

## **EMISSION INVENTORY**

### **INTRODUCTION**

This chapter discusses the District's emission inventory (EI). It also describes the federal requirements pertaining to emissions inventories for State Implementation Plan (SIP) submittals and includes summaries of the emission inventories used in the PM10 Plan.

Emission inventories are lists of all known pollutant sources for a specific area. The District relies on emissions inventories as one of the key factors used to develop a strategy to attain air quality standards and to prioritize the adoption of controls. It is important to recognize that the emission inventory is not a direct measure of air quality. The emission inventory does not explain how long pollutants stay in the air, how they react in the atmosphere to form other substances, or how far they travel. Nevertheless, an accurate inventory is critical to the success of the air quality modeling used to demonstrate attainment of the standards.

The federal Clean Air Act (CAA) section 172(c)(3) requires all plan submittals to include a comprehensive, accurate, and current inventory of actual emissions from all sources of the relevant pollutant(s). The inventory that meets these qualifications is selected as the base year inventory. All other inventories used in the PM10 Plan rely on the base year inventory to forecast and backcast other years. The year 1999 was selected as the base year for the PM10 Plan because it has the most complete emission inventory currently available.

The base year and subsequent year emission inventories describe fall and winter seasons, and average annual emissions for directly emitted PM10 and PM10 precursors. Seasonal inventories are provided to account for the differences in emissions occurring during the times of year when the SJVAB exceeds the 24-hour PM10 standard. Pollutants that form PM10 in reactions in the atmosphere are referred to as PM10 precursors. PM10 precursors inventoried in the PM10 Plan include oxides of nitrogen (NOx), volatile organic compounds (VOC), oxides of sulfur (SOx), and ammonia.

The emission inventory for 2002 is the basis of an important PM10 planning requirement. As a consequence of failure to attain the PM10 standard by the CAA deadline, the PM10 Plan is required to demonstrate at least five percent per year reductions in PM10 or PM10 precursors based on the most recent emission inventory. The District must calculate progress toward this milestone from the date of such submission until attainment. In this case, the PM10 Plan was due December 31, 2002. Therefore, the 2002 inventory was used as the baseline to

calculate the quantitative milestones required for 2005, 2008 and the attainment year 2010.

The emission inventory is divided into source categories and subcategories. The main source categories are stationary sources (both point and aggregated), area sources, on-road mobile sources, and off-road mobile sources. These source categories are described in greater detail in the next section. Source categories provide a convenient way to organize the emission inventory and to determine the significance of particular sources.

The inventory for the PM10 Plan will be incorporated into the SIP. Any significant changes to the 1999 or the 2002 inventories will require a public participation process that includes a public hearing and District Governing Board adoption. Inventories will also be updated during reasonable further progress reports that are required every three years until attainment. The emission inventory is continuously being updated and improved. Chapter 8, 'Ongoing Activities,' identifies emission inventory improvements that the District plans to address in the near future.

## EMISSION INVENTORY

Determining emissions involves the use of emission factors. The EPA describes an emission factor as a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. These factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., grams of particulate emitted per gallon of fuel burned). Such factors facilitate estimation of emissions from various sources of air pollution. In most cases, these factors are simply the averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average).

The general equation for emission estimation is:

$$E = A \times EF \times (1 - ER/100)$$

where:

- E = emissions,
- A = activity rate,
- EF = emission factor, and
- ER= overall emission reduction efficiency, %.

The extent of completeness and detail of the emissions information is determined by the information available from published references. Emissions from some processes are better documented than others. For example, several emission factors may be listed for the production of one substance: one factor for each of a number of steps in the production process such as neutralization, drying,

distillation, and other operations. However, because of less extensive information, only one emission factor may be given for production facility releases for another substance, though emissions are probably produced during several intermediate steps. There may be more than one emission factor for the production of a certain substance because differing production processes may exist, or because different control devices may be used<sup>1</sup>.

It is important to realize that emissions inventories are only estimates, since it is highly impractical to directly measure and compile emissions on a continuous basis from a multitude of sources. Methods such as surveys and sampling are used to overcome this limitation. Actual emission measurements can be taken on a sample of devices to determine an average emission rate. Source tests at stationary emission sources provide a snapshot of emission rates that can then be applied over time. Field measurements of fugitive dust emissions taken at area sources such as construction sites can be used to determine an average emission rate under a variety of conditions. Generally, emission factors developed using a large number of measurements are more accurate than those relying on fewer measurements. The EPA has developed a comprehensive source for emission factors known as the "Compilation of Air Pollutant Emission Factors," or commonly referred to as "AP42." The ARB also compiles California-specific emission factors for many sources. The District is responsible for selecting emission factors for stationary sources and some area sources.

Once an emission factor is determined, the next step is to determine the population (number of sources) and extent of each source. Population data is collected directly and indirectly. For example, vehicle registration data is reported directly to the state. Stationary sources must obtain a permit from the District and so populations of permitted equipment are directly obtained and are reasonably accurate. The number of fireplaces is not reported and must be estimated indirectly using housing statistics and surveys. Each source category has its own methodology.

The next step is to determine an activity rate. Activity data is reported in hours of operation, gallons of fuel used, miles traveled, and other units. Stationary sources of emissions permitted by the District are required to report actual emissions to ensure that they remain below their emission limits. This provides detailed activity data that is used in the emission inventory. Often, a survey is carried out to determine usage rates. For example, people are asked to report how much wood they burn in their fireplaces and the type of woodburning devices they use, or vehicle miles traveled is estimated with the aid of traffic counts, travel surveys, and transportation models.

A variety of measurement units are applied to emission-producing activities. For example, when estimating emission factors for engines, data such as horsepower, hours of operation, or gallons of fuel used may be used to

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<sup>1</sup> <http://www.epa.gov/oar/oaqps/efactors.html>

determine emissions. Population or miles driven may be used as units for other sources to determine emission factors for water heaters or vehicles, respectively. The emission estimates for most point sources (specific facilities) are more reliable than the estimates based on studies because emission estimates from point sources are usually generated from the use of source tests, and the emission factors for that source are generated from this test. Furthermore, facility operators can inform the District of their actual production figures or fuel burned which eliminates the need for the District to estimate this type of data.

Emissions inventories are never considered to be entirely complete at one given time. These inventories can always be improved with the use of better emission factors and activity data. The District, in cooperation with the ARB, is committed to continually updating the emission inventory as research studies, emission factor updates, and other information become available. When emissions data change dramatically, the District is committed to revising the inventory and to ensuring that any impact is reflected in the control strategy and the attainment demonstration.

The 1999 EI used in this PM10 Plan uses the most recent data available; therefore, it differs from the published 1999 inventories for earlier plans. The detailed emissions inventories for 1999, 2002, 2005, 2008, and 2010 are included as reference document to this Plan. Summaries of these inventories are found at the end of this chapter.

The PM10 Plan also includes an emission inventory of PM10 precursors. Precursors are those compounds that are emitted into the atmosphere as a gas and that form PM10 through a variety of chemical processes. Since the amount of secondary material formed is dependent on atmospheric conditions and the presence of other reactive compounds, the amount of secondary particulates cannot be directly calculated for an emission inventory. However, with the use of an atmospheric model, the precursor emission inventory can be used to estimate particulate formation under the conditions experienced in the SJVAB. This is the same method used for ozone, which is a product of atmospheric processes involving VOC and NO<sub>x</sub>. Precursors examined for the PM10 Plan are VOC, NO<sub>x</sub>, ammonia (NH<sub>3</sub>), and SO<sub>x</sub>. Of these precursors only NO<sub>x</sub> appears to make a significant contribution to the attainment strategy. However, because of uncertainty in the precursor modeling, the District and ARB have developed inventories for each precursor. This is the first attempt by ARB to produce an NH<sub>3</sub> inventory for the SJVAB. The inventory is prepared differently than the criteria pollutants inventory. Ammonia emission estimates have a large amount of uncertainty and the District has committed to its improvement. The NH<sub>3</sub> inventory is shown in tables at the end of this chapter.

## Stationary Sources

Stationary source emissions are classified as an emission source that is fixed in place rather than movable (e.g., stack, engine, large water heater, etc.). Primary processes that produce air pollution are fuel combustion; industrial processes; solvent use; miscellaneous processes; petroleum processing, storage, and transfer; and waste burning. The specific sources associated with these processes are listed within the following source categories:

1. Fuel Combustion: This category contains emissions produced by stationary fossil fuel combustion equipment such as boilers and engines. Emissions in this category are produced by the following sources:
  - a. Petroleum Refining: Fuel burning equipment located at refineries;
  - b. Agricultural: Orchard heaters;
  - c. Oil and Gas Production: Stationary internal combustion engines, boilers, heaters, turbines, and steam generators at facilities engaged in the extraction and processing of petroleum products for shipment, using fuels such as natural gas, distillate oil, and liquified petroleum gas;
  - d. Electric Utilities: Diesel and natural gas turbines;
  - e. Other Manufacturing/Industrial: The same type of equipment as listed under Oil and Gas Production, but used in industrial and manufacturing activities;
  - f. Other Services and Commerce: Fuel combustion equipment including commercial space and water heaters; and
  - g. Other: Unspecified fuel combustion processes.
2. Industrial Processes: This category produces VOC and NOx emissions from the following sources:
  - a. Mineral Processes: Crushed rock and other mineral processing;
  - b. Food and Agriculture: Sugar beet processing, wine fermentation, wine and brandy aging, bakeries, spice manufacturing, and commercial charbroiling;
  - c. Chemical: Fiberglass operations, synthetic rubber and plastics manufacturing and miscellaneous chemical processes; and
  - d. Other: Unspecified industrial processes.
3. Petroleum Processing, Storage and Transfer: This category includes emissions resulting from the handling of petroleum liquids and gases at extraction, processing, transport, and marketing facilities. Because this category includes emissions related to the handling of petroleum products, and does not include combustion sources, it is comprised entirely of VOC emissions. Emissions in this category are produced by the following sources:

- a. Oil and Gas Extraction: Valves, fittings, compressor seals, flanges, storage tanks, crude oil sumps and pits, and oil production tanks;
- b. Petroleum Marketing: Petroleum storage tanks, loading of marine vessels and tank cars/trucks with crude oil, natural gas transmission losses, underground gasoline tanks, and vehicle refueling;
- c. Petroleum Refining: Valves, fittings, storage tanks and loading racks at refining facilities; and
- d. Other: Unspecified emissions related to the handling of petroleum liquids and gases.

Sources of air pollution in the stationary source inventory are tracked as point sources or aggregated-point sources. Point sources are those facilities that emit pollutants in quantities sufficient to require individual tracking of their emissions (generally over 10 tons per year) and include processing, manufacturing, and industrial operations.

Aggregated-point sources are point sources that emit less than 10 tons per year of any one pollutant. There are far too many of these to keep track of individually, but when added together they can represent a large quantity of air pollution. Examples of these sources include gas stations, water heaters, and space heating. Emissions from these types of sources are calculated on a broader scale of estimation, and not on an individual basis. For example, emissions from gas stations are generally calculated by the amount of gasoline sold in each county, with an emission factor based on 1000 gallons sold.

### **Area Sources**

Area sources include source categories that are associated with human activity and the emissions that take place over a wide geographic area. Area sources dominate the PM10 inventory as a directly emitted source category. Fugitive dust sources of PM10 (e.g., paved roads, unpaved roads, and agricultural operations) are examples of area sources. In addition, paints, cooking, construction, and consumer products are also considered area sources. The following is a more descriptive list of the types of sources categories found under area sources:

1. Miscellaneous Processes: The emissions in this category are produced by the following sources:
  - a. Pesticide Application: Synthetic and non-synthetic pesticides used for agricultural and non-agricultural purposes;
  - b. Unplanned Fires: Timber, brush, grassland wildfire, and auto/structural fires;
  - c. Residential Fuel Combustion: fuel oil, propane, natural gas, and wood, etc.

- d. Waste Disposal: Decomposition of waste material at landfill sites;
  - e. Farming Operations;
  - f. Construction and Demolition;
  - g. Entrained Road Dust – Paved;
  - h. Entrained Road Dust – Unpaved;
  - i. Fugitive Windblown Dust; and
  - j. Other: Other unspecified processes.
2. Solvent Use: This inventory category consists of evaporative emissions from surface coatings, degreasing operations, and manufacturing activities. Emissions in this category are produced by the following sources:
- a. Dry Cleaning: Petroleum and other dry cleaning solvents;
  - b. Architectural Coating: Oil and water based paints and thinners used to paint commercial and residential buildings and other structures;
  - c. Asphalt Paving: Cutback asphalt, emulsified asphalt, hot-mix asphalt, and road oils;
  - d. Printing: Inks, solvents, and cleaning agents;
  - e. Consumer Products: Antiperspirants and deodorants, air fresheners, automotive windshield wiper fluids, bathroom cleaners, consumer engine cleaners, barbecue lighter fluid, and aerosol insect repellents;
  - f. Industrial Solvent Use: Organic cleaning agents and solvents used in industrial processes such as the fabrication of plastic products and surface coating operations;
  - g. Degreasing: Petroleum and synthetic solvents used to clean parts and materials at industrial and commercial facilities;
  - h. Other Surface Coating: Paints, thinners, and cleaning agents for auto painting, solvent vats used in manufacturing, coatings used for aircraft parts, solvent used for adhesives and sealants, industrial coatings for plastics, paper, marine vessels, and wood furniture;
  - i. Other Manufacturing/Industrial: Thinning solvents; and
  - j. Other: Unspecified solvent use emissions.
3. Waste Burning: This category includes various activities that burn waste materials. Waste Burning sources contribute emissions from the following sources:
- a. Incineration: Incinerators and flares burning process gas;
  - b. Agricultural Debris: Field crop residue and pruning;
  - c. Range Management: Forest vegetation and chaparral; and
  - d. Other: Weed abatement and fire fighter training.

Methods used to estimate emissions for area sources are similar to aggregated-point sources, but area source emissions are more difficult to estimate. The same techniques used in estimating point source emissions are often used, but

with less reliability. For example, it is difficult to determine the number of residential fireplaces as well as the amount of wood burned in fireplaces within the District. Although there are methods to estimate this, the quality of data is not as reliable or accurate as that of point sources and point source tests. The estimates are based on total activity during a season and they do not provide much information about typical use, daily activity, or exact location of the source.

## Mobile Sources

The mobile source inventory includes emissions from vehicles and mobile equipment powered by piston and turbine engines. Mobile sources are grouped as on-road vehicles (e.g., cars and trucks), and other mobile sources (e.g., tractors, construction equipment, and lawn and garden equipment).

Mobile source emissions (VOC, NO<sub>x</sub>, SO<sub>x</sub>, CO, NH<sub>3</sub>, and PM<sub>10</sub>) result from fuel combustion and fuel evaporation. For example, evaporative emissions from automobile fuel tanks are a source of VOC emissions. During the day, increasing temperatures cause gasoline in tanks and fuel systems to expand, displacing vapors (which are mostly VOC) into the atmosphere unless they are contained by an on-board vapor recovery system. Mobile source emissions categories are as follows:

1. On-Road Motor Vehicles: This category includes light-duty passenger vehicles (automobiles), light-duty trucks (pick-up trucks), medium-duty trucks, heavy-duty trucks (dominated by diesel trucks), motorcycles, and heavy-duty diesel buses. The on-road motor vehicle emission inventory was developed for the District by the California Air Resources Board (ARB).
2. Other Mobile sources: this group includes ships, boats, airplanes, trains, residential utility equipment, and construction equipment which do not produce emissions on roads and highways. It includes the following types of sources:
  - a. Aircraft - Government: Military aircraft;
  - b. Aircraft - Other: Commercial and general aviation;
  - c. Mobile Equipment: Farm equipment and construction equipment not included in the utility equipment category;
  - d. Off-Road Vehicles: Commercial boats, recreational boats, four-wheel drive passenger vehicles, and off-road motorcycles;
  - e. Ships: Commercial shipping;
  - f. Trains: The District is traversed by a several major railway lines linking the area with the Sacramento and Bay Areas, and the Southeast Desert; and
  - g. Utility Equipment: Small utility engines driving chain saws, lawn mowers, leaf blowers, and portable compressors and generators.



The PM10 Plan uses ARB's mobile source emission inventory model EMFAC2002 version 2.08 to calculate on-road mobile source emissions. The ARB developed EMFAC in lieu of the EPA's motor vehicle emissions model MOBILE. The benefit of the ARB's model is that statewide motor vehicle emission control programs are included in the emission estimates. Basin-wide summaries of the District's on-road motor vehicle emission inventory for 1999, 2002, 2005, 2008, and 2010 are included in Appendix B.

The off-road emission inventory is developed with emission estimates from ARB's OFF-ROAD model. Other mobile categories, such as locomotives and aircraft, are estimated using emission factors developed by the EPA.

### **Natural Sources**

In addition to man-made air pollution, there are natural sources of emissions, also known as biogenic sources (i.e., plants, molds, and animals,) and geogenic sources (such as windblown dust from undisturbed land and the earth itself). These natural sources emit significant quantities of pollutants. For example, certain types of vegetation emit large amounts of isoprene, terpenes, and other organic compounds that are VOC. Emission rates depend upon plant species, season, biomass density, time of day, local temperature, moisture, and other factors.

The biogenic inventory for the San Joaquin Valley has been the subject of recent research and refinements. The biogenic VOC emission inventory is estimated at 379.37 tons per day for the District. Seasonal or annual estimates have not been prepared using this updated methodology, but it provides a sense of the magnitude of biogenic emissions during the summer. A typical winter day emissions and a typical fall day emissions will be provided by ARB prior to the release of the final plan.

### **Base Year Inventory**

A base year inventory is defined as an inventory of actual annual and typical weekday peak season emissions used in calculating projected inventories and in developing control strategies. The base year inventory is defined to include man-made sources of PM10, NOx, SOx, NH<sub>3</sub>, and VOC emissions. It must include emissions from all point, area, and highway and non-highway mobile sources located within the nonattainment area. Since the EPA has not issued any guidance on the types of emissions inventories to be included in this PM10 Plan, the District followed the basic guidance that was issued for the ozone attainment SIP and made modifications as appropriate.

## Revisions to Base Year Inventory

The emission inventory is prepared through the joint efforts of the ARB and the District. The ARB is responsible for on and off-road mobile sources. The District is responsible for point sources. Both agencies are responsible for area sources.

Prior to the current planning process, the last time the PM10 inventory was significantly updated was in 1997. The 1997 inventory was based on a 1993 inventory base year. These changes produced a dramatic decrease in the geologic dust of 20-70 percent, depending on the category. The changes in geologic dust are primarily due to introducing source specific activity and emission rates where none were available for previous inventories.

Starting in January 2002, ARB and the District took a systematic look at each of the categories in the emission inventory. Staff determined that the existing methodologies for area sources were still valid, but their inputs and emission factors needed updating. Staff also found that the stationary source inventory was recently updated for other reasons and needed no further work. On and off-road mobile source inventories are always being updated and the District determined to use the latest version of EMFAC and the Off-Road Model to develop the estimates.

The updates to the area source inventory primarily reflected an update of the underlying data to the 1999 activity levels, an update of emission factors where available, minor changes to methodologies where needed, and better spatial and temporal information. These changes should be considered refinements to the emission inventory and not a major overhaul of the inventory.

Table 3-1 below contains a list of source categories that were evaluated for this PM10 Plan. A check in the box means that the category was actually updated. A description of the changes to each of the categories that were updated can be found in Appendix C. Only emission categories that were evaluated are shown on this table.

**Table 3-1  
Summary of Emission Source Categories Evaluated and Updated**

<b>Category</b>	<b>Updated</b>	<b>Category</b>	<b>Updated</b>
<b>Stationary Source</b>		<b>Area Source</b>	
Electric Utilities	<input checked="" type="checkbox"/>	Paved Road Dust	<input checked="" type="checkbox"/>
Cogeneration	<input checked="" type="checkbox"/>	Unpaved Road Dust – Non-Ag	<input checked="" type="checkbox"/>
Oil and Gas Production	<input checked="" type="checkbox"/>	Unpaved Road Dust – Ag	<input checked="" type="checkbox"/>
Petroleum Refining	<input checked="" type="checkbox"/>	Agricultural Operations	<input checked="" type="checkbox"/>
Manufacturing and Industrial	<input checked="" type="checkbox"/>	Woodstoves & Fireplaces	<input checked="" type="checkbox"/>
Food and Agricultural	<input checked="" type="checkbox"/>	Agricultural Burning	<input checked="" type="checkbox"/>
Service and Commercial	<input checked="" type="checkbox"/>	Prescribed Burning	<input checked="" type="checkbox"/>
Sewage Treatment	<input checked="" type="checkbox"/>	Construction	<input checked="" type="checkbox"/>
Landfills, Incinerators	<input checked="" type="checkbox"/>	Commercial Charbroiling	<input checked="" type="checkbox"/>
Degreasing and Other	<input checked="" type="checkbox"/>	Livestock	<input checked="" type="checkbox"/>
Coatings and Adhesives	<input checked="" type="checkbox"/>	Fertilizers - Ammonia	<input checked="" type="checkbox"/>
Printing	<input checked="" type="checkbox"/>	Pesticides	<input type="checkbox"/>
Oil and Gas Production	<input checked="" type="checkbox"/>	Consumer products	<input type="checkbox"/>
Petroleum Refining	<input checked="" type="checkbox"/>	Architectural coatings	<input type="checkbox"/>
Petroleum Marketing	<input checked="" type="checkbox"/>	Refrigerants	<input type="checkbox"/>
Chemical	<input checked="" type="checkbox"/>	Solvent evaporation	<input type="checkbox"/>
Food and Agriculture	<input checked="" type="checkbox"/>	Windblown dust from ag lands	<input type="checkbox"/>
Mineral Processes	<input checked="" type="checkbox"/>	Structure and car fires	<input type="checkbox"/>
Metal Processes, Wood & Paper	<input checked="" type="checkbox"/>	Asphalt paving / roofing	<input type="checkbox"/>
Glass and Related Products	<input checked="" type="checkbox"/>	Utility equipment	<input type="checkbox"/>
<b>On-Road Mobile<sup>2</sup></b>		<b>Off-Road Mobile<sup>3</sup></b>	
Light Duty Passenger	<input checked="" type="checkbox"/>	Aircraft	<input checked="" type="checkbox"/>
Light Duty Trucks	<input checked="" type="checkbox"/>	Trains	<input checked="" type="checkbox"/>
Medium & Heavy Duty Gas Truck	<input checked="" type="checkbox"/>	Ships and Commercial Boats	<input checked="" type="checkbox"/>
Light & Med Duty Diesel Truck	<input checked="" type="checkbox"/>	Recreational Boats	<input checked="" type="checkbox"/>
Heavy Duty Diesel Truck	<input checked="" type="checkbox"/>	Off-Road Recreational Vehicles	<input checked="" type="checkbox"/>
Motorcycles	<input checked="" type="checkbox"/>	Off-Road Equipment	<input checked="" type="checkbox"/>
Heavy Duty Diesel Buses	<input checked="" type="checkbox"/>	Farm Equipment	<input checked="" type="checkbox"/>
Heavy Duty Gas Buses	<input checked="" type="checkbox"/>	Fuel Storage and Handling	<input checked="" type="checkbox"/>
School Buses	<input checked="" type="checkbox"/>		
Motor Homes	<input checked="" type="checkbox"/>		

## Growth and Control Factors

Projecting quantities of pollution in future years is traditionally accomplished by assuming that PM10, NOx, SOx, NH<sub>3</sub>, and VOC emissions are directly related to activity and control levels. If an activity level increases, it is generally assumed that emissions will similarly increase. Activity levels are represented by indicators such as population, housing, employment, oil and gas production, and vehicle miles traveled. These indicators are referred to as "surrogates". The ratio of the projected surrogate for each year to the actual 1999 level of activity is referred to as its growth factor. Growth factors are multiplied by 1999 emissions to project future year's emissions. A growth factor of less than one indicates a decline in an activity (declining emissions) over the planning period, while a growth factor of more than one indicates an increase in activity (increasing emissions).

<sup>2</sup> EMFAC2002 version 2.08 was used in calculating the emissions in this category.

<sup>3</sup> For all off road categories, the most current emission estimates from the Off-Road model was used.

Using the best data available, the ARB and the District compiled growth factor estimates for the years 1970 through 2030 for each group of sources and in each of the eight counties within the District. Although using growth factors is a standard method for projecting emissions, their use cannot account for all activities that might occur in an area during a given time frame. However, growth factors tend to be more accurate when applied to the SJVAB as a whole. For example, one facility might gain in market share while another loses its market share even though production increases at both facilities. While the overall growth factor is correct, each facility had very different growth rates. A report showing the growth factors that were used is located in a reference document.

The ARB estimates the on-road mobile source emissions growth for each class of vehicle, based on information obtained from the Transportation Planning Agencies (TPAs) located within the District, and Caltrans. Also, enhanced inspection and maintenance programs for motor vehicles and other motor vehicle control programs are factored into the mobile source projections included in this PM10 Plan. These data collectively represent the best available estimates on a county-by-county basis of future activity levels for mobile sources within the District.

After the baseline emission inventory is multiplied by a growth factor, it is then multiplied by a control factor. A control factor is a weighted average that represents the level of controls of one or more rules, regulations, and/or programs, for a group of sources. This control factor takes into account information other than control levels as stated in a rule or program. Rule penetration, compliance rates, public awareness, participation, and other agency's rules that affect the air quality are all considered in determining a control factor. Control factors need to be updated on a continuing basis as the production levels, industry types and size, programs, public awareness, base year inventories, and other conditions change over time. Control factor estimates for the years 1970-2030 were compiled by the District and ARB and can be found in a reference document.

## **FUTURE YEAR INVENTORIES**

Detailed Annual, Fourth, and First quarter inventories for the 1999, 2002, 2005, 2008, and 2010 inventories are available in a reference document to this Plan. At the end of this chapter, there is a series of summary tables that show the annual emissions of a year followed by that year's seasonal emissions. The summary tables include 1999, 2002, 2005, and 2010 emissions.

## **AVERAGE ANNUAL, SEASONAL, PLANNING, AND MODELING INVENTORIES**

An annual average inventory represents the emissions on an average day during a year, by taking the total annual emissions in tons and dividing them by 365 days. Fall emissions are represented by the emissions that occur in October and November, and the winter emissions are represented by the emissions that occur in November, December, and January. The month of November is a transitional month between the fall (primarily geological) episodes and the winter (primarily ammonium nitrate) episodes. The reason that these four months were chosen is that these months were the only months where exceedances of the federal 24-hour PM10 standard were measured. For more details, please see the chapters that discuss modeling and air quality data. These monthly inventories are called modeling inventories and are prepared based on the ARB's published guidelines, as described below.

The point source emissions for modeling inventories are based on average daily emissions during that month. For example, some businesses have certain months that are busier than others. These busy months will have more emissions than slower months. An example of this type of operation is a tomato processing plant, which has more emissions during harvest time than any other time during the year. Data on normal operating schedules (hours per day, days per week, and weeks per year) are collected as a part of routine point source inventory procedures.

Area and aggregate-point source emissions are based on an estimated monthly throughput (e.g. gasoline usage peaks during the summer). Representative profiles showing monthly variation in emissions are prepared for each source category. These profiles are then used to obtain average operating day emissions. Once the average daily emissions by month are obtained, the monthly emissions are totaled and then divided by the total number of months. This number represents the average weekday emissions for the season. Please see Appendix D for the fall and winter inventories.

Planning inventories are used as the base for preparing plans. In this document, the inventory for 2002 is the planning inventory. The fall and winter modeling inventories were used to determine the necessary control strategy to attain the federal 24-hour PM10 standard. The 2002 annual average inventory will be used to show attainment of the federal annual PM10 standard and compliance with the five percent reduction per year requirement.

## **MOTOR VEHICLE EMISSION BUDGETS FOR CONFORMITY**

In accordance with the 1990 Clean Air Act Amendments, conformity requirements are intended to ensure that transportation activities do not result in air quality degradation. Section 176 of the Amendments requires that

transportation plans, programs, and projects conform to applicable air quality plans before the transportation action is approved by a Metropolitan Planning Organization (MPO).

Section 176(c) provides the framework for ensuring that Federal actions conform to air quality plans under section 110. Conformity to an implementation plan means that proposed activities must not (1) cause or contribute to any new violation of any standard in any area, (2) increase the frequency or severity of any existing violation of any standard in any area, or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area. For nonattainment areas required demonstrating RFP and attainment, EPA requires that the SIP revision contain statements of the motor vehicle emissions on which the demonstrations are based. These statements become the “emission budgets” for highway and transit vehicles. The transportation plans and programs produced by the transportation planning process are required to result in emissions that are less than or equal to the budget.

EPA transportation conformity regulations issued in November 1993 establish criteria involving the comparison of projected transportation plan emissions with the motor vehicle emissions assumed in the applicable air quality plans. The regulations define the term “motor vehicle emissions budget” as meaning “the portion of the total allowable emissions defined in a revision of the applicable implementation plan (or in an implementation plan revision which was endorsed by the Governor or his or her designee) for a certain date for the purpose of meeting reasonable further progress milestones or attainment or maintenance demonstrations, for any criteria pollutant or its precursors, allocated by the applicable implementation plan to highway and transit vehicles.”

*NOTE: Federal transportation conformity regulations are found in 40 CFR Part 51, subpart T – Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Laws. Part 93, subpart A of this chapter was revised by the EPA in the August 15, 1997 Federal Register.*

Regional emissions have been estimated for 1999, 2002, 2005, 2008, and 2010. The reasonable further progress demonstration contained in Chapter 7 is based on the average annual daily emissions for milestone years 2005 and 2008. In addition, the modeling demonstrates attainment of both the annual average standard and the 24-hour standard in 2010. In accordance with the conformity rule described in more detail below, motor vehicle emissions budgets are being established for 2005, 2008, and 2010 based on the average annual daily emissions that are applicable for both the annual and 24-hour PM10 standards.

For conformity purposes, the motor vehicle emissions budget for PM10 includes regional reentrained dust from travel on paved roads, vehicular exhaust, travel on unpaved roads, and road construction. Section 93.122(d)(2) of the federal

conformity rule requires that PM10 from construction-related fugitive dust be included in the regional PM10 emissions analysis, if it is identified as a contributor to the nonattainment problem in a PM10 implementation plan.

Section 93.102(b)(2)(iii) of the federal conformity rule identifies VOC and NOx as the two PM10 precursor pollutants that must also have a motor vehicle emissions budget if deemed significant. The air quality modeling indicates that VOC is not a significant precursor. Accordingly, a motor vehicle emissions budget for NOx is being established and includes vehicular exhaust only. It is important to note that the conformity rule does not require sulfur oxides or ammonia to be addressed.

According to EPA (November 24, 1993 Federal Register, page 62194), the emissions budget applies as a ceiling on emissions in the year for which it is defined, and for all subsequent years until another year for which a different budget is defined or until a SIP revision modifies the budget. The emissions budgets provided in Table 3-2 are applicable for both the annual and 24-hour PM10 standards.

The budgets are derived starting with projections from ARB's EMFAC2002 on-road mobile source emission factor model. These are adjusted to account for any baseline emission reductions not included in the model and any emissions that the model does not project (e.g., road dust). Finally, any new emission reduction commitments are subtracted from the adjusted baseline to arrive at the conformity budgets. It is important to note that Section 93.124(e) of the federal conformity rule indicates that nonattainment areas with more than one MPO may establish motor vehicle emission budgets for each MPO in the implementation plan. As a result, County-level emission budgets are provided in this plan. The following is the 2010 budget calculation for Fresno County. The calculation methodology for the other years and counties is identical.

	NOx	PM10
<b>Emissions Baseline</b>		
Baseline EMFAC2002	32.9	1.5
I/M Improvements/Expansion	0.6	0.0
Reentrained road dust (paved)	--	13.7
Reentrained road dust (unpaved)	--	0.9
Road Construction Dust	--	4.6
Adjusted Baseline	33.3	20.7
<b>Control Measures</b>		
New State Measures	2.2	0.0
<b>New Local Measures</b>	0.4	4.6
<b>Conformity Emission Budgets*</b>	29.7	16.2

\*Rounded up to the nearest tenth

**Table 3-2  
Motor Vehicle Emissions Budgets  
(tons per average annual day)**

County	2005		2008		2010	
	PM10	NOx	PM10	NOx	PM10	NOx
<b>Fresno</b>	14.1	42.6	13.3	36.4	16.2	29.7
<b>Kern</b>	10.6	38.8	10.7	34.2	10.8	28.4
<b>Kings</b>	5.6	7.5	5.6	6.5	6.7	5.4
<b>Madera</b>	4.3	9.9	4.3	9.1	4.5	7.8
<b>Merced</b>	5.5	15.3	5.2	12.5	5.3	9.9
<b>San Joaquin</b>	9.0	28.9	9.0	23.4	9.2	18.3
<b>Stanislaus</b>	6.5	22.5	6.1	18.7	6.1	14.9
<b>Tulare</b>	8.7	23.6	7.9	20.1	8.9	16.4

Section 93.124 of the federal conformity rule, in particular 93.124(c), allows for the SIP to establish trading mechanisms between budgets for pollutants or precursors, or among budgets allocated to mobile and other sources. This SIP allows trading from the motor vehicle emissions budget for the PM10 precursor NOx to the motor vehicle emissions budget for primary PM10 using a 1.5 to 1 ratio. The trading mechanism will allow the agencies responsible for demonstrating transportation conformity in the San Joaquin Valley to supplement the 2010 budget for PM10 with a portion of the 2010 budget for NOx, and use these adjusted motor vehicle emissions budgets for PM10 and NOx to demonstrate transportation conformity with the PM10 SIP for analysis years after 2010.

The trading mechanism will be used only for conformity analyses for years after 2010. To ensure that the trading mechanism does not impact the ability to meet the NOx budget, the NOx emission reductions available to supplement the PM10 budget shall only be those remaining after the NOx budget has been met. Finally, reductions from the State's motor vehicle control program shall be calculated using ARB approved factors and methodologies.

The agency responsible for demonstration transportation conformity shall clearly document the calculations used in the trading, along with any additional reductions of NOx or PM10 emissions in the conformity analysis. In addition, in light of the role that growth in travel plays in PM10 emissions in the Valley, the San Joaquin Valley COG Directors have committed to conduct feasibility analyses as part of each new Regional Transportation Plan, excluding revisions (i.e., amendments). The analysis will identify and evaluate potential control measures that could be included in the Regional Transportation Plans (see Appendix O). Any additional PM10 or NOx reductions achieved in the RTPs



shall be credited in the transportation conformity demonstration. Reductions achieved after 2010 shall be credited prior to implementing the trading mechanism.

## PRE-BASELINE EMISSION REDUCTION CREDITS

The District requires all new and modified stationary sources that increase emissions in amounts in excess of emission offset thresholds to obtain emission reduction credits (ERC) to offset the growth in emissions. District Rule 2201 (New and Modified Stationary Source Review Rule) contains the offset requirement. Offsets represent either on-site reductions or the use of banked ERCs. Calendar year 2002 constitutes the baseline year for this PM10 Plan. The District expects that some pre-baseline credits will be used to allow growth from permitted stationary sources.

The General Preamble (57 FR 13498) states that “the pre-baseline ERCs must be reflected as growth and included in the attainment demonstration *“to the extent that the State expects that such credits will be used as offsets or netting prior to attainment of the ambient standards.”* The August 26, 1994 memorandum from John Seitz, EPA’s Director of Office of Air Quality Planning and Standards, to David Howekamp of EPA Region IX provides two ways for inclusion of these ERCs as growth by stating that *“A state may choose to show that the magnitude of the pre-1990 ERCs (in absolute tonnage) was included in the growth factor, or the state may choose to show that it was not included in the growth factor, but in addition to anticipated general growth.”*

By including the pre-baseline ERCs in the growth factor, the District has selected the first methodology provided in Seitz’s memorandum. However, in either case, the purpose is to show that

$$\text{baseline inventory} + \text{growth} + \text{ERCs(pre-baseline)} - \text{offsets} - \text{reductions}$$

will result in a projected inventory adequate to attain the NAAQS and any applicable rate of progress, where

$$\text{growth} = \text{non-permitted growth} + \text{permitted growth}$$

$$\text{offsets} = \text{ERCs(post-baseline)} + \text{ERCs(pre-baseline)}$$

$$\text{reductions} = \text{reductions required by the measures in the Plan}$$

Growth Estimate: The emissions trends and growth estimates in this plan were generated using the reports from the California Emission Forecasting System (CEFS). The SIP/CCOS emission inventory and associated emissions projections were developed jointly by the California Air Pollution Control and Air Quality Management Districts and the California Air Resources Board (ARB).

The CEFS's computer tools were used to develop projections and the emission estimates based on the most currently available growth and control data available at the time of the forecast runs. The CEFS was developed in the 1990s to assist in the development of air quality plans, determining how and where air pollution can be reduced, tracking progress towards meeting plans goals and mandates, and in constructing emission trends.

A key component of CEFS is the growth data. As a part of Central California Ozone Study (CCOS), the growth factors were enhanced in 2001. The February 26, 2001 report titled "DEVELOPMENT OF EMISSIONS GROWTH SURROGATES AND ACTIVITY PROJECTIONS USED IN FORECASTING POINT AND AREA SOURCE EMISSIONS" describes efforts undertaken to identify the most appropriate growth surrogates for stationary sources. The growth estimates generated by CEFS include growth in emissions requiring offsets under New Source Review Rule as well those that can be accommodated without triggering offsets. Tables 1 through 4 in Appendix F show total growth rates of 8.6 tons/day of NOX, 8 tons/day of VOCs, 2.3 ton/day of PM10, and 2.6 tons/day of SOx. Tables 1 through 4 also show the expected reductions for each pollutant from the measures contained or relied on in this Plan. As shown in Tables 1 through 4 in Appendix F, the projected inventory for 2010 incorporates the projected growth as well as the expected controls from the measures contained in the Plan. Notwithstanding slight rounding errors, the projected 2010 inventory equals the baseline inventory plus the projected growth minus the expected reductions from the controls contained in the Plan.

Pre-Baseline Offset Usage Estimate: Under District's New Source Review Rule 2201, new sources with emissions exceeding the following level must offset their emissions:

NOx .....	20,000 lbs/year
VOC.....	20,000 lbs/year
PM10.....	29,200 lbs/year
SOx.....	54,750 lbs/year
CO (attainment area) .....	200,000 lbs/year
CO (non-attainment area) .....	30,000 lbs/year

Additionally, for existing facilities with emissions meeting or exceeding the above levels, any increase in emissions must be offset.

The amount of offsets required was estimated by establishing the percentage of permitting actions for each source category that would be subject to offset

requirements under Rule 2201. For each source category, this percentage was established based on past permitting history, the fraction of sources in the category with emissions at or above the offset trigger levels, and the historical permitting activity for the source category. The following factors were used in estimating the potential need for offsets:

- All increases from modifications to existing sources with potential emissions at or above the above offset thresholds would require offsets (District Rule 2201).
- New sources with emissions exceeding the above offset thresholds would require offsets (District Rule 2201).
- The percentage of sources that meet any of the above criteria was estimated by examining past permitting history and by projecting future permitting based on the estimated growth. For instance, the majority of permitting actions with increases in emissions from oil production facilities come from sources with potential emissions in excess of the above offset thresholds. Therefore, for that source category, it was assumed that 100% of increase in overall emissions would require offsets.

The quantity of required offsets was then established by multiplying the expected growth in emissions for each source category by this percentage and the expected offset ratio. District rule 2201 establishes offset ratios ranging from 1.3:1 to 1.5:1 based on the distance from the source of ERCs to the source with increase in emissions. An offset ratio of 1.5:1 applies to all transaction where the distance is greater than 15 miles. Historically, most transactions in the District involve a distance of greater 15 miles. For calendar year 2002, the average offset ratio for all permitting actions was slightly higher than 1.4:1. Therefore, an average offset ratio of 1.4:1 was used for these calculations.

Tables 1 through 4 of Appendix F contain the expected growth, percentage of activities subject to offset requirements, and the expected quantity of offsets for each pollutant.

Although some offsets are expected to come from post-baseline reduction, this Plan conservatively assumes that all offset will be pre-baseline. The expected pre-baseline offset usage after 2002 through 2010, as shown in Tables 1 through 4 of appendix F, is estimated as follows:

NOx .....	7.01 tons/day
VOC .....	6.41 tons/day
PM10 .....	1.90 tons/day
SOx .....	1.93 tons/day

As shown above, the quantity of pre-baseline offsets that expected to be used between 2002 and 2010 are less than the estimated growth in emissions for each pollutant. As currently adopted, if growth in new and modified sources occurs at the rate estimated in this Plan, the use of offsets as provided in Rule 2201 will ensure that permitted increases in major source emissions will not interfere with progress toward attainment of federal PM10 standards or the achievement of the 5 percent per year reduction in PM10 or PM10 precursors emissions. As discussed in Chapter 7, the District satisfies the requirement for Reasonable Further Progress with above-mentioned projected inventories and without taking credit for the ERCs required of and provided by the new and modified stationary sources.

Safeguards to assure Plan integrity despite the use of pre-baseline credits: In order to assure the use of pre-baseline ERCs do not interfere with attainment effort and the applicable rate of progress, this Plan incorporates the following safeguards:

- The District will place a cap on the amount of pre-baseline credits that can be used. Although the District has relied on a number of conservative assumptions in estimating the usage quantity of pre-baseline credits, some degree of uncertainty exists. For instance, unexpected growth or irregular permitting activity may occur for one or more source categories. The cap on the use of pre-baseline ERCs will be enforced by tracking the use of such credits and disallowing such credits through permitting actions when the above-specified levels are reached. The District Rules and Regulations will be amended to require tracking and enforcement of the above referenced CAP within 12 months after EPA approval of this Plan.
- Although some ERCs will come from post-baseline reductions, this Plan conservatively assumes that all offsets will come from pre-baseline reductions. As discussed earlier, federal law only requires the pre-baseline ERCs to be included in the growth and the attainment demonstration. This plan assumes that all ERCs will be pre-baseline ERCs and, therefore, includes them all in the projected inventory as growth. Using a larger than permissible projected inventory leads to conservative conclusions relating to the attainment and Reasonable Further Progress demonstrations.
- Although permissible, this plan does not take credit for reductions and mitigations required under the District's New Source Review Rule. In particular, this Plan does not reduce the future years emissions by taking credit for the amount of ERCs provided through permitting actions. This conservative approach assures that the attainment demonstration is not affected by the use of pre-baseline ERCs. Attainment and the required 5% Reasonable Further Progress is demonstrated without reducing the projected emissions with an amount corresponding to the mitigations provided by ERCs.

**Table 3-3  
Estimated NOx Growth, Control, and Estimated Offset Use**

<b>STATIONARY SOURCES</b>								
<i>SUMMARY CATEGORY NAME</i>	2002 Emissions Tons/day	Growth Factor (%)	Estimated Growth (tons/day)	Control Factor (%)	Required Reductions (tons/day)	2010 Emissions Tons/day	Percent Requiring Offsets	Estimated Offsets (tons/day)
<b>FUEL COMBUSTION</b>								
ELECTRIC UTILITIES	2.824	10.12%	0.286	3.53%	0.110	2.98	80	0.32
COGENERATION	10.439	15.39%	1.606	46.38%	5.587	6.328	80	1.80
OIL AND GAS PRODUCTION (COMBUSTION)	25.023	1.00%	0.250	0.78%	0.197	25.549	80	0.28
PETROLEUM REFINING (COMBUSTION)	1.458	0.00%	0.000	0.00%	0.000	1.459	80	0.00
MANUFACTURING AND INDUSTRIAL	30.072	11.00%	3.306	0.42%	0.141	33.885	30	1.39
FOOD AND AGRICULTURAL PROCESSING	19.873	-2.21%	-0.438	-0.05%	-0.009	19.44	10	
SERVICE AND COMMERCIAL	29.183	7.26%	2.118	0.07%	0.022	31.396	50	1.48
OTHER (FUEL COMBUSTION)	8.424	-0.01%	-0.001	24.93%	2.100	6.324		
<b>* TOTAL FUEL COMBUSTION</b>	127.295					127.362		
<b>WASTE DISPOSAL</b>								
SEWAGE TREATMENT	0		0.000		0.000	0		
LANDFILLS	0		0.000		0.000	0		
INCINERATORS	0.052	8.77%	0.005	0.00%	0.000	0.057	25	0.00
SOIL REMEDIATION	0		0.000		0.000	0		
OTHER (WASTE DISPOSAL)	0		0.000		0.000	0		
<b>* TOTAL WASTE DISPOSAL</b>	0.052					0.057		

<b>CLEANING AND SURFACE COATINGS</b>								
LAUNDERING	0		0.000		0.000	0		
DEGREASING	0		0.000		0.000	0		
COATINGS AND RELATED PROCESS SOLVENTS	0		0.000		0.000	0		
PRINTING	0		0.000		0.000	0		
ADHESIVES AND SEALANTS	0		0.000		0.000	0		
OTHER (CLEANING AND SURFACE COATINGS)	0.003	40.00%	0.001	0.00%	0.000	0.005	10	0.00
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	<b>0.003</b>		<b>0.000</b>			<b>0.005</b>		
<b>PETROLEUM PRODUCTION AND MARKETING</b>								
OIL AND GAS PRODUCTION	0.181	21.98%	0.040	0.62%	0.001	0.232	80	0.04
PETROLEUM REFINING	0.091	0.00%	0.000	0.00%	0.000	0.091	80	0.00
PETROLEUM MARKETING	0.02	23.08%	0.005	0.00%	0.000	0.026		
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	<b>0.292</b>					<b>0.348</b>		
<b>INDUSTRIAL PROCESSES</b>								
CHEMICAL	0.131	13.25%	0.017	0.80%	0.001	0.151	25	0.01
FOOD AND AGRICULTURE	9.171	-2.42%	-0.222	-0.05%	-0.005	8.954	10	
MINERAL PROCESSES	1.459	11.47%	0.167	0.00%	0.000	1.648	25	0.06
METAL PROCESSES	0.017	5.56%	0.001	0.00%	0.000	0.018		
WOOD AND PAPER	0.002	0.00%	0.000	0.00%	0.000	0.002		
GLASS AND RELATED PRODUCTS	12.283	11.83%	1.453	25.64%	3.521	10.315	80	1.63
ELECTRONICS	0.002	33.33%	0.001	0.00%	0.000	0.003	25	0.00
OTHER (INDUSTRIAL PROCESSES)	0.02	20.00%	0.004	0.00%	0.000	0.025	25	0.00

* TOTAL INDUSTRIAL PROCESSES	23.083					21.115		
** TOTAL STATIONARY SOURCES	150.725					148.887		
<b>GRAND TOTAL FOR SAN JOAQUIN VALLEY UNIFIED APCD</b>	150.725		8.597			148.887		7.01

**Table 3 - 4**  
**Estimated VOC Growth, Control, and Estimated Offset Use**

<b>STATIONARY SOURCES</b>								
<i>SUMMARY CATEGORY NAME</i>	2002 Emissions Tons/day	Growth Factor (%)	Estimated Growth (tons/day)	Control Factor (%)	Required Reductions (tons/day)	2010 Emissions Tons/day	Percent Requiring Offsets	Estimated Offsets (tons/day)
<b>FUEL COMBUSTION</b>								
ELECTRIC UTILITIES	0.393	22.65%	0.089	-0.29%	-0.001	0.482	80	0.10
COGENERATION	0.819	15.75%	0.129	0.00%	0.000	0.948	80	0.14
OIL AND GAS PRODUCTION (COMBUSTION)	2.899	9.04%	0.262	0.00%	0.000	3.161	80	0.29
PETROLEUM REFINING (COMBUSTION)	0.07	0.00%	0.000	0.00%	0.000	0.07	80	0.00
MANUFACTURING AND INDUSTRIAL	0.259	18.53%	0.048	0.00%	0.000	0.307	25	0.02
FOOD AND AGRICULTURAL PROCESSING	2.452	-2.24%	-0.055	-0.04%	-0.001	2.397	10	
SERVICE AND COMMERCIAL	2.543	7.12%	0.181	0.04%	0.001	2.724	25	0.06

OTHER (FUEL COMBUSTION)	0.567	0.00%	0.000	32.80%	0.186	0.381		
<b>* TOTAL FUEL COMBUSTION</b>	10.003					10.469		
<b>WASTE DISPOSAL</b>								
SEWAGE TREATMENT	0.02	15.00%	0.003	0.00%	0.000	0.023	25	0.00
LANDFILLS	2.918	16.28%	0.475	0.00%	0.000	3.393	50	0.33
INCINERATORS	0		0.000		0.000	0.001	25	0.00
SOIL REMEDIATION	0.006	16.67%	0.001	0.00%	0.000	0.007	25	0.00
OTHER (WASTE DISPOSAL)	0.497	19.92%	0.099	0.00%	0.000	0.596	25	0.03
<b>* TOTAL WASTE DISPOSAL</b>	3.442							
<b>CLEANING AND SURFACE COATINGS</b>								
LAUNDERING	0.057	19.30%	0.011	0.00%	0.000	0.068		
DEGREASING	8.743	-5.25%	-0.459	83.16%	6.889	1.489		
COATINGS AND RELATED PROCESS SOLVENTS	14.464	22.66%	3.278	2.07%	0.368	17.43	50	2.29
PRINTING	1.496	13.10%	0.196	0.00%	0.000	1.692	25	0.07
ADHESIVES AND SEALANTS	0.714	-15.13%	-0.108	0.00%	0.000	0.606	25	
OTHER (CLEANING AND SURFACE COATINGS)	3.033	31.88%	0.967	0.00%	0.000	4	50	0.68
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	28.506					25.285		
<b>PETROLEUM PRODUCTION AND MARKETING</b>								
OIL AND GAS PRODUCTION	31.511	0.85%	0.269	0.88%	0.280	31.477	80	0.30
PETROLEUM REFINING	1.398	0.29%	0.004	2.08%	0.029	1.373	80	0.00
PETROLEUM MARKETING	6.97	15.47%	1.078	0.60%	0.048	7.997	80	1.21
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	39.879					40.846		
<b>INDUSTRIAL PROCESSES</b>								
CHEMICAL	1.98	23.38%	0.463	0.05%	0.001	2.443	25	0.16



FOOD AND AGRICULTURE	10.308	9.25%	0.954	2.90%	0.327	10.947	50	0.67
MINERAL PROCESSES	0.277	15.52%	0.043	0.00%	0.000	0.32	25	0.02
METAL PROCESSES	0.151	0.66%	0.001	0.00%	0.000	0.152		
WOOD AND PAPER	0		0.000		0.000	0		
GLASS AND RELATED PRODUCTS	0.114	11.40%	0.013	0.00%	0.000	0.127	80	0.01
ELECTRONICS	0.022	77.27%	0.017	0.00%	0.000	0.039	25	0.01
OTHER (INDUSTRIAL PROCESSES)	0.133	9.02%	0.012	0.00%	0.000	0.145	25	0.00
<b>* TOTAL INDUSTRIAL PROCESSES</b>	12.987					14.173		
<b>** TOTAL STATIONARY SOURCES</b>	94.816					94.793		
<b>GRAND TOTAL FOR SAN JOAQUIN VALLEY UNIFIED APCD</b>	94.816		7.971			94.793		6.41

**Table 3 - 5  
Estimated PM10 Growth, Control, and Estimated Offset Use**

<b>STATIONARY SOURCES</b>								
<i>SUMMARY CATEGORY NAME</i>	2002 Emissions Tons/day	Growth Factor (%)	Estimated Growth (tons/day)	Control Factor (%)	Required Reductions (tons/day)	2010 Emissions Tons/day	Percent Requiring Offsets	Estimated Offsets (tons/day)
<b>FUEL COMBUSTION</b>								
ELECTRIC UTILITIES	0.339	11.80%	0.040	0.00%	0.000	0.379	80	0.04
COGENERATION	0.845	16.92%	0.143	0.00%	0.000	0.988	80	0.16

OIL AND GAS PRODUCTION (COMBUSTION)	1.899	7.53%	0.143	0.00%	0.000	2.042	80	0.16
PETROLEUM REFINING (COMBUSTION)	0.175	0.00%	0.000	0.00%	0.000	0.175	80	0.00
MANUFACTURING AND INDUSTRIAL	0.751	15.18%	0.114	0.00%	0.000	0.865	25	0.04
FOOD AND AGRICULTURAL PROCESSING	1.401	-2.14%	-0.030	-0.07%	-0.001	1.371	10	
SERVICE AND COMMERCIAL	1.181	7.11%	0.084	0.00%	0.000	1.265	25	0.03
OTHER (FUEL COMBUSTION)	0.28	0.00%	0.000	30.00%	0.084	0.196		
<b>* TOTAL FUEL COMBUSTION</b>	<b>6.872</b>					<b>7.281</b>		
<b>WASTE DISPOSAL</b>								
SEWAGE TREATMENT	0		0.000		0.000	0		
LANDFILLS	0.006	0.00%	0.000	0.00%	0.000	0.006	25	
INCINERATORS	0.002	0.00%	0.000	0.00%	0.000	0.002	25	0.00
SOIL REMEDIATION	0		0.000		0.000	0		
OTHER (WASTE DISPOSAL)	0.002	0.00%	0.000	0.00%	0.000	0.002	25	
<b>* TOTAL WASTE DISPOSAL</b>	<b>0.009</b>					<b>0.01</b>		
<b>CLEANING AND SURFACE COATINGS</b>								
LAUNDERING	0		0.000		0.000	0		
DEGREASING	0		0.000		0.000	0		
COATINGS AND RELATED PROCESS SOLVENTS	0.04	12.50%	0.005	0.00%	0.000	0.045	25	0.00
PRINTING	0.056	12.50%	0.007	0.00%	0.000	0.063	25	0.00
ADHESIVES AND SEALANTS	0		0.000		0.000	0	25	0.00
OTHER (CLEANING AND SURFACE COATINGS)	0		0.000		0.000	0		
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	<b>0.096</b>		<b>0.000</b>			<b>0.108</b>		
<b>PETROLEUM PRODUCTION AND MARKETING</b>								

OIL AND GAS PRODUCTION	0.035	14.29%	0.005	0.00%	0.000	0.04	100	0.01
PETROLEUM REFINING	0.059	0.00%	0.000	0.00%	0.000	0.059	100	0.00
PETROLEUM MARKETING								
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	0.094					0.098		
<b>INDUSTRIAL PROCESSES</b>								
CHEMICAL	1.951	32.19%	0.628	0.00%	0.000	2.579	50	0.44
FOOD AND AGRICULTURE	10.002	4.77%	0.477	-0.02%	-0.002	10.479	50	0.33
MINERAL PROCESSES	5.247	10.50%	0.551	0.02%	0.001	5.798	75	0.58
METAL PROCESSES	0.177	1.13%	0.002	0.00%	0.000	0.179		
WOOD AND PAPER	0.363	14.60%	0.053	0.00%	0.000	0.416		
GLASS AND RELATED PRODUCTS	0.559	12.16%	0.068	0.00%	0.000	0.627	100	0.10
ELECTRONICS								
OTHER (INDUSTRIAL PROCESSES)	0.081	22.22%	0.018	0.00%	0.000	0.099	25	0.01
<b>* TOTAL INDUSTRIAL PROCESSES</b>	18.379					20.178		
<b>** TOTAL STATIONARY SOURCES</b>	25.449					27.674		
<b>GRAND TOTAL FOR SAN JOAQUIN VALLEY UNIFIED APCD</b>	25.449		2.308			27.674		1.90

**Table 3 - 6  
Estimated SOx Growth, Control, and Estimated Offset Use**

<b>STATIONARY SOURCES</b>								
<i>SUMMARY CATEGORY NAME</i>	2002 Emissions Tons/day	Growth Factor (%)	Estimated Growth (tons/day)	Control Factor (%)	Required Reductions (tons/day)	2010 Emissions Tons/day	Percent Requiring Offsets	Estimated Offsets (tons/day)
<b>FUEL COMBUSTION</b>								
ELECTRIC UTILITIES	0.976	2.66%	0.026	0.00%	0.000	1.002	80	0.03
COGENERATION	0.697	9.47%	0.066	0.00%	0.000	0.763	80	0.07
OIL AND GAS PRODUCTION (COMBUSTION)	7.902	9.08%	0.718	0.03%	0.002	8.62	80	0.80
PETROLEUM REFINING (COMBUSTION)	1.11	0.18%	0.002	0.00%	0.000	1.113	80	0.00
MANUFACTURING AND INDUSTRIAL	6.149	15.42%	0.948	-0.04%	-0.003	7.097	25	0.33
FOOD AND AGRICULTURAL PROCESSING	2.239	-1.16%	-0.026	-0.09%	-0.002	2.213	10	
SERVICE AND COMMERCIAL	1.253	6.70%	0.084	0.00%	0.000	1.337	20	0.02
OTHER (FUEL COMBUSTION)	1.123	0.00%	0.000	-3.03%	-0.034	1.157		
<b>* TOTAL FUEL COMBUSTION</b>	<b>21.449</b>					<b>23.302</b>		
<b>WASTE DISPOSAL</b>								
SEWAGE TREATMENT	0				0.000	0	20	0.00
LANDFILLS	0				0.000	0	20	0.00
INCINERATORS	0.006	16.67%	0.001	0.00%	0.000	0.007	20	0.00
SOIL REMEDIATION	0				0.000	0	20	0.00
OTHER (WASTE DISPOSAL)	0				0.000	0	20	0.00
<b>* TOTAL WASTE DISPOSAL</b>	<b>0.006</b>			<b>0.00%</b>		<b>0.007</b>		

<b>CLEANING AND SURFACE COATINGS</b>								
LAUNDERING	0				0.000	0		
DEGREASING	0				0.000	0		
COATINGS AND RELATED PROCESS SOLVENTS	0				0.000	0		
PRINTING	0				0.000	0		
ADHESIVES AND SEALANTS	0				0.000	0		
OTHER (CLEANING AND SURFACE COATINGS)	0				0.000	0		
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	0					0		
<b>PETROLEUM PRODUCTION AND MARKETING</b>								
OIL AND GAS PRODUCTION	0.106	28.30%	0.030	0.00%	0.000	0.136	80	0.03
PETROLEUM REFINING	0.188	0.00%		0.00%	0.000	0.188	80	0.00
PETROLEUM MARKETING	0				0.000	0	25	0.00
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	0.293			0.35%		0.323		
<b>INDUSTRIAL PROCESSES</b>								
CHEMICAL	0.345	12.46%	0.043	0.00%	0.000	0.388	15	0.01
FOOD AND AGRICULTURE	1.03	4.66%	0.048	0.00%	0.000	1.078	15	0.01
MINERAL PROCESSES	1.225	13.96%	0.171	-0.09%	-0.001	1.396	15	0.04
METAL PROCESSES	0.069	4.35%	0.003	0.00%	0.000	0.072		
WOOD AND PAPER	0		0.000		0.000	0		
GLASS AND RELATED PRODUCTS	4.069	12.68%	0.516	-0.05%	-0.002	4.585	80	0.58
ELECTRONICS	0		0.000		0.000	0	25	0.00
OTHER (INDUSTRIAL PROCESSES)	0		0.000		0.000	0	15	0.00

* TOTAL INDUSTRIAL PROCESSES	6.738					7.519		
** TOTAL STATIONARY SOURCES	28.486					31.151		
<b>GRAND TOTAL FOR SAN JOAQUIN VALLEY UNIFIED APCD</b>	28.486		2.630			31.151		1.93

**CONCLUSION**

This PM10 Plan contains the most up-to-date and accurate emission inventory possible within the time allowed to accomplish the full range of tasks required to assemble a plan meeting all CAA requirements. Many emission categories were updated to reflect current data and emission factors. Many emission improvement projects are in process and the emission inventory will be updated as the projects are completed. The District and the ARB are already planning new emission inventory improvement projects that will be accomplished in the next few years. As these projects are completed, the inventory will be updated. ERC caps have been determined and set.

Following this subsection, there are a series of summary tables that show the annual emissions of a year followed by that year's seasonal emissions. The years shown are 1999, 2002, 2005, 2008, and 2010. The detailed emission inventories for 1993, 1999, 2002, 2005, 2008, and 2010 are found in a reference document to this Plan.

**Table 3-7:  
Annual Average Total Organic Gases (TOG)  
Tons per day**

<b>STATIONARY SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>FUEL COMBUSTION</b>					
ELECTRIC UTILITIES	3.4	3.9	4.3	4.6	4.9
COGENERATION	8.3	8.8	9.7	10.1	10.1
OIL AND GAS PRODUCTION (COMBUSTION)	35.3	37.7	41.6	41.7	41.4
PETROLEUM REFINING (COMBUSTION)	0.3	0.3	0.3	0.3	0.3
MANUFACTURING AND INDUSTRIAL	0.6	0.6	0.7	0.7	0.7
FOOD AND AGRICULTURAL PROCESSING	3.1	3.0	3.0	3.0	3.0
SERVICE AND COMMERCIAL	7.3	7.7	7.9	8.1	8.1
OTHER (FUEL COMBUSTION)	0.9	0.8	0.7	0.6	0.6
<b>* TOTAL FUEL COMBUSTION</b>	59.1	62.8	68.2	69.1	69.0
<b>WASTE DISPOSAL</b>					
SEWAGE TREATMENT	0.0	0.0	0.0	0.0	0.0
LANDFILLS	211.1	226.2	240.3	253.9	263.0
INCINERATORS	0.0	0.0	0.0	0.0	0.0
SOIL REMEDIATION	0.0	0.0	0.0	0.0	0.0
OTHER (WASTE DISPOSAL)	1.6	1.8	1.9	2.0	2.1
<b>* TOTAL WASTE DISPOSAL</b>	212.8	228.0	242.2	256.0	265.1
<b>CLEANING AND SURFACE COATINGS</b>					
LAUNDERING	0.7	0.7	0.8	0.8	0.9
DEGREASING	14.7	11.2	2.5	2.6	2.7
COATINGS AND RELATED PROCESS SOLVENTS	14.1	15.1	15.8	17.1	18.1
PRINTING	1.4	1.5	1.6	1.6	1.7
ADHESIVES AND SEALANTS	0.8	0.8	0.8	0.7	0.7

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OTHER (CLEANING AND SURFACE COATINGS)	3.9	4.3	4.9	5.4	5.7
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	<b>35.6</b>	<b>33.6</b>	<b>26.3</b>	<b>28.3</b>	<b>29.8</b>
<b>PETROLEUM PRODUCTION AND MARKETING</b>					
OIL AND GAS PRODUCTION	54.7	53.4	55.1	55.2	54.1
PETROLEUM REFINING	1.8	1.8	1.8	1.8	1.8
PETROLEUM MARKETING	13.5	14.4	15.6	16.0	16.2
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	<b>70.0</b>	<b>69.6</b>	<b>72.5</b>	<b>73.1</b>	<b>72.1</b>
<b>INDUSTRIAL PROCESSES</b>					
CHEMICAL	2.5	2.7	3.0	3.2	3.4
FOOD AND AGRICULTURE	10.6	11.0	11.1	11.4	11.7
MINERAL PROCESSES	0.3	0.3	0.4	0.4	0.4
METAL PROCESSES	0.2	0.2	0.2	0.2	0.2
WOOD AND PAPER	0.0	0.0	0.0	0.0	0.0
GLASS AND RELATED PRODUCTS	0.1	0.1	0.2	0.2	0.2
ELECTRONICS	0.0	0.0	0.0	0.1	0.1
OTHER (INDUSTRIAL PROCESSES)	0.2	0.2	0.2	0.2	0.2
<b>* TOTAL INDUSTRIAL PROCESSES</b>	<b>14.1</b>	<b>14.7</b>	<b>15.0</b>	<b>15.6</b>	<b>16.1</b>
<b>** TOTAL STATIONARY SOURCES</b>	<b>391.6</b>	<b>408.8</b>	<b>424.2</b>	<b>442.0</b>	<b>452.2</b>
<b>AREA-WIDE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>SOLVENT EVAPORATION</b>					
CONSUMER PRODUCTS	30.8	30.9	28.8	30.6	31.8
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	12.1	12.6	10.9	11.2	11.4
PESTICIDES/FERTILIZERS	28.4	26.4	25.4	24.4	23.8
ASPHALT PAVING / ROOFING	2.6	2.7	2.7	2.8	2.8
<b>* TOTAL SOLVENT EVAPORATION</b>	<b>73.9</b>	<b>72.6</b>	<b>67.8</b>	<b>69.0</b>	<b>69.8</b>
<b>MISCELLANEOUS PROCESSES</b>					
RESIDENTIAL FUEL COMBUSTION	14.3	14.6	14.8	15.0	15.1
FARMING OPERATIONS	713.3	762.1	804.9	862.0	900.1
CONSTRUCTION AND DEMOLITION	0.0	0.0	0.0	0.0	0.0
PAVED ROAD DUST	0.0	0.0	0.0	0.0	0.0
UNPAVED ROAD DUST	0.0	0.0	0.0	0.0	0.0
FUGITIVE WINDBLOWN DUST	0.0	0.0	0.0	0.0	0.0
FIRES	0.1	0.1	0.1	0.1	0.1
WASTE BURNING AND DISPOSAL	47.8	47.3	46.8	46.4	46.1
COOKING	0.6	0.6	0.6	0.7	0.7
OTHER (MISCELLANEOUS PROCESSES)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL MISCELLANEOUS PROCESSES</b>	<b>776.1</b>	<b>824.7</b>	<b>867.3</b>	<b>924.2</b>	<b>962.2</b>
<b>** TOTAL AREA-WIDE SOURCES</b>	<b>850.0</b>	<b>897.3</b>	<b>935.1</b>	<b>993.2</b>	<b>1031.9</b>
<b>MOBILE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>ON-ROAD MOTOR VEHICLES</b>					
LIGHT DUTY PASSENGER (LDA)	56.6	43.5	33.2	25.1	20.7
LIGHT DUTY TRUCKS - 1 (LDT1)	28.2	23.1	19.3	15.8	13.5
LIGHT DUTY TRUCKS - 2 (LDT2)	18.6	15.6	13.4	11.4	10.3
MEDIUM DUTY TRUCKS (MDV)	8.1	6.7	5.8	5.0	4.6
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	8.2	3.6	2.3	1.8	1.6
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.7	0.6	0.6	0.6	0.6



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MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	6.1	5.0	4.1	3.3	2.8
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	4.0	2.8	2.3	1.9	1.7
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.1	0.2	0.2	0.2	0.2
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.2	0.2	0.2	0.2	0.2
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.6	0.7	0.7	0.7	0.6
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	4.7	4.8	4.6	4.1	3.8
MOTORCYCLES (MCY)	2.5	2.4	2.3	2.2	2.1
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.2	0.2	0.2	0.2	0.2
HEAVY DUTY GAS URBAN BUSES (UB)	1.3	1.2	1.2	1.2	1.2
SCHOOL BUSES (SB)	0.5	0.4	0.3	0.3	0.3
MOTOR HOMES (MH)	1.0	1.0	1.0	0.8	0.7
<b>* TOTAL ON-ROAD MOTOR VEHICLES</b>	<b>141.6</b>	<b>111.9</b>	<b>91.8</b>	<b>74.7</b>	<b>65.0</b>
<b>OTHER MOBILE SOURCES</b>					
AIRCRAFT	12.3	13.3	14.0	14.4	14.7
TRAINS	0.9	0.9	0.9	0.8	0.8
SHIPS AND COMMERCIAL BOATS	0.1	0.1	0.1	0.1	0.1
RECREATIONAL BOATS	13.1	11.4	10.0	8.7	7.2
OFF-ROAD RECREATIONAL VEHICLES	5.2	4.8	5.0	5.2	5.3
OFF-ROAD EQUIPMENT	14.8	12.8	11.2	10.6	8.9
FARM EQUIPMENT	10.2	9.4	8.6	7.3	6.8
FUEL STORAGE AND HANDLING	7.7	7.2	2.7	2.3	2.4
<b>* TOTAL OTHER MOBILE SOURCES</b>	<b>64.4</b>	<b>59.8</b>	<b>52.4</b>	<b>49.3</b>	<b>46.2</b>
<b>** TOTAL MOBILE SOURCES</b>	<b>206.0</b>	<b>171.7</b>	<b>144.2</b>	<b>124.0</b>	<b>111.1</b>
<b>GRAND TOTAL TOG FOR SAN JOAQUIN VALLEY</b>	<b>1447.6</b>	<b>1477.8</b>	<b>1503.5</b>	<b>1559.3</b>	<b>1595.3</b>

**Table 3-8:  
Annual Average Volatile Organic Compounds (VOC)  
Tons per day**

<b>STATIONARY SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>FUEL COMBUSTION</b>					
ELECTRIC UTILITIES	0.3	0.4	0.4	0.5	0.5
COGENERATION	0.8	0.8	0.9	0.9	0.9
OIL AND GAS PRODUCTION (COMBUSTION)	2.7	2.9	3.2	3.2	3.2
PETROLEUM REFINING (COMBUSTION)	0.1	0.1	0.1	0.1	0.1
MANUFACTURING AND INDUSTRIAL	0.2	0.3	0.3	0.3	0.3
FOOD AND AGRICULTURAL PROCESSING	2.5	2.5	2.4	2.4	2.4
SERVICE AND COMMERCIAL	2.4	2.5	2.6	2.7	2.7
OTHER (FUEL COMBUSTION)	0.6	0.6	0.5	0.4	0.4
<b>* TOTAL FUEL COMBUSTION</b>	<b>9.6</b>	<b>10.0</b>	<b>10.4</b>	<b>10.5</b>	<b>10.5</b>
<b>WASTE DISPOSAL</b>					
SEWAGE TREATMENT	0.0	0.0	0.0	0.0	0.0
LANDFILLS	2.7	2.9	3.1	3.3	3.4
INCINERATORS	0.0	0.0	0.0	0.0	0.0
SOIL REMEDIATION	0.0	0.0	0.0	0.0	0.0
OTHER (WASTE DISPOSAL)	0.5	0.5	0.5	0.6	0.6

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<b>* TOTAL WASTE DISPOSAL</b>	3.2	3.4	3.7	3.9	4.0
<b>CLEANING AND SURFACE COATINGS</b>					
LAUNDERING	0.1	0.1	0.1	0.1	0.1
DEGREASING	12.3	8.7	1.5	1.5	1.5
COATINGS AND RELATED PROCESS SOLVENTS	13.5	14.5	15.1	16.4	17.4
PRINTING	1.4	1.5	1.5	1.6	1.7
ADHESIVES AND SEALANTS	0.7	0.7	0.7	0.6	0.6
OTHER (CLEANING AND SURFACE COATINGS)	2.7	3.0	3.4	3.8	4.0
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	30.7	28.5	22.3	24.0	25.3
<b>PETROLEUM PRODUCTION AND MARKETING</b>					
OIL AND GAS PRODUCTION	32.5	31.5	32.3	32.2	31.5
PETROLEUM REFINING	1.4	1.4	1.4	1.4	1.4
PETROLEUM MARKETING	6.5	7.0	7.4	7.7	8.0
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	40.3	39.9	41.0	41.3	40.8
<b>INDUSTRIAL PROCESSES</b>					
CHEMICAL	1.8	2.0	2.2	2.3	2.4
FOOD AND AGRICULTURE	9.9	10.3	10.3	10.7	10.9
MINERAL PROCESSES	0.3	0.3	0.3	0.3	0.3
METAL PROCESSES	0.2	0.2	0.2	0.2	0.2
WOOD AND PAPER	0.0	0.0	0.0	0.0	0.0
GLASS AND RELATED PRODUCTS	0.1	0.1	0.1	0.1	0.1
ELECTRONICS	0.0	0.0	0.0	0.0	0.0
OTHER (INDUSTRIAL PROCESSES)	0.1	0.1	0.1	0.1	0.1
<b>* TOTAL INDUSTRIAL PROCESSES</b>	12.4	13.0	13.2	13.8	14.2
<b>** TOTAL STATIONARY SOURCES</b>	96.3	94.8	90.6	93.4	94.8
<b>AREA-WIDE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>SOLVENT EVAPORATION</b>					
CONSUMER PRODUCTS	25.9	25.7	24.2	25.7	26.7
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	11.8	12.3	10.7	11.0	11.1
PESTICIDES/FERTILIZERS	28.4	26.4	25.4	24.4	23.8
ASPHALT PAVING / ROOFING	2.2	2.3	2.3	2.4	2.4
<b>* TOTAL SOLVENT EVAPORATION</b>	68.4	66.7	62.6	63.5	64.1
<b>MISCELLANEOUS PROCESSES</b>					
RESIDENTIAL FUEL COMBUSTION	6.3	6.4	6.5	6.6	6.6
FARMING OPERATIONS	57.1	61.0	64.4	69.0	72.0
CONSTRUCTION AND DEMOLITION	0.0	0.0	0.0	0.0	0.0
PAVED ROAD DUST	0.0	0.0	0.0	0.0	0.0
UNPAVED ROAD DUST	0.0	0.0	0.0	0.0	0.0
FUGITIVE WINDBLOWN DUST	0.0	0.0	0.0	0.0	0.0
FIRES	0.1	0.1	0.1	0.1	0.1
WASTE BURNING AND DISPOSAL	26.7	26.4	26.1	25.9	25.7
COOKING	0.4	0.5	0.4	0.5	0.5
OTHER (MISCELLANEOUS PROCESSES)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL MISCELLANEOUS PROCESSES</b>	90.5	94.2	97.5	102.0	104.9
<b>** TOTAL AREA-WIDE SOURCES</b>	158.9	161.0	160.1	165.5	169.0
<b>MOBILE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010

<b>ON-ROAD MOTOR VEHICLES</b>					
LIGHT DUTY PASSENGER (LDA)	52.4	40.1	30.7	23.1	19.1
LIGHT DUTY TRUCKS - 1 (LDT1)	26.1	21.3	17.8	14.6	12.5
LIGHT DUTY TRUCKS - 2 (LDT2)	17.1	14.3	12.3	10.5	9.5
MEDIUM DUTY TRUCKS (MDV)	7.4	6.1	5.3	4.6	4.2
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	7.6	3.4	2.1	1.6	1.5
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.6	0.6	0.6	0.6	0.5
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	5.7	4.6	3.8	3.0	2.6
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	3.6	2.5	2.1	1.7	1.5
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.1	0.1	0.2	0.2	0.2
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.1	0.2	0.2	0.2	0.2
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.5	0.6	0.6	0.6	0.6
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	4.1	4.2	4.0	3.6	3.3
MOTORCYCLES (MCY)	2.4	2.3	2.2	2.0	1.9
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.2	0.2	0.2	0.2	0.2
HEAVY DUTY GAS URBAN BUSES (UB)	1.1	1.0	1.0	1.0	0.9
SCHOOL BUSES (SB)	0.4	0.3	0.3	0.3	0.3
MOTOR HOMES (MH)	0.9	0.9	0.8	0.7	0.6
<b>* TOTAL ON-ROAD MOTOR VEHICLES</b>	<b>130.4</b>	<b>102.7</b>	<b>84.2</b>	<b>68.4</b>	<b>59.4</b>
<b>OTHER MOBILE SOURCES</b>					
AIRCRAFT	11.0	11.8	12.5	12.9	13.2
TRAINS	0.8	0.8	0.8	0.7	0.7
SHIPS AND COMMERCIAL BOATS	0.1	0.1	0.1	0.1	0.1
RECREATIONAL BOATS	12.2	10.5	9.3	8.1	6.7
OFF-ROAD RECREATIONAL VEHICLES	4.8	4.5	4.6	4.8	4.9
OFF-ROAD EQUIPMENT	13.3	11.3	9.9	9.5	8.0
FARM EQUIPMENT	9.1	8.3	7.6	6.5	6.0
FUEL STORAGE AND HANDLING	7.7	7.2	2.7	2.3	2.4
<b>* TOTAL OTHER MOBILE SOURCES</b>	<b>58.8</b>	<b>54.5</b>	<b>47.4</b>	<b>44.8</b>	<b>41.9</b>
<b>** TOTAL MOBILE SOURCES</b>	<b>189.2</b>	<b>157.2</b>	<b>131.6</b>	<b>113.2</b>	<b>101.2</b>
<b>GRAND TOTAL VOC FOR SAN JOAQUIN VALLEY</b>	<b>444.4</b>	<b>413.0</b>	<b>382.4</b>	<b>372.1</b>	<b>365.0</b>

**Table 3-9:  
Annual Average Oxides of Nitrogen (NOx)  
Tons per day**

<b>STATIONARY SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>FUEL COMBUSTION</b>					
ELECTRIC UTILITIES	3.0	2.8	2.9	2.8	3.0
COGENERATION	11.0	10.4	9.7	6.2	6.3
OIL AND GAS PRODUCTION (COMBUSTION)	40.6	25.0	26.4	26.0	25.5
PETROLEUM REFINING (COMBUSTION)	1.5	1.5	1.5	1.5	1.5
MANUFACTURING AND INDUSTRIAL	31.3	30.1	31.6	33.0	33.9
FOOD AND AGRICULTURAL PROCESSING	20.2	19.9	19.7	19.5	19.4
SERVICE AND COMMERCIAL	28.7	29.2	30.4	31.1	31.4

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OTHER (FUEL COMBUSTION)	9.0	8.4	7.7	6.9	6.3
<b>* TOTAL FUEL COMBUSTION</b>	<b>145.3</b>	<b>127.3</b>	<b>129.9</b>	<b>126.9</b>	<b>127.4</b>
<b>WASTE DISPOSAL</b>					
SEWAGE TREATMENT	0.0	0.0	0.0	0.0	0.0
LANDFILLS	0.0	0.0	0.0	0.0	0.0
INCINERATORS	0.1	0.1	0.1	0.1	0.1
SOIL REMEDIATION	0.0	0.0	0.0	0.0	0.0
OTHER (WASTE DISPOSAL)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL WASTE DISPOSAL</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
<b>CLEANING AND SURFACE COATINGS</b>					
LAUNDERING	0.0	0.0	0.0	0.0	0.0
DEGREASING	0.0	0.0	0.0	0.0	0.0
COATINGS AND RELATED PROCESS SOLVENTS	0.0	0.0	0.0	0.0	0.0
PRINTING	0.0	0.0	0.0	0.0	0.0
ADHESIVES AND SEALANTS	0.0	0.0	0.0	0.0	0.0
OTHER (CLEANING AND SURFACE COATINGS)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>PETROLEUM PRODUCTION AND MARKETING</b>					
OIL AND GAS PRODUCTION	0.2	0.2	0.2	0.2	0.2
PETROLEUM REFINING	0.1	0.1	0.1	0.1	0.1
PETROLEUM MARKETING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>
<b>INDUSTRIAL PROCESSES</b>					
CHEMICAL	0.1	0.1	0.1	0.1	0.2
FOOD AND AGRICULTURE	9.3	9.2	9.1	9.0	9.0
MINERAL PROCESSES	1.4	1.5	1.5	1.6	1.6
METAL PROCESSES	0.0	0.0	0.0	0.0	0.0
WOOD AND PAPER	0.0	0.0	0.0	0.0	0.0
GLASS AND RELATED PRODUCTS	12.3	12.3	11.8	9.9	10.3
ELECTRONICS	0.0	0.0	0.0	0.0	0.0
OTHER (INDUSTRIAL PROCESSES)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL INDUSTRIAL PROCESSES</b>	<b>23.2</b>	<b>23.1</b>	<b>22.6</b>	<b>20.7</b>	<b>21.1</b>
<b>** TOTAL STATIONARY SOURCES</b>	<b>168.8</b>	<b>150.7</b>	<b>152.9</b>	<b>148.0</b>	<b>148.9</b>
<b>AREA-WIDE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>SOLVENT EVAPORATION</b>					
CONSUMER PRODUCTS	0.0	0.0	0.0	0.0	0.0
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	0.0	0.0	0.0	0.0	0.0
PESTICIDES/FERTILIZERS	0.0	0.0	0.0	0.0	0.0
ASPHALT PAVING / ROOFING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL SOLVENT EVAPORATION</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>MISCELLANEOUS PROCESSES</b>					
RESIDENTIAL FUEL COMBUSTION	6.8	6.6	6.4	6.3	6.3
FARMING OPERATIONS	0.0	0.0	0.0	0.0	0.0
CONSTRUCTION AND DEMOLITION	0.0	0.0	0.0	0.0	0.0
PAVED ROAD DUST	0.0	0.0	0.0	0.0	0.0
UNPAVED ROAD DUST	0.0	0.0	0.0	0.0	0.0
FUGITIVE WINDBLOWN DUST	0.0	0.0	0.0	0.0	0.0

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FIRES	0.0	0.0	0.0	0.0	0.0
WASTE BURNING AND DISPOSAL	4.6	4.6	4.5	4.5	4.5
COOKING	0.0	0.0	0.0	0.0	0.0
OTHER (MISCELLANEOUS PROCESSES)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL MISCELLANEOUS PROCESSES</b>	11.4	11.2	11.0	10.8	10.8
<b>** TOTAL AREA-WIDE SOURCES</b>	11.4	11.2	11.0	10.8	10.8
<b>MOBILE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>ON-ROAD MOTOR VEHICLES</b>					
LIGHT DUTY PASSENGER (LDA)	47.2	37.7	28.2	21.3	17.5
LIGHT DUTY TRUCKS - 1 (LDT1)	28.9	23.8	18.5	14.4	12.1
LIGHT DUTY TRUCKS - 2 (LDT2)	24.7	20.9	16.9	13.8	12.0
MEDIUM DUTY TRUCKS (MDV)	11.8	10.2	8.4	7.0	6.1
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	2.8	2.1	2.1	2.4	2.6
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.8	0.7	0.7	0.7	0.7
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	3.0	2.9	2.6	2.2	2.0
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	5.5	4.7	3.9	3.0	2.5
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	1.2	2.6	2.8	2.5	2.1
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	2.2	2.3	2.1	1.9	1.6
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	18.0	19.3	18.3	16.2	14.3
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	86.0	87.9	81.4	70.9	61.9
MOTORCYCLES (MCY)	0.4	0.5	0.5	0.6	0.6
HEAVY DUTY DIESEL URBAN BUSES (UB)	3.6	3.7	3.7	3.6	3.6
HEAVY DUTY GAS URBAN BUSES (UB)	1.0	1.0	1.0	1.1	1.1
SCHOOL BUSES (SB)	2.0	2.2	2.4	2.4	2.5
MOTOR HOMES (MH)	2.1	2.1	2.1	2.0	1.9
<b>* TOTAL ON-ROAD MOTOR VEHICLES</b>	241.1	224.5	195.6	165.9	145.1
<b>OTHER MOBILE SOURCES</b>					
AIRCRAFT	3.3	3.5	3.7	3.9	3.9
TRAINS	19.9	17.5	13.6	11.5	10.8
SHIPS AND COMMERCIAL BOATS	0.3	0.3	0.3	0.3	0.3
RECREATIONAL BOATS	2.2	2.5	3.1	3.3	3.3
OFF-ROAD RECREATIONAL VEHICLES	0.4	0.5	0.5	0.5	0.5
OFF-ROAD EQUIPMENT	51.7	49.0	44.4	39.0	34.4
FARM EQUIPMENT	66.2	60.1	53.7	47.8	43.6
FUEL STORAGE AND HANDLING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL OTHER MOBILE SOURCES</b>	143.9	133.3	119.3	106.1	96.8
<b>** TOTAL MOBILE SOURCES</b>	385.0	357.9	314.9	272.1	242.0
<b>GRAND TOTAL NOX FOR SAN JOAQUIN VALLEY</b>	<b>565.2</b>	<b>519.8</b>	<b>478.8</b>	<b>430.9</b>	<b>401.6</b>

**Table 3-10:  
Annual Average Oxides of Sulfur (SO<sub>x</sub>)  
Tons per day**

<b>STATIONARY SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>FUEL COMBUSTION</b>					
ELECTRIC UTILITIES	1.0	1.0	1.0	1.0	1.0
COGENERATION	0.7	0.7	0.7	0.8	0.8
OIL AND GAS PRODUCTION (COMBUSTION)	7.4	7.9	8.7	8.7	8.6
PETROLEUM REFINING (COMBUSTION)	1.1	1.1	1.1	1.1	1.1
MANUFACTURING AND INDUSTRIAL	5.5	6.1	6.7	6.9	7.1
FOOD AND AGRICULTURAL PROCESSING	2.2	2.2	2.2	2.2	2.2
SERVICE AND COMMERCIAL	1.2	1.3	1.3	1.3	1.3
OTHER (FUEL COMBUSTION)	1.2	1.1	1.1	1.1	1.2
<b>* TOTAL FUEL COMBUSTION</b>	<b>20.3</b>	<b>21.4</b>	<b>22.8</b>	<b>23.1</b>	<b>23.3</b>
<b>WASTE DISPOSAL</b>					
SEWAGE TREATMENT	0.0	0.0	0.0	0.0	0.0
LANDFILLS	0.0	0.0	0.0	0.0	0.0
INCINERATORS	0.0	0.0	0.0	0.0	0.0
SOIL REMEDIATION	0.0	0.0	0.0	0.0	0.0
OTHER (WASTE DISPOSAL)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL WASTE DISPOSAL</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>CLEANING AND SURFACE COATINGS</b>					
LAUNDERING	0.0	0.0	0.0	0.0	0.0
DEGREASING	0.0	0.0	0.0	0.0	0.0
COATINGS AND RELATED PROCESS SOLVENTS	0.0	0.0	0.0	0.0	0.0
PRINTING	0.0	0.0	0.0	0.0	0.0
ADHESIVES AND SEALANTS	0.0	0.0	0.0	0.0	0.0
OTHER (CLEANING AND SURFACE COATINGS)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>PETROLEUM PRODUCTION AND MARKETING</b>					
OIL AND GAS PRODUCTION	0.1	0.1	0.1	0.1	0.1
PETROLEUM REFINING	0.2	0.2	0.2	0.2	0.2
PETROLEUM MARKETING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>
<b>INDUSTRIAL PROCESSES</b>					
CHEMICAL	0.3	0.3	0.4	0.4	0.4
FOOD AND AGRICULTURE	1.0	1.0	1.0	1.1	1.1
MINERAL PROCESSES	1.2	1.2	1.3	1.3	1.4
METAL PROCESSES	0.1	0.1	0.1	0.1	0.1
WOOD AND PAPER	0.0	0.0	0.0	0.0	0.0
GLASS AND RELATED PRODUCTS	4.0	4.1	4.2	4.4	4.6
ELECTRONICS	0.0	0.0	0.0	0.0	0.0
OTHER (INDUSTRIAL PROCESSES)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL INDUSTRIAL PROCESSES</b>	<b>6.5</b>	<b>6.7</b>	<b>6.9</b>	<b>7.2</b>	<b>7.5</b>
<b>** TOTAL STATIONARY SOURCES</b>	<b>27.1</b>	<b>28.5</b>	<b>30.1</b>	<b>30.7</b>	<b>31.2</b>

<b>AREA-WIDE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>SOLVENT EVAPORATION</b>					
CONSUMER PRODUCTS	0.0	0.0	0.0	0.0	0.0
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	0.0	0.0	0.0	0.0	0.0
PESTICIDES/FERTILIZERS	0.0	0.0	0.0	0.0	0.0
ASPHALT PAVING / ROOFING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL SOLVENT EVAPORATION</b>	0.0	0.0	0.0	0.0	0.0
<b>MISCELLANEOUS PROCESSES</b>					
RESIDENTIAL FUEL COMBUSTION	0.3	0.3	0.3	0.3	0.3
FARMING OPERATIONS	0.0	0.0	0.0	0.0	0.0
CONSTRUCTION AND DEMOLITION	0.0	0.0	0.0	0.0	0.0
PAVED ROAD DUST	0.0	0.0	0.0	0.0	0.0
UNPAVED ROAD DUST	0.0	0.0	0.0	0.0	0.0
FUGITIVE WINDBLOWN DUST	0.0	0.0	0.0	0.0	0.0
FIRES	0.0	0.0	0.0	0.0	0.0
WASTE BURNING AND DISPOSAL	0.1	0.1	0.1	0.1	0.1
COOKING	0.0	0.0	0.0	0.0	0.0
OTHER (MISCELLANEOUS PROCESSES)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL MISCELLANEOUS PROCESSES</b>	0.4	0.4	0.4	0.4	0.4
<b>** TOTAL AREA-WIDE SOURCES</b>	0.4	0.4	0.4	0.4	0.4
<b>MOBILE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>ON-ROAD MOTOR VEHICLES</b>					
LIGHT DUTY PASSENGER (LDA)	0.2	0.3	0.2	0.2	0.2
LIGHT DUTY TRUCKS - 1 (LDT1)	0.1	0.1	0.1	0.1	0.1
LIGHT DUTY TRUCKS - 2 (LDT2)	0.1	0.1	0.1	0.1	0.1
MEDIUM DUTY TRUCKS (MDV)	0.0	0.1	0.0	0.0	0.0
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.0	0.0	0.0	0.0	0.0
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.0	0.0	0.0	0.0	0.0
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.0	0.0	0.0	0.0	0.0
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.0	0.0	0.0	0.0	0.0
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.0	0.0	0.0	0.0	0.0
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.0	0.0	0.0	0.0	0.0
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.2	0.2	0.2	0.0	0.0
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.8	0.9	1.0	0.1	0.1
MOTORCYCLES (MCY)	0.0	0.0	0.0	0.0	0.0
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.0	0.0	0.0	0.0	0.0
HEAVY DUTY GAS URBAN BUSES (UB)	0.0	0.0	0.0	0.0	0.0
SCHOOL BUSES (SB)	0.0	0.0	0.0	0.0	0.0
MOTOR HOMES (MH)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL ON-ROAD MOTOR VEHICLES</b>	1.6	1.8	1.7	0.6	0.6
<b>OTHER MOBILE SOURCES</b>					
AIRCRAFT	0.3	0.4	0.4	0.4	0.4
TRAINS	0.2	0.2	0.2	0.2	0.2
SHIPS AND COMMERCIAL BOATS	0.4	0.4	0.4	0.4	0.4
RECREATIONAL BOATS	0.1	0.1	0.0	0.1	0.0
OFF-ROAD RECREATIONAL VEHICLES	0.0	0.0	0.0	0.0	0.0

OFF-ROAD EQUIPMENT	0.1	0.1	0.1	0.1	0.1
FARM EQUIPMENT	0.1	0.1	0.1	0.1	0.1
FUEL STORAGE AND HANDLING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL OTHER MOBILE SOURCES</b>	<b>1.1</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>
<b>** TOTAL MOBILE SOURCES</b>	<b>2.7</b>	<b>3.0</b>	<b>2.9</b>	<b>1.8</b>	<b>1.8</b>
<b>GRAND TOTAL SOX FOR SAN JOAQUIN VALLEY</b>	<b>30.2</b>	<b>31.8</b>	<b>33.4</b>	<b>32.8</b>	<b>33.3</b>

**Table 3-11:  
Annual Average Particulate Matter < 10 Microns (PM10)  
Tons per day**

<b>STATIONARY SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>FUEL COMBUSTION</b>					
ELECTRIC UTILITIES	0.3	0.3	0.4	0.4	0.4
COGENERATION	0.7	0.8	0.9	1.0	1.0
OIL AND GAS PRODUCTION (COMBUSTION)	1.8	1.9	2.1	2.1	2.0
PETROLEUM REFINING (COMBUSTION)	0.2	0.2	0.2	0.2	0.2
MANUFACTURING AND INDUSTRIAL	0.7	0.8	0.8	0.8	0.9
FOOD AND AGRICULTURAL PROCESSING	1.4	1.4	1.4	1.4	1.4
SERVICE AND COMMERCIAL	1.1	1.2	1.2	1.3	1.3
OTHER (FUEL COMBUSTION)	0.3	0.3	0.2	0.2	0.2
<b>* TOTAL FUEL COMBUSTION</b>	<b>6.6</b>	<b>6.9</b>	<b>7.2</b>	<b>7.3</b>	<b>7.3</b>
<b>WASTE DISPOSAL</b>					
SEWAGE TREATMENT	0.0	0.0	0.0	0.0	0.0
LANDFILLS	0.0	0.0	0.0	0.0	0.0
INCINERATORS	0.0	0.0	0.0	0.0	0.0
SOIL REMEDIATION	0.0	0.0	0.0	0.0	0.0
OTHER (WASTE DISPOSAL)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL WASTE DISPOSAL</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>CLEANING AND SURFACE COATINGS</b>					
LAUNDERING	0.0	0.0	0.0	0.0	0.0
DEGREASING	0.0	0.0	0.0	0.0	0.0
COATINGS AND RELATED PROCESS SOLVENTS	0.0	0.0	0.0	0.0	0.0
PRINTING	0.1	0.1	0.1	0.1	0.1
ADHESIVES AND SEALANTS	0.0	0.0	0.0	0.0	0.0
OTHER (CLEANING AND SURFACE COATINGS)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL CLEANING AND SURFACE COATINGS</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
<b>PETROLEUM PRODUCTION AND MARKETING</b>					
OIL AND GAS PRODUCTION	0.0	0.0	0.0	0.0	0.0
PETROLEUM REFINING	0.1	0.1	0.1	0.1	0.1
PETROLEUM MARKETING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL PETROLEUM PRODUCTION AND MARKETING</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
<b>INDUSTRIAL PROCESSES</b>					
CHEMICAL	1.7	2.0	2.2	2.4	2.6
FOOD AND AGRICULTURE	9.9	10.0	10.1	10.3	10.5



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MINERAL PROCESSES	5.3	5.6	5.7	6.0	6.1
METAL PROCESSES	0.2	0.2	0.2	0.2	0.2
WOOD AND PAPER	0.4	0.4	0.4	0.4	0.4
GLASS AND RELATED PRODUCTS	0.5	0.6	0.6	0.6	0.6
ELECTRONICS	0.0	0.0	0.0	0.0	0.0
OTHER (INDUSTRIAL PROCESSES)	0.1	0.1	0.1	0.1	0.1
<b>* TOTAL INDUSTRIAL PROCESSES</b>	18.0	18.7	19.3	20.0	20.5
<b>** TOTAL STATIONARY SOURCES</b>	24.7	25.8	26.6	27.4	28.0
<b>AREA-WIDE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>SOLVENT EVAPORATION</b>					
CONSUMER PRODUCTS	0.0	0.0	0.0	0.0	0.0
ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	0.0	0.0	0.0	0.0	0.0
PESTICIDES/FERTILIZERS	0.0	0.0	0.0	0.0	0.0
ASPHALT PAVING / ROOFING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL SOLVENT EVAPORATION</b>	0.0	0.0	0.0	0.0	0.0
<b>MISCELLANEOUS PROCESSES</b>					
RESIDENTIAL FUEL COMBUSTION	11.8	12.0	12.3	12.5	12.6
FARMING OPERATIONS	80.2	79.6	78.9	78.3	77.8
CONSTRUCTION AND DEMOLITION	11.6	12.1	14.2	15.0	21.6
PAVED ROAD DUST	46.2	50.7	55.1	59.8	63.2
UNPAVED ROAD DUST	34.6	34.9	35.3	35.6	35.8
UNPAVED TRAFFIC AREAS	7.3	7.2	7.2	7.1	7.1
FUGITIVE WINDBLOWN DUST	51.1	50.7	50.3	49.8	49.6
FIRES	0.2	0.2	0.2	0.2	0.2
WASTE BURNING AND DISPOSAL	40.1	39.6	39.2	38.9	38.6
COOKING	1.9	2.0	2.1	2.2	2.2
OTHER (MISCELLANEOUS PROCESSES)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL MISCELLANEOUS PROCESSES</b>	285.0	289.1	294.7	299.3	308.7
<b>** TOTAL AREA-WIDE SOURCES</b>	285.0	289.1	294.7	299.3	308.7
<b>MOBILE SOURCES</b>					
<i>SUMMARY CATEGORY NAME</i>	1999	2002	2005	2008	2010
<b>ON-ROAD MOTOR VEHICLES</b>					
LIGHT DUTY PASSENGER (LDA)	1.4	1.5	1.6	1.8	1.8
LIGHT DUTY TRUCKS - 1 (LDT1)	0.6	0.7	0.7	0.8	0.8
LIGHT DUTY TRUCKS - 2 (LDT2)	0.6	0.6	0.7	0.8	0.8
MEDIUM DUTY TRUCKS (MDV)	0.2	0.2	0.3	0.3	0.3
LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.1	0.1	0.1	0.1	0.1
LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.0	0.0	0.0	0.0	0.0
MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.0	0.0	0.0	0.0	0.0
HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.0	0.0	0.0	0.0	0.0
LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.0	0.0	0.0	0.0	0.0
LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.0	0.0	0.0	0.0	0.0
MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.6	0.6	0.6	0.6	0.5
HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	2.3	2.1	1.9	1.6	1.5
MOTORCYCLES (MCY)	0.0	0.0	0.0	0.0	0.0
HEAVY DUTY DIESEL URBAN BUSES (UB)	0.1	0.1	0.1	0.1	0.1
HEAVY DUTY GAS URBAN BUSES (UB)	0.0	0.0	0.0	0.0	0.0

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SCHOOL BUSES (SB)	0.1	0.1	0.1	0.1	0.1
MOTOR HOMES (MH)	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL ON-ROAD MOTOR VEHICLES</b>	<b>6.0</b>	<b>6.1</b>	<b>6.2</b>	<b>6.2</b>	<b>6.2</b>
<b>OTHER MOBILE SOURCES</b>					
AIRCRAFT	0.4	0.4	0.4	0.4	0.4
TRAINS	0.4	0.4	0.4	0.3	0.3
SHIPS AND COMMERCIAL BOATS	0.1	0.0	0.0	0.0	0.0
RECREATIONAL BOATS	0.6	0.6	0.8	0.9	0.9
OFF-ROAD RECREATIONAL VEHICLES	0.0	0.0	0.0	0.0	0.0
OFF-ROAD EQUIPMENT	3.2	3.1	2.9	2.6	2.4
FARM EQUIPMENT	4.2	3.9	3.6	3.2	3.0
FUEL STORAGE AND HANDLING	0.0	0.0	0.0	0.0	0.0
<b>* TOTAL OTHER MOBILE SOURCES</b>	<b>8.9</b>	<b>8.6</b>	<b>8.2</b>	<b>7.6</b>	<b>7.1</b>
<b>** TOTAL MOBILE SOURCES</b>	<b>14.9</b>	<b>14.7</b>	<b>14.5</b>	<b>13.8</b>	<b>13.4</b>
<b>GRAND TOTAL PM10 FOR SAN JOAQUIN VALLEY</b>	<b>324.7</b>	<b>329.5</b>	<b>335.8</b>	<b>340.5</b>	<b>350.1</b>

**Table 3-12  
Summary of Annual Ammonia Emissions  
(tons per day)**

<b>Source Category</b>	<b>1999</b>	<b>2002</b>	<b>2005</b>	<b>2008</b>	<b>2010</b>
Burning – Ag & Timber	0.9	0.9	0.9	0.9	0.9
Burning – Residential	0.6	0.6	0.6	0.6	0.6
Composting	14.8	16.0	17.3	18.6	19.4
Domestic	5.1	5.4	5.9	6.3	6.6
Fertilizer Application	15.3	15.1	15.0	14.8	14.8
Landfill	2.5	2.7	2.8	3.0	3.1
Beef	40.0	40.0	40.0	40.0	40.0
Dairy	216.4	240.7	262.3	285.7	302.6
Poultry	46.3	46.3	46.3	46.3	46.3
Other Livestock	8.9	8.9	8.9	8.9	8.9
Motor Vehicles	5.1	5.7	6.2	6.8	7.1
Native	1.4	1.4	1.4	1.4	1.4
POTW (Sewage Treatment)	0.0	0.0	0.0	0.0	0.0
Soil – Natural and Ag	13.7	13.7	13.7	13.7	13.7
<b>TOTAL</b>	<b>371.0</b>	<b>397.4</b>	<b>421.4</b>	<b>447.1</b>	<b>465.4</b>

The ARB provided a winter biogenic inventory indicating that biogenic VOC emissions are 22 tons per day. No detailed breakdown was provided for biogenic species.