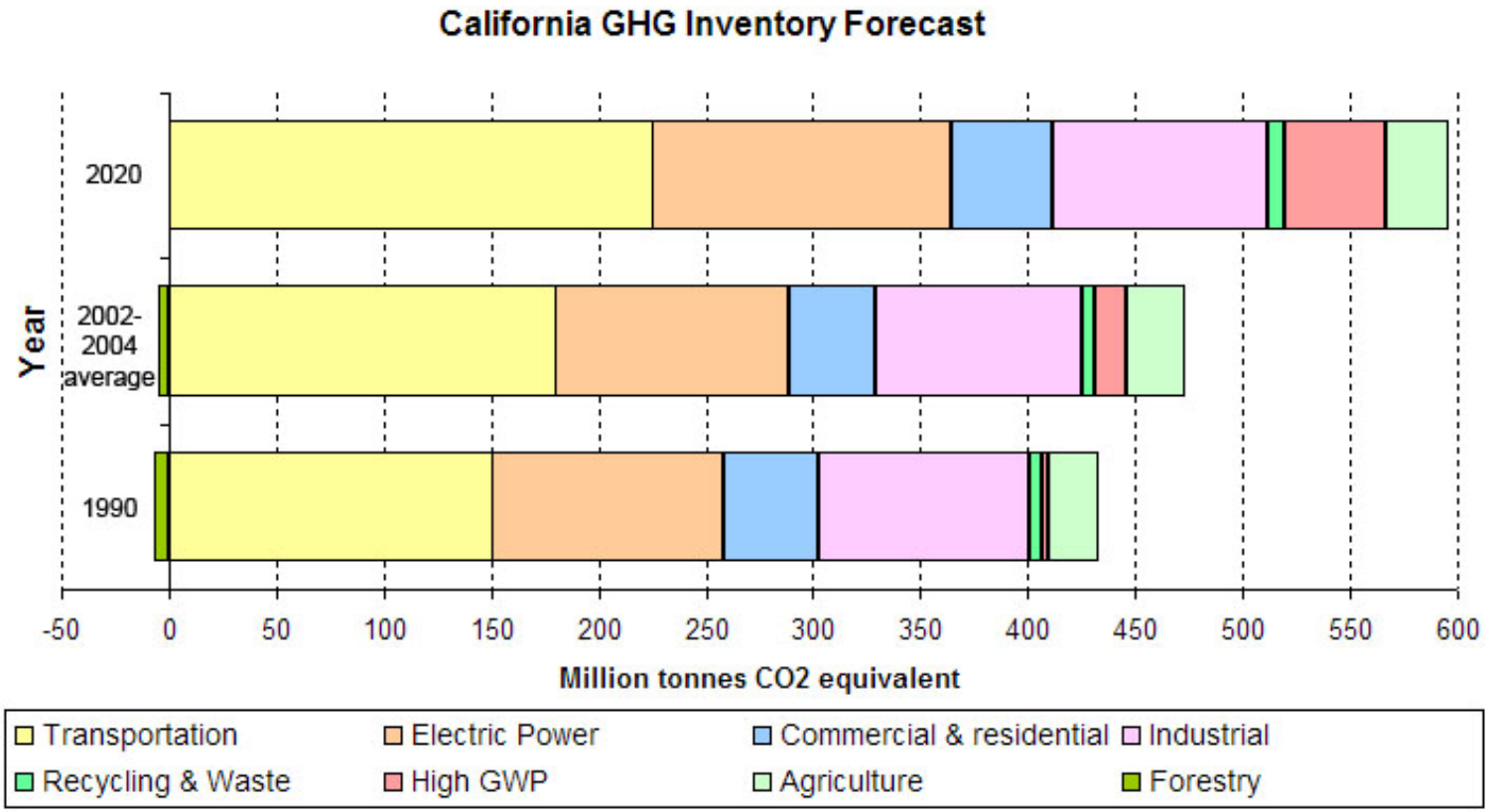
- Growth Factors from CARB 2020 Business as Usual (BAU) Forecasted Inventory.

- CARB's growth was from 2004 to 2020. To obtain projected growths for Kings County in each category, the percent per year growth predicted by CARB was calculated and the factor was applied to the number of years between base information and future years.

Years Between
- 2007 and 2020 = 13
- 2007 and 2035 = 28
- 2004 and 2020 = 16
- 2004 and 2035 = 31

- Forecasts for vehicular information were supplied within the EMFAC2007's model.

- All data is for Kings County total. Speciation between incorporated and unincorporated areas was not available at this level of analysis.



Source: CARB 2010e

Exhibit 12-9
Greenhouse Gas Inventory Data
Draft 2020 Forecast

Table 12-9: Kings County Greenhouse Gas Emissions Inventory

Category	Data Year	Metric Tons CO2e		
	2007	Current	2020	2035
Electrical Usage	2007	354,062	433,767	525,733
Natural Gas Combustion	2007	350,039	303,315	249,402
Vehicular	2004	875,276	1,135,167	1,480,604
Solid Waste	2007	285,891	393,100	493,608
Livestock	2007	1,446,695	1,641,192	1,865,612
TOTAL		3,311,962	3,909,560	4,616,995
Source: MBA 2009				

12.5: FUTURE AIR QUALITY

To understand how air quality will change in the future, forecasts are developed using state and KCAG estimates of population growth and emission activities. This section provides forecasts for the pollutants of concern in Kings County.

12.5.1 - Growth Projections

The San Joaquin Valley is one of the fastest growing areas of California. ARB has a projection of the county's population to 2020. The population of Kings County in 1990 was 101,866, and grew to 160,779 in 2009. The estimates of Kings County population at the highest growth rates put the population at 205,707 people by 2020. Corcoran's represents approximately 17% of the overall County's population projections. Land uses and transportation are both important when considering air pollution. Higher populations generally increase residential, industrial, and commercial sources of air pollution. Higher populations also mean more transportation activities. If these activities include an increase in vehicle miles traveled, there is a direct link between increase in population and air pollution. It is the responsibility of Kings County and KCAG to project future vehicle miles traveled. Exhibit 11 shows the increases in VMT and population in Kings County through 2020.

Projected Emissions Inventories

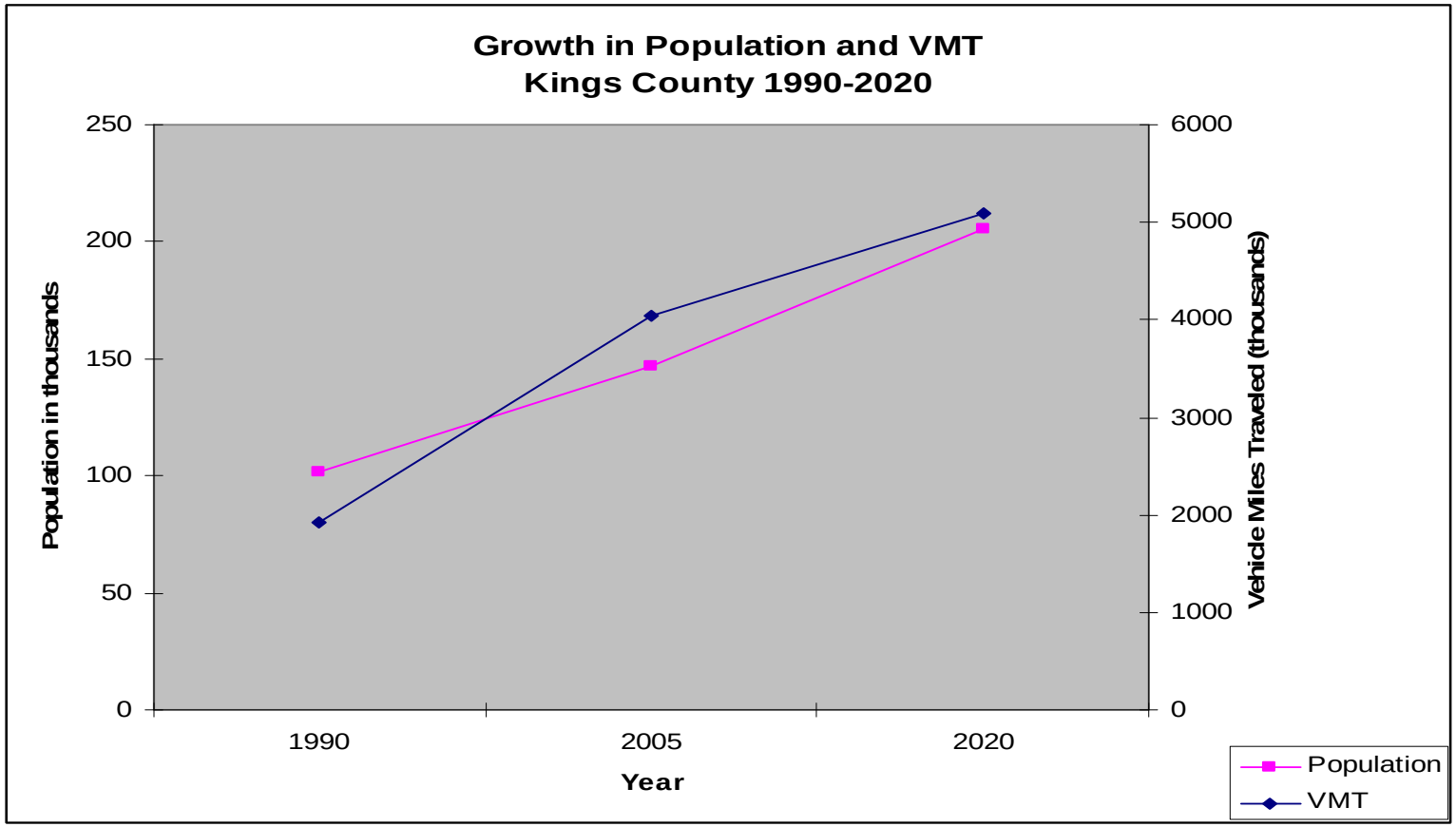
Forecasted emission inventories have been developed for the SJVAB and Kings County. The forecasted inventories were calculated from a 2002 baseline inventory and reflect regulations adopted through 2009 when the forecast was produced. The following charts represent projections of emissions for 2010, 2015, and 2020 by future inventories.

As Exhibit 12 shows, total emissions of ROG are projected to fall until 2010 but then steadily increase through 2020. The main component increasing within this time range is the emission of ROG from area-wide sources. The ROG emissions from mobile sources decrease over this time period but are offset by increases in emissions from the other three categories of emissions.

Kings County NO_x emissions are expected to decrease by 40.8 percent, as shown in Exhibit 13. The decrease in NO_x is directly associated to a decrease in NO_x emissions from mobile sources.

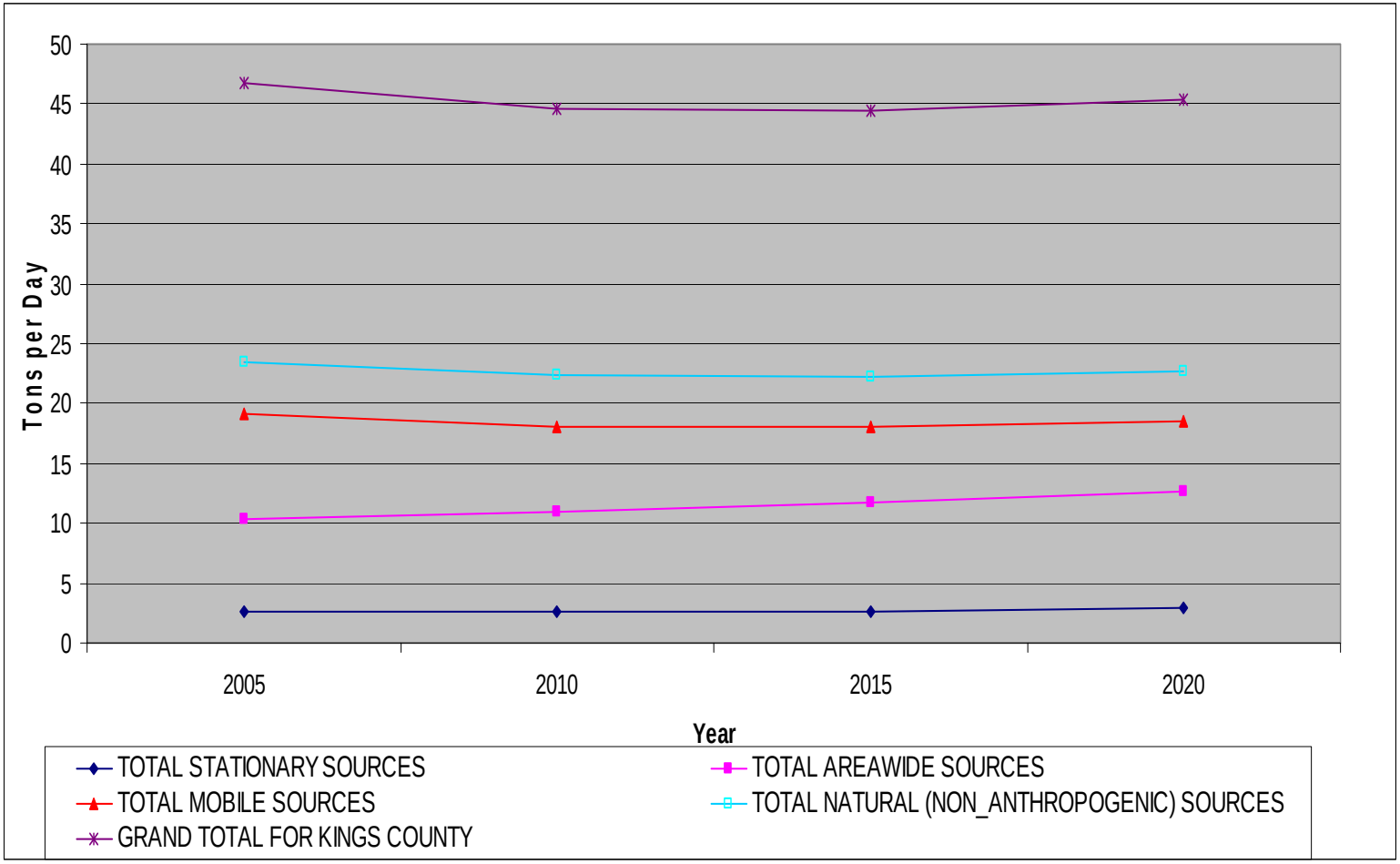
Kings County's PM_{10} emissions are projected to increase slightly from 2010 to 2020 (Exhibit 14).

This increase is driven by and increase in area-wide source emissions of PM_{10}. The other categories of contributors are flat across the time period.



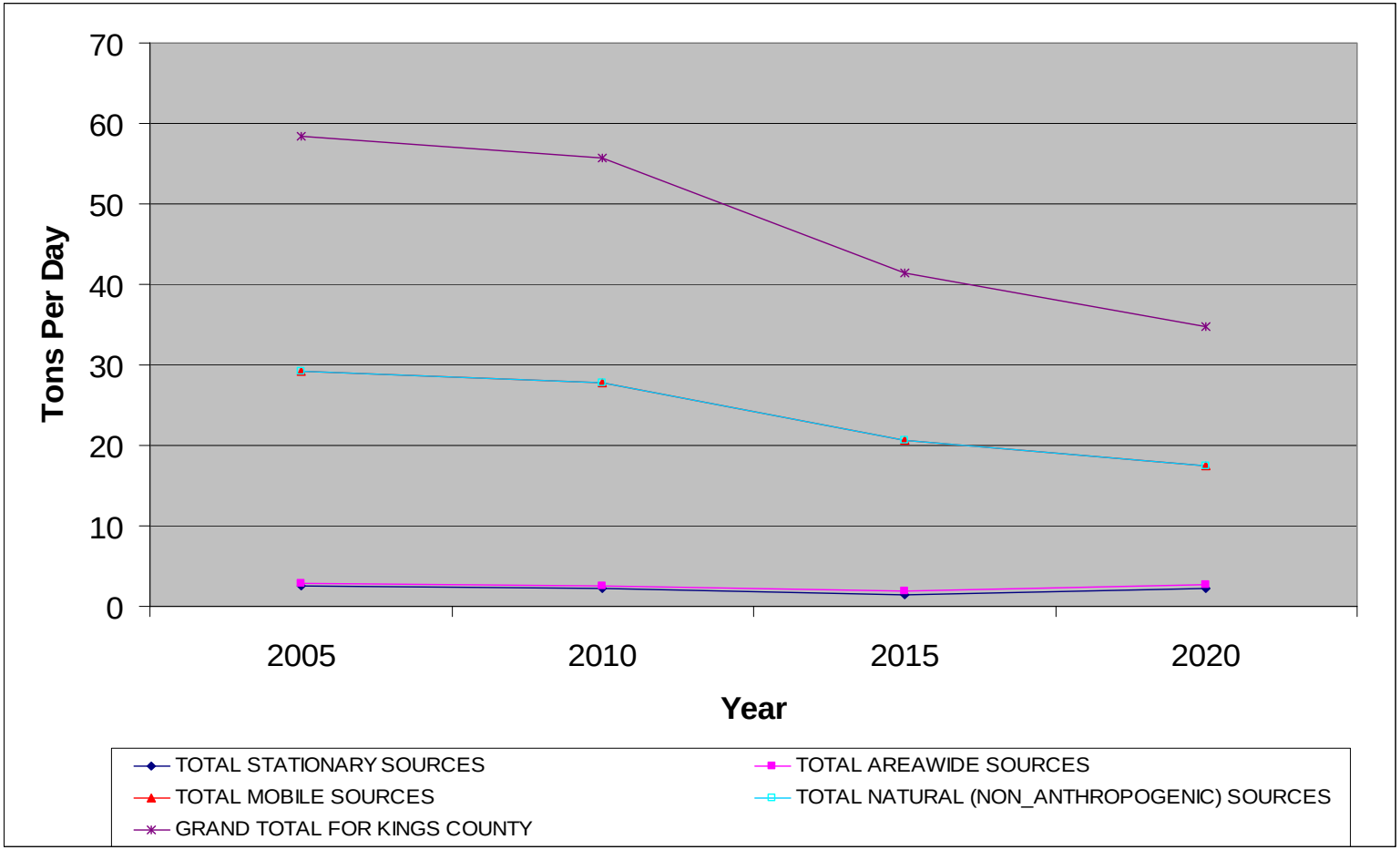
Source: ARB Population and Vehicle Trend Report

Exhibit 12-10
Growth in Population and VMT in the San Joaquin Valley from 1990-2020



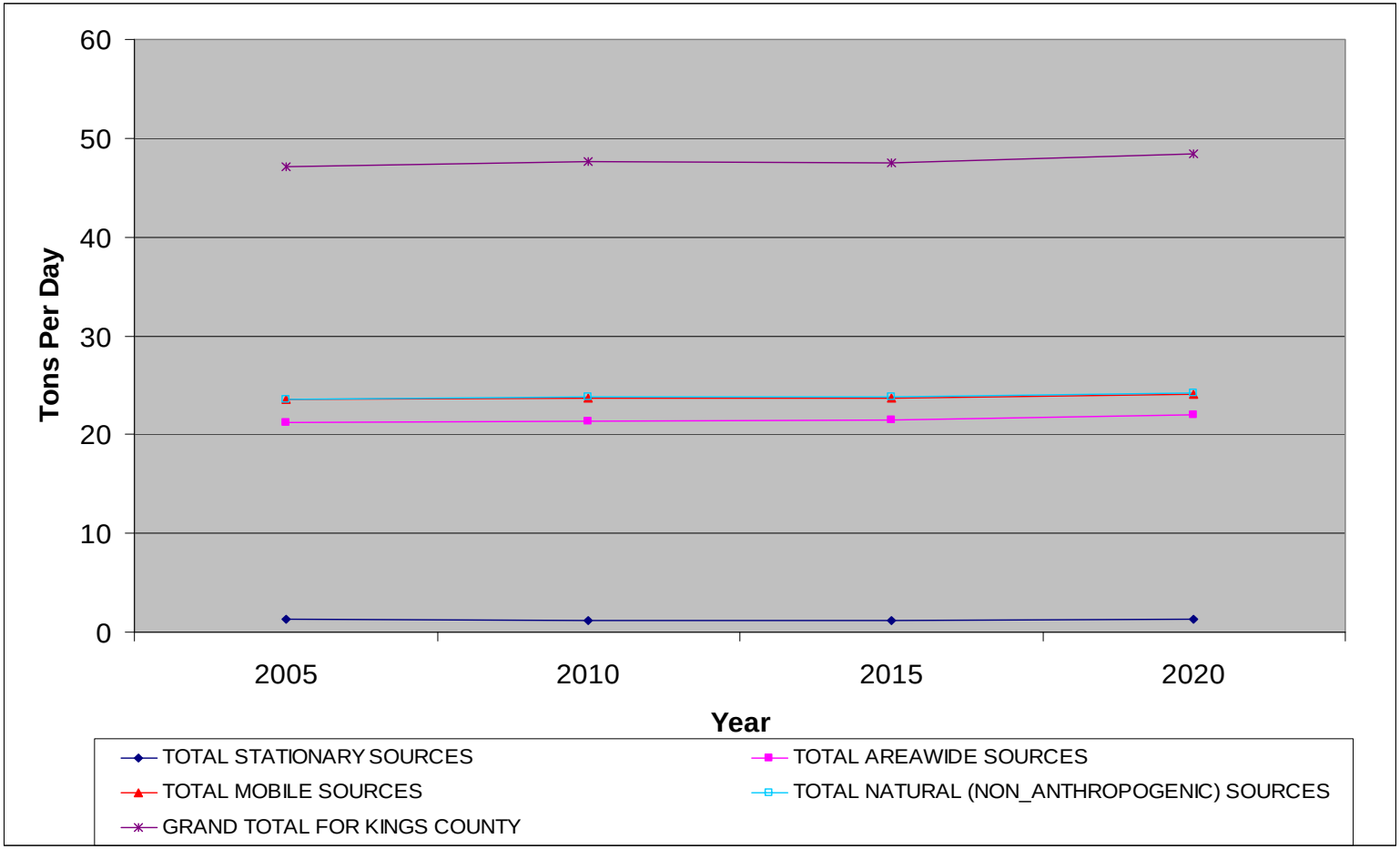
Source: CARB 2010c

Exhibit 12-11
Kings County Projected Emissions of ROG



Source: CARB 2010c

Exhibit 12-12
Kings County Projected Emissions of NOx



Source: CARB 2010c

Exhibit 12-13
Kings County Projected Emissions of PM10

Overall air pollution emissions from Kings County only increase slightly if at all from 2010-2020. The increase in population over that same time period might suggest air pollutants to have steeper increases than projected. Rules, regulations, and policies adopted by all air pollution controlling agencies with authority in Kings County have worked to counteract negative impacts on air quality that are due to population growth.

Furthermore, the continued efforts by CARB, SJVUAPCD, Kings County, and KCAG to enact policies, rules, and regulations for smart growth, since the inventory forecast has only continued to enable Kings County to achieve and broaden reductions in air pollution emissions. Programs such as KCAG's Blue Print Planning process allow the stakeholders in Kings County air quality to steer the County toward smart development, which has minimized air quality impacts. SB 375 also aims to reduce greenhouse gas emissions by focusing development on infill and transportation-centered communities. While this legislation is directed at greenhouse gases, it also has air quality impacts, since greenhouse gas emissions are the result of fossil fuel burning, a major contributor of air quality contaminants as well.

As part of SB 375, regional GHG emission reduction targets will be set by the CARB. In January 2009, CARB appointed a Regional Targets Advisory Committee (Committee) to recommend factors to be considered and methodologies to be used for setting GHG emission reduction targets for the affected regions. As the local transportation agency, KCAG will be included as part of the Committee. CARB in coordination with the Committee will have until September 30, 2010 to establish the regional emission reduction target for cars and light trucks. These emission reduction targets do not include reduced emissions resulting from greater fuel efficiency or from the use of low carbon fuels, both of which are governed by other legislation and regulation. GHG emissions for Kings County presumably will be projected to decrease as GHG emission reduction measures are implemented. BAU GHG emission projections are provided in Table 9. Projections of future GHG emissions after application of emission reduction measures are beyond the scope of this document.

12.6: REFERENCES

12.6.1 - References Cited

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