SUBCHAPTER 3.2

AIR QUALITY

Criteria Air Pollutants

Non-Criteria Air Pollutants

3.2 AIR QUALITY

3.2.1 Criteria Air Pollutants

The purpose of the 2012 AQMP is designed to address the federal eight-hour and one-hour (revoked) ozone and PM2.5 air quality standards, to satisfy the planning requirements of the federal Clean Air Act (CAA), and to develop transportation emission budgets using the latest approved motor vehicle emissions model and planning assumptions. This chapter summarizes emissions that occurred in the Basin during the 2008 base year, and projected emissions in the years 2014, 2019, 2023, and 2030. More detailed emission data analyses are presented in Appendix III of the ~~Draft~~ 2012 AQMP. The 2008 base year emissions inventory reflects adopted air regulations with current compliance dates as of 2008; whereas future baseline emissions inventories are based on adopted air regulations with both current and future compliance dates. A list of the SCAQMD's and CARB's rules and regulations that are part of the base year and future-year baseline emissions inventories is presented in Appendix III of the ~~Draft~~ 2012 AQMP. The SCAQMD is committed to implement the SCAQMD rules that are incorporated in the ~~Draft~~ 2012 AQMP future baseline emissions inventories.

The emissions inventory is divided into four major classifications: point, area, on-road, and off-road sources. The 2008 base year point source emissions are based principally on reported data from facilities using the SCAQMD's Annual Emissions Reporting Program. The area source emissions are estimated jointly by CARB and the SCAQMD. The on-road emissions are calculated by applying CARB's EMFAC2011 emission factors to the transportation activity data provided by Southern California Association of Governments (SCAG) from their adopted 2012 Regional Transportation Plan (2012 RTP). CARB's 2011 In-Use Off-Road Fleet Inventory Model is used for the construction, mining, gardening and agricultural equipment. CARB also provides other off-road emissions, such as ocean-going vessels, commercial harbor craft, locomotives and cargo handling equipment. Aircraft emissions are based on an updated analysis by the SCAQMD. The future emission forecasts are primarily based on demographic and economic growth projections provided by SCAG. In addition, emission reductions resulting from SCAQMD regulations adopted by June, 2012 and CARB regulations adopted by August 2011 are included in the baseline.

This chapter summarizes the major components of developing the base year and future baseline inventories. More detailed information, such as CARB's and the SCAQMD's emission reductions resulting from adopted rules and regulations since the 2007 AQMP, growth factors, and demographic trends, are presented in Appendix III of the ~~Draft~~ 2012 AQMP. In addition, the top ten source categories contributing to the 2008, 2014, and 2023 emission inventories are identified in this chapter. Understanding information about the highest emitting source categories leads to the identification of potentially more effective and/or cost effective control strategies for improving air quality.

3.2.1.1 Current Emission Inventories

Two inventories are prepared for the ~~Draft~~ 2012 AQMP for the purpose of regulatory and SIP performance tracking and transportation conformity: an annual average inventory, and a summer planning inventory. Baseline emissions data presented in this chapter are based on average annual day emissions (e.g., total annual emissions divided by 365 days) and seasonally adjusted summer planning inventory emissions. The ~~Draft~~ 2012 AQMP uses annual average day emissions to estimate the cost-effectiveness of control measures, to rank control measure implementation, and to perform PM2.5 modeling and analysis. The summer planning inventory emissions are developed to capture the emission levels during a poor ozone air quality season, and are used to report emission reduction progress as required by the federal and California CAAs.

Detailed information regarding the emissions inventory development for the base year and future years, the emissions by major source category of the base year, and future baseline emission inventories are presented in Appendix III of the ~~Draft~~ 2012 AQMP. Attachments A and B to Appendix III list the annual average and summer planning emissions by major source category for 2008, 2014, 2017, 2019, 2023 and 2030, respectively. Attachment C to Appendix III of the ~~Draft~~ 2012 AQMP has the top VOC and NOx point sources which emitted greater than or equal to ten tons per year in 2008. Attachment D to the Appendix III of the ~~Draft~~ 2012 AQMP contains the on-road emissions by vehicle class and by pollutant for 2008, 2014, 2019, 2023 and 2030. Attachment E to Appendix III of the ~~Draft~~ 2012 AQMP shows emissions associated with the combustion of diesel fuel for various source categories.

3.2.1.1.1 Stationary Sources

Stationary sources can be divided into two major subcategories: point and area sources. Point sources are large emitters with one or more emission sources at a permitted facility with an identified location (e.g., power plants, refineries). These facilities have annual emissions of four tons or more of either VOC, NOx, SOx, PM, or annual emissions of over 100 tons of CO or toxic air contaminants (TACs). Facility owners/operators are required to report their criteria pollutant emissions and selected TACs to the SCAQMD on an annual basis, if any of these thresholds are exceeded.

Area sources consist of many small emission sources (e.g., residential water heaters, architectural coatings, consumer products, as well as, permitted sources smaller than the above thresholds), which are distributed across the region. There are about 400 area source categories for which emissions are jointly developed by CARB and the SCAQMD. The emissions from these sources are estimated using activity information and emission factors. Activity data are usually obtained from survey data or scientific reports (e.g., Energy Information Administration (EIA) reports for fuel consumption other than natural gas fuel, Southern California Gas Company for natural gas consumption, paint suppliers, and SCAQMD databases). The emission factors are based on rule compliance factors, source tests, Material Safety Data Sheets (MSDS), default factors (mostly from AP-42, U.S. EPA's published emission factor compilation), or weighted emission factors derived from the point sources in annual emissions reports. Socioeconomic data may also be used to estimate emissions over specific areas.

Appendix III of the ~~Draft~~ 2012 AQMP has more detail regarding emissions from specific source categories such as fuel combustion sources, landfills, composting waste, metal-coating operations, architectural coatings, and livestock waste. Since the 2007 AQMP was finalized, new area source categories, such as liquefied petroleum gas (LPG) transmission losses, storage tank and pipeline cleaning and degassing, and architectural colorants were characterized and included in the emission inventories. These updates and new additions are listed below:

- Fuel combustion sources: The emissions inventories from commercial and industrial internal combustion engines were updated to include the portable equipment emissions.
- Landfills: The emission inventories for this area source category was revised to incorporate CARB's landfills greenhouse gas (GHG) emissions.
- Composting waste operations: The emission inventories for this area source category were revised to include the emissions from green waste composting covered under SCAQMD Rule 1133.3. The 2007 AQMP only included the emissions from co-composting, as it relates to SCAQMD Rule 1133.2.
- Metal coating operations: The area source emissions inventory in the 2007 AQMP only included the emissions from small permitted facilities with VOC emissions below four tons per year. As such, emissions from these sources have been underreported in the 2007 AQMP. During the rule development process amending Rule 1107, SCAQMD staff discovered numerous small shops using coating materials with compliant high-solid content, which were subsequently thinned beyond the allowable limits allowed by Rule 1107. The ~~Draft~~ 2012 AQMP revised emission inventory adjusts the 2007 AQMP emission inventory to account for excess emissions from these coating activities.
- Architectural coating category: Three new area source categories were added to the emissions inventory under this category to track the emissions from colorants.
- LPG transmission losses: This newly added area source category was developed to quantify the emissions from LPG storage and fueling losses.
- Livestock waste sources: This emission inventory category was updated to reflect the difference in types of dairy cattle milking cows, dry cows, calves, and heifers as each type of cattle has specific VOC and NH3 emission factors based on the quantity of manure production.
- Storage tanks and pipeline cleaning: This new area source emissions category was added to quantify the emissions from these types of operations.

3.2.1.1.2 Mobile Sources

Mobile sources consist of two subcategories: on-road and off-road sources. On-road sources are from vehicles that are licensed to drive on public roads. Off-road sources are typically registered with the state and cannot be typically driven on public roads. On-road vehicle emissions are calculated by applying CARB's EMFAC2011 emissions factors to the transportation activity data provided by SCAG in their adopted 2012 RTP. Spatial distribution data from Caltrans' Direct Travel Impact Model (DTIM4) are used to generate gridded emissions for regional air quality modeling. Off-road emissions are calculated using CARB's 2011 In-Use Off-Road Emissions Inventory model for construction, mining, gardening, and agricultural equipment. Ship, locomotive, and aircraft emissions are excluded from CARB's In-Use Off-Road Emissions Inventory model. The emissions for 2008 and future years were revised separately based on the most recently available data.

3.2.1.1.3 On-Road

CARB's EMFAC2011 has been updated to reflect more recent vehicle population, activity, and emissions data. Light-duty motor vehicle fleet age, vehicle type, and vehicle population are updated based on 2009 California Department of Motor Vehicles data. The model also reflects recently adopted rules and benefits that were not reflected in EMFAC2007. The rules and benefits include on-road diesel fleet rules, the Pavley Clean Car Standards, and the Low Carbon Fuel standard. The most important improvement in the model is the integration of new data and methods to estimate emissions from diesel trucks and buses. CARB's Truck and Bus Regulation for the on-road heavy-duty in-use diesel vehicles applies to nearly all privately owned diesel fueled trucks and privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. EMFAC2011 includes the emissions benefits of the Truck and Bus Rule and previously adopted rules for other on-road diesel equipment. The impacts of the recent recession on emissions, quantified as part of the truck and bus rulemaking, are also included.

EMFAC2011 uses a modular emissions modeling approach that departs from past EMFAC versions. The first module, named EMFAC-LDV, is used as the basis for estimating emissions from gasoline powered on-road vehicles, diesel vehicles below 14,000 pounds GVWR, and urban transit buses. The second module, called EMFAC-HD, is the basis for emissions estimates for diesel trucks and buses with a GVWR greater than 14,000 pounds operating in California. This module is based on the Statewide Truck and Bus Rule emissions inventory that was developed between 2007 and 2010 and approved by ~~the~~ CARB ~~Board~~ in December 2010. The third module is called EMFAC2011SG. It takes the output from EMFAC-LDV and EMFAC-HD and applies scaling factors to estimate emissions consistent with user-defined vehicle miles of travel and vehicle speeds. Together the three modules comprise EMFAC2011.

Several external adjustments were made to EMFAC2011 in the ~~Draft~~ 2012 AQMP to reflect CARB's rules and regulations, which were adopted after the development of EMFAC2011. The adjustments include the advanced clean cars regulations, reformulated gasoline, and smog check improvement.

Figure 3.2-1 compares the on-road emissions between EMFAC2007 V2.3 used in the 2007 AQMP and EMFAC2011 used in the ~~Draft~~ 2012 AQMP, respectively. It should be noted that the comparison for 2008 reflects changes in methodology; whereas, the comparison for 2023 includes adopted rules and updated growth projections since the release of EMFAC2007. In general, the emissions are lower in EMFAC2011 as compared to EMFAC2007. The lower emissions can be attributed to additional rules and regulations, which result in reduced emissions, revisions to growth projections, and the economic impacts of the recent recession.

3.2.1.1.4 Off-Road

Emissions from off-road vehicle categories (construction & mining equipment, lawn & gardening equipment, ground support equipment, agricultural equipment) in CARB's In-Use Off-Road Emissions Inventory Model were developed primarily based on estimated activity levels and emission factors. Ships, commercial harbor craft, locomotives, aircraft, and cargo handling equipment emissions are not included in CARB's In-Use Off-Road Emissions Inventory Model. Separate models or estimations were used for these emissions sources. The off-road source population, activities, and emission factors were re-evaluated and re-estimated since the 2007 AQMP. Consequently, the emissions are modified accordingly.

The major updates and/or improvements to the off-road inventory include:

1. The equipment population in CARB's In-Use Off-Road Emissions Inventory model was updated by using the equipment population reported to CARB for rule compliance. Based on information from CARB, the total population in 2009 was 26 percent lower than had been anticipated in 2007 due to fleet downsizing during the recent recession.

2. The equipment hours of use in CARB's In-Use Off-Road Emissions Inventory model were updated with reported activity data for the period between 2007 and 2009. According to CARB staff, the new data indicates a 30 percent or greater reduction in most cases in 2009 activity data when compared to 2007 activity data due to the recession.

3. The equipment load factor in CARB's In-Use Off-Road Emissions Inventory model was updated using a 2009 academic study and information from engine manufacturers. According to CARB, the new data suggests that the load factors should be reduced by about 33 percent.

4. According to CARB staff, construction activity and emissions have dropped by more than 50 percent between 2005 and 2011. Emissions beyond 2011 are uncertain and depend on the pace of economic recovery. The future growth in CARB's In-Use Off-Road Emissions Inventory model was projected based on the average of the future forecast scenarios. CARB's data suggest off-road activity and emissions will recover slowly from the recessionary lows.

5. Locomotive inventories reflect the 2008 U.S. EPA Locomotive regulations and adjustments due to economic activity.

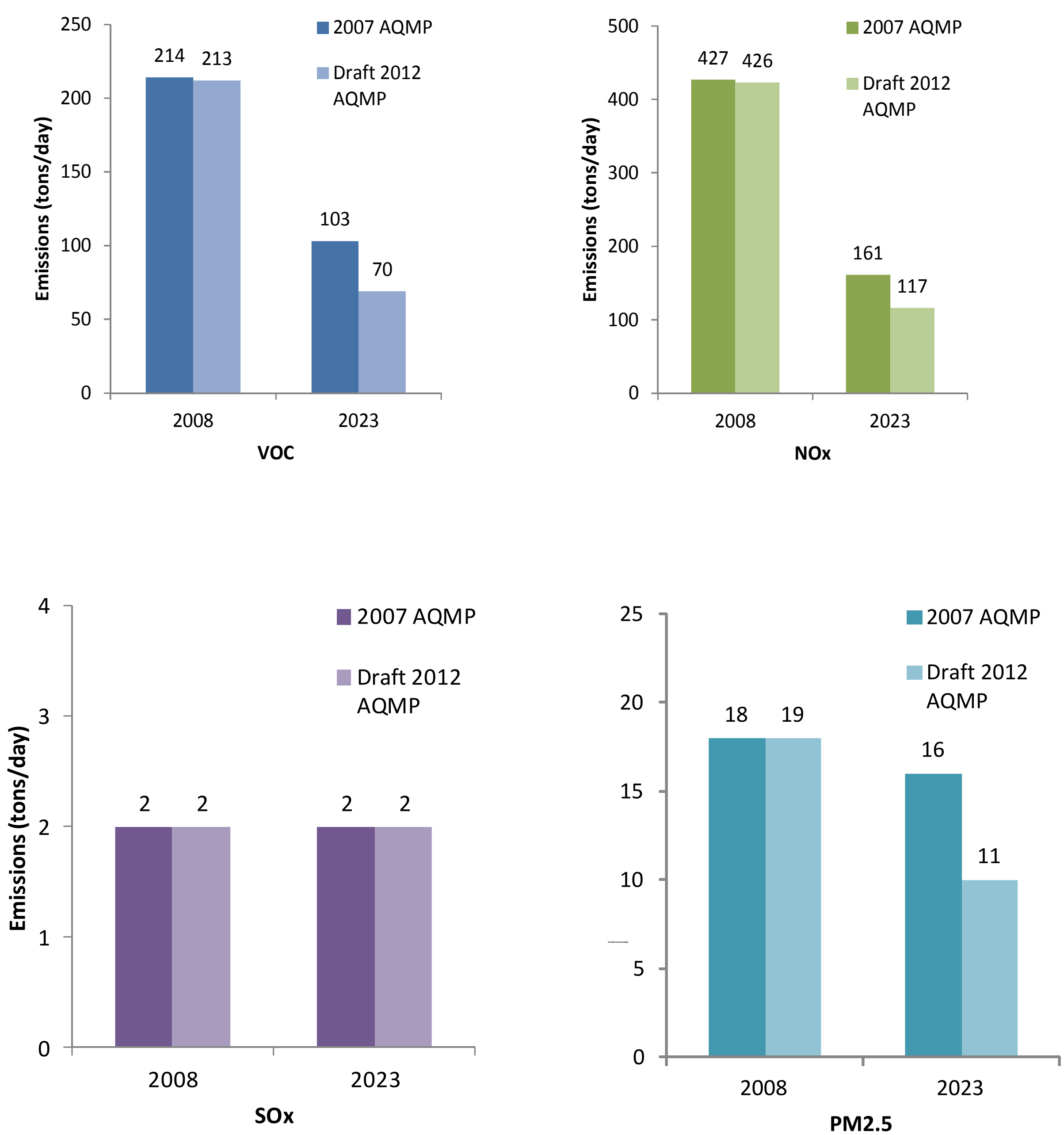

FIGURE 3.2-1

Comparison of On-Road Emissions Between EMFAC2007 V2.3 (2007 AQMP) and EMFAC2011 (~~Draft~~ 2012 AQMP)
(VOC & NOx – Summer Planning; SOx & PM2.5 – Annual Average Inventory)

6. Cargo handling equipment was updated with population, activity, engine load, and recessionary impacts on growth. The updates are based on new information collected since 2005. The new information includes CARB's regulatory reporting data, which includes all the cargo handling equipment in the state including their model year, horsepower and activity. In addition, the Ports of Los Angeles and Long Beach have developed annual emissions inventories, and a number of the major rail yards and other ports in the state have completed individual emission inventories.

7. Ocean-going vessel emissions in the ~~Draft~~ 2012 AQMP included CARB's fuel regulation for ocean-going vessels and the 2007 shore power regulation. The improvements and corrections include recoding the model for speed, updating auxiliary engine information, updating ship routing, revising vessel speed reduction compliance rates, and an adjustment factor to estimate the effects of the recession. In March 2010, the International Maritime Organization (IMO) officially designated the waters within 200 miles of the North American Coast as an Emissions Control Area (ECA). Beginning August 2012, IMO requires ships that travel these waters use fuel with a sulfur content of less than or equal to 1.0 percent, and in 2015 the sulfur limit will be further reduced to 0.1 percent. Additionally, vessels built after January 1, 2016, will be required to meet the most stringent IMO Tier 3 NOx emission levels, while transiting within the 200 mile ECA zone. Outer Continental Shelf (OCS) emissions (e.g., emissions from vessels beyond the three-mile state waters line) are included in the ships emissions as well.

8. Another improvement was the development of a separate emission category for commercial harbor craft using a new commercial harbor craft database. CARB approved a regulation to significantly reduce diesel PM and NOx emissions from diesel-fueled engines on commercial harbor craft vessels. These vessels emit an estimated three tons per day of diesel PM and 70 tons per day of NOx statewide in 2007. The harbor craft database includes emissions from crew and supply, excursion, fishing, pilot, tow boats, barge, and dredge vessels.

9. The aircraft emissions inventory was updated for the 2008 base year and the 2035 forecast year based on the latest available activity data and calculation methodologies. A total of 43 airports were identified as having aircraft operations within the SCAQMD boundaries including commercial air carrier, air taxi, general aviation, and military aircraft operations. The sources of activity data include airport operators (for several commercial and military airports), FAA's databases (e.g., Bureau of Transportation Statistics, Air Traffic Activity Data System, and Terminal Area Forecast), and SCAG. For commercial air carrier operations, SCAG's 2035 forecast, which is consistent with the forecast adopted for the 2012 RTP, reflects the future aircraft fleet mix. The emissions calculation methodology was primarily based on the application of FAA's Emissions and Dispersion Modeling System (EDMS) model for airports with detailed activity data for commercial air carrier operations (by aircraft make and model). For other airports and aircraft types (e.g., general aviation, air taxi, military), the total number of landing and takeoff activity data was used in conjunction with the U.S. EPA's average emission factors for major aircraft types (e.g., general aviation, air taxi,

military). For the intermediate milestone years, the emissions inventories were linearly interpolated between 2008 and 2035.

Several external adjustments to the off-road emissions were made to reflect CARB's rules and regulations and new estimates of activity. The adjustments include locomotives, large spark ignition engines and non-agricultural internal combustion engines. Figure 3.2-2 shows a comparison between the off-road baseline emissions in the 2007 AQMP and the ~~Draft~~ 2012 AQMP. In general, the emissions are lower in the 2011 In-Use Off-Road Emissions Inventory model, except for 2008 SOx emissions. The projected 2008 off-road NOx emissions in the 2007 AQMP were 339 tons per day, while the 2008 base year off-road NOx emissions in the ~~Draft~~ 2012 AQMP are 209 tons per day. The 2011 In-Use Off-Road Emissions Inventory generated lower emissions because of rules and regulations adopted since 2007 OFFROAD model, updated data, future growth corrections and recessionary impacts to commercial and industrial mobile equipment. The higher 2008 estimated SOx emissions reflect a temporary stay in the implementation of the lower sulfur content marine fuel regulation that occurred during a portion of 2008.

3.2.1.1.5 Uncertainty in the Inventory

An effective AQMP relies on a complete and accurate emission inventory. Over the years, significant improvements have been made in emission estimates for sources affected by control measures. Increased use of continuous monitoring and source tests has contributed to the improvement in point source inventories. Technical assistance to facilities and auditing of reported emissions by SCAQMD staff have also improved the accuracy of the emissions inventory. Area source inventories that rely on average emission factors and regional activities have inherent uncertainty. Industry-specific surveys and source-specific studies during rule development have provided much needed refinement to the emissions estimates.

Mobile source inventories remain the greatest challenge due to new information continuously collected from the large number and types of equipment and engines. Every AQMP revision provides an opportunity to further improve the current knowledge of mobile source inventories. The ~~Draft~~ 2012 AQMP is not an exception. As described earlier, many improvements were included in EMFAC2011, and such work is ongoing. However, it should be acknowledged that there are still areas that could be significantly improved if better data were available. Technological changes and advancement in the area of electric, hybrid, flexible fuel, fuel cell vehicles coupled with changes in future gasoline prices all add uncertainty to the on-road emissions inventory.

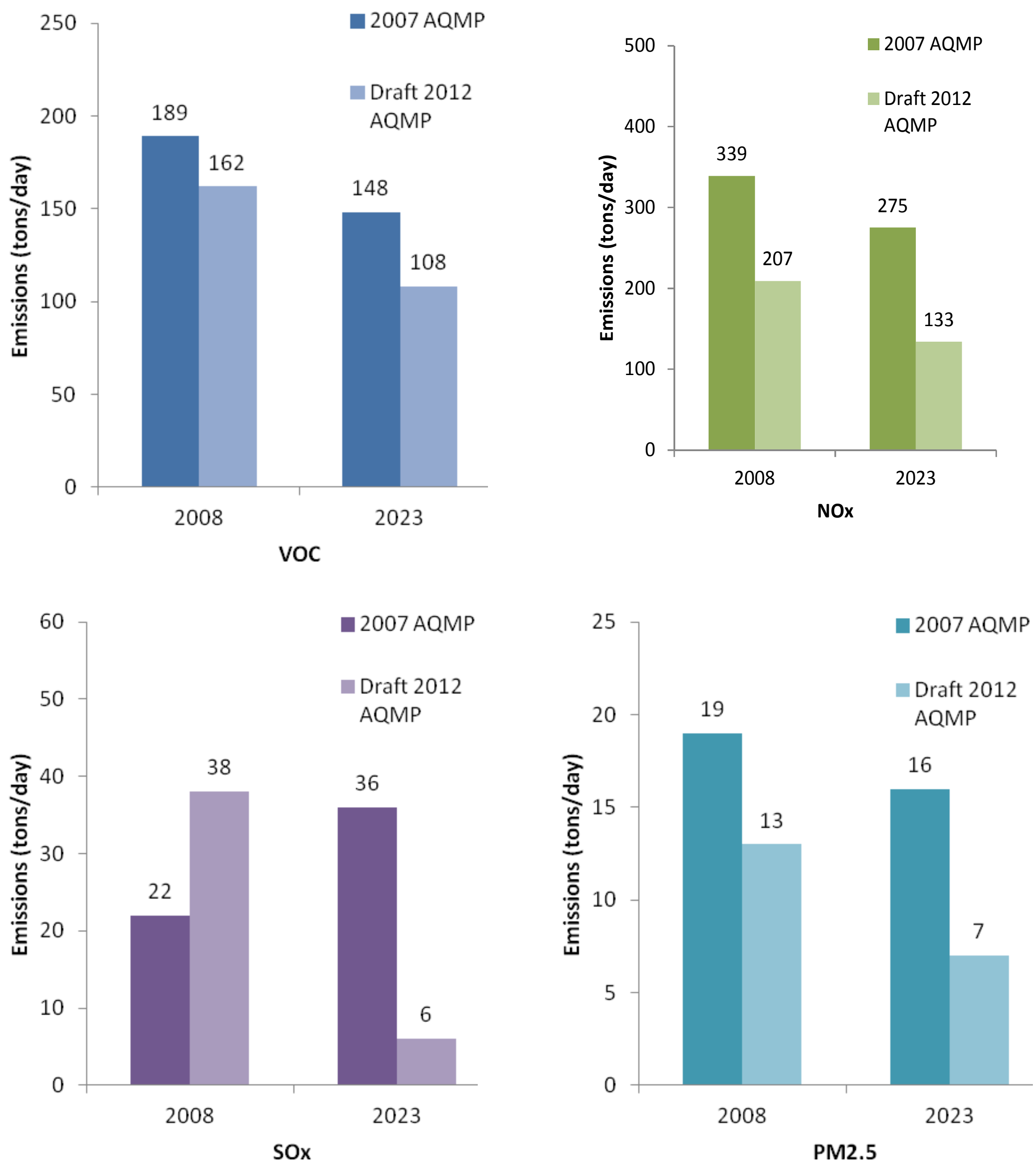

FIGURE 3.2-2

Comparison of Off-Road Emissions Between 2007 AQMP and ~~Draft~~ 2012 AQMP
(VOC & NOx – Summer Planning; SOx & PM2.5 – Annual Average Inventory)

It is important to note that the recent recession began in 2007, and since it was unforeseen at the time, associated impacts were not included in the 2007 AQMP. As the ~~Draft~~ 2012 AQMP is developed, Southern California is in a slow economic recovery. The impact of the recession is deep and is still being felt and, thus, adds to the uncertainty in the emission estimates provided in this analysis. There are many challenges with making accurate projections of future growth, such as, where vehicle trips will occur, the distribution between various modes of transportation (such as trucks and trains), as well as, estimates for population growth and changes to the numbers and types of jobs held. Forecasts are made with the best information available; nevertheless, these issues contribute to the overall uncertainty in emissions projections. Fortunately, AQMP updates are generally developed every three to four years; thereby allowing for frequent improvements to the emission inventories.

3.2.1.1.6 *Gridded Emissions*

The air quality modeling region for the 2012 AQMP extends to Southern Kern County in the north, the Arizona border in the east, northern Mexico in the south and more than 100 miles offshore to the west. The modeling area is divided into a grid system comprised of four kilometer square grid cells defined by Lambert Conformal coordinates. Both stationary and mobile source emissions are allocated to individual grid cells within the modeled area. In general, daily modeling emissions are used. Variations in temperature, hours of operation, speed of motor vehicles, and/or other factors are considered in developing gridded motor vehicle emissions. The gridded emissions data used for both PM2.5 and ozone modeling applications differ from the average annual day or planning inventory emission data in two respects: (1) the air quality modeling region covers larger geographic areas than the Basin; and (2) emissions used in air quality modeling represent day-specific instead of average or seasonal conditions. For PM2.5, the annual average day is use d in the air quality modeling, which represents the characteristic of emissions that contribute to year-round particulate impacts. The summer planning inventory, which is used for ozone modeling analyses, focuses on the warmer months (May through October) when evaporative VOC emissions play an important role in ozone formation.

3.2.1.2 Base Year Emissions - 2008 Emission Inventory

Table 3.2-1A compares the annual average emissions between the 2008 base year in the ~~Draft~~ 2012 AQMP and the projected 2008 emissions in the 2007 AQMP by major source category for VOC and NOx. Table 3.2-1B compares the annual average emissions between the 2008 base year in the ~~Draft~~ 2012 AQMP and the projected 2008 emissions in the 2007 AQMP for SOx and PM2.5. Due to the economic recession which began in 2007, it is expected that the more recent 2008 base year emissions estimates should be lower than the previously projected 2008 emissions. Yet, several categories show higher emissions in the 2008 base year in the ~~Draft~~ 2012 AQMP, such as fuel consumption, waste disposal, petroleum production and marketing for VOC; fuel consumption for NOx; off-road emissions for SOx; and industrial processes for PM2.5. The reasons for these differences are as follows:

1. Fuel consumption – The emissions from commercial and industrial internal combustion engines were updated to include portable equipment emissions, which were overlooked in the 2007 AQMP. The update causes increases in emissions for this category.

2. Waste disposal – Due to erroneous activity data reported by point sources in the 2007 AQMP, landfill emissions were revised substantially upward in the corrected emissions inventory used for the 2012 AQMP. In addition, landfill emission estimation methodology was revised to incorporate CARB's GHG Emission Inventory data, which includes the amount of methane being generated in 2008. Industry stakeholders have requested further evaluation of these emission factors used. As a result, the SCAQMD staff will initiate a working group to undertake this effort.

3. Petroleum production and marketing – Two new area source categories (LPG transmission, storage tanks and pipeline cleaning and degassing) were added to the ~~Draft~~ 2012 AQMP. LPG transmission sources were added based on data from the development of Rule 1177. LPG transmission source category includes the fugitive emissions associated with transfer and dispensing of LPG and is based on emission rates derived from the SCAQMD source tests conducted in 2008 and 2011, sale volumes provided by the industry association, and category breakdowns. A total of 8.4 tons per day VOC emissions were added to the 2008 emissions inventory. The storage tanks and pipeline cleaning and degassing source category was updated based on Rule 1149 amendments to reflect more frequent degassing events, as well as, the effectiveness of control techniques. During the amendment to the rule, it was determined that the actual number of degassing events were more than triple the number that was estimated when the rule was originally developed. It was also originally assumed that once the degassing rule requirements were fulfilled, there would be no more fugitive emissions; however, a review of degassing logs indicated that sludge and product residual in the storage tanks continued to generate fugitive emissions, which significantly increase the emissions from the storage tanks. Finally, the source category was expanded to include previously exempted tanks and pipelines. The storage tanks and pipeline source adds 1.4 tons per day VOC to the 2008 base year.

4. Off-road SOx – CARB adopted a regulation in 2005 to set sulfur content limits on marine fuels for auxiliary diesel engines and diesel-electric engines operated on ocean-going vessels within California waters and 24 nautical miles of the California coastline. The regulation became effective January 1, 2007, and as a result the SOx reductions were accounted for in the 2007 AQMP. However, pursuant to an injunction issued by a federal district court (district court), CARB ceased enforcing the regulation in the fall of 2007. See *Pacific Merchant Shipping Ass'n v. Thomas A. Cackette* (E.D. Cal. Aug. 30, 2007), No. Civ. S-06 2791-WBS-KJM. CARB filed an appeal with the Ninth Circuit and requested a stay of the injunction pending the appeal. As permitted under the appellate court stay, CARB decided to continue to enforce the regulation while litigation involving the regulation remained active. On May 7, 2008, CARB issued another announcement to discontinue enforcement of the regulation pursuant to the same injunction after the Court of Appeals issued its decisions which invalidated the 2005 regulation. In the meantime, CARB staff prepared a new Ocean-Going Vessel Clean Fuel Regulation that was approved by its Board on July 24, 2008, and implementation began on July 1, 2009. The 2008 regulation includes the auxiliary engines and also the main engines and auxiliary boilers on ocean-going vessels within the same 24 nautical miles zone as the earlier auxiliary engine rule. The 2008

regulation achieves higher SOx reductions than the original auxiliary engine rule, primarily due to regulating the main engines and auxiliary boilers in addition to the auxiliary engines.

Tables 3.2-1A and 3.2-1B show the 2008 emissions inventory by major source category. Table 3.2-2A shows annual average emissions, while 3.2-2B shows the summer planning inventory. Stationary sources are subdivided into point (e.g., chemical manufacturing, petroleum production, and electric utilities) and area sources (e.g., architectural coatings, residential water heaters, consumer products, and permitted sources smaller than the emission reporting threshold – generally four tons per year). Mobile sources consist of on-road (e.g., light-duty passenger cars) and off-road sources (e.g., trains and ships). Entrained road dust emissions are also included.

Figure 3.2-3 characterizes relative contributions by stationary and mobile source categories. On- and off-road sources continue to be the major contributors for each of the five criteria pollutants. Overall, total mobile source emissions account for 59 percent of the VOC and 88 percent of the NOx emissions for these two ozone-forming pollutants, based on the summer planning inventory. The on-road mobile category alone contributes about 33 and 59 percent of the VOC and NOx emissions, respectively, and approximately 27 percent of the CO for the annual average inventory. For directly emitted PM2.5, mobile sources represent 23 percent of the emissions with another 10 percent due to vehicle-related entrained road dust.

Within the category of stationary sources, point sources contribute more SOx emissions than area sources. Area sources play a major role in VOC emissions, emitting about seven times more than point sources. Area sources, including sources such as commercial cooking, are the predominant source of directly emitted PM2.5 emissions (39 percent).

3.2.1.3 Future Emissions

3.2.1.3.1 Data Development

The milestone years 2008, 2014, 2019, 2023, and 2030 are the years for which emission inventories were developed as they are relevant target years under the federal CAA and the California CAA. The base year for the 24-hour PM2.5 attainment demonstration is 2008. The attainment year for the federal 2006 24-hour PM2.5 standard without an extension is 2014 and 2019 represents the latest attainment date with a full five-year extension. The 80 ppb federal 8-hour ozone standard attainment deadline is 2023, and the new 75 ppb 8-hour ozone standard deadline is 2032. A 2030 inventory will be used to approximate this latter year.

TABLE 3.2-1A

Comparison of VOC and NOx Emissions By Major Source Category of
2008 Base Year in ~~Revised Draft~~ 2012 AQMP and Projected 2008 in 2007 AQMP
Annual Average Inventory (tpd[a])

SOURCE CATEGORY	2007 AQMP	~~Draft~~ 2012 AQMP	Percent Change	2007 AQMP	~~Draft~~ 2012 AQMP	Percent Change
	VOC			NOx		
STATIONARY SOURCES						
Fuel Combustion	7	14	~~97~~100%	30	~~41~~ 40	36%
Waste Disposal	8	12	50~~1~~%	2	2	~~-24~~0%
Cleaning and Surface Coatings	37	37	0%	0	0	0%
Petroleum Production and Marketing	32	41	28%	0	0	0%
Industrial Processes	19	16	-16~~7~~%	0	0	0%
SOLVENT EVAPORATION						
Consumer Products	97	98	1%	0	0	0%
Architectural Coatings	23	22	-5%	0	0	0%
Others	3	2	-33~~2~~%	0	0	0%
Misc. Processes	15	15~~6~~	~~4~~0%	26	26	0%
RECLAIM Sources	0	-0%-	0%-	29	23	-21~~0~~%
Total Stationary Sources	**241**	**257**	**7%**	**87**	**92**	**6%**
MOBILE SOURCES						
On-Road Vehicles	207	209	1%	447	462	3%
Off-Road Vehicles	150	127	-15%	325	204	-37%
Total Mobile Sources	**357**	**336**	**-6%**	**772**	**666**	**-14%**
TOTAL	**598**	**593**	**-1%**	**859**	**758~~7~~**	**-12~~4~~%**

[a] Values are rounded to nearest integer.

TABLE 3.2-1B

Comparison of SOx and PM2.5 Emissions By Major Source Category of 2008 Base Year in ~~Revised Draft~~ 2012 AQMP and Projected 2008 in 2007 AQMP Annual Average (tpd[a])

SOURCE CATEGORY	2007 AQMP	~~Draft~~ 2012 AQMP	Percent Change	2007 AQMP	~~Draft~~ 2012 AQMP	Percent Change
	SOx			PM2.5		
STATIONARY SOURCES						
Fuel Combustion	2	2	~~-3~~0%	6	6	~~-3~~0%
Waste Disposal	0	0	0%	0	0	0%
Cleaning and Surface Coatings	0	0	0%	1	1~~2~~	~~5~~30%
Petroleum Production and Marketing	1	1	~~-32~~0%	1	2	100~~68~~%
Industrial Processes	0	0	0%	5	7	40~~37~~%
Solvent Evaporation						
Consumer Products	0	0	0%	0	0	0%
Architectural Coatings	0	0	0%	0	0	0%
Others	0	0	0%	0	0	0%
Misc. Processes	1	1	~~-46~~0%	52	32	-39%
RECLAIM Sources	12	10	-17~~5~~%	0	0	0%
Total Stationary Sources	16	14	-12~~4~~%	65	48	-26%
MOBILE SOURCES						
On-Road Vehicles	2	2	~~5~~0%	18	19	~~3~~6%
Off-Road Vehicles	14	38	171~~0~~%	18	13	-28~~5~~%
Total Mobile Sources	16	40	150~~3~~%	36	32	-11%
TOTAL	32	54	~~70~~64%	101	80	-21%

[a] Values are rounded to nearest integer.
[b] Refer to Base Year Emissions – Off-road-SOx.

TABLE 3.2-2A

Summary of Emissions By Major Source Category: 2008 Base Year
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
STATIONARY SOURCES					
Fuel Combustion	14	41	57	2	6
Waste Disposal	12	2	1	0	0
Cleaning and Surface Coatings	37	0	0	0	2
Petroleum Production and Marketing	41	0	5	1	2
Industrial Processes	16	0	2	0	7
Solvent Evaporation					
Consumer Products	98	0	0	0	0
Architectural Coatings	22	0	0	0	0
Others	2	0	0	0	0
Misc. Processes	15~~6~~	26	72	1	32
RECLAIM Sources	0	23	0	10	0
Total Stationary Sources	257	92	137	14	~~41~~ 48
MOBILE SOURCES					
On-Road Vehicles	209	462	1,966	2	19
Off-Road Vehicles	127	204	778	38	13
Total Mobile Sources	336	666	2,744	40	32
TOTAL	593	758~~7~~	2,881	54	~~73~~ 80

[a] Values are rounded to nearest integer.

TABLE 3.2-2B

Summary of Emissions By Major Source Category: 2008 Base Year Summer Planning Inventory (tpd[a])

SOURCE CATEGORY	SUMMER OZONE PRECURSORS	
	VOC	NOx
STATIONARY SOURCES		
Fuel Combustion	14	~~42~~ 41
Waste Disposal	12	2
Cleaning and Surface Coatings	43	0
Petroleum Production and Marketing	41	0
Industrial Processes	19	0
Solvent Evaporation		
Consumer Products	100	0
Architectural Coatings	25	0
Others	2	0
Misc. Processes	9	19
RECLAIM Sources		24
Total Stationary Sources	**264**	**87**
MOBILE SOURCES		
On-Road Vehicles	213	426
Off-Road Vehicles	163	208
Total Mobile Sources	**376**	**634**
TOTAL	**~~640~~ 639**	**721**

[a] Values are rounded to nearest integer.

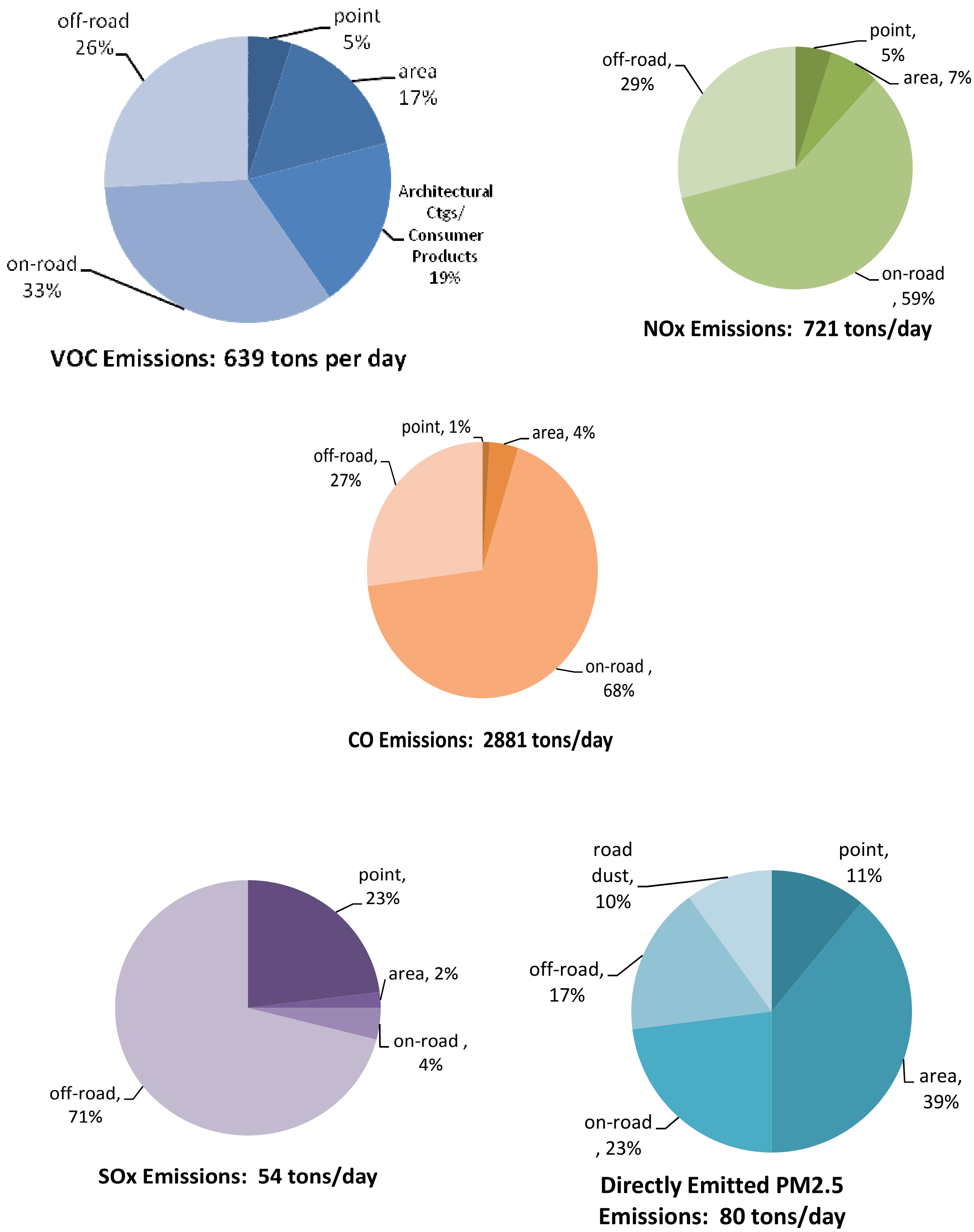

FIGURE 3.2-3
Relative Contribution by Source Category to 2008 Emission Inventory
(VOC & NOx – Summer Planning; CO, SOx, & PM2.5 – Annual Average Inventory)

Future stationary emission inventories are divided into RECLAIM and non-RECLAIM emissions. Future NOx and SOx emissions from RECLAIM sources are estimated based on their allocations as specified by SCAQMD Rule 2002 –Allocations for NOx and SOx. The forecasts for non-RECLAIM emissions were derived using: (1) emissions from the 2008 base year; (2) expected controls after implementation of SCAQMD rules adopted by June, 2012, and CARB rules adopted as of August 2011; and (3) activity growth in various source categories between the base and future years.

Demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) developed by SCAG for their 2012 RTP are used in the ~~Draft~~ 2012 AQMP. Industry growth factors for 2008, 2014, 2018, 2020, 2023, and 2030 are also provided by SCAG, and interim years are calculated by linear interpolation. Table 3.2-3 summarizes key socioeconomic parameters used in the ~~Draft~~ 2012 AQMP for emissions inventory development.

TABLE 3.2-3

Baseline Demographic Forecasts in the ~~Draft~~ 2012 AQMP

CATEGORY	2008	2023	2023 % GROWTH FROM 2008	2030	2030 % GROWTH FROM 2008
Population (Millions)	15.6	17.3	11%	18.1	16%
Housing Units (Millions)	5.1	5.7	12%	6.0	18%
Total Employment (Millions)	7.0	7.7	10%	8.1	16%
Daily VMT (Millions)	379	396	4%	421	11%

Current forecasts indicate that this region will experience a population growth of 11 percent between 2008 and 2023, with a four percent increase in vehicle miles traveled (VMT); and a population growth of 16 percent by the year 2030 with a 11 percent increase in VMT.

As compared to the projections in the 2007 AQMP, the current 2030 projections in the ~~Draft~~ 2012 AQMP show about 1.5 million less population (7.6 percent less), 900,000 less total employment (10 percent less), and 32 million miles less in the daily VMT forecast (7.1 percent less).

3.2.1.3.2 Summary of Future Baseline Emissions

Emissions data by source categories (point, area, on-road mobile and off-road mobile sources) and by pollutants are presented in Tables 3.2-4 through 3.2-7 for the years 2014, 2019, 2023, and 2030. The tables provide annual average, as well as, summer planning inventories.

Without any additional controls, VOC, NOx, and SOx emissions are expected to decrease due to existing regulations, such as controls on off-road equipment, new vehicle standards, and the RECLAIM programs. Figure 3.2-4 illustrates the relative contribution to the 2023 emissions inventory by source category. A comparison of Figures 3.2-3 and 3.2-4 indicates that the on-road mobile category continues to be a major contributor to CO and NOx emissions. However, due to already-adopted regulations, on-road mobile sources in 2023 account for: about 16 percent of total VOC emissions compared to 33 percent in 2008; about ~~37~~ 36 percent of total NOx emissions compared to 59 percent in 2008; and about 38 percent of total CO emissions compared to 27 percent in 2008. Meanwhile, area sources became a major contributor to VOC emissions from 17 percent in 2008 to 25 percent in 2023.

TABLE 3.2-4A

Summary of Emissions By Major Source Category: 2014 Baseline
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
STATIONARY SOURCES					
Fuel Combustion	13	~~23~~ 27	54	2	6
Waste Disposal	12	1	1	0	0
Cleaning and Surface Coatings	39	0	0	0	2
Petroleum Production and Marketing	38	0	5	1	2
Industrial Processes	13	0	2	0	7
Solvent Evaporation					
Consumer Products	85	0	0	0	0
Architectural Coatings	15	0	0	0	0
Others	2	0	0	0	0
Misc. Processes	17	21	102	1	33
RECLAIM Sources	0	27	0	8	0
Total Stationary Sources	**234**	**~~73~~ 77**	**163**	**~~14~~ 12**	**~~48~~ 49**
MOBILE SOURCES					
On-Road Vehicles	117	272	1,165	2	12
Off-Road Vehicles	100	157	766	4	8
Total Mobile Sources	**217**	**429**	**1,931**	**6**	**20**
TOTAL	**451**	**~~502~~ 506**	**2,095**	**~~54~~ 18**	**~~80~~ 70**

[a] Values are rounded to nearest integer.

TABLE 3.2-4B

Summary of Emissions By Major Source Category: 2014 Baseline
Summer Planning Inventory (tpd[a])

SOURCE CATEGORY	SUMMER OZONE PRECURSORS	
	VOC	NOx
Stationary Sources		
Fuel Combustion	13	~~23~~ 28
Waste Disposal	12	2
Cleaning and Surface Coatings	45	0
Petroleum Production and Marketing	38	0
Industrial Processes	15	0
Solvent Evaporation		
Consumer Products	86	0
Architectural Coatings	18	0
Others	2	0
Misc. Processes	10	15
RECLAIM Sources	0-	27
Total Stationary Sources	**239**	**~~68~~ 72**
Mobile Sources		
On-Road Vehicles	120	251
Off-Road Vehicles	128	161
Total Mobile Sources	248	412
TOTAL	**~~488~~ 487**	**~~480~~ 480**

[a] Values are rounded to nearest integer.

TABLE 3.2-5A

Summary of Emissions By Major Source Category: 2019 Baseline
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
Stationary Sources					
Fuel Combustion	14	~~22~~ 27	56	2	6
Waste Disposal	13	2	1	0	0
Cleaning and Surface Coatings	46	0	0	0	2
Petroleum Production and Marketing	36	0	5	1	2
Industrial Processes	15	0	2	0	8
Solvent Evaporation					
Consumer Products	87	0	0	0	0
Architectural Coatings	16	0	0	0	0
Others	2	0	0	0	0
Misc. Processes*	16	18	102	1	34
RECLAIM Sources	0	27	0	6	0
Total Stationary Sources	**245**	**~~69~~ 74**	**165**	**11**	**52**
Mobile Sources					
On-Road Vehicles	80	186	755	2	11
Off-Road Vehicles	90	145	796	5	7
Total Mobile Sources	170	331	1,550	7	18
TOTAL	**415**	**~~400~~ 405**	**1,716**	**18**	**70**

[a] Values are rounded to nearest integer.

TABLE 3.2-5B

Summary of Emissions By Major Source Category: 2019 Baseline Summer Planning Inventory (tpd[a])

STATIONARY SOURCES	SUMMER OZONE PRECURSORS	
	VOC	~~VOC~~ NOx
Fuel Combustion	14	~~22~~ 28
Waste Disposal	13	2
Cleaning and Surface Coatings	53	0
Petroleum Production and Marketing	36	0
Industrial Processes	17	0
Solvent Evaporation		
Consumer Products	89	0
Architectural Coatings	19	0
Others	2	0
Misc. Processes	9	13
RECLAIM Sources		27
Total Stationary Sources	**252**	**~~65~~ 70**
Mobile Sources		
On-Road Vehicles	83	173
Off-Road Vehicles	114	148
Total Mobile Sources	**197**	**321**
TOTAL	**448**	**~~385~~ 391**

[a] Values are rounded to nearest integer.

TABLE 3.2-6A

Summary of Emissions By Major Source Category: 2023 Baseline
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
Stationary Sources					
Fuel Combustion	14	~~21~~ 27	56	2	6
Waste Disposal	14	2	1	0	0
Cleaning and Surface Coatings	49	0	0	0	2
Petroleum Production and Marketing	36	0	5	1	2
Industrial Processes	16	0	2	0	8
Solvent Evaporation					
Consumer Products	89	0	0	0	0
Architectural	17	0	0	0	0
Others	2	0	0	0	0
Misc. Processes*	16	17	102	1	35
RECLAIM Sources	0	27	0	6	0
Total Stationary Sources	**253**	**~~67~~ 73**	**166**	**11**	**53**
Mobile Sources					
On-Road Vehicles	67	126	591	2	11
Off-Road Vehicles	85	130	826	6	7
Total Mobile Sources	**153**	**255**	**1,417**	**8**	**18**
TOTAL	**406**	**~~322~~ 328**	**1,583**	**18**	**71**

[a] Values are rounded to nearest integer.

TABLE 3.2-6B

Summary of Emissions By Major Source Category: 2023 Baseline Summer Planning Inventory (tpd[a])

SOURCE CATEGORY	Summer Ozone Precursors	
	VOC	NOx
Stationary Sources		
Fuel Combustion	14	~~21~~ 27
Waste Disposal	14	2
Cleaning and Surface Coatings	56	0
Petroleum Production and Marketing	37	0
Industrial Processes	18	0
Solvent Evaporation		
Consumer Products	91	0
Architectural	20	0
Others	3	0
Misc. Processes	9	13
RECLAIM Sources		27
Total Stationary Sources	261	~~64~~ 70
Mobile Sources		
On-Road Vehicles	70	117
Off-Road Vehicles	108	133
Total Mobile Sources	177	250
TOTAL	**438**	**~~313~~ 319**

[a] Values are rounded to nearest integer.

TABLE 3.2-7A

Summary of Emissions By Major Source Category: 2030 Baseline
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
Stationary Sources					
Fuel Combustion	15	~~21~~ 28	59	3	6
Waste Disposal	15	2	1	1	0
Cleaning and Surface Coatings	54	0	0	0	2
Petroleum Production and Marketing	38	0	5	1	2
Industrial Processes	17	0	2	0	9
Solvent Evaporation					
Consumer Products	93	0	0	0	0
Architectural	18	0	0	0	0
Others	2	0	0	0	0
Misc. Processes*	16	15	102	1	36
RECLAIM Sources		27		6	0
Total Stationary Sources	**268**	**~~65~~ 72**	**169**	**11**	**55**
Mobile Sources					
On-Road Vehicles	55	101	446	2	12
Off-Road Vehicles	84	116	886	7	6
Total Mobile Sources	139	217	1,333	9	18
TOTAL	**407**	**~~283~~ 289**	**1,501**	**20**	**73**

[a] Values are rounded to nearest integer.

TABLE 3.2-7B

Summary of Emissions By Major Source Category: 2030 Baseline Summer Planning Inventory (tpd[a])

SOURCE CATEGORY	Summer Ozone Precursors	
	VOC	**NOx**
Stationary Sources		
Fuel Combustion	15	~~22~~ 29
Waste Disposal	15	2
Cleaning and Surface Coatings	62	0
Petroleum Production and Marketing	38	0
Industrial Processes	19	0
Solvent Evaporation		
Consumer Products	95	0
Architectural	~~20~~ 21	0
Others	3	0
Misc. Processes	9	12
RECLAIM Sources	0	27
Total Stationary Sources	**~~276~~ 277**	**~~63~~ 70**
Mobile Sources		
On-Road Vehicles	56	95
Off-Road Vehicles	105	119
Total Mobile Sources	**161**	**214**
TOTAL	**437**	**~~277~~ 284**

[a] Values are rounded to nearest integer.

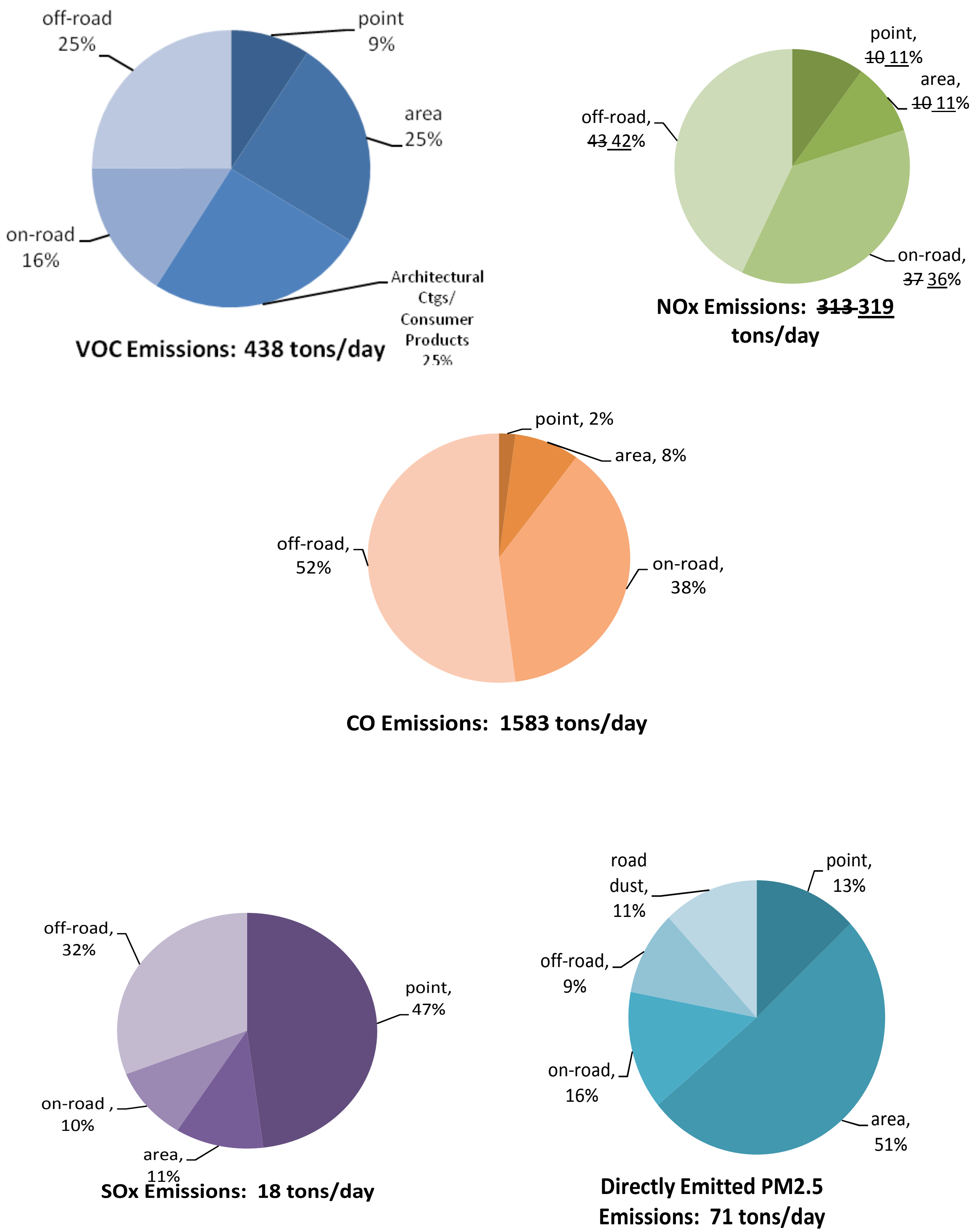

FIGURE 3.2-4

Relative Contribution by Source Category to 2023 Emission Inventory
(VOC & NOx – Summer Planning; CO, SOx, & PM2.5 – Annual Average Inventory)

3.2.1.2 Air Quality Monitoring

This section provides an overview of air quality in the district. A more detailed discussion of current and projected future air quality in the district, with and without additional control measures can be found in the Final Program EIR for the 2012 AQMP (Chapter 3).

It is the responsibility of the SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, CO, NO2, PM10, PM2.5 SO2 and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM10 and SO2, far more stringent. California has also established standards for sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. The state and national ambient air quality standards for each of these pollutants and their effects on health are summarized in Table 3.2-8. The SCAQMD monitors levels of various criteria pollutants at 34 monitoring stations. The 2010 air quality data from SCAQMD's monitoring stations are presented in Table 3.2-9.

3.2.1.2.1 Carbon Monoxide

CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. According to the 2007 AQMP, in 2002, the inventory baseline year, approximately 98 percent of the CO emitted into the Basin's atmosphere was from mobile sources. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the Basin exhibit large spatial and temporal variations due to variations in the rate at which CO is emitted and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable portion of the day.

TABLE 3.2-8

State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard[a]	Federal Primary Standard[b]	Most Relevant Effects
Ozone (0_3)	1-hour	0.09 ppm (180 μg/m^3)	No Federal Standard	(a) Short-term exposures: 1) Pulmonary function decrements and localized lung edema in humans and animals; and, 2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; and, (d) Property damage.
	8-hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)	
Suspended Particulate Matter (PM10)	24-hour	50 μg/m^3	150 μg/m^3	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; and (b) Excess seasonal declines in pulmonary function, especially in children.
	Annual Arithmetic Mean	20 μg/m^3	No Federal Standard	
Suspended Particulate Matter (PM2.5)	24-hour	No State Standard	35 μg/m^3	(a) Increased hospital admissions and emergency room visits for heart and lung disease; (b) Increased respiratory symptoms and disease; and (c) Decreased lung functions and premature death.
	Annual Arithmetic Mean	12 μg/m^3	15.0 μg/m^3	
Carbon Monoxide (CO)	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and, (d) Possible increased risk to fetuses.
	8-Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	

TABLE 3.2-8 (Concluded)

State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard[a]	Federal Primary Standard[b]	Most Relevant Effects
Nitrogen Dioxide (NO_2)	1-Hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and, (c) Contribution to atmospheric discoloration.
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	
Sulfur Dioxide (SO_2)	1-Hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)–	Broncho-constriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
	24-Hour	0.04 ppm (105 µg/m^3)		
Sulfates	24-Hour	25 µg/m^3	No Federal Standard	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and, (f) Property damage
Hydrogen Sulfide (H_2S)	1-Hour	0.03 ppm (42 µg/m^3)	No Federal Standard	Odor annoyance.
Lead (Pb)	30-Day Average	1.5 µg/m^3	No Federal Standard	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction.
	Calendar Quarter	No State Standard	1.5 µg/m^3	
	Rolling 3-Month Average	No State Standard	0.15 µg/m^3	
Visibility Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more due to particles when relative humidity is less than 70 percent.	No Federal Standard	The Statewide standard is intended to limit the frequency and severity of visibility impairment due to regional haze. This is a visibility based standard not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent.
Vinyl Chloride	24-Hour	0.01 ppm (26 µg/m^3)	No Federal Standard	Highly toxic and a known carcinogen that causes a rare cancer of the liver.

a The California ambient air quality standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and PM_{25} are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

b The national ambient air quality standards, other than O3 and those based on annual averages, are not to be exceeded more than once a year. The O3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standards is equal to or less than one.

KEY: ppb = parts per billion parts of air, by volume; ppm = parts per million parts of air, by volume; µg/m^3 = micrograms per cubic meter; mg/ m^3 = milligrams per cubic meter

TABLE 3.2-9

2010 Air Quality Data – South Coast Air Quality Management District

CARBON MONOXIDE (CO)[a]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. ppm, 1-hour	Max. Conc. ppm, 8-hour
LOS ANGELES COUNTY				
1	Central Los Angeles	364	3	2.3
2	Northwest Coastal Los Angeles County	364	2	1.4
3	Southwest Coastal Los Angeles County	344	3	2.2
4	South Coastal Los Angeles County 1	358	3	2.1
4	South Coastal Los Angeles County 2	-	-	-
6	West San Fernando Valley	365	3	2.6
7	East San Fernando Valley	364	3	2.4
8	West San Gabriel Valley	355	3	2.0
9	East San Gabriel Valley 1	355	3	1.3
9	East San Gabriel Valley 2	360	2	1.3
10	Pomona/Walnut Valley	365	3	1.8
11	South San Gabriel Valley	364	2	1.9
12	South Central Los Angeles County	353	6	3.6
13	Santa Clarita Valley	355	2	1.1
ORANGE COUNTY				
16	North Orange County	356	3	1.8
17	Central Orange County	358	3	2.0
18	North Coastal Orange County	364	2	2.1
19	Saddleback Valley	362	1	0.9
RIVERSIDE COUNTY				
22	Norco/Corona	-	-	-
23	Metropolitan Riverside County 1	364	3	1.8
23	Metropolitan Riverside County 2	355	3	1.7
23	Mira Loma	360	3	1.9
24	Perris Valley	-	-	-
25	Lake Elsinore	363	1	0.6
29	Banning Airport	-	-	-
30	Coachella Valley 1**	365	2	0.5
30	Coachella Valley 2**	-	-	-
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	353	2	1.8
33	Southwest San Bernardino Valley	-	-	-
34	Central San Bernardino Valley 1	359	3	1.4
34	Central San Bernardino Valley 2	326	2	1.7
35	East San Bernardino Valley	-	-	-
37	Central San Bernardino Mountains	-	-	-
38	East San Bernardino Mountains	-	-	-
DISTRICT MAXIMUM			6	3.6
SOUTH COAST AIR BASIN			6	3.6

KEY:

ppm = parts per million -- = Pollutant not monitored ** Salton Sea Air Basin

[a] The federal 8-hour standard (8-hour average CO > 9 ppm) and state 8-hour standard (8-hour average CO > 9.0 ppm) were not exceeded. The federal and state 1-hour standards (35 ppm and 20 ppm) were not exceeded either.

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

OZONE (O_3)										
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hr	Max. Conc. in ppm 8-hr	4th High Conc. ppm 8-hr	No. Days Standard Exceeded: Health Advisory ≥ 0.15 ppm 1-hr	Federal: Old > 0.12 ppm 1-hr	Federal: Current >0.075 ppm 8-hr	State: Current > 0.09 ppm 1-hr	State: Current > 0.070 ppm 8-hr
LOS ANGELES COUNTY										
1	Central Los Angeles	357	0.098	0.080	0.064	0	0	1	1	1
2	Northwest Coastal Los Angeles County	360	0.099	0.078	0.069	0	0	1	2	4
3	Southwest Coastal Los Angeles County	319	0.089	0.070	0.059	0	0	0	0	1
4	South Coastal Los Angeles County 1	358	0.101	0.084	0.057	0	0	1	1	1
4	South Coastal Los Angeles County 2	-	-	-	-	-	-	-	-	-
6	West San Fernando Valley	295	0.122	0.091	0.086	0	0	19	11	40
7	East San Fernando Valley	317	0.111	0.084	0.076	0	0	4	3	11
8	West San Gabriel Valley	325	0.101	0.081	0.075	0	0	3	1	6
9	East San Gabriel Valley 1	356	0.104	0.081	0.075	0	0	3	5	10
9	East San Gabriel Valley 2	350	0.124	0.099	0.090	0	0	20	25	48
10	Pomona/Walnut Valley	342	0.115	0.082	0.076	0	0	4	9	20
11	South San Gabriel Valley	358	0.112	0.086	0.059	0	0	1	1	1
12	South Central Los Angeles County	358	0.081	0.062	0.050	0	0	0	0	0
13	Santa Clarita Valley	331	0.126	0.105	0.087	0	0	23	18	44
ORANGE COUNTY										
16	North Orange County	351	0.118	0.096	0.071	0	0	1	2	4
17	Central Orange County	331	0.104	0.088	0.060	0	0	1	1	1
18	North Coastal Orange County	353	0.097	0.076	0.060	0	0	1	1	2
19	Saddleback Valley	353	0.117	0.082	0.069	0	0	2	2	2
RIVERSIDE COUNTY										
22	Norco/Corona	-	-	-	-	-	-	-	-	-
23	Metropolitan Riverside County 1	341	0.128	0.098	0.092	0	1	47	31	78
23	Metropolitan Riverside County 2	-	-	-	-	-	-	-	-	-
23	Mira Loma	324	0.121	0.094	0.090	0	0	38	22	63
24	Perris Valley	343	0.122	0.107	0.099	0	0	50	42	82
25	Lake Elsinore	355	0.107	0.091	0.086	0	0	24	15	42
29	Banning Airport	328	0.124	0.107	0.099	0	0	60	31	84
30	Coachella Valley 1**	361	0.114	0.099	0.092	0	0	52	23	83
30	Coachella Valley 2**	348	0.100	0.087	0.084	0	0	19	7	47
SAN BERNARDINO COUNTY										
32	Northwest San Bernardino Valley	349	0.131	0.097	0.090	0	1	39	31	59
33	Southwest San Bernardino Valley	-	-	-	-	-	-	-	-	-
34	Central San Bernardino Valley 1	350	0.143	0.100	0.094	0	2	33	28	55
34	Central San Bernardino Valley 2	354	0.129	0.105	0.095	0	1	40	27	63
35	East San Bernardino Valley	363	0.128	0.112	0.097	0	1	61	43	86
37	Central San Bernardino Mountains	364	0.142	0.123	0.109	0	6	74	52	101
38	East San Bernardino Mountains	-	-	-	-	-	-	-	-	-
	DISTRICT MAXIMUM		0.143	0.123	0.109	0	6	74	52	101
	SOUTH COAST AIR BASIN		0.143	0.123	0.109	0	7	102	79	131

KEY:

ppm = parts per million -- = Pollutant not monitored ** Salton Sea Air Basin

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

NITROGEN DIOXIDE (NO_2)[b]					
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	1-hour Max. Conc. ppb, 1,	1-hour 98th Percentile Conc. ppb,	Annual Average AAM Conc. ppb
LOS ANGELES COUNTY					
1	Central Los Angeles	364	89.0	70.5	25.0
2	Northwest Coastal Los Angeles County	365	70.8	57.4	15.6
3	Southwest Coastal Los Angeles County	358	75.8	60.9	12.1
4	South Coastal Los Angeles County 1	360	92.8	70.2	19.8
4	South Coastal Los Angeles County 2	-			-
6	West San Fernando Valley	365	75.0	56.0	16.7
7	East San Fernando Valley	359	82.0	64.3	24.1
8	West San Gabriel Valley	355	71.0	63.0	19.6
9	East San Gabriel Valley 1	364	77.2	59.6	18.5
9	East San Gabriel Valley 2	360	78.5	55.5	15.4
10	Pomona/Walnut Valley	365	97.0	72.5	26.2
11	South San Gabriel Valley	364	79.0	65.4	22.9
12	South Central Los Angeles County	364	76.8	68.8	17.9
13	Santa Clarita Valley	364	59.3	54.2	14.3
ORANGE COUNTY					
16	North Orange County	333	82.5	61.6	20.1
17	Central Orange County	364	73.3	61.1	17.5
18	North Coastal Orange County	364	70.0	56.0	11.3
19	Saddleback Valley	-			-
RIVERSIDE COUNTY					
22	Norco/Corona	-			-
23	Metropolitan Riverside County 1	333	64.5	57.0	16.8
23	Metropolitan Riverside County 2	361	60.8	51.5	17.2
23	Mira Loma	365	62.2	50.3	15.1
24	Perris Valley	-			-
25	Lake Elsinore	363	51.2	40.6	10.1
29	Banning Airport	365	65.7	53.2	11.6
30	Coachella Valley 1**	365	45.7	39.0	8.5
30	Coachella Valley 2**	-			-
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	365	78.9	58.0	20.4
33	Southwest San Bernardino Valley	-			-
34	Central San Bernardino Valley 1	363	71.9	64.8	23.1
34	Central San Bernardino Valley 2	365	69.2	56.6	18.8
35	East San Bernardino Valley	-			-
37	Central San Bernardino Mountains	-			-
38	East San Bernardino Mountains	-			-
DISTRICT MAXIMUM			97.0	72.5	26.2
SOUTH COAST AIR BASIN			97.0	72.5	26.2

KEY:

ppb = parts per billion   AAM = Annual Arithmetic Mean   -- = Pollutant not monitored   ** Salton Sea Air Basin

[b] The NO2 federal 1-hour standard is 100 ppb and the annual standard is annual arithmetic mean NO_2 > 0.0534 ppm. The state 1-hour and annual standards are 0.18 ppm and 0.030 ppm.

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

SULFUR DIOXIDE (SO_2)[c]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Maximum Conc. ppb, 1-hour	Maximum Conc. ppb, 24-hour
LOS ANGELES COUNTY				
1	Central Los Angeles	355	9.8	1.5
2	Northwest Coastal Los Angeles County	-	-	-
3	Southwest Coastal Los Angeles County	327	25.9	3.5
4	South Coastal Los Angeles County 1	329	40.0	6.0
4	South Coastal Los Angeles County 2	-	-	-
6	West San Fernando Valley	-	-	-
7	East San Fernando Valley	233*	14.9	4.1
8	West San Gabriel Valley	-	-	-
9	East San Gabriel Valley 1	-	-	-
9	East San Gabriel Valley 2	-	-	-
10	Pomona/Walnut Valley	-	-	-
11	South San Gabriel Valley	-	-	-
12	South Central Los Angeles County	-	-	-
13	Santa Clarita Valley	-	-	-
ORANGE COUNTY				
16	North Orange County	-	-	-
17	Central Orange County	-	-	-
18	North Coastal Orange County	348	9.5	2.1
19	Saddleback Valley	-	-	-
RIVERSIDE COUNTY				
22	Norco/Corona	-	-	-
23	Metropolitan Riverside County 1	349	17.6	4.6
23	Metropolitan Riverside County 2	-	-	-
23	Mira Loma	-	-	-
24	Perris Valley	-	-	-
25	Lake Elsinore	-	-	-
29	Banning Airport	-	-	-
30	Coachella Valley 1**	-	-	-
30	Coachella Valley 2**	-	-	-
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	-	-	-
33	Southwest San Bernardino Valley	-	-	-
34	Central San Bernardino Valley 1	330*	6.6	1.6
34	Central San Bernardino Valley 2	-	-	-
35	East San Bernardino Valley	-	-	-
37	Central San Bernardino Mountains	-	-	-
38	East San Bernardino Mountains	-	-	-
DISTRICT MAXIMUM			40.0	6.0
SOUTH COAST AIR BASIN			40.0	6.0

KEY:

ppb = parts per billion -- = Pollutant not monitored ** Salton Sea Air Basin

[c] The federal SO2 1-hour standard is 75 ppb (0.075 ppm). The state standards are 1-hour average SO_2 > 0.25 ppm and 24-hour average SO_2 > 0.04 ppm.

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. μg/m³, 24-hour	No. (%) Samples Exceeding Standard: Federal > 150 μg/m³, 24-hour	No. (%) Samples Exceeding Standard: State > 50 μg/m³, 24-hour	Annual Average AAM Conc. μg/m³
SUSPENDED PARTICULATE MATTER PM10[d]						
LOS ANGELES COUNTY						
1	Central Los Angeles	56	42	0	0	27.1
2	Northwest Coastal Los Angeles County	-	-	-	-	-
3	Southwest Coastal Los Angeles County	55	37	0	0	20.6
4	South Coastal Los Angeles County 1	58	44	0	0	22.0
4	South Coastal Los Angeles County 2	59	76	0	2(3.4%)	27.3
6	West San Fernando Valley	-	-	-	-	-
7	East San Fernando Valley	55	51	0	1(1.8%)	29.6
8	West San Fernando Valley	-	-	-	-	-
9	East San Gabriel Valley 1	55	70	0	5(9.1%)	29.8
9	East San Gabriel Valley 2	-	-	-	-	-
10	Pomona/Walnut Valley	-	-	-	-	-
11	South San Gabriel Valley	-	-	-	-	-
12	South Central Los Angeles County	-	-	-	-	-
13	Santa Clarita Valley	57	40	0	0	21.0
ORANGE COUNTY						
16	North Orange County	-	-	-	-	-
17	Central Orange County	57	43	0	0	22.4
18	North Coastal Orange County	-	-	-	-	-
19	Saddleback Valley	58	34	0	0	18.1
RIVERSIDE COUNTY0						
22	Norco/Corona	61	50	0	0	27.2
23	Metropolitan Riverside County 1	122	75	0	7(5.7%)	32.8
23	Metropolitan Riverside County 2	-	-	-	-	-
23	Mira Loma	60	89	0	25(41.7%)	42.3
24	Perris Valley	61	51	0	1(1.6%)	28.0
25	Lake Elsinore	-	-	-	-	-
29	Banning Airport	60	55	0	1(1.7%)	21.8
30	Coachella Valley 1**	61	37	0	0	18.7
30	Coachella Valley 2**	119	107	0	6(5%)	29.3
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	-	-	-	-	-
33	Southwest San Bernardino Valley	60	87	0	3(5%)	31.8
34	Central San Bernardino Valley 1	53	62	0	9(17%)	33.9
34	Central San Bernardino Valley 2	59	63	0	3(5.1%)	32.4
35	East San Bernardino Valley	58	57	0	1(1.7%)	25.8
37	Central San Bernardino Mountains	57	39	0	0	18.9
38	East San Bernardino Mountains	-	-	-	-	-
	DISTRICT MAXIMUM		107	0	25	42.3
	SOUTH COAST AIR BASIN		89	0	34	42.3

KEY:

μg/m³ = micrograms per cubic meter of air   AAM = Annual Arithmetic Mean   -- = Pollutant not monitored   ** Salton Sea Air Basin

[d] PM10 samples were collected every 6 days at all sites except for Station Numbers 4144 and 4157, where samples were collected every 3 days. The Federal annual PM10 standard (AAM > 50 μg/m³) was revoked in 2006. State standard is annual average (AAM) > 20 μg/m³

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM2.5 [e]						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. µg/m^3, 24-hour	98th Percentile Conc. in µg/m^3 24-hr	No. (%) Samples Exceeding Federal Std > 35 µg/m^3, 24-hour	Annual Average AAM Conc. µg/m^3
LOS ANGELES COUNTY						
1	Central Los Angeles	335	39.2	27.1	2(0.6%)	11.9
2	Northwest Coastal Los Angeles County	-	-	-	-	-
3	Southwest Coastal Los Angeles County	-	-	-	-	-
4	South Coastal Los Angeles County 1	338	35.0	28.3	0	10.5
4	South Coastal Los Angeles County 2	351	33.7	26.5	0	10.4
6	West San Fernando Valley	100	40.7	30.4	1(1.0%)	10.2
7	East San Fernando Valley	322	43.7	31.8	4(1.2%)	12.5
8	West San Gabriel Valley	97	35.2	24.0	0	10.2
9	East San Gabriel Valley 1	93	44.4	35.4	1(1.1%)	10.9
9	East San Gabriel Valley 2	-	-	-	-	-
10	Pomona/Walnut Valley	-	-	-	-	-
11	South San Gabriel Valley	117	34.9	32.0	0	12.5
12	South Central Los Angeles County	111	38.2	31.8	1(0.9%)	12.5
13	Santa Clarita Valley	-	-	-	-	-
ORANGE COUNTY						
16	North Orange County	-	-	-	-	-
17	Central Orange County	331	31.7	25.2	0	10.2
18	North Coastal Orange County	-	-	-	-	-
19	Saddleback Valley	116	19.9	17.3	0	8.0
RIVERSIDE COUNTY						
22	Norco/Corona	-	-	-	-	-
23	Metropolitan Riverside County 1	351	46.5	32.0	4(1.1%)	13.2
23	Metropolitan Riverside County 2	115	43.7	27.3	2(1.7%)	11.0
23	Mira Loma	340	54.2	36.1	8(2.4%)	15.2
24	Perris Valley	-	-	-	-	-
25	Lake Elsinore	-	-	-	-	-
29	Banning Airport	-	-	-	-	-
30	Coachella Valley 1**	111	12.8	12.6	0	6.0
30	Coachella Valley 2**	112	16.0	12.2	0	6.8
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	-	-	-	-	-
33	Southwest San Bernardino Valley	112	46.1	31.2	1(0.9%)	13.0
34	Central San Bernardino Valley 1	112	42.6	30.8	2(1.8%)	12.0
34	Central San Bernardino Valley 2	119	39.3	29.7	2(1.7%)	11.1
35	East San Bernardino Valley	-	-	-	-	-
37	Central San Bernardino Mountains	-	-	-	-	-
38	East San Bernardino Mountains	53	35.4	27.5	0	8.4
DISTRICT MAXIMUM			54.2	36.1	8	15.2
SOUTH COAST AIR BASIN			54.2	36.1	13	15.2

KEY:

µg/m^3 = micrograms per cubic meter of air   AAM = Annual Arithmetic Mean   -- = Pollutant not monitored   ** Salton Sea Air Basin

[e] PM2.5 samples were collected every 3 days at all sites except for station numbers 069, 072, 077, 087, 3176, 4144 and 4165, where samples were taken daily, and station number 5818 where samples were taken every 6 days. Federal annual PM2.5 standard is annual average (AAM) > 15.0 µg/m^3. State standard is annual average (AAM) > 12.0 µg/m^3.

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TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

TOTAL SUSPENDED PARTICULATES TSP[f]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. $\mu g/m^3$, 24-hour	Annual Average AAM Conc. $\mu g/m^3$
LOS ANGELES COUNTY				
1	Central Los Angeles	53	105	53.3
2	Northwest Coastal Los Angeles County	59	82	40.8
3	Southwest Coastal Los Angeles County	55	85	36.7
4	South Coastal Los Angeles County 1	60	129	45.5
4	South Coastal Los Angeles County 2	57	130	50.8
6	West San Fernando Valley	-	-	-
7	East San Fernando Valley	-	-	-
8	West San Gabriel Valley	58	58	36.4
9	East San Gabriel Valley 1	53	136	58.2
9	East San Gabriel Valley 2	-	-	-
10	Pomona/Walnut Valley	-	-	-
11	South San Gabriel Valley	59	265	86.1
12	South Central Los Angeles County	58	94	49.2
13	Santa Clarita Valley	-	-	-
ORANGE COUNTY				
16	North Orange County	-	-	-
17	Central Orange County	-	-	-
18	North Coastal Orange County	-	-	-
19	Saddleback Valley	-	-	-
RIVERSIDE COUNTY				
22	Norco/Corona	-	-	-
23	Metropolitan Riverside County 1	60	131	64.3
23	Metropolitan Riverside County 2	59	88	45.0
23	Mira Loma	-	-	-
24	Perris Valley	-	-	-
25	Lake Elsinore	-	-	-
29	Banning Airport	-	-	-
30	Coachella Valley 1**	-	-	-
30	Coachella Valley 2**	-	-	-
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	59	86	46.7
33	Southwest San Bernardino Valley	-	-	-
34	Central San Bernardino Valley 1	61	142	73.3
34	Central San Bernardino Valley 2	60	106	57.7
35	East San Bernardino Valley	-	-	-
37	Central San Bernardino Mountains	-	-	-
38	East San Bernardino Mountains	-	-	-
DISTRICT MAXIMUM			265	86.1
SOUTH COAST AIR BASIN			265	86.1

KEY:

$\mu g/m^3$ = micrograms per cubic meter of air AAM = Annual Arithmetic Mean -- = Pollutant not monitored ** Salton Sea Air Basin

[f] TSP Particulate samples were taken every six days at all sites monitored..

TABLE 3.2-9 (Concluded)

2010 Air Quality Data – South Coast Air Quality Management District

Source Receptor Area No.	Location of Air Monitoring Station	LEAD[g] Max. Monthly Average Conc. m) µg/m³	LEAD[g] Max. Quarterly Average Conc. m) µg/m³	SULFATES (SOx)[g] Max. Conc. µg/m³, 24-hour	SULFATES (SOx)[g] No. (%) Samples Exceeding State Standard ≥ 25 µg/m³, 24-hour
LOS ANGELES COUNTY					
1	Central Los Angeles	0.02	0.01	9.1	0
2	Northwest Coastal Los Angeles County	--	--	7.5	0
3	Southwest Coastal Los Angeles County	0.01	0.01	9.7	0
4	South Coastal Los Angeles County 1	0.01	0.01	11.8	0
4	South Coastal Los Angeles County 2	0.01	0.01	12.2	0
6	West San Fernando Valley	--	--	-	-
7	East San Fernando Valley	--	--	-	-
8	West San Gabriel Valley	--	--	7.7	0
9	East San Gabriel Valley 1	--	--	6.4	0
9	East San Gabriel Valley 2	--	--	-	-
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	0.02	0.01	8.5	0
12	South Central Los Angeles County	0.01	0.01	7.8	0
13	Santa Clarita Valley	--	--	--	--
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	--	--
18	North Coastal Orange County	--	--	--	--
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metropolitan Riverside County 1	0.01	0.01	6.7	0
23	Metropolitan Riverside County 2	0.01	0.01	5.0	0
23	Mira Loma	--	--	--	--
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
29	Banning Airport	--	--	--	--
30	Coachella Valley 1**	--	--	--	--
30	Coachella Valley 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	0.01	0.01	10.1	0
33	Southwest San Bernardino Valley	--	--	--	--
34	Central San Bernardino Valley 1	--	--	6.3	0
34	Central San Bernardino Valley 2	0.01	0.01	11.4	0
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM		0.02	0.01	12.2	0
SOUTH COAST AIR BASIN		0.02	0.01	12.2	0

KEY:

µg/m³ = micrograms per cubic meter of air -- = Pollutant not monitored ** Salton Sea Air Basin

[g] Lead and sulfate samples were collected every six days at all sites monitored.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply to the heart.

Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses (unborn babies), and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes.

Reductions in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels. These include pre-term births and heart abnormalities.

Carbon monoxide concentrations were measured at 25 locations in the Basin and neighboring SSAB areas in 2010. Carbon monoxide concentrations did not exceed the standards in 2010. The highest one-hour average carbon monoxide concentration recorded (6.0 ppm in the South Central Los Angeles County area) was 17 percent of the federal one-hour carbon monoxide standard of 35 ppm. The highest eight-hour average carbon monoxide concentration recorded (3.6 ppm in the South Central Los Angeles County area) was 40 percent of the federal eight-hour carbon monoxide standard of 9.0 ppm. The state one-hour standard is also 9.0 ppm. The highest eight-hour average carbon monoxide concentration is 18 percent of the state eight-hour carbon monoxide standard of 20 ppm.

The 2003 AQMP revisions to the SCAQMD's CO Plan served two purposes: it replaced the 1997 attainment demonstration that lapsed at the end of 2000; and it provided the basis for a CO maintenance plan in the future. In 2004, the SCAQMD formally requested the U.S. EPA to re-designate the Basin from non-attainment to attainment with the CO National Ambient Air Quality Standards. On February 24, 2007, U.S. EPA published in the Federal Register its proposed decision to re-designate the Basin from non-attainment to attainment for CO. The comment period on the re-designation proposal closed on March 16, 2007 with no comments received by the U.S. EPA. On May 11, 2007, U.S. EPA published in the Federal Register its final decision to approve the SCAQMD's request for re-designation from non-attainment to attainment for CO, effective June 11, 2007.

3.2.1.2.2 Ozone

Ozone (O3), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (e.g., from 0.03 ppm to 0.05 ppm).

While ozone is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells and ambient ozone concentrations in the Basin are frequently sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection.

Individuals exercising outdoors, children and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term exposures (lasting for a few hours) to ozone at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in high ozone communities. Elevated ozone levels are also associated with increased school absences.

Ozone exposure under exercising conditions is known to increase the severity of the abovementioned observed responses. Animal studies suggest that exposures to a combination of pollutants which include ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

In 2010, the SCAQMD regularly monitored ozone concentrations at 28 locations in the Basin and SSAB. Maximum ozone concentrations for all areas monitored were below the stage 1 episode level (0.20 ppm) and below the health advisory level (0.15 ppm). Maximum ozone concentrations in the SSAB areas monitored by the SCAQMD were lower than in the Basin and were below the health advisory level.

In 2010, the maximum ozone concentrations in the Basin continued to exceed federal standards by wide margins. Maximum one-hour and eight-hour average ozone concentrations were 0.143 ppm and 0.123 ppm, respectively (the maximum one-hour was recorded in the Central San Bernardino Valley 1 area, the eight-hour maximum was recorded in the Central San Bernardino Mountains area). The federal one-hour ozone standard was revoked and replaced by the eight-hour average ozone standard effective June 15, 2005. U.S. EPA has revised the federal eight-hour ozone standard from 0.84 ppm to 0.075 ppm, effective May 27, 2008. The maximum eight-hour concentration was 164 percent of the new federal standard. The maximum one-hour concentration was 159 percent of the one-hour state ozone standard of 0.09 ppm. The maximum eight-hour concentration was 175 percent of the eight-hour state ozone standard of 0.070 ppm.

The objective of the 2012 AQMP is to attain and maintain ambient air quality standards. Based upon the modeling analysis described in the Program Environmental Impact Report for the 2007 AQMP, implementation of all control measures contained in the 2012 AQMP is anticipated to bring the district into compliance with the federal eight-hour ozone standard by 2023 and the state eight-hour ozone standard beyond 2023.

3.2.1.2.3 Nitrogen Dioxide

NO2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N2) and oxygen (O2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO2. NO2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO2, are referred to collectively as NOx. In the presence of sunlight, NO2 reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO3) which reacts further to form nitrates, components of PM2.5 and PM10.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to NO2 at levels found in homes with gas stoves, which are higher than ambient levels found in southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma and/or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. More recent studies have found associations between NO2 exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms and emergency room asthma visits.

In animals, exposure to levels of NO2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of ozone and NO2.

In 2010, nitrogen dioxide concentrations were monitored at 24 locations. No area of the Basin or SSAB exceeded the federal or state standards for nitrogen dioxide. The Basin has not exceeded the federal standard for nitrogen dioxide (0.0534 ppm) since 1991, when the Los Angeles County portion of the Basin recorded the last exceedance of the standard in any county within the United States.

In 2010, the maximum annual average concentration was 26.2 ppb recorded in the Pomona/Walnut Valley area. Effective March 20, 2008, CARB revised the nitrogen dioxide one-hour standard from 0.25 ppm to 0.18 ppm and established a new annual standard of 0.30 ppm. In addition, U.S. EPA has established a new federal one-hour NO2 standard of 100 ppb (98th percentile concentration), effective April 7, 2010. The highest one-hour average concentration recorded (97.0 ppb in Pomona/Walnut Valley) was 53 percent of the state one-hour standard and the highest annual average concentration recorded (26.2 ppb in Pomona/Walnut Valley) was 87 percent of the state annual average standard. NOx emission reductions continue to be necessary because it is a precursor to both ozone and PM (PM2.5 and PM10) concentrations.

3.2.1.2.4 Sulfur Dioxide

SO2 is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H2SO4), which contributes to acid precipitation, and sulfates, which are components of PM10 and PM2.5. Most of the SO2 emitted into the atmosphere is produced by burning sulfur-containing fuels.

Exposure of a few minutes to low levels of SO2 can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO2. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, is observed after acute higher exposure to SO2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO2.

Animal studies suggest that despite SO2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO2 levels. In these studies, efforts to separate the effects of SO2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

No exceedances of federal or state standards for sulfur dioxide occurred in 2010 at any of the seven district locations monitored. The maximum one-hour sulfur dioxide concentration was 40.0 ppb, as recorded in the South Coastal Los Angeles County 1 area. The maximum 24-hour sulfur dioxide concentration was 6.0 ppb, as recorded in South Coastal Los Angeles County 1 area. The U.S. EPA revised the federal sulfur dioxide standard by establishing a new one-hour standard of 0.075 ppm and revoking the existing annual arithmetic mean (0.03 ppm) and the 24-hour average (0.14 ppm), effective August 2, 2010. The state standards are 0.25 ppm for the one-hour average and 0.04 ppm for the 24-hour average. Though sulfur dioxide concentrations remain well below the standards, sulfur dioxide is a precursor to sulfate, which is a component of fine particulate matter, PM10, and PM2.5. Historical measurements showed concentrations to be well below standards and monitoring has been discontinued.

3.2.1.2.5 Particulate Matter (PM10 and PM2.5)

Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter. In addition to children, the elderly, and people with pre-existing respiratory and/or cardiovascular disease appear to be more susceptible to the effects of PM10 and PM2.5.

The SCAQMD monitored PM10 concentrations at 21 locations in 2010. The federal 24-hour PM10 standard (150 µg/m3) was not exceeded at any of the locations monitored in 2010. The maximum 24-hour PM10 concentration of 107 µg/m3 was recorded in the Coachella Valley No. 2 area and was 71 percent of the federal standard and 214 percent of the much more stringent state 24-hour PM10 standard (50 µg/m3). The state 24-hour PM10 standard was exceeded at 12 of the 21 monitoring stations. The maximum annual average PM10 concentration of 42.3 µg/m3 was recorded in Mira Loma. The maximum annual average PM10 concentration in Mira Loma was 211 percent of the state standard. The federal annual PM10 standard has been revoked.

In 2010, PM2.5 concentrations were monitored at 20 locations throughout the district. U.S. EPA revised the federal 24-hour PM2.5 standard from 65 µg/m3 to 35 µg/m3, effective December 17, 2006. In 2010, the maximum PM2.5 concentrations in the Basin exceeded the new federal 24-hour PM2.5 standard in all but six locations. The maximum 24-hour PM2.5 concentration of 54.2 µg/m3 was recorded in the Mira Loma area, which represents 154 percent of the federal standard of 35 µg/m3. The maximum annual average concentration of 15.2 µg/m3 was recorded in Mira Loma, which represents 101 percent of the federal standard of 15 µg/m3 and 126 percent of the state standard of 12 µg/m3.

Similar to PM10 concentrations, PM2.5 concentrations were higher in the inland valley areas of San Bernardino and Metropolitan Riverside counties. However, PM2.5 concentrations were also high in Central Los Angeles County. The high PM2.5 concentrations in Los Angeles County are mainly due to the secondary formation of smaller particulates resulting from mobile and stationary source activities. In contrast to PM10, PM2.5 concentrations were low in the Coachella Valley area of SSAB. PM10 concentrations are normally higher in the desert areas due to windblown and fugitive dust emissions.

3.2.1.2.6 Lead

Lead in the atmosphere is present as a mixture of a number of lead compounds. Leaded gasoline and lead smelters have been the main sources of lead emitted into the air. Due to the phasing out of leaded gasoline, there was a dramatic reduction in atmospheric lead in the Basin over the past three decades.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Lead poisoning can cause anemia, lethargy, seizures, and death. It appears that there are no direct effects of lead on the respiratory system. Lead can be stored in the bone from early-age environmental exposure, and elevated blood lead levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland), and osteoporosis (breakdown of bone tissue). Fetuses and breast-fed babies can be exposed to higher levels of lead because of previous environmental lead exposure of their mothers.

The old federal and current state standards for lead were not exceeded in any area of the district in 2010. There have been no violations of these standards at the SCAQMD's regular air monitoring stations since 1982, as a result of removal of lead from gasoline. The maximum quarterly average lead concentration (0.01 μg/m3 at monitoring stations in South San Gabriel Valley, South Central Los Angeles County, and Central San Bernardino Valley No. 2) was 0.7 percent of the old federal quarterly average lead standard (1.5 μg/m3). The maximum monthly average lead concentration (0.01 μg/m3 in South San Gabriel Valley and South Central Los Angeles County), measured at special monitoring sites immediately adjacent to stationary sources of lead was 0.7 percent of the state monthly average lead standard. No lead data were obtained at SSAB and Orange County stations in 2010. Because historical lead data showed concentrations in SSAB and Orange County areas to be well below the standard, measurements have been discontinued.

On November 12, 2008, U.S. EPA published new national ambient air quality standards for lead, which became effective January 12, 2010. The existing national lead standard, 1.5 μg/m3, was reduced to 0.15 μg/m3, averaged over a rolling three-month period. The new federal standard was not exceeded at any source/receptor location in 2010. Nevertheless, U.S. EPA designated the Los Angeles County portion of the Basin as non-attainment for the new lead standard, effective December 31, 2010, primarily based on emissions from two battery recycling facilities. In response to the new federal lead standard, the SCAQMD adopted Rule 1420.1 – Emissions Standard for Lead from Large Lead-Acid Battery Recycling Facilities, in November 2010, to ensure that lead emissions do not exceed the new federal standard. Further, in May 2012, the SCAQMD adopted the 2012 Lead SIP to address the revision to the federal lead standard, which outlines the strategy and pollution control activities to demonstrate attainment of the federal lead standard before December 31, 2015.

3.2.1.2.7 Sulfates

Sulfates (SOx) are chemical compounds which contain the sulfate ion and are part of the mixture of solid materials which make up PM10. Most of the sulfates in the atmosphere are produced by oxidation of SO2. Oxidation of sulfur dioxide yields sulfur trioxide (SO3) which reacts with water to form sulfuric acid, which contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM10 and PM2.5.

Most of the health effects associated with fine particles and SO2 at ambient levels are also associated with SOx. Thus, both mortality and morbidity effects have been observed with an increase in ambient SOx concentrations. However, efforts to separate the effects of SOx from the effects of other pollutants have generally not been successful.

Clinical studies of asthmatics exposed to sulfuric acid suggest that adolescent asthmatics are possibly a subgroup susceptible to acid aerosol exposure. Animal studies suggest that acidic particles such as sulfuric acid aerosol and ammonium bisulfate are more toxic than non-acidic particles like ammonium sulfate. Whether the effects are attributable to acidity or to particles remains unresolved.

In 2010, the state 24-hour sulfate standard (25 µg/m3) was not exceeded in any of the monitoring locations in the district. No sulfate data were obtained at SSAB and Orange County stations in 2010. Historical sulfate data showed sulfate concentrations in the SSAB and Orange County areas to be well below the standard; thus, measurements in these areas have been discontinued. There are no federal sulfate standards.

3.2.1.2.8 Vinyl Chloride

Vinyl chloride is a colorless, flammable gas at ambient temperature and pressure. It is also highly toxic and is classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as A1 (confirmed carcinogen in humans) and by the International Agency for Research on Cancer (IARC) as 1 (known to be a human carcinogen)(Air Gas, 2010). At room temperature, vinyl chloride is a gas with a sickly sweet odor that is easily condensed. However, it is stored as a liquid. Due to the hazardous nature of vinyl chloride to human health there are no end products that use vinyl chloride in its monomer form. Vinyl chloride is a chemical intermediate, not a final product. It is an important industrial chemical chiefly used to produce polymer polyvinyl chloride (PVC). The process involves vinyl chloride liquid fed to polymerization reactors where it is converted from a monomer to a polymer PVC. The final product of the polymerization process is PVC in either a flake or pellet form. Billions of pounds of PVC are sold on the global market each year. From its flake or pellet form, PVC is sold to companies that heat and mold the PVC into end products such as PVC pipe and bottles.

In the past, vinyl chloride emissions have been associated primarily with sources such as landfills. Risks from exposure to vinyl chloride are considered to be a localized impacts rather than regional impacts. Because landfills in the district are subject to SCAQMD 1150.1, which contains stringent requirements for landfill gas collection and control, potential vinyl chloride emissions are below the level of detection. Therefore, the SCAQMD does not monitor for vinyl chloride at its monitoring stations.

3.2.1.2.9 Volatile Organic Compounds

It should be noted that there are no state or national ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because limiting VOC emissions reduces the rate of photochemical reactions that contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM10 and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOCs because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

3.2.1.2.10 Visibility

In 2005, annual average visibility at Rudiboux (Riverside), the worst case, was just over 10 miles (SCAQMD, 2007). With the exception of Lake County, which is designated in attainment, all of the air districts in California are currently designated as unclassified with respect to the CAAQS for visibility reducing particles.

In Class-I wilderness areas, which typically have visual range measured in tens of miles the deciview metric is used to estimate an individual's perception of visibility. The deciview index works inversely to visual range which is measured in miles or kilometers whereby a lower deciview is optimal. In the South Coast Air Basin, the Class-I areas are typically restricted to higher elevations (greater than 6,000 feet above sea level) or far downwind of the metropolitan emission source areas. Visibility in these areas is typically unrestricted due to regional haze despite being in close proximity to the urban setting. The 2005 baseline deciview mapping of the Basin is presented in Figure 3.2-5. All of the Class-I wilderness areas reside in areas having average deciview values less than 20 with many portions of those areas having average deciview values less than 10. By contrast, Rubidoux, in the Basin has a deciview value exceeding 30.

3.2.1.2.10.1 Federal Regional Haze Rule

The federal Regional Haze Rule, established by the U.S. EPA pursuant to CAA section 169A, establishes the national goal to prevent future and remedy existing impairment of visibility in federal Class I areas (such as federal wilderness areas and national parks). U.S. EPA's visibility regulations (40 CFR 51.300 through 51.309), require states to develop measures necessary to make reasonable progress towards remedying visibility impairment in these federal Class I areas. Section 169A and these regulations also require Best Available Retrofit Technology for certain large stationary sources that were put in place between 1962 and 1977. See Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations, 70 Fed. Reg. 39104 (July 6, 2005).

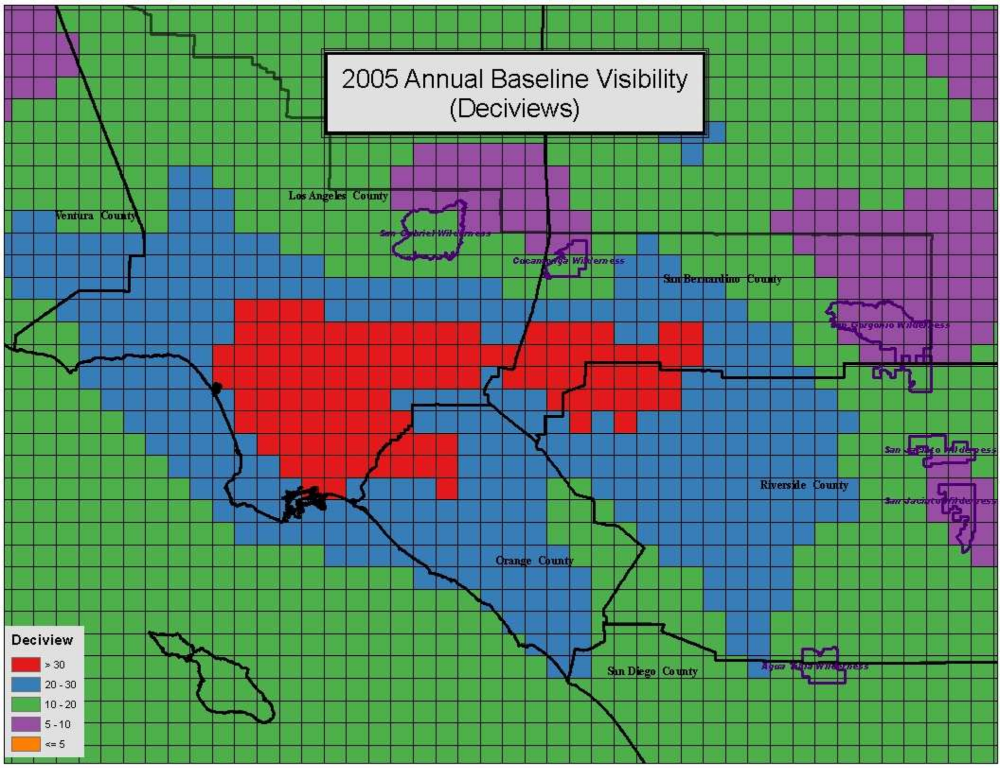

FIGURE 3.2-5

2005 Annual Baseline Visibility

3.2.1.2.10.2 California Air Resources Board

Since deterioration of visibility is one of the most obvious manifestations of air pollution and plays a major role in the public's perception of air quality, the state of California has adopted a standard for visibility or visual range. Until 1989, the standard was based on visibility estimates made by human observers. The standard was changed to require measurement of visual range using instruments that measure light scattering and absorption by suspended particles.

The visibility standard is based on the distance that atmospheric conditions allow a person to see at a given time and location. Visibility reduction from air pollution is often due to the presence of sulfur and nitrogen oxides, as well as particulate matter. Visibility degradation occurs when visibility reducing particles are produced in sufficient amounts such that the extinction coefficient is greater than 0.23 inverse kilometers (to reduce the visual range to less than 10 miles) at relative humidity less than 70 percent, 8-hour average (from 10:00 a.m. to 6:00 p.m.) according to the state standard. Future-year visibility in the Basin is projected empirically using the results derived from a regression analysis of visibility with air quality measurements. The regression data set consisted of aerosol composition data collected during a special monitoring program conducted concurrently with visibility data collection (prevailing visibility observations from airports and visibility measurements from district monitoring stations). A full description of the visibility analysis is given in Appendix V of the 2012 AQMP.

With future year reductions of PM2.5 from implementation of all proposed emission controls for 2015, the annual average visibility would improve from 10 miles (calculated for 2008) to over 20 miles at Rubidoux, for example. Visual range in 2021 at all other Basin sites is expected to equal or exceed the Rubidoux visual range. Visual range is expected to double from the 2008 baseline due to reductions of secondary PM2.5, directly emitted PM2.5 (including diesel soot) and lower nitrogen dioxide concentrations as a result of 2007 AQMP controls.

To meet Federal Regional Haze Rule requirements, ~~the~~ CARB ~~California Air Resources Board~~ adopted the California Regional Haze Plan on January 22, 2009, addressing California's visibility goals through 2018. As stated in Table 3.3-12 above, ~~the~~ California's statewide standard (applicable outside of the Lake Tahoe area) for Visibility Reducing Particles is an extinction coefficient of 0.23 per kilometer over an 8-hour averaging period. This translates to visibility of ten miles or more due to particles when relative humidity is less than 70 percent.

3.2.2 Non-Criteria Pollutants

Although the SCAQMD's primary mandate is attaining the State and National Ambient Air Quality Standards for criteria pollutants within the district, SCAQMD also has a general responsibility pursuant to HSC §41700 to control emissions of air contaminants and prevent endangerment to public health. Additionally, state law requires the SCAQMD to implement airborne toxic control measures (ATCM) adopted by CARB, and to implement the Air Toxics "Hot Spots" Act. As a result, the SCAQMD has regulated pollutants other than criteria pollutants such as TACs, greenhouse gases and stratospheric ozone depleting compounds. The SCAQMD has developed a number of rules to control non-criteria pollutants from both new and existing sources. These rules originated through state directives, CAA requirements, or the SCAQMD rulemaking process.

In addition to promulgating non-criteria pollutant rules, the SCAQMD has been evaluating AQMP control measures as well as existing rules to determine whether or not they would affect, either positively or negatively, emissions of non-criteria pollutants. For example, rules in which VOC components of coating materials are replaced by a non-photochemically reactive chlorinated substance would reduce the impacts resulting from ozone formation, but could increase emissions of toxic compounds or other substances that may have adverse impacts on human health.

The following subsections summarize the existing setting for the two major categories of non-criteria pollutants: compounds that contribute to TACs global climate change, and stratospheric ozone depletion.

3.2.2.1 Air Quality – Toxic Air Contaminants

3.2.2.1.1 Federal

Under Section 112 of the CAA, U.S. EPA is required to regulate sources that emit one or more of the 187 federally listed hazardous air pollutants (HAPs). HAPs are air toxic pollutants identified in the CAA, which are known or suspected of causing cancer or other serious health effects. The federal HAPs are listed on the U.S. EPA website at http://www.epa.gov/ttn/atw/orig189.html. In order to implement the CAA, approximately 100 National Emission Standards for Hazardous Air Pollutants (NESHAPs) have been promulgated by U.S. EPA for major sources (sources emitting greater than 10 tons per year of a single HAP or greater than 25 tons per year of multiple HAPs). The SCAQMD can either directly implement NESHAPs or adopt rules that contain requirements at least as stringent as the NESHAP requirements. However, since NESHAPs often apply to sources in the district that are controlled, many of the sources that would have been subject to federal requirements already comply or are exempt.

In addition to the major source NESHAPs, U.S. EPA has also controlled HAPs from urban areas by developing Area Source NESHAPs under their Urban Air Toxics Strategy. U.S. EPA defines an area source as a source that emits less than 10 tons annually of any single hazardous air pollutant or less than 25 tons annually of a combination of hazardous air pollutants. The CAA requires the U.S. EPA to identify a list of at least 30 air toxics that pose the greatest potential health threat in urban areas. U.S. EPA is further required to identify and establish a list of area source categories that represent 90 percent of the emissions of the 30 urban air toxics associated with area sources, for which Area Source NESHAPs are to be developed under the CAA. U.S. EPA has identified a total of 70 area source categories with regulations promulgated for more than 30 categories so far. ~~Appendix A lists key NESHAPs recently adopted or amended by U.S. EPA.~~

The federal toxics program recognizes diesel engine exhaust as a health hazard, however, diesel particulate matter itself is not one of their listed toxic air contaminants. Rather, each toxic compound in the speciated list of compounds in exhaust is considered separately. Although there are no specific NESHAP regulations for diesel PM, diesel particulate emission reductions are realized through federal regulations including diesel fuel standards and emission standards for stationary, marine, and locomotive engines; and idling controls for locomotives.

3.2.2.1.2 State

The California air toxics program was based on the CAA and the original federal list of hazardous air pollutants. The state program was established in 1983 under the Toxic Air Contaminant Identification and Control Act, Assembly Bill (AB) 1807, Tanner. Under the state program, toxic air contaminants are identified through a two-step process of risk identification and risk management. This two-step process was designed to protect residents from the health effects of toxic substances in the air.

3.2.2.1.2.1 Control of TACs under the TAC Identification and Control Program

California's TAC identification and control program, adopted in 1983 as AB 1807, is a two-step program in which substances are identified as TACs, and ATCMs are adopted to control emissions from specific sources. CARB has adopted a regulation designating all 188 federal hazardous air pollutants (HAPs) as TACs.

ATCMs are developed by CARB and implemented by the SCAQMD and other air districts through the adoption of regulations of equal or greater stringency. Generally, the ATCMs reduce emissions to achieve exposure levels below a determined health threshold. If no such threshold levels are determined, emissions are reduced to the lowest level achievable through the best available control technology unless it is determined that an alternative level of emission reduction is adequate to protect public health.

Under California law, a federal NESHAP automatically becomes a state ATCM, unless CARB has already adopted an ATCM for the source category. Once a NESHAP becomes an ATCM, CARB and each air pollution control or air quality management district have certain responsibilities related to adoption or implementation and enforcement of the NESHAP/ATCM.

3.2.2.1.2.2 Control of TACs under the Air Toxics "Hot Spots" Act

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) establishes a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with the emissions. Facilities are phased into the AB 2588 program based on their emissions of criteria pollutants or their occurrence on lists of toxic emitters compiled by the SCAQMD. Phase I consists of facilities that emit over 25 tons per year of any criteria pollutant and facilities present on the SCAQMD's toxics list. Phase I facilities entered the program by reporting their air TAC emissions for calendar year 1989. Phase II consists of facilities that emit between 10 and 25 tons per year of any criteria pollutant, and submitted air toxic inventory reports for calendar year 1990 emissions. Phase III consists of certain designated types of facilities which emit less than 10 tons per year of any criteria pollutant, and submitted inventory reports for calendar year 1991 emissions. Inventory reports are required to be updated every four years under the state law.

3.2.2.1.2.3 Air Toxics Control Measures

As part of its risk management efforts, CARB has passed state ATCMs to address air toxics from mobile and stationary sources. Some key ATCMs for stationary sources include reductions of benzene emissions from service stations, hexavalent chromium emissions from chrome plating, perchloroethylene emissions from dry cleaning, ethylene oxide emissions from sterilizers, and multiple air toxics from the automotive painting and repair industries.

Many of CARB's recent ATCMs are part of the CARB Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (DRRP) which was adopted in September 2000 (http://www.arb.ca.gov/diesel/documents/rrpapp.htm) with the goal of reducing diesel particulate matter emissions from compression ignition engines and associated health risk by 75 percent by 2010 and 85 percent by 2020. The DRRP includes strategies to reduce emissions from new and existing engines through the use of ultra-low sulfur diesel fuel, add-on controls, and engine replacement. In addition to stationary source engines, the plan addresses diesel PM emissions from mobile sources such as trucks, buses, construction equipment, locomotives, and ships. ~~Appendix A lists key ATCMs recently adopted or amended by CARB.~~

3.2.2.1.3 SCAQMD

SCAQMD has regulated criteria air pollutants using either a technology-based or an emissions limit approach. The technology-based approach defines specific control technologies that may be installed to reduce pollutant emissions. The emission limit approach establishes an emission limit, and allows industry to use any emission control equipment, as long as the emission requirements are met. The regulation of TACs often uses a health risk-based approach, but may also require a regulatory approach similar to criteria pollutants, as explained in the following subsections.

3.2.2.1.3.1 Rules and Regulations

Under the SCAQMD's toxic regulatory program there are 15 source-specific rules that target toxic emission reductions that regulate over 10,000 sources such as metal finishing, spraying operations, dry cleaners, film cleaning, gasoline dispensing, and diesel-fueled stationary engines to name a few. In addition, other source-specific rules targeting criteria pollutant reductions also reduce toxic emissions, such as Rule 461 which reduces benzene emissions from gasoline dispensing and Rule 1124 which reduces perchloroethylene, trichloroethylene, and methylene chloride emissions from aerospace operations.

New and modified sources of toxic air contaminants in the district are subject to Rule 1401 - New Source Review of Toxic Air Contaminants and Rule 212 - Standards for Approving Permits. Rule 212 requires notification of the SCAQMD's intent to grant a permit to construct a significant project, defined as a new or modified permit unit located within 1000 feet of a school (a state law requirement under AB 3205), a new or modified permit unit posing an maximum individual cancer risk of one in one million (1×10^{-6}) or greater, or a new or modified facility with criteria pollutant emissions exceeding specified daily maximums. Distribution of notice is required to all addresses within a 1/4-mile radius, or other area deemed appropriate by the SCAQMD. Rule 1401 currently controls emissions of carcinogenic and non-carcinogenic (health effects other than cancer) air contaminants from new, modified and relocated sources by specifying limits on cancer risk and hazard index (explained further in the following discussion), respectively. The rule lists nearly 300 TACs that are evaluated during the SCAQMD's permitting process for new, modified or relocated sources. During the past decade, more than 80 compounds have been added or had risk values amended. The addition of diesel particulate matter from diesel-fueled internal combustion engines as a TAC in March 2008 was the most significant of recent amendments to the rule. Rule 1401.1 sets risk thresholds for new and relocated facilities near schools. The requirements are more stringent than those for other air toxics rules in order to provide additional protection to school children.

3.2.2.1.3.2 Air Toxics Control Plan

In March 2000, the SCAQMD Governing Board approved the Air Toxics Control Plan (ATCP) which was the first comprehensive plan in the nation to guide future toxic rulemaking and programs. The ATCP was developed to lay out the SCAQMD's air toxics control program which built upon existing federal, state, and local toxic control programs as well as co-benefits from implementation of State Implementation Plan (SIP) measures. The concept for the plan was an outgrowth of the Environmental Justice principles and the Environmental Justice Initiatives adopted by the SCAQMD Governing Board in October 1997. Monitoring studies and air toxics regulations that were created from these initiatives emphasized the need for a more systematic approach to reducing toxic air contaminants. The intent of the plan was to reduce exposure to air toxics in an equitable and cost-effective manner that promotes clean, healthful air in the district. The plan proposed control strategies to reduce toxic air contaminants in the district implemented between years 2000 and 2010 through cooperative efforts of the SCAQMD, local governments, CARB and U.S. EPA.

3.2.2.1.3.3 2003 Cumulative Impact Reduction Strategies

The SCAQMD Governing Board approved a cumulative impacts reduction strategy in September 2003. The resulting 25 cumulative impacts strategies were a key element of the 2004 Addendum to the ATCP. The strategies included rules, policies, funding, education, and cooperation with other agencies. Some of the key SCAQMD accomplishments related to the cumulative impacts reduction strategies were:

- Rule 1401.1 which set more stringent health risk requirements for new and relocated facilities near schools
- Rule 1470 which established diesel PM emission limits and other requirements for diesel-fueled engines
- Rule 1469.1 which regulated chrome spraying operations
- Rule 410 which addresses odors from transfer stations and material recovery facilities
- Intergovernmental Review comment letters for CEQA documents
- SCAQMD's land use guidance document
- Additional protection in toxics rules for sensitive receptors, such as more stringent requirements for chrome plating operations and diesel engines located near schools

3.2.2.1.3.4 Addendum to the ATCP

The Addendum to the ATCP (Addendum) was adopted by the SCAQMD Governing Board in 2004 and served as a status report regarding implementation of the various mobile and stationary source strategies in the 2000 ATCP and introduced new measures to further address air toxics. The main elements of the Addendum were to address the progress made in implementation of the 2000 ATCP control strategies provide a historical perspective of air toxic emissions and current air toxic levels; incorporate the Cumulative Impact Reduction Strategies approved by the SCAQMD Governing Board in 2003 and additional measures identified in the 2003 AQMP; project future air toxic levels to the extent feasible; and summarize future efforts to develop the next ATCP. Significant progress had been made in implementing most of the SCAQMD strategies from the 2000 ATCP and the 2004 Addendum. CARB has also made notable progress in mobile source measures via its Diesel Risk Reduction Plan, especially for goods movement related sources, while the U.S. EPA continued to implement their air toxic programs applicable to stationary sources

3.2.2.1.3.5 Clean Communities Plan

On November 5, 2010, the SCAQMD Governing Board approved the 2010 Clean Communities Plan (CCP). The CCP was an update to the 2000 Air Toxics Control Plan (ATCP) and the 2004 Addendum. The objective of the 2010 CCP is to reduce the exposure to air toxics and air-related nuisances throughout the district, with emphasis on cumulative impacts. The elements of the 2010 CCP are community exposure reduction, community participation, communication and outreach, agency coordination, monitoring and compliance, source-specific programs, and nuisance. The centerpiece of the 2010 CCP is a pilot study through which the SCAQMD staff will work with community stakeholders to identify and develop solutions community-specific to air quality issues in two communities: (1) the City of San Bernardino; and, (2) Boyle Heights and surrounding areas.

3.2.2.1.3.6 Control of TACs under the Air Toxics "Hot Spots" Act

In October 1992, the SCAQMD Governing Board adopted public notification procedures for Phase I and II facilities. These procedures specify that AB 2588 facilities must provide public notice when exceeding the following risk levels:

- Maximum Individual Cancer Risk: greater than 10 in one million (10×10^{-6})
- Total Hazard Index: greater than 1.0 for TACs except lead, or > 0.5 for lead

Public notice is to be provided by letters mailed to all addresses and all parents of children attending school in the impacted area. In addition, facilities must hold a public meeting and provide copies of the facility risk assessment in all school libraries and a public library in the impacted area.

The AB2588 Toxics "Hot Spots" Program is implemented through Rule 1402. The SCAQMD continues to review health risk assessments submitted. Notification is required from facilities with a significant risk under the AB 2588 program based on their initial approved health risk assessments and will continue on an ongoing basis as additional and subsequent health risk assessments are reviewed and approved.

There are currently about 600 facilities in the SCAQMD's AB2588 program. Since 1992 when the state Health and Safety Code incorporated a risk reduction requirement in the program, the SCAQMD has reviewed and approved over 300 HRAs, 44 facilities were required to do a public notice, and 21 facilities were subject to risk reduction. Currently, over 96 percent of the facilities in the program have cancer risks below ten in a million and over 98 percent have acute and chronic hazard indices of less than one.

3.2.2.1.3.7 CEQA Intergovernmental Review Program

The SCAQMD staff, through its Intergovernmental Review (IGR) provides comments to lead agencies on air quality analyses and mitigation measures in CEQA documents. The following are some key programs and tools that have been developed more recently to strengthen air quality analyses, specifically as they relate to exposure of mobile source air toxics:

- SCAQMD's Mobile Source Committee approved the "Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions" (August 2002). This document provides guidance for analyzing cancer risks from diesel particulate matter from truck idling and movement (e.g., truck stops, warehouse and distribution centers, or transit centers), ship hotelling at ports, and train idling.

- Cal/EPA and CARB's "Air Quality and Land Use Handbook: A Community Health Perspective" (April 2005), provides recommended siting distances for incompatible land uses.

- Western Riverside Council of Governments Air Quality Task Force developed a policy document titled, "Good Neighbor Guidelines for Siting New and/or Modified Warehouse/Distribution Facilities" (September 2005). This document provides guidance to local government on preventive measures to reduce neighborhood exposure to toxic air contaminants from warehousing facilities.

3.2.2.1.3.8 Environmental Justice (EJ)

Environmental justice has long been a focus of the SCAQMD. In 1990, the SCAQMD formed an Ethnic Community Advisory Group that was recently restructured as the Environmental Justice Advisory Group (EJAG). EJAG's mission is to advise and assist SCAQMD in protecting and improving public health in SCAQMD's most impacted communities through the reduction and prevention of air pollution.

In 1997, the SCAQMD Governing Board adopted four guiding principles and ten initiatives (http://www.aqmd.gov/ej/history.htm) to ensure environmental equity. Also i~~I~~n 1997, the SCAQMD Governing Board expanded the initiatives to include the "Children's Air Quality Agenda" focusing on the disproportionate impacts of poor air quality on children. Some key initiatives that have been implemented were the Multiple Air Toxics Exposure Studies (MATES, MATES II and MATES III); the Clean Fleet Rules, the Cumulative Impacts strategies; funding for lower emitting technologies under the Carl Moyer Program; the Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning; a guidance document on Air Quality Issues in School Site Selection; and the 2000 Air Toxics Control Plan and its 2004 Addendum. Key initiatives focusing on communities and residents include the Clean Air Congress; the Clean School Bus Program; Asthma and Air Quality Consortium; Brain and Lung Tumor and Air Pollution Foundation; air quality presentations to schools and community and civic groups; and Town Hall meetings. Technological and scientific projects and programs have been a large part of the SCAQMD's EJ program since its inception. Over time, the EJ program's focus on public education, outreach, and opportunities for public participation have greatly increased. Public education materials and other resources for the public are available on the SCAQMD's website (www.AQMD.gov)

3.2.2.1.3.9 AB 2766 Subvention Funds

AB2766 subvention funds, money collected by the state as part of vehicle registration and passed through to the SCAQMD, is used to fund projects of local cities that reduce motor vehicle air pollutants. The Clean Fuels Program, funded by a surcharge on motor vehicle registrations in the SCAQMD, reduces TAC emissions through co-funding projects to develop and demonstrate low-emission clean fuels and advanced technologies, and to promote commercialization and deployment of promising or proven technologies in Southern California.

3.2.2.1.3.10 Carl Moyer Program

Another program that targets diesel emission reductions is the Carl Moyer program which provides grants for projects that achieve early or extra emission reductions beyond what is required by regulations. Examples of eligible projects include cleaner on-road, off-road, marine, locomotive, and stationary agricultural pump engines. Other endeavors of the SCAQMD's Technology Advancement Office help to reduce diesel PM emissions through co-funding research and demonstration projects of clean technologies, such as low-emitting locomotives.

3.2.2.1.3.11 Control of TACs with Risk Reduction Audits and Plans

Senate Bill (SB) 1731, enacted in 1992 and codified at HSC §44390 et seq., amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan which will reduce the risk below a defined significant risk level within specified time limits. SCAQMD Rule 1402 - Control of Toxic Air Contaminants From Existing Sources, was adopted on April 8, 1994, to implement the requirements of SB 1731.

In addition to the TAC rules adopted by SCAQMD under authority of AB 1807 and SB 1731, the SCAQMD has adopted source-specific TAC rules, based on the specific level of TAC emitted and the needs of the area. These rules are similar to the state's ATCMs because they are source-specific and only address emissions and risk from specific compounds and operations.

3.2.2.1.3.12 Multiple Air Toxics Exposure Studies

Multiple Air Toxics Exposure Study (MATES)

In 1986, SCAQMD conducted the first MATES Study to determine the Basin-wide risks associated with major airborne carcinogens. At the time, the state of technology was such that only twenty known air toxic compounds could be analyzed and diesel exhaust particulate did not have an agency accepted carcinogenic health risk value. Toxic air contaminants are determined by the U.S. EPA, and by the Cal/EPA, including the Office of Environmental Health Hazard Assessment and the ARB. For purposes of MATES, the California carcinogenic health risk factors were used. The maximum combined individual health risk for simultaneous exposure to pollutants under the study was estimated to be 600 to 5,000 in one million.

Multiple Air Toxics Exposure Study II (MATES II)

At its October 10, 1997 meeting, the SCAQMD Governing Board directed staff to conduct a follow up to the MATES study to quantify the magnitude of population exposure risk from existing sources of selected air toxic contaminants at that time. The follow up study, MATES II, included a monitoring program of 40 known air toxic compounds, an updated emissions inventory of toxic air contaminants (including microinventories around each of the 14 microscale sites), and a modeling effort to characterize health risks from hazardous air pollutants. The estimated basin-wide carcinogenic health risk from ambient measurements was 1,400 per million people. About 70 percent of the basin wide health risk was attributed to diesel particulate emissions; about 20 percent to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde); about 10 percent of basin wide health risk was attributed to stationary sources (which include industrial sources and other certain specifically identified commercial businesses such as dry cleaners and print shops.)

Multiple Air Toxics Exposure Study III (MATES III)

MATES III was a follow up to previous air toxics studies in the Basin and was part of the SCAQMD Governing Board's 2003-04 Environmental Justice Workplan. The MATES III Study consists of several elements including a monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to characterize carcinogenic health risk across the Basin. Besides toxics, additional measurements include organic carbon, elemental carbon, and total carbon, as well as, Particulate Matter (PM), including PM2.5. It did not estimate mortality or other health effects from particulate exposures. MATES III revealed a general downward trend in air toxic pollutant concentrations with an estimated basin-wide lifetime carcinogenic health risk of 1,200 in one million. Mobile sources accounted for 94 percent of the basin-wide lifetime carcinogenic health risk with diesel exhaust particulate contributing to 84 percent of the mobile source basin-wide lifetime carcinogenic health risk. Non-diesel carcinogenic health risk was reduced declined by 50 percent from the MATES II values.

3.2.2.2.4 Health Effects

3.2.2.2.4.1 Carcinogenic Health Risks from Toxic Air Contaminants

One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of causing cancer. It is currently estimated that about one in four deaths in the United States is attributable to cancer. About two percent of cancer deaths in the United States may be attributable to environmental pollution (Doll and Peto 1981). The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods.

3.2.2.2.4.2 Non-Cancer Health Risks from Toxic Air Contaminants

Unlike carcinogens, for most TAC non-carcinogens it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) develops Reference Exposure Levels (RELs) for TACs which are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The non-cancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

3.2.2.2 Climate Change

Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Data indicate that the current temperature record differs from previous climate changes in rate and magnitude.

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs), comparable to a greenhouse, which captures and traps radiant energy. GHGs are emitted by natural processes and human activities. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), and perfluorocarbon (PFCs). The GHGs absorb longwave radiant energy emitted by the Earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the Earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect." Emissions from human activities such as fossil fuel combustion for electricity production and vehicles have elevated the concentration of these gases in the atmosphere.

CO2 is an odorless, colorless greenhouse gas. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of CO2 are from burning coal, oil, natural gas, and wood.

CH4 is a flammable gas and is the main component of natural gas. N2O, also known as laughing gas, is a colorless greenhouse gas. Some industrial processes such as fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions also contribute to the atmospheric load of N2O. HFCs are synthetic man-made chemicals that are used as a substitute for chlorofluorocarbons (whose production was stopped as required by the Montreal Protocol) for automobile air conditioners and refrigerants. The two main sources of PFCs are primary aluminum production and semiconductor manufacture. SF6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Scientific consensus, as reflected in recent reports issued by the United Nations Intergovernmental Panel on Climate Change, is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHGs in the atmosphere due to human activities. Industrial activities, particularly increased consumption of fossil fuels (e.g., gasoline, diesel, wood, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of greenhouse gases at 400 to 450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below two degrees Celsius, which is assumed to be necessary to avoid dangerous impacts from climate change.

The potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, air quality impacts, and sea level rise. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease carrying insects. Those diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding, hurricanes, and wildfires can displace people and agriculture, which would have negative consequences. Drought in some areas may increase, which would decrease water and food availability. Global warming may also contribute to air quality problems from increased frequency of smog and particulate air pollution.

The impacts of climate change will also affect projects in various ways. Effects of climate change are rising sea levels and changes in snow pack. The extent of climate change impacts at specific locations remains unclear. It is expected that Federal, State and local agencies will more precisely quantify impacts in various regions. As an example, it is expected that the California Department of Water Resources will formalize a list of foreseeable water quality issues associated with various degrees of climate change. Once state government agencies make these lists available, they could be used to more precisely determine to what extent a project creates global climate change impacts.

3.2.2.2.1 Federal

3.2.2.2.1.1 Greenhouse Gas Endangerment Findings

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the CAA (). The Endangerment Finding stated that CO2, CH4, N2O, HFCs, PFCs, and SF6 taken in combination endanger both the public health and the public welfare of current and future generations. The Cause or Contribute Finding stated that the combined emissions from motor vehicles and motor vehicle engines contribute to the greenhouse gas air pollution that endangers public health and welfare. These findings were a prerequisite for implementing GHG standards for vehicles. The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) finalized emission standards for light-duty vehicles in May 2010 and for heavy-duty vehicles in August of 2011.

3.2.2.2.1.2 Renewable Fuel Standard

The RFS program was established under the Energy Policy Act (EPAct) of 2005, and required 7.5 billion gallons of renewable-fuel to be blended into gasoline by 2012. Under the Energy Independence and Security Act (EISA) of 2007, the RFS program was expanded to include diesel, required the volume of renewable fuel blended into transportation fuel be increased from nine billion gallons in 2008 to 36 billion gallons by 2022, established new categories of renewable fuel and required U.S. EPA to apply lifecycle GHG performance threshold standards so that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces. The RFS is expected to reduce greenhouse gas emissions by 138 million metric tons, about the annual emissions of 27 million passenger vehicles, replacing about seven percent of expected annual diesel consumption and decreasing oil imports by $41.5 billion.

3.2.2.2.1.3 GHG Tailoring Rule

On May 13, 2010, U.S. EPA finalized the Tailoring Rule to phase in the applicability of the PSD and Title V operating permit programs for GHGs. The rule was tailored to include the largest GHG emitters, while excluding smaller sources (restaurants, commercial facilities and small farms). The first step (January 2, 2011 to June 30, 2011) addressed the largest sources that contributed 65 percent of the stationary GHG sources. Title V GHG requirements were triggered only when affected facility owners/operators were applying, renewing or revising their permits for non-GHG pollutants. PSD GHG requirements were applicable only if sources were undergoing permitting actions for other non-GHG pollutants and the permitted action would increase GHG emission by 75,000 metric tons of CO2e per year or more.

The second step (July 1, 2011 to June 30, 2013), included sources that emit or have the potential to emit 100,000 of CO2e metric tons per year or more. Newly constructed sources that are not major sources for non-GHG pollutants would not be subject to PSD GHG requirements unless it emits 100,000 tons of CO2e per year or more. Modifications to a major source would not be subject to PSD GHG requirements unless it generates a net increase of 75,000 tons of CO2e per year or more. Sources not subject to Title V would not be subject to Title V GHG requirements unless 100,000 tons of CO2e per year or more would be emitted.

The third step of the Tailoring Rule was finalized on July 12, 2012. The third step determined not to not to lower the current PSD and Title V applicability thresholds for GHG-emitting sources established in the Tailoring Rule for Steps 1 and 2. The rule also promulgates regulatory revisions for better implementation of the federal program for establishing plantwide applicability limitations (PALs) for GHG emissions, which will improve the administration of the GHG PSD permitting programs.

3.2.2.2.1.4 GHG Reporting Program

U.S. EPA issued the Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98) under the 2008 Consolidated Appropriations Act. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG data from large sources and suppliers under the Greenhouse Gas Reporting Program (GHGRP). Suppliers of certain products that would result in GHG emissions if released, combusted or oxidized; direct emitting source categories; and facilities that inject CO_2 underground for geologic sequestration or any purpose other than geologic sequestration are included. Facilities that emit 25,000 metric tons or more per year of GHGs in CO2 equivalents (CO2e) are required to submit annual reports to U.S. EPA. For the 2010 calendar, there were 6,260 entities that reported GHG data under this program, and 467 of the entities reporting were from California. Of the 3,200 million metric tons of CO2e that were reported nationally, 112 million metric tons were from California Power plants were the largest stationary source of direct U.S. GHG emissions with 2,326 million metric tons of CO2e, followed by refineries with 183 million metric tons of CO2e. CO2 emissions accounted for largest share of direct emissions with 95 percent, followed by methane with four percent, and nitrous oxide and fluorinated gases representing the remaining one percent.

3.2.2.2.2 State

3.2.2.2.2.1 Executive Order S-3-05

In June 2005, then Governor Schwarzenegger signed Executive Order S-3-05, which established emission reduction targets. The goals would reduce GHG emissions to 2000 levels by 2010, then to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

3.2.2.2.2.2 AB 32: Global Warming Solutions Act

On September 27, 2006, Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, was enacted by the State of California and signed by Governor Schwarzenegger. AB 32 expanded on Executive Order #S-3-05. The legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 represents the first enforceable state-wide program in the United States to cap all GHG emissions from major industries that includes penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce greenhouse gas emissions in California and from power generation facilities located outside the state that serve California residents and businesses.

AB 32 requires CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of GHG by January 1, 2008;
- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions; and
- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHG by January 1, 2011.

The combination of Executive Order #S-3-05 and AB 32 will require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

Consistent with the requirement to develop an emission reduction plan, CARB prepared a Scoping Plan indicating how GHG emission reductions will be achieved through regulations, market mechanisms, and other actions. The Scoping Plan was released for public review and comment in October 2008 and approved by CARB on December 11, 2008. The Scoping Plan calls for reducing greenhouse gas emissions to 1990 levels by 2020. This means cutting approximately 30 percent from business-as-usual (BAU) emission levels projected for 2020, or about 15 percent from today's levels. Key elements of CARB staff's recommendations for reducing California's greenhouse gas emissions to 1990 levels by 2020 contained in the Scoping Plan include the following:

- Expansion and strengthening of existing energy efficiency programs and building and appliance standards;
- Expansion of the Renewables Portfolio Standard to 33 percent;
- Development of a California cap-and-trade program that links with other Western Climate Initiative (WCI) Partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gases and pursuing policies and incentives to achieve those targets;
- Adoption and implementation of existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Targeted fees, including a public good charge on water use, fees on high GWP gases and a fee to fund the state's long-term commitment to AB 32 administration.

In response to the comments received on the Draft Scoping Plan and at the November 2008 public hearing, CARB made a few changes to the Draft Scoping Plan, primarily to:

- State that California "will transition to 100 percent auction" of allowances and expects to "auction significantly more [allowances] than the Western Climate Initiative minimum;"
- Make clear that allowance set-asides could be used to provide incentives for voluntary renewable power purchases by businesses and individuals and for increased energy efficiency;
- Make clear that allowance set-asides can be used to ensure that voluntary actions, such as renewable power purchases, can be used to reduce greenhouse gas emissions under the cap;
- Provide allowances are not required from carbon neutral projects; and
- Mandate that commercial recycling be implemented to replace virgin raw materials with recyclables.

3.2.2.2.2.3 SB 97 - CEQA: Greenhouse Gas Emissions

On August 24, 2007, Governor Schwarzenegger signed into law Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions stating, "This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research (OPR) and the Resources Agency to develop CEQA guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions." OPR's amendments provided guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments did not establish a threshold for significance for GHG emissions. The amendments became effective on March 18, 2010. SB 97 was repealed on January 1, 2010.

3.2.2.2.2.4 Office of Planning and Research - Technical Advisory on CEQA and Climate Change

Consistent with SB 97, on June 19, 2008, OPR released its "Technical Advisory on CEQA and Climate Change," which was developed in cooperation with the Resources Agency, the Cal/EPA, and the CARB. According to OPR, the "Technical Advisory" offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.

According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively considerable" even though its GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

In 2009, total California greenhouse gas emissions were 457 million metric tons of carbon dioxide equivalent (MMTCO2e); net emissions were 453 MMTCO2e, reflecting the influence of sinks (net CO2 flux from forestry). While total emissions have increased by 5.5 percent from 1990 to 2009, emissions decreased by 5.8 percent from 2008 to 2009 (485 to 457 MMTCO2e). The total net emissions between 2000 and 2009 decreased from 459 to 453 MMTCO2e, representing a 1.3 percent decrease from 2000 and a 6.1 percent increase from the 1990 emissions level. The transportation sector accounted for approximately 38 percent of the total emissions, while the industrial sector accounted for approximately 20 percent. Emissions from electricity generation were about 23 percent with almost equal contributions from in-state and imported electricity.

Per capita emissions in California have slightly declined from 2000 to 2009 (by 9.7 percent), but the overall nine percent increase in population during the same period offsets the emission reductions. From a per capita sector perspective, industrial per capita emissions have declined 21 percent from 2000 to 2009, while per capita emissions for ozone depleting substances (ODS) substitutes saw the highest increase (52 percent).

From a broader geographical perspective, the state of California ranked second in the United States for 2007 greenhouse gas emissions, only behind Texas. However, from a per capita standpoint, California had the 46th lowest GHG emissions. On a global scale, California had the 14th largest carbon dioxide emissions and the 19th largest per capita emissions. The GHG inventory is divided into three categories: stationary sources, on-road mobile sources, and off-road mobile sources.

3.2.2.2.2.5 AB 1493 Vehicular Emissions: Carbon Dioxide

Prior to the U.S. EPA and NHTSA joint rulemaking, the Governor signed Assembly Bill (AB) 1493 (2002). AB 1493 requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

CARB originally approved regulations to reduce GHGs from passenger vehicles in September 2004, with the regulations to take effect in 2009. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1). California's first request to the U.S. EPA to implement GHG standards for passenger vehicles was made in December 2005 and denied in March 2008. The U.S. EPA then granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles on June 30, 2009.

On April 1, 2010, the CARB filed amended regulations for passenger vehicles as part of California's commitment toward the National Program to reduce new passenger vehicle

GHGs from 2012 through 2016. The amendments will prepare California to harmonize its rules with the federal Light-Duty Vehicle GHG Standards and CAFE Standards (discussed above).

3.2.2.2.2.6 Senate Bill 1368 (2006)

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a greenhouse gas emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

3.2.2.2.2.7 Executive Order S-1-07 (2007)

Governor Schwarzenegger signed Executive Order S-1-07 in 2007 which finds that the transportation sector is the main source of GHG emissions in California. The executive order proclaims the transportation sector accounts for over 40 percent of statewide GHG emissions. The executive order also establishes a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020.

In particular, the executive order established a Low-Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by CEC on December 24, 2007) and was submitted to CARB for consideration as an "early action" item under AB 32. CARB adopted the LCFS on April 23, 2009.

3.2.2.2.2.8 Senate Bill 375 (2008)

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. As part of the alignment, SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) which prescribes land use allocation in that MPO's Regional Transportation Plan (RTP). CARB, in consultation with MPOs, is required to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned GHG emission reduction targets. If MPOs do not meet the GHG reduction targets, transportation projects located in the MPO boundaries would not be eligible for funding programmed after January 1, 2012.

CARB appointed the Regional Targets Advisory Committee (RTAC), as required under SB 375, on January 23, 2009. The RTAC's charge was to advise ARB on the factors to be considered and methodologies to be used for establishing regional targets. The RTAC provided its recommendation to CARB on September 29, 2009. CARB must adopt final targets by September 30, 2010.

3.2.2.2.2.9 Executive Order S-13-08 (2008)

Governor Schwarzenegger signed Executive Order S-13-08 on November 14, 2008 which directs California to develop methods for adapting to climate change through preparation of a statewide plan. The executive order directs OPR, in cooperation with the Resources Agency, to provide land use planning guidance related to sea level rise and other climate change impacts by May 30, 2009. The order also directs the Resources Agency to develop a state Climate Adaptation Strategy by June 30, 2009 and to convene an independent panel to complete the first California Sea Level Rise Assessment Report. The assessment report is required to be completed by December 1, 2010 and required to meet the following four criteria:

1. Project the relative sea level rise specific to California by taking into account issues such as coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates;
2. Identify the range of uncertainty in selected sea level rise projections;
3. Synthesize existing information on projected sea level rise impacts to state infrastructure (e.g., roads, public facilities, beaches), natural areas, and coastal and marine ecosystems; and
4. Discuss future research needs relating to sea level rise in California.

3.2.2.2.2.10 Senate Bills 1078 and 107 and Executive Order S-14-08 (2008)

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then Governor Schwarzenegger signed Executive Order S-14-08, which expands the state’s Renewable Portfolio Standard to 33 percent renewable power by 2020.

3.2.2.2.2.11 SB X-1-2

SB X1-2 was signed by Governor Edmund G. Brown, Jr., in April 2011. SB X1-2 created a new Renewables Portfolio Standard (RPS), which preempted the CARB’s 33 percent Renewable Electricity Standard. The new RPS applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. These entities must adopt the new RPS goals of 20 percent of retails sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement by the end of 2020.

3.2.2.2.2 SCAQMD

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the AQMP. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include support of the adoption of a California greenhouse gas emission reduction goal.

3.2.2.2.2.1 Basin GHG Policy and Inventory

The SCAQMD has established a policy, adopted by the SCAQMD Governing Board at its September 5, 2008 meeting, to actively seek opportunities to reduce emissions of criteria, toxic, and climate change pollutants. The policy includes the intent to assist businesses and local governments implementing climate change measures, decrease the agency's carbon footprint, and provide climate change information to the public. The SCAQMD will take the following actions:

1. Work cooperatively with other agencies/entities to develop quantification protocols, rules, and programs related to greenhouse gases;
2. Share experiences and lessons learned relative to the Regional Clean Air Incentives Market (RECLAIM) to help inform state, multi-state, and federal development of effective, enforceable cap-and-trade programs. To the extent practicable, staff will actively engage in current and future regulatory development to ensure that early actions taken by local businesses to reduce greenhouse gases will be treated fairly and equitably. SCAQMD staff will seek to streamline administrative procedures to the extent feasible to facilitate the implementation of AB 32 measures;
3. Review and comment on proposed legislation related to climate change and greenhouse gases, pursuant to the 'Guiding Principles for SCAQMD Staff Comments on Legislation Relating to Climate Change' approved at the SCAQMD Governing Board's Special Meeting in April 2008;
4. Provide higher priority to funding Technology Advancement Office (TAO) projects or contracts that also reduce greenhouse gas emissions;
5. Develop recommendations through a public process for an interim greenhouse gas CEQA significance threshold, until such time that an applicable and appropriate statewide greenhouse gas significance level is established. Provide guidance on analyzing greenhouse gas emissions and identify mitigation measures. Continue to consider GHG impacts and mitigation in SCAQMD lead agency documents and in comments when SCAQMD is a responsible agency;
6. Revise the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning to include information on greenhouse gas strategies as a resource for local governments. The Guidance Document will be consistent with state guidance, including CARB's Scoping Plan;

7. Update the Basin's greenhouse gas inventory in conjunction with each Air Quality Management Plan. Information and data used will be determined in consultation with CARB, to ensure consistency with state programs. Staff will also assist local governments in developing greenhouse gas inventories;

8. Bring recommendations to the SCAQMD Governing Board on how the agency can reduce its own carbon footprint, including drafting a Green Building Policy with recommendations regarding SCAQMD purchases, building maintenance, and other areas of products and services. Assess employee travel as well as other activities that are not part of a GHG inventory and determine what greenhouse gas emissions these activities represent, how they could be reduced, and what it would cost to offset the emissions;

9. Provide educational materials concerning climate change and available actions to reduce greenhouse gas emissions on the SCAQMD website, in brochures, and other venues to help cities and counties, businesses, households, schools, and others learn about ways to reduce their electricity and water use through conservation or other efforts, improve energy efficiency, reduce vehicle miles traveled, access alternative mobility resources, utilize low emission vehicles and implement other climate friendly strategies; and

10. Conduct conferences, or include topics in other conferences, as appropriate, related to various aspects of climate change, including understanding impacts, technology advancement, public education, and other emerging aspects of climate change science.

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. SCAQMD's recommended interim GHG significance threshold proposal uses a tiered approach to determining significance. Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. Tier 2 consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. Tier 3 establishes a screening significance threshold level to determine significance using a 90 percent emission capture rate approach, which corresponds to 10,000 metric tons of CO2 equivalent emissions per year (MTCO2e/year). Tier 4, to be based on performance standards, is yet to be developed. Under Tier 5 the project proponent would allow offsets to reduce GHG emission impacts to less than the proposed screening level. If CARB adopts statewide significance thresholds, SCAQMD staff plans to report back to the SCAQMD Governing Board regarding any recommended changes or additions to the SCAQMD's interim threshold.

Table 3.2-10 presents the GHG emission inventory by major source categories in calendar year 2008, as identified in the 2012 AQMP, for Basin. The emissions reported herein are based on in-basin energy consumption and do not include out-of-basin energy production (e.g., power plants, crude oil production) or delivery emissions (e.g., natural gas pipeline loss). Three major GHG pollutants have been included: the CO2, N2O, and CH4. These GHG emissions are reported in MMTCO2e. Mobile sources generate 59.4 percent of the

TABLE 3.2-10

2008 GHG Emissions for Basin

		Emission (TPD)			Emission (TPY)			MMTONS
CODE	Source Category	CO2	N2O	CH4	CO2	N2O	CH4	CO2e
	Fuel Combustion							
10	Electric Utilities	34,303	.08	0.71	12,520,562	29.0	258	11.4
20	Cogeneration	872	.00	0.02	318,340	0.60	6.00	0.29
30	Oil and Gas Production (combustion)	2,908	.01	0.08	1,061,470	4.71	29.5	0.96
40	Petroleum Refining (Combustion)	44,654	.06	0.57	16,298,766	20.7	207	14.8
50	Manufacturing and Industrial	22,182	.06	0.48	8,096,396	20.9	174	7.35
52	Food and Agricultural Processing	927	00	0.02	338,516	0.84	7.16	0.31
60	Service and Commercial	21,889	0.08	0.59	7,989,416	30.8	215	7.26
99	Other (Fuel Combustion)	2,241	0.2	0.16	818,057	8.58	58	0.75
Total Fuel Combustion		**129,977**	**0.32**	**2.62**	**47,441,523**	**116**	**956**	**43.1**
	Waste Disposal							
110	Sewage Treatment	26.4	0.00	0.00	9,653	0.12	1.50	0.01
120	Landfills	3,166	0.04	505	1,155,509	14.0	184,451	4.57
130	Incineration	580	0.00	0.02	211,708	0.81	5.48	0.19
199	Other (Waste Disposal)			2.25	0	0.00	820	0.02
Total Waste Disposal		**3,772**	**0.04**	**508**	**1,376,870**	**14.9**	**185,278**	**4.78**
	Cleaning and Surface Coatings							
210	Laundering							
220	Degreasing							
230	Coatings and Related Processes	27.1	0.00	0.21	9,890	0.02	78.0	0.01
240	Printing			0.00	0	0.00	0.00	0.00
250	Adhesives and Sealants			0.00	0	0.00	0.00	0.00
299	Other (Cleaning and Surface Coatings)	2,621	0.00	0.12	956,739	1.20	43.9	0.87
Total Cleaning and Surface Coatings		**2,648**	**0.00**	**0.33**	**966,628**	**1.22**	**122**	**0.88**
	Petroleum Production and Marketing							
310	Oil and Gas Production	92.1	0.00	0.92	33,605	0.06	336	0.04
320	Petroleum Refining	770	0.00	1.65	280,932	0.36	603	0.27
330	Petroleum Marketing			83.8	0	0.00	30,598	0.58
399	Other (Petroleum Production and Marketing)			0.00	0	0.00	0	0.00
Total Petroleum Production and Marketing		**862**	**0.00**	**86.4**	**314,536**	**0.42**	**31,537**	**0.89**

TABLE 3.2-10 (Continued)

2008 GHG Emissions for Basin

		Emission (TPD)			Emission (TPY)			MMTONS
CODE	**Source Category**	**CO2**	**N2O**	**CH4**	**CO2**	**N2O**	**CH4**	**CO2e**
	Industrial Processes							
410	Chemical			0.92	0	0.00	337	0.01
420	Food and Agriculture			0.02	0	0.00	7.10	0.00
430	Mineral Processes	279	0.00	0.05	101,804	0.19	17.3	0.09
440	Metal Processes			0.02	0	0.00	9.10	0.00
450	Wood and Paper			0.00	0	0.00	0.00	0.00
460	Glass and Related Products			0.00	0	0.00	0.90	0.00
470	Electronics			0.00	0	0.00	0.00	0.00
499	Other (Industrial Processes)	0.08	0.00	0.47	28	0.00	172	0.00
	Total Industrial Processes	**279**	**0.00**	**1.49**	**101,832**	**0.19**	**543**	**0.10**
	Solvent Evaporation							
510	Consumer Products			0.00	0.00	0.00	0.00	0.00
520	Architectural Coatings and Related Solvent			0.00	0.00	0.00	0.00	0.00
530	Pesticides/Fertilizers			0.00	0.00	0.00	0.00	0.00
540	Asphalt Paving/Roofing			0.07	0.00	0.00	24.20	0.00
	Total Solvent Evaporation	**0.00**	**0.00**	**0.07**	**0.00**	**0.00**	**24.20**	**0.00**
	Miscellaneous Processes							
610	Residential Fuel Combustion	38,850	0.12	0.95	14,180,326	45.3	347	12.9
620	Farming Operations			25.6	0.00	0.00	9,354	0.18
630	Construction and Demolition			0.00	0.00	0.00	0	0.00
640	Paved Road Dust			0.00	0.00	0.00	0	0.00
645	Unpaved Road Dust			0.00	0.00	0.00	0	0.00
650	Fugitive Windblown Dust			0.00	0.00	0.00	0	0.00
660	Fires			0.08	0.00	0.00	30.9	0.00
670	Waste Burning and Disposal			0.58	0.00	0.00	212	0.00
680	Utility Equipment				0.00	0.00		0.00
690	Cooking			0.64	0.00	0.00	235	0.00
699	Other (Miscellaneous Processes			0.00	0.00	0.00	0	0.00
	Total Miscellaneous Processes	**38,850**	**0.12**	**27.9**	**14,180,326**	**45.3**	**10,179**	**13.1**

TABLE 3.2-10 (CONCLUDED)

2008 GHG Emissions for Basin

		Emission (TPD)			Emission (TPY)			MMTONS
CODE	**Source Category**	**CO2**	**N2O**	**CH4**	**CO2**	**N2O**	**CH4**	**CO2e**
On-Road Motor Vehicles								
710	Light Duty Passenger Auto (LDA)	84,679	2.72	3.62	30,907,957	993	1,321	28.3
722	Light Duty Trucks 1 (T1 : up to 3750 lb.)	22,319	0.72	0.96	8,146,321	263	350	7.47
723	Light Duty Trucks 2 (T2 : 3751-5750 lb.)	33,495	1.08	1.43	12,225,619	392	523	11.2
724	Medium Duty Trucks (T3 : 5751-8500 lb.)	29,415	0.94	1.25	10,736,309	343	456	9.85
732	Light Heavy Duty Gas Trucks 1 (T4 : 8501-10000 lb.)	8,195	0.16	0.21	2,991,059	57.3	76.7	2.73
733	Light Heavy Duty Gas Trucks 2 (T5 : 10001-14000 lb.)	1,116	0.05	0.07	407,174	19.0	25.6	0.38
734	Medium Heavy Duty Gas Trucks (T6 : 14001-33000 lb.)	727	0.02	0.20	265,506	5.48	73.0	0.24
736	Heavy Heavy Duty Gas Trucks ((HHDGT > 33000 lb.)	102	0.01	0.01	37,198	2.19	2.56	0.03
742	Light Heavy Duty Diesel Trucks 1 (T4 : 8501-10000 lb.)	2,166	0.02	0.02	790,600	6.94	7.30	0.72
743	Light Heavy Duty Diesel Trucks 2 (T5 : 10001-14000 lb.)	735	0.01	0.01	268,413	2.56	2.92	0.24
744	Medium Heavy Duty Diesel Truck (T6 : 14001-33000 lb.)	5,422	0.02	0.02	1,978,974	8.40	8.76	1.80
746	Heavy Heavy Duty Diesel Trucks (HHDDT > 33000 lb.)	17,017	0.05	0.05	6,211,247	17.5	16.4	5.64
750	Motorcycles (MCY)	7,959	0.26	0.34	2,904,910	94.9	124	2.66
760	Diesel Urban Buses (UB)	2,135	0.00	0.00	779,389	1.46	1.46	0.71
762	Gas Urban Buses (UB)	166	0.02	0.02	60,654	8.40	6.94	0.06
770	School Buses (SB)	337	0.00	0.00	122,995	1.46	1.46	0.11
776	Other Buses (OB)	927	0.00	0.00	338,430	0.73	0.73	0.31
780	Motor Homes (MH)	568	0.03	0.04	207,431	11.0	14.6	0.19
Total On-Road Motor Vehicles		**217,480**	**6.11**	**8.26**	**79,380,188**	**155**	**187**	**72.7**
Other Mobile Sources								
810	Aircraft	37,455	0.10	0.09	13,670,930	36.5	31.8	12.4
820	Trains	586	0.00	0.00	213,835	0.45	1.38	0.19
830	Ships and Commercial Boats	3,452	0.01	0.02	1,259,927	2.64	8.13	1.14
	Other Off-road sources (construction equipment, airport equipment, oil and gas drilling equipment)	16,080	1.72	8.84	5,869,123	628	3,226	5.56
Total Other Mobile Sources		**57,572**	**1.83**	**8.95**	**21,013,816**	**668**	**3,268**	**19.3**
Total Stationary and Area Sources		**176,388**	**0.49**	**626**	**64,381,716**	**178**	**228,639**	**63**
Total On-Road Vehicles		**217,480**	**6.11**	**8.26**	**79,380,188**	**155**	**187**	**73**
Total Other Mobile*		**57,572**	**1.83**	**8.95**	**21,013,816**	**668**	**3,268**	**19**
Total 2008 Baseline GHG Emissions for Basin		**451,440**	**8.42**	**644**	**164,775,719**	**1,001**	**232,094**	**155**

equipment, airport equipment, oil and gas drilling equipment. The remaining 40.6 percent of the total Basin GHG emissions are from stationary and area sources. The largest stationary/area source is fuel combustion, which is 27.8 percent of the total Basin GHG emissions (68.6 percent of the GHG emissions from the stationary and area source category).

3.2.2.3 Air Quality – Ozone Depletion

The Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) is an international treaty designed to phase out halogenated hydrocarbons (chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs)), which are considered ozone depleting substances (ODSs). The Montreal Protocol was first signed in September 16, 1987 and has been revised seven times. The United States ratified the original Montreal Protocol and each of its revisions.

3.2.2.3.1 Federal

Under Title VI of the CAA, U.S. EPA is responsible for programs that protect the stratospheric ozone layer. Title 40, Part 82 of the Code of Federal Regulations contains U.S. EPA's regulations to protect the ozone layer. U.S. EPA regulations phase out the production and import of ODSs consistent with the Montreal Protocol. ODSs are typically used as refrigerants or as foam blowing agents. ODS are regulated as Class I or Class II controlled substances. Class I substances have a higher ozone-depleting potential and have been completely phased out in the U.S., except for exemptions allowed under the Montreal Protocol. Class II substances are hydrochlorofluorocarbons (HCFCs), which are transitional substitutes for many Class I substances and are being phased out.

3.2.2.3.2 State

3.2.2.3.2.1 AB 32: Global Warming Solutions Act

Some ODS exhibit high global warming potentials. As stated in Section 3.2.2.2.2.2~~3.1~~, ARB developed a cap and trade regulation under AB 32. The cap and trade regulation includes the Compliance Offset Protocol Ozone Depleting Substances Projects, which provides methods to quantify and report GHG emission reductions associated with the destruction of high global warming potential ODS sourced from and destroyed within the U.S. that would have otherwise been released to the atmosphere. The protocol must be used to quantify and report GHG reductions under the ARB's GHG Cap and Trade Regulation.

3.2.2.3.2.2 Refrigerant Management Program

As part AB 32, ARB adopted a regulation (Refrigerant Management Program) in 2009 to reduce GHG emissions from stationary sources through refrigerant leak detection and monitoring, leak repair, system retirement and retrofitting, reporting and recordkeeping, and proper refrigerant cylinder use, sale, and disposal.

3.2.2.3.2.3 HFC Emission Reduction Measures for Mobile Air Conditioning - Regulation for Small Containers of Automotive Refrigerant

The automotive refrigerant small containers regulation applies to the sale, use, and disposal of small containers of automotive refrigerant with a GWP greater than 150. Emission reductions are achieved through implementation of four requirements: 1) use of a self-sealing valve on the container, 2) improved labeling instructions, 3) a deposit and recycling program for small containers, and 4) an education program that emphasizes best practices for vehicle recharging. This regulation went into effect on January 1, 2010 with a one-year sell-through period for containers manufactured before January 1, 2010. The target recycle rate is initially set at 90 percent, and rose to 95 percent beginning January 1, 2012.

3.2.2.3.2 SCAQMD

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy targeted a transition away from chlorofluorocarbons (CFCs) as an industrial refrigerant and propellant in aerosol cans. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives for ODSs:

- phase out the use and corresponding emissions of chlorofluorocarbons (CFCs), methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons (HCFCs) by the year 2000;
- develop recycling regulations for HCFCs; and
- develop an emissions inventory and control strategy for methyl bromide.

3.2.3.3.2.1 Rule 1122 – Solvent Degreasers

Rule 1112 applies to all persons who own or operate batch-loaded cold cleaners, open-top vapor degreasers, all types of conveyorized degreasers, and air-tight and airless cleaning systems that carry out solvent degreasing operations with a solvent containing Volatile Organic Compounds (VOCs) or with a NESHAP halogenated solvent. Some ODSs (carbon tetrachloride and 1,1,1-trichloroethane) are NESHAP halogenated solvents.

3.2.2.3.2.2 Rule 1171 – Solvent Cleaning Operations

Rule 1171 reduces emissions of volatile organic compounds (VOCs), toxic air contaminants, and stratospheric ozone-depleting or globalwarming compounds from the use, storage and disposal of solvent cleaning materials in solvent cleaning operations and activities

3.2.2.3.2.3 Rule 1411 - Recovery or Recycling of Refrigerants from Motor Vehicle Air Conditioners

Rule 1411 prohibits release or disposal of refrigerants used in motor vehicle air conditioners and prohibits the sale of refrigerants in containers which contain less than 20 pounds of refrigerant.

3.2.2.3.2.4 Rule 1415 - Reduction of Refrigerant Emissions from Stationary Air Conditioning Systems

Rule 1415 reduces emissions of high-global warming potential refrigerants from stationary air conditioning systems by requiring persons subject to this rule to reclaim, recover, or recycle refrigerant and to minimize refrigerant leakage.

3.2.2.3.2.5 Rule 1418 - Halon Emissions from Fire Extinguishing Equipment

Rule 1418 reduce halon emissions by requiring the recovery and recycling of halon from fire extinguishing systems, by limiting the use of halon to specified necessary applications, and by prohibiting the sale of portable halon fire extinguishers that contain less than five pounds of halon.