SANTA CLARITA SUBREGIONAL ANALYSIS

NOVEMBER 2004

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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EXECUTIVE SUMMARY

Background on Subregional Analysis

The overall blueprint for attainment strategy in the greater South Coast basin is the Air Quality Management Plan (AQMP). The AQMP assesses and addresses regional air quality as a macrocosm. Since 2002, as part of SCAQMD's ongoing Environmental Justice program, the SCAQMD Governing Board has also asked staff to carry out one or more "subregional analyses" each year, as "mini-AQMP" microcosms.

A subregional analysis seeks to identify disproportionate air quality impacts in a specific geographic area, and if found, to address and mitigate these impacts. Thus far, the following subregional analyses have been requested by the Board, all involving potentially disproportionate exposure to unhealthful emissions: Mira Loma (concern: diesel exhaust from large clusters of truck warehouse facilities); the Alameda Corridor (concern: diesel exhaust from port operations, the freight rail expressway, associated rail yards, and on-road trucks); and in this report, the Santa Clarita Valley (concern: transported ozone and potential increases in fugitive dust and diesel exhaust emissions stemming from proposed aggregate mining and gravel hauling operations).

In 2003, SCAQMD's Santa Clarita Valley monitoring station recorded the highest official 1-hour ozone reading in Los Angeles county (a maximum concentration of 0.194 parts per million [ppm]). Ozone concentrations in Santa Clarita exceeded the federal 1- and 8-hour standards of 0.12 and 0.08 ppm on 35 and 69 days respectively.

In the spring of 2004, the SCAQMD Governing Board directed that the District provide an expanded analysis of subregional air quality, beyond that presented in the AQMP, to examine and assess several air quality issues confronting the Santa Clarita Valley. In response to this direction, an analysis has been conducted to discuss the observed air quality, the contributing factors to recent trends and to assess the roles of local emissions and pollution transport in relationship to the observations. In addition, the analysis attempts to characterize the potential impacts of development in both the residential sector and in the industrial sector as represented by the development of the Soledad Canyon Sand and Gravel Mining Project (Cemex/Transit Mixed Concrete, Inc. [Cemex/TMC]). The results of the analysis are grouped into three categories: observed ambient air quality (ozone and PM10/PM2.5), simulated ozone and PM10 impacts from future development of available land parcels in the valley, and potential toxic risk from diesel soot emissions associated with the in-situ mining and gravel hauling operations from the Cemex/TMC project.

Ozone and PM10 Air Quality (Sections 2 and 3):

- Santa Clarita does not meet the federal and California ozone air quality standards.

- The recent increase in the number of days exceeding the federal 1-hour ozone standard has been impacted mostly by weather and the movement of the monitoring station location (the old site was unsuitably impacted by local emissions);

- The city can experience a 50 part per billion (ppb) gradient of ozone concentrations from west to east on smoggy days;

- The highest PM10 concentrations in the Santa Clarita Valley are observed in the City of Santa Clarita near the Interstate 5 (I5) and State Route 14/Antelope Valley (SR-14) freeways;

- Transport from the San Fernando Valley and Los Angeles dominates both local ozone and particulate air quality;

- Santa Clarita emissions contribute about 2 percent to local ozone impact;

- Local particulate emissions contribute about 10 percent to the annual average observed PM10 concentration;

- Weekend ozone concentrations under average wind transport conditions are approximately 23 percent higher than weekdays; and

- Santa Clarita meets federal PM10 standards but exceeds the more restrictive California standard.

Impacts from Future Development (Sections 3, 4 and 5)

- Doubling of motor vehicle emissions in the city of Santa Clarita will have a nominal impact to local PM10 and no impact to local ozone;

- When simultaneous 25-year build-out of all recorded, pending and approved land parcels in the city and county portions of the valley is assumed, simulated annual PM10 concentrations are projected to increase up to 5 micrograms per cubic meter ($\mu g/m^3$);

- The maximum regional annual average PM10 impact is projected to occur near Newhall Ranch;

- The annual average regional impact due to the development of the Cemex/TMC facility is projected to result in an increase of up to 3 $\mu g/m^3$, in the immediate area surrounding the mine;

- A focus point source analysis of the Cemex/TMC mine projected an annual PM10 impact of up to 16 $\mu g/m^3$ (at the fence line of the facility); and

- Future development would not cause violations of the federal annual average PM10 standard but could cause possible violations of the state standard.

Toxic Risk Analyses (Section 6)

- The MATES II regional toxic risk study estimated an average risk of 500 in one million for the City of Santa Clarita;
- By comparison, the average toxic risk for the South Coast Air Basin (Basin) is approximately 1,400 in one million;
- In general, simulations using a Gaussian model in the Basin are conducted using the urban meteorological assumption. Due to its unique topography, the Santa Clarita Valley was simulated using both the urban and rural meteorological assumptions to bound the analysis;
- Model-simulated maximum risk to the city of Santa Clarita from diesel emissions associated with mining and hauling operations from the Cemex/TMC project ranges from 10 to 25 in one million, dependent upon the meteorological profile: urban or rural, respectively;
- The northeast portion of the city adjacent to the SR-14 and Soledad Canyon Road split would experience the greatest impact; and
- The maximum risk to a sensitive receptor (school) ranges from 7 to 20 in one million, dependent upon the meteorological profile: urban or rural, respectively.

The City of Santa Clarita through its air quality element has instituted many air pollution mitigation measures and is considering additional options. This analysis concludes by providing selected potential mitigation measures **(Section 7)** that address fugitive dust issues and emissions from diesel mobile sources.

1.0 INTRODUCTION

At its August 2003 meeting; the Governing Board of the South Coast Air Quality Management District (District) adopted the 2003 revision to the Air Quality Management Plan (AQMP) for the South Coast Air Basin (Basin). The 2003 AQMP, which has since been forwarded to the California Air Resources Board (CARB), and approved for inclusion in the California State Implementation Plan (SIP), is the region's blueprint towards clean air. The AQMP provides regional characterization of the air quality problem and proposes the development of specific emissions control measures and rule implementation schedules to meet clean air goals. While the AQMP details the road map to regional attainment of all air quality standards, it is not directly focused on the subregional or localized air quality impacts that affect individual communities.

The City of Santa Clarita has requested that the District conduct an expanded analysis of subregional air quality, beyond that presented in the AQMP, to exam and assess several air quality issues confronting both the city and its sphere of influence, the Santa Clarita Valley. The city and valley are both rapidly developing. The community is developing a subregional plan "One Valley, One Vision," which defines the goals of growth and development for the incorporated and unincorporated cities of the valley while maintaining a high quality of life. As part of this planning effort, the city has requested that the District provide answers to key issues that are intimate to the local area. These included:

- Characterizing and evaluating the observed ozone and particulate air quality

    - trends;
    - impact of local emissions; and
    - and what is termed the "weekend effect".

- Evaluating the impact of potential development growth on air quality

    - through increased mobile source emissions; and
    - by simulating the valley build-out .

- Evaluating the impact of proposed Cemex/TMC mining operations.

- Providing potential mitigation measures.

2.0 BACKGROUND

The city of Santa Clarita (Figure 2-1) is located approximately 35 miles northwest of central Los Angeles, with its southern boundary abutting the northern portion of the San Fernando Pass. The majority of the city resides between Interstate 5 and State Routes 126 and 14. The size of the city accounts for roughly 25 percent of the 200-square mile Santa Clarita Valley.

The estimated population of Santa Clarita in 2003 was approximately 163,000 with an estimated total population in the Santa Clarita Valley of 172,000. The population of the city has grown over 35 percent since 1990 with 75 percent of the population residing in single family dwellings. The population growth rate has been complemented with substantial growth in housing, within the incorporated boundaries of the city and on adjacent developed land in both Los Angeles and Ventura counties.

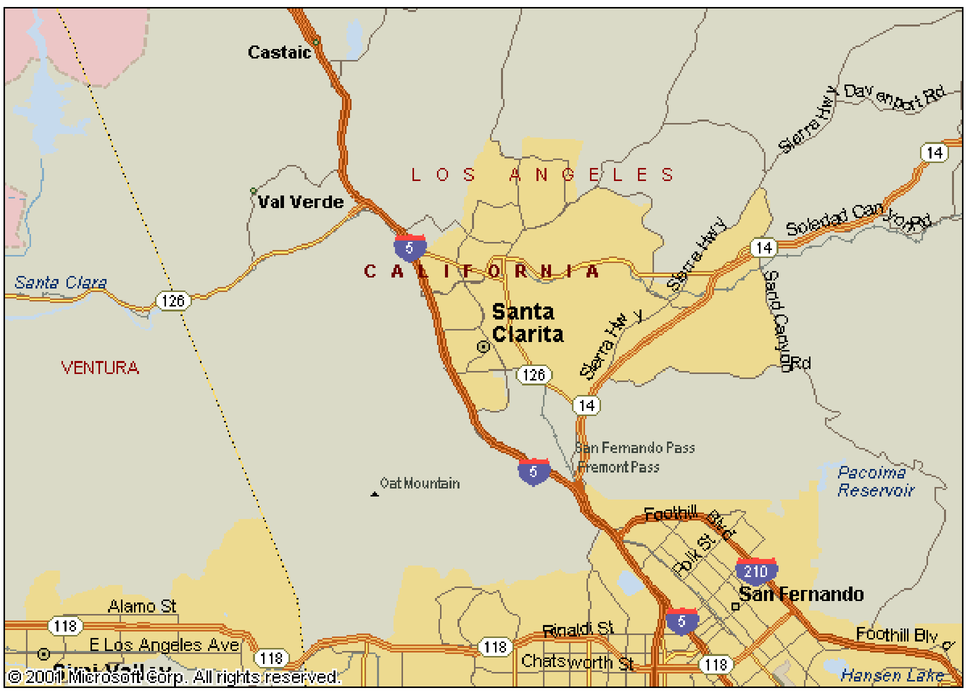

FIGURE 2-1

Santa Clarita and Neighboring Communities

While residents commuting to the San Fernando Valley and Central Los Angeles account for a large percentage of the work force, the Santa Clarita Valley retains more than 30,000 jobs. Commuting to the Santa Clarita Valley represents a growing contribution to traffic and emissions.

2.1 Meteorological Profile

During the 1997 Southern California Ozone Study (SCOS97, conducted by a partnership of air districts, CARB and U.S. EPA), extensive measurements of meteorological and air quality data were taken to help characterize the pollutant build-up and transport processes that take place in the Basin. The August 4-7, 1997 meteorological episode captured the build-up of an ozone episode and the development of a coastal eddy that resulted in transport of the polluted air mass to the Santa Clarita Valley over successive days. The episode was simulated as part of the Basin ozone attainment demonstration for the 2003 Air Quality Management Plan. In later sections of this report, these simulations are used to demonstrate the relative impact of transport to the Santa Clarita air quality problem due to emissions in the valley and in the upwind emissions source areas.

The following sections briefly describe the observed wind flow and inversion characteristics that uniquely impact the Santa Clarita Valley.

2.1.1 Wind Flow

The meteorological profile of the Santa Clarita Valley is dominated by the diurnal sea breeze wind circulation that is characteristic of Southern California. Daytime wind transport into the Santa Clarita Valley occurs along two primary routes: from the south through the Newhall pass, and from the west following the Santa Clara River (Figure 2-2). The thermally driven southwesterly wind flow exits the valley mainly through the eastern canyons on a traverse towards the Antelope Valley. A smaller percentage of the wind flow into the Santa Clarita Valley is channeled up the side canyons which are generally north-south in orientation. Average wind speeds during the afternoon range between 5 and 10 miles per hour. At night, weak drainage flow from the surrounding mountains collects along the Santa Clara River bed and is transported westward towards the coast.

Seasonally, the sea breeze is strongest during the spring and summer months. The typical flow pattern into the valley is augmented by region-wide southerly flow that accompanies the development of coastal eddies in the Southern California bight. The formation of coastal eddies occurs approximately 15 percent of the year. When the eddy is established, it promotes regional transport from the majority of the air pollution sources in the coastal plain. Less frequent, but well pronounced in the Santa Clarita Valley, are the periodic Santa Ana northerly winds which are routinely characterized by wind gusts in excess of 30 mph.

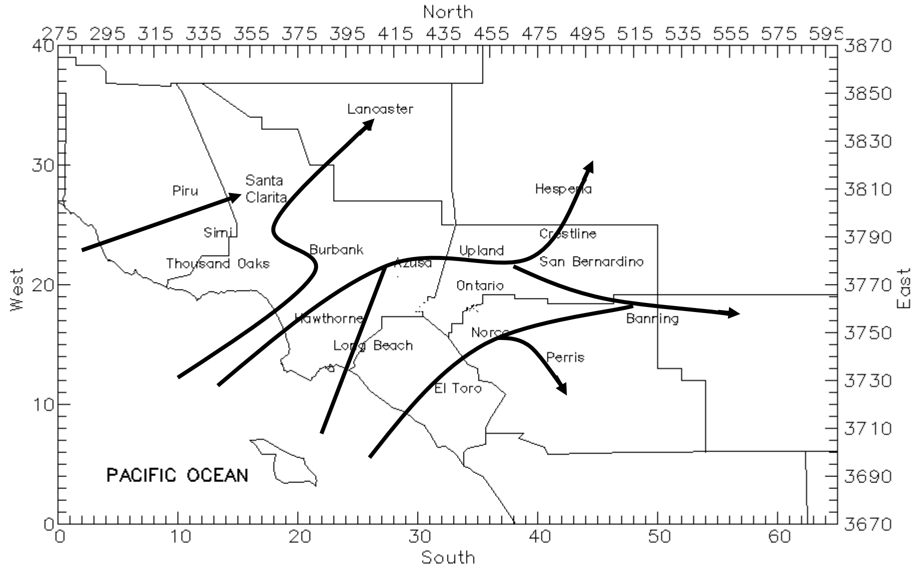

FIGURE 2-2

Prevailing Wind Transport to the Mojave Desert

The overwhelming contribution of pollution transport to the Santa Clarita Valley comes from the San Fernando Valley and metropolitan Los Angeles. Figure 2-3 depicts the seasonal-hourly wind frequency diagrams or "wind roses" for the Santa Clarita SCAQMD monitoring station for the period 1991-2000. Excluding periods of calm winds that occur as the sea breeze begins and ends (49.2 percent of all hours), the major daytime wind vectors are from the south and upwind emission source areas. This is particularly evident in the spring and summer months. In addition, several field studies have confirmed the prevalent transport route through the Newhall Pass by tracing the northward movement of inert tracer gases released in the Metropolitan Los Angeles areas.

Table 2-1 summarizes the frequency of occurrence of different daytime transport regimes to Santa Clarita. In general, average transport, which is characterized by a moderate-to-strong sea breeze through the Newhall Pass, occurs two-thirds of all days. In contrast, Santa Clarita is mostly impacted from local emissions under calm winds and weak offshore flow which occurs less than ten percent of all days.

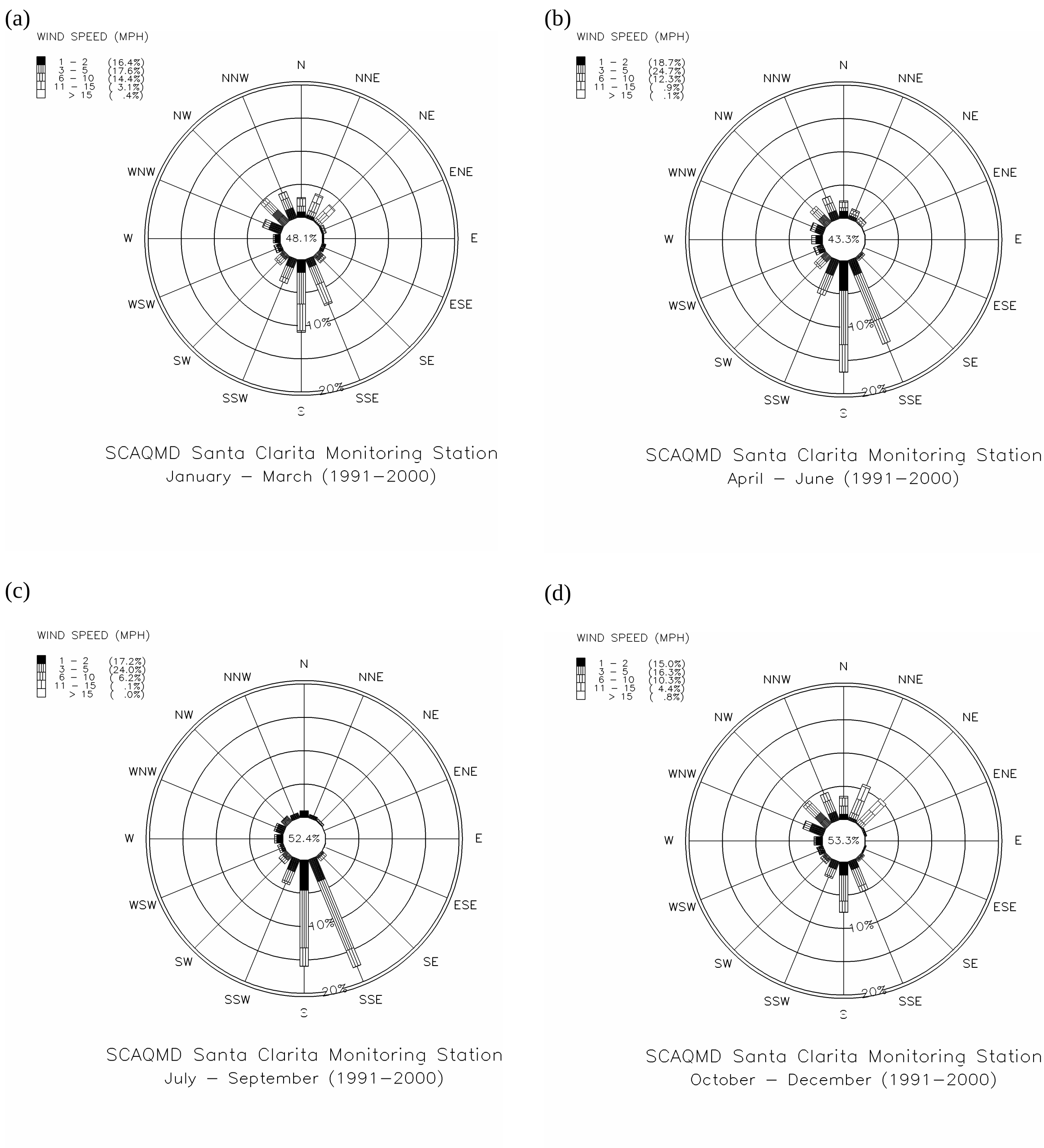

FIGURE 2-3

Hourly Wind Rose for Santa Clarita (1991-2000):
(a) Winter, (b) Spring, (c) Summer, (d) Fall

TABLE 2-1

Frequency and Strength of Daytime Wind Transport to Santa Clarita

Transport Regime	Frequency of Days	Characteristics
Local	6	Calm winds or weak offshore flow
Weak	20	Light winds onshore
Average	66	Moderate to strong sea breeze through Newhall pass and Santa Clara River Valley
Overwhelming	8	Strong Catalina eddy or an approaching storm system

2.1.2 Inversion Characteristics and Mixing

The elevation of the Santa Clarita Valley varies from just over 1000 feet to about 1700 feet above mean sea level (msl) in the eastern portion of the city. The base of the morning coastal inversion layer typically resides within a layer approximately 1000 and 3000 feet above msl with a median height of approximately 1200 feet msl. On many days, the coastal and San Fernando portions of the Basin reside in the marine layer while Santa Clarita is above the inversion base in the stable air within the inversion layer. When the inversion is lower than the elevation of the valley, Santa Clarita will take on the climatic characteristics of the high desert. These include limited cloud cover from the marine layer, low humidity and a rapid warming of daytime temperatures. Vertical mixing of the atmosphere under these conditions is limited in the pre-dawn and early morning hours due to the very stable atmosphere. Higher levels of tailpipe emissions are trapped close to the ground but the rapid heating of the atmosphere after dawn limits the amount of stagnation, acting to disperse morning pollution vertically.

On days when the height of the base of the inversion layer is approximately equal to or greater than the elevation of the valley, a modified marine air climatic profile is observed in Santa Clarita. This will often include clouds or fog, higher humidity and slower rise in daytime temperature. Vertical mixing of the atmosphere will readily disperse ground level emissions; however, the extent of mixing will be determined by the inversion base height above mean sea level relative to the terrain elevation. As a consequence, on days when the morning inversion is elevated over Santa Clarita, the mixed layer, or area of the atmosphere where pollutants readily disperse, can actually be shallower than over the San Fernando Valley and coastal plain. These conditions often accompany the development of a coastal eddy and enhanced wind transport into the valley.

As the air over Southern California heats during the day, vertical mixing in the coastal plain and San Fernando Valley will typically reach between 3000 and 5000 feet. Developing ozone and particulate air pollution caught in the mixed layer is transported with the winds towards the Santa Clarita Valley. The pollutant-laden air mass extends high enough in the atmosphere to easily move through the Newhall Pass into the valley proper. The transported pollutant air mass typically retains the marine or coastal climatic characteristics and is several degrees cooler in temperature than the air it is displacing in the Santa Clarita Valley. The cooler pollutant-laden air tends to hug the ground creating a temperature contrast between the pollutant air mass and the warmer air above in the mixed layer. As a result, the movement of the polluted air mass into Santa Clarita acts to regenerate a low-level inversion whereby the transported pollutants are concentrated in a shallow layer.

On days when Southern California experiences extreme heat, the inversion layer is broken and vertical mixing of the atmosphere becomes unlimited. Under this condition transport into the Santa Clarita Valley is limited and pollutant levels are characteristically low in the area.

2.2 Air Quality Profile

Any assessment of the Santa Clarita air quality profile must begin with an assessment of the trend of air pollution in the South Coast Air Basin. In general, the region is most greatly impacted by ground-level ozone. Particulate matter, separated into a fine mode (PM2.5 - aerodynamic diameter less than or equal to 2.5 microns) and a coarse mode (PM10 - aerodynamic diameter of 10 microns or smaller, including PM2.5), is the second major contributing pollutant to Basin air quality. To a lesser extent, and more restricted in geographical impact is carbon monoxide, a third pollutant of concern.

The federal air quality pollutant standard attainment designations characterize the Basin as a region. The Basin is classified non-attainment for ozone, PM10, and carbon monoxide. Each of these pollutants impacts the health of the Basin population through short-term acute exposure and long term chronic impacts. On a sub-regional scale, Santa Clarita exceeds only the federal standard for ozone.

Ozone is an oxidant that readily reacts with tissue in the respiratory tract; primarily the cilia in the bronchi and the alveoli in the lungs. Irritation, combined with inflammation caused by exposure leads to scarring of the alveoli cell walls and reduced pulmonary function with repeated exposure over time. Particulates, especially the fine portion, are easily inhaled and deeply penetrate the respiratory tract, causing irritation and inflammation. The particulates often serve as platforms for toxic materials and are associated with increases in mortality rates. Asthmatics, the, very young, the aged and people with pre-existing chronic respiratory ailments, are among the susceptible segments of the population who have been identified as being greatly impacted by exposure to either ozone or particulates.

Although not measured frequently in very high concentrations, carbon monoxide can cause impairment of consciousness and is especially harmful to people with emphysema or heart conditions. The Basin has met the criteria defining attainment of the carbon monoxide since 2002. A petition to re-designate the Basin as attainment will be submitted to U.S. EPA in the near future.

2.2.1 Ozone Trend

Figure 2-4 depicts the long-term trend of days when the federal 1-hour ozone has been exceeded at one or more locations in the Basin. Also depicted in the figure is the regional peak concentration. As demonstrated by the trend, ozone air quality has significantly improved since the mid-1970's. The rate of improvement has slowed in the later 1990's and has shown a minor reversal over the past two years.

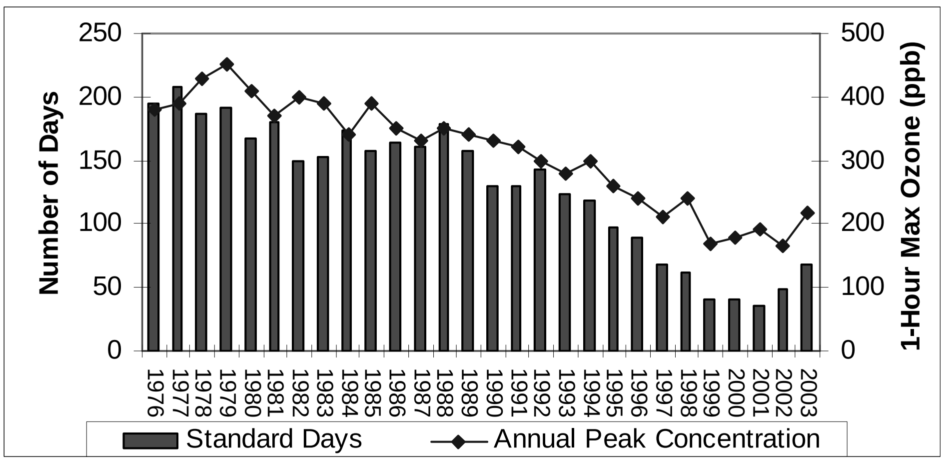

FIGURE 2-4

Trend of Days Exceeding the Federal 1-Hour Ozone Standard in the South Coast Air Basin and Annual Peak Concentration (ppb)

Figure 2-5 depicts the long-term trend of days when the federal 1-hour ozone standard was exceeded at Santa Clarita. When compared to the Basin totals, the trends are generally consistent with time. On average, Santa Clarita experiences violations of the 1-hour ozone standard on approximately fifty percent of the days each year that a basin-wide violation occurs.

Two features are very prominent in the recent ozone trend: First, no violations of the federal 1-hour average ozone standard were observed at the Santa Clarita monitoring site in 1999 and only one was observed the following year. The second characteristic of the recent trend has been the sharp increase in the number of violations observed in 2002 and 2003. A fundamental question arises when analyzing the recent trend: was the improvement in 1999-2000 real or is the 2002-2003 increase in violations a truer measure of ambient ozone in the area?

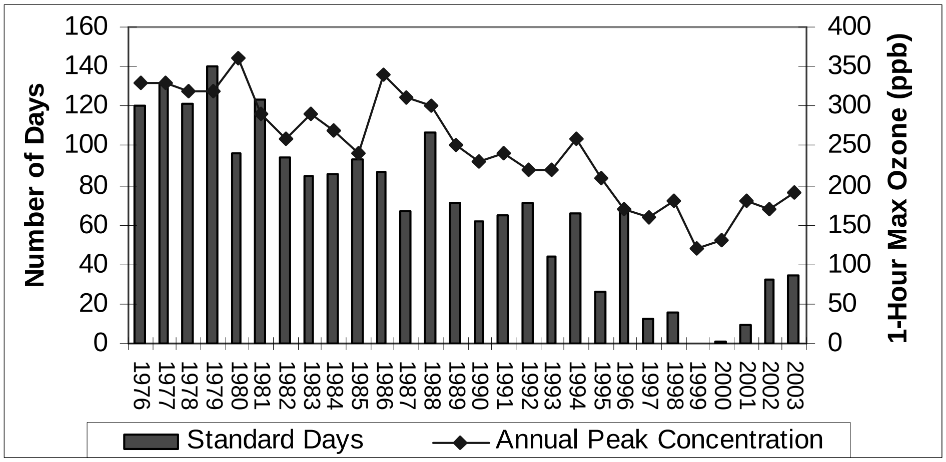

FIGURE 2-5

Trend of Days Exceeding the Federal 1-Hour Ozone Standard in Santa Clarita and Annual Peak Concentration (ppb)

2.2.1.1 Air Monitoring Station Relocation

In the spring of 2001, the Santa Clarita monitoring station was moved from its long-term location at L.A. County Fire Station #73 (24875 N. San Fernando Road, Newhall) to a site approximately one half mile to the east in a county maintenance yard. The fire station monitoring site on San Fernando Road was limited in space and had exposure interference from trees. The site was also adjacent to the fire department's diesel refueling station and was impacted from traffic emissions on San Fernando Road and from fire station activities. Diesel fire equipment, as well as routine traffic, emit high volumes of nitric oxide (NO). NO readily reacts with ambient ozone to titrate ozone concentrations nearby the NO emissions source. As a consequence, the fire station site may have been reading nominally lower ozone concentrations than the surrounding area. District staff determined that the new monitoring location receives better exposure and was less subjected to traffic influences than at the fire station.

At the time of the move, the ozone instrumentation was replaced and upgraded. The older equipment used at the fire station was found to have a problem with surface resistance on the intake manifold that scavenged ozone before reaching the analyzer. It is difficult to determine to what extent and when the equipment began to experience a loss in recorded ozone. The equipment is routinely calibrated and performance is determined to be acceptable if the results are within an acceptable range prescribed by both U.S. EPA and CARB. It is most likely that the instrument was operating at the lower bounds of acceptable performance at the fire station monitoring site during 1999 and 2000. This feature, together with favorable weather conditions, may have accounted for the unusually low number of days exceeding the federal 1-hour average ozone standard. After the monitoring site relocation in the spring of 2001, higher ozone concentrations were observed by the new instrumentation. Concurrently, Santa Clarita experienced an upswing in the number of days exceeding the federal standard in 2001 and 2002 while leveling off in 2003. Other factors such as wildfire activity, regional changes in emissions levels and seasonal weather also may have contributed to the observed trend.

2.2.1.2 Wildfires

Due to drought conditions resulting from the record low rainfall measured over the past few years, much of the vegetation in the wildland interfacing the urban portion of the Basin has been stressed and has had dangerously low fuel moisture. Numerous wildfires have been ignited in Southern California. In particular the Santa Clarita area has been impacted each of the past three years (2002-2004). While the direct air quality impact caused by wildfires is due to fine particulates from the smoke, chemical reactions take place in the smoke plume that can elevate ozone concentrations. Experimental data captured from the Lodi Canyon controlled burns conducted in the Angeles National Forest during the late fall of 1986 indicated that on days having low ozone formation potential, a burn could generate concentrations of ozone exceeding 200 ppb with the smoke plume. The fires that occurred in the Santa Clarita valley during 2002 were very stubborn, lasting several days. Unlike the typical Santa Ana borne wildfires, the 2002 and 2004 fires fed upon the strong onshore sea breeze flow. Re-circulation of the smoke was observed throughout the Santa Clarita area and back into the San Fernando Valley. Several violations of the federal ozone standard occurred in both receptor areas as the fires burned and there existed a strong likelihood that the fires played a role in the enhanced ozone formation.

2.2.2 PM10 Trend

Figure 2-6 depicts the long-term trend of the peak annual average PM10 concentrations in the Basin. Also depicted in the figure is the regional peak 24- hour average concentration. The Basin exceeds the federal annual average PM10 standard (50 ug/m^3) and the 24-hour daily average standard (150 µg/m^3). The trend of annual average particulate has shown improvement since the late 1980's, however at a slower pace regionally than ozone. While the peak 24-hour average concentration continues to exceed the federal 24-hour average standard, it is important to note that since the mid 1990's the overwhelming number of days exceeding the standard were associated with high wind events (i.e. Santa Ana weather conditions and wildfires).

In the Santa Clarita Valley, annual average and 24-hour average concentrations of particulates are below the respective federal standards. Figure 2-7 shows the PM10 trends from 1989 through 2002. Over the last decade, the annual average concentration has been consistently about 70 percent of the federal annual standard. For the same period, the 24-hour maximum concentration has been on average less than 50 percent of the federal standard.

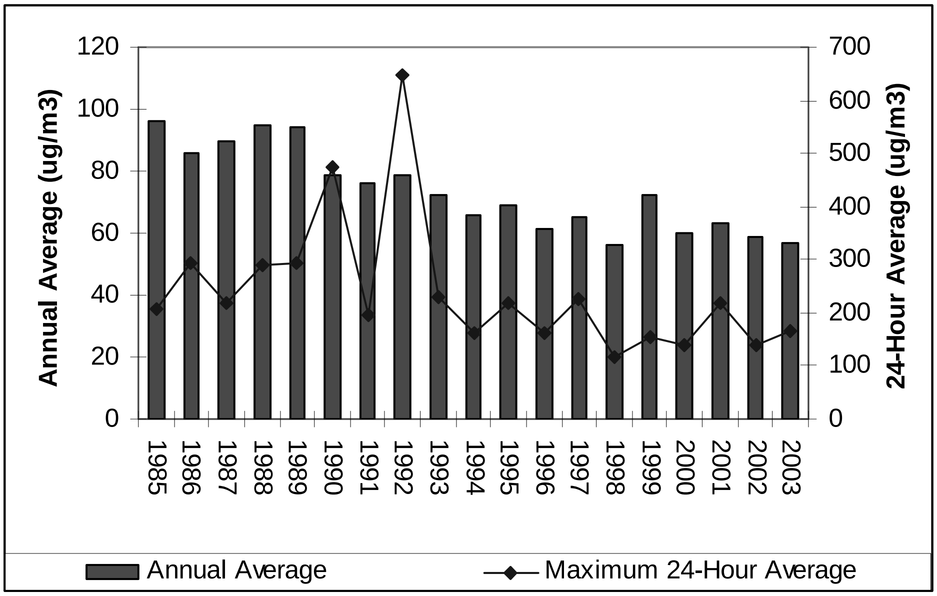

FIGURE 2-6

Basin Annual Average and Maximum 24-Hour Average PM10 Concentration

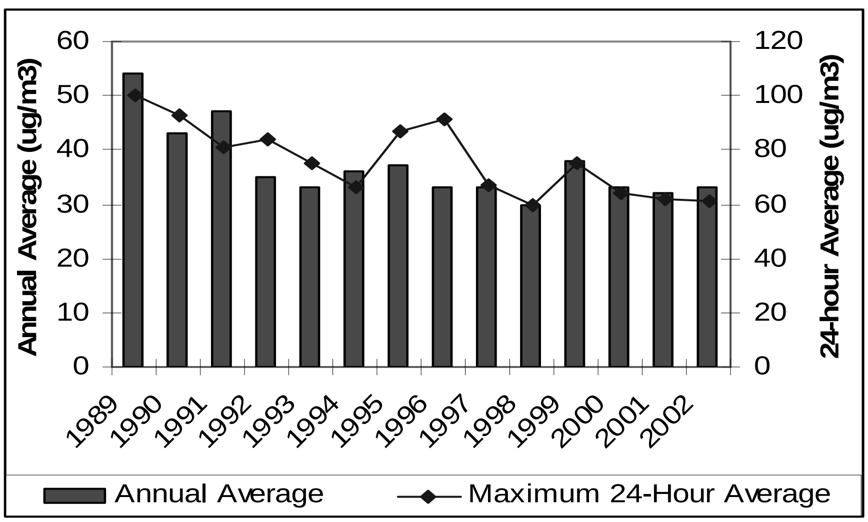

FIGURE 2-7

Santa Clarita Annual Average and Maximum 24-Hour Average PM10 Concentration

3.0 OZONE SIMULATIONS

Air quality modeling simulations were conducted to further examine the ozone impact to Santa Clarita. The modeling analyses were conducted to answer specific questions including:

- What is the subregional gradient of ozone in the Santa Clarita Valley?
- What is Santa Clarita's contribution to local smog formation?
- What is the "weekday effect" and how does it impact Santa Clarita?

3.1 Base and Future Year Simulations

The simulations were conducted for the 2003 AQMP modeling domain, using the SCOS97 meteorological episodes. The SCOS97 meteorological episode includes four days exhibiting increasing degrees of transport to the valley. August 4, 1997, the first day in the episode, was classified as a weak transport day, which occurs approximately 20 percent of the time. August 5, 1997, was classified as a local day, with little or minor transport into Santa Clarita. The local day occurs roughly 6 percent of the year. The final two days of the meteorological episode August 6, 1997, and August 7, 1997, were characteristic of the typical transport pattern which is observed on approximately 66 percent of all days.

Simulations were conducted for the full 2003 AQMP modeling domain. Figure 3-1 presents the Santa Clarita Valley subset of the full modeling domain (grids 15,25 [east-west] through 22,30 [north-south]). The hatched area includes the grids comprising the city of Santa Clarita. Interstates 5 and 210 and State Route 14 are drawn on the figure to provide reference landmarks. Each grid is 5 square kilometers in size.

3.1.3 Local vs. Regional Emissions

Ozone concentrations were simulated for three modeling inventories representing the estimated reactive emissions in the environment. The emissions inventories were developed for 2002 to reflect the conditions observed when ozone concentrations began to increase in the valley; 2007, a milestone year when the Antelope Valley must attain the federal standard; and 2010, the year the South Coast Air Basin must attain the federal 1-hour ozone standard. The emissions inventories include daily tonnages of directly emitted carbon monoxide (CO), oxides of nitrogen (NOx), volatile organic compounds (VOC) and particulate matter as PM10. VOC and NOx are the primary precursors "building blocks" of ozone. As is depicted in Table 3-1, Santa Clarita is a relatively small contributor to the total emissions of the key pollutants in both Los Angeles county and the Basin as a whole. Across the board, the emissions are typically less than three percent of the county total and two percent of the Basin total.

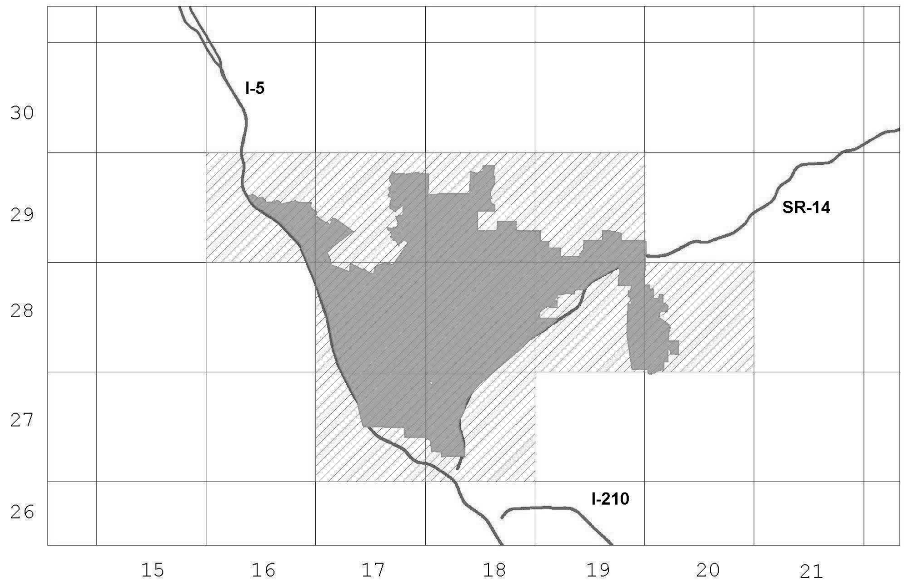

FIGURE 3-1

Santa Clarita Valley Portion of the 2003 AQMP Modeling Domain

TABLE 3-1

2002 Santa Clarita Emissions Profile

Emissions	CO	NOx	VOC	PM10
Santa Clarita (Tons Per Day)	63.9	19.3	11.2	3.4
Percentage of LA County	2.2	3.0	2.2	2.4
Percentage of Basin	1.4	1.8	1.4	1.2

3.1.2 2003 AQMP Ozone Model Simulations

The rate of progress towards achieving standard compliance is demonstrated in the 2003 AQMP ozone model simulations. Table 3-2 summarizes the results of the model simulations. In 2002, the highest observed 1-hour average ozone concentration at Santa Clarita reached 169 ppb. Model simulations for a day experiencing average transport but approximately the 95th percentile for ozone formation potential were projected to reach 146 ppb. While the weather conditions for the day simulated and the day having the observed peak are not exactly the same, the potential for ozone generation is roughly equivalent and the projection indicated that an ozone health advisory episode was likely to occur given the emissions present in the atmosphere in 2002. What is encouraging is that on weak or local transport days, Santa Clarita was simulated to attain the federal standard. Extending the analysis to 2007 predicts that Santa Clarita will marginally exceed the standard and by 2010 the city and valley will be in attainment.

TABLE 3-2

2003 AQMP Model-Predicted Santa Clarita Maximum 1-Hour Average Ozone Concentration (ppb)

Transport Regime	2002	2007	2010
Local	78	77	68
Weak	118	115	103
Average	146	135	109

3.2 Ozone Gradients

A closer grid-level examination of the model-simulated ozone concentrations for an average transport day using the 2002 emissions inventory is presented in Figure 3-2. Santa Clarita, like several communities in the Basin, experiences a gradient of ozone air pollution throughout the city. The northwestern portion of the city can be cleaner than the eastern and southeastern portions by as much as 50 ppb. While transport to Santa Clarita via the Santa Clara River valley is a factor, the bulk of the transport originates from the San Fernando Valley and the coastal plain of Los Angeles. The location of the old fire station monitoring site is in grid 17 [horizontal axis], 27 [vertical-axis]). The monitoring station relocation in 2001 shifted the analyzer location in the direction of the main pollution transport corridor and increasing ozone. Thus, on days when ozone concentrations measured at the fire station monitoring site were just below the federal standard (124 ppb) it is likely that the projected concentration at the new location could be higher, causing the standard to be violated. Clearly, the move of the monitoring station and the equipment replacement has impacted the frequency of days reported exceeding the federal standard since 2001.

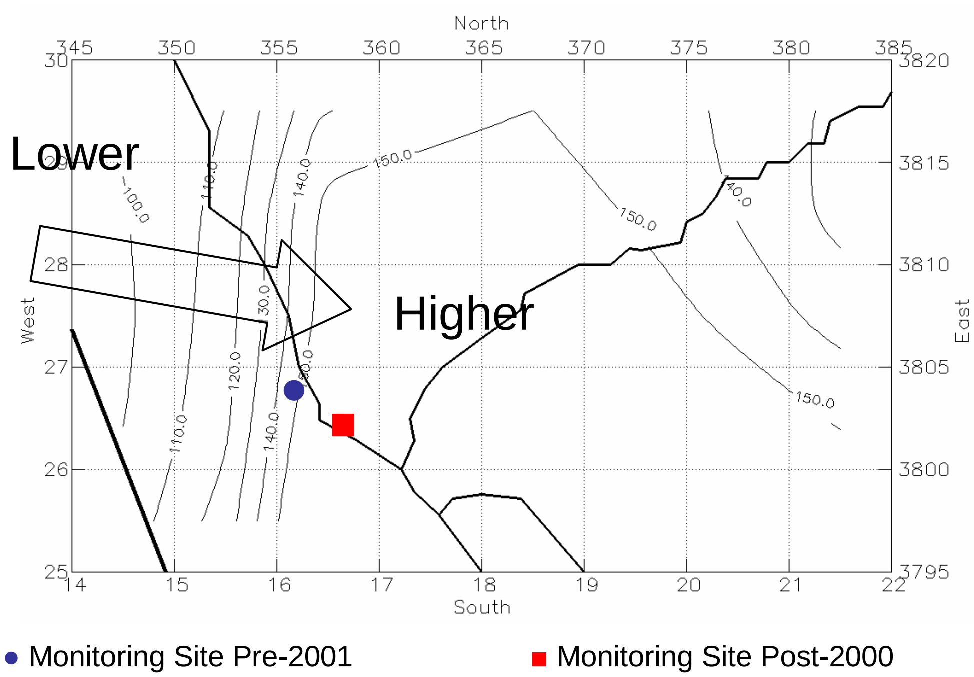

FIGURE 3-2

2002 Simulated Ozone (ppb) Gradient in Santa Clarita Valley for the Average Transport Regime

3.3 Santa Clarita's Contribution to Observed Ozone

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A principal question asked by residents and city officials of Santa Clarita was "what is our contribution to the ozone problem?" Table 3-3 summarizes a series of ozone sensitivity simulations where selected segments of the emissions were withdrawn from the analysis to assess the impact of different source regions to Santa Clarita's locally observed ozone. The first simulation withdrew all of the anthropogenic (man-made) emissions from Santa Clarita. A second simulation withdrew the emissions from upwind Santa Barbara and Ventura counties. An additional simulation doubled the Santa Clarita emissions to test the impact to the community.

In general, under average transport conditions, emissions from the Santa Clarita area do not contribute significantly to ozone formation in the city. In fact, the emissions of oxides of nitrogen act to scavenge some of the ozone that is transported to the area. (This is depicted by a negative value of the percentage contribution listed in Table 3-3). Under local and weak transport conditions, emissions from Santa Clarita have a minor contribution to the observed ozone air quality profile. In contrast, the Ventura and Santa Barbara emissions, coupled contribute as much as 10 percent to the ozone problem under average transport conditions. Ozone transport and emissions from the San Fernando Valley and the Los Angeles coastal plain are responsible for the bulk of the observed ozone in Santa Clarita. Carryover, the process where yesterday's smog provides a platform for today's smog to develop, is also a factor.

TABLE 3-3

Percentage Emissions Contribution to Santa Clarita Ozone Air Quality

Transport Regime	Santa Clarita Emissions	Doubled Santa Clarita Emissions	Santa Barbara & Ventura Emissions	Carryover & Other Basin Emissions
Local	2.8	0.7	0.7	96.5
Weak	1.2	-0.2	6.0	92.8
Average	-2.9	-2.9	9.9	93.0

3.4 Weekend Effect

A final issue that was addressed through the ozone simulations was the "weekend effect" and its impact on Santa Clarita air quality. Ozone concentrations observed on weekend days are higher than that observed on weekdays. Figure 3-3 illustrates the day-of-week smog season average ozone concentrations for 1-hour and 8-hour averaging periods measured in Santa Clarita. Over the period 2001-2003, a disproportionate percentage of the days exceeding the standard occurred on weekend days (43 percent as opposed to the expected two days out of seven or 28 percent). In general, the weekend effect reflects the change in emissions levels and emissions sources that occur from weekdays (Monday-Thursday) and Friday, Saturday and Sunday. The primary cause of the weekend effect has been postulated in several analyses as the change in motor vehicle emissions patterns both in space and time as the weekend progresses. In general the postulation is as follows: Extended commuting on Friday night coupled with a later start to the morning commute on both Saturday and Sunday gives rise to a more reactive pollution cloud; the reactive pollutant cloud generates ozone concentrations earlier in the day, reaching peak concentrations at a faster pace. In addition, the weekend effect is most notable nearby the emissions source areas.

Three scenarios were simulated to test the impact of the weekend effect on transport of ozone to Santa Clarita. First, the August SCOS97 ozone meteorological episode was simulated assuming the August 4 through 7, 1997, episode took place on a Friday through Monday rather than a Monday through Thursday as it was observed. For this simulation, August 5 was assigned the Saturday emissions profile and August 6 the Sunday emissions profile. The analysis was repeated moving the start date (August 4) to a Thursday, placing August 6 as the Saturday and August 7 as Sunday. A third simulation was conducted placing August 4 on a Wednesday so that the August 7 was treated as a Saturday.

The reasoning for this rotation was to test the weekend effect when the Friday emissions were placed in different meteorological scenarios. In the first simulation, the Friday meteorology was classified as a weak transport day. The second simulation placed Friday as a local transport day. For the third simulation the Friday was classified as an average transport scenario.

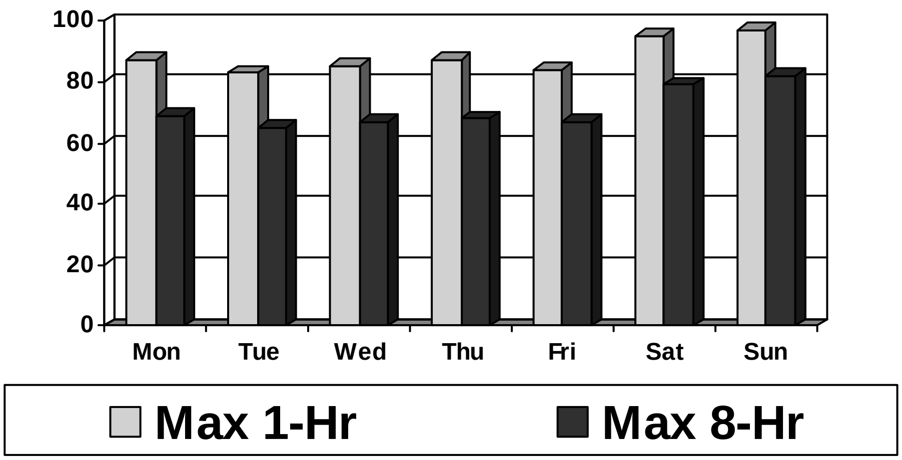

FIGURE 3-3

2001-2003 Average Santa Clarita Daily Maximum 1-Hour Average Ozone Concentration (ppb)

The results of the weekend simulations for the Santa Clarita modeling area are presented in Table 3-4. The analysis indicated that on weekend days experiencing average transport, ozone concentrations could increase by as much as 23 percent over weekdays. Under weak or local transport conditions, the weekend effect would be negated.

TABLE 3-4

Simulated Weekend Change in Ozone Concentration from Weekdays at Santa Clarita

Transport Regime	**Percentage Change in Ozone Concentrations**
Local	-6.5
Weak	-3.3
Average	+ 22.9

4.0 PARTICULATE SIMULATIONS: CURRENT IMPACTS

PM10 and PM2.5 are comprised of several components which are associated with a variety of sources. Sulfate, nitrate and organic particulate are mostly associated with urban smog that is transported to Santa Clarita and comprise the bulk of the fine particulate PM2.5 mass. Elemental carbon (including diesel soot) together with roadway and construction dust have local emissions source contributions as well as the urban signature. This is clearly observed in Santa Clarita where traffic generates re-entrained road dust and diesel soot and construction projects are widespread.

Air quality modeling simulations were conducted to examine the relative contributions of smog transport and local source emissions to the PM10 impact on Santa Clarita. The modeling analyses were conducted to answer specific questions including:

- What is Santa Clarita's contribution to local PM10 and PM2.5 levels?
- What will be the impact of valley growth on PM10 air quality?
- What will be the impact of the Cemex/TMC mining operations on PM10 air quality

4.1 PM10 Gradient

Figure 4-1 depicts the 2002 simulated annual average PM10 concentration for the Santa Clarita Valley. The peak particulate concentrations are well represented by the air monitoring site (grid 17,29) where the southern and central portions of the city experience the highest concentrations. The concentration drops significantly in the northern third and eastern portion of the city. The easternmost edge of the city is roughly 18 $\mu g/m^3$ cleaner than the central portion of the city. The highest PM10 concentrations occur nearby the traffic arteries where road dust is a major contributing factor. Localized hot-spots for particulate emissions are also observed and correspond to construction activities and mining in the valley. The valley, overall, is in compliance with the federal annual average PM10 standard.

4.2 Santa Clarita's Contribution to Observed PM10 and PM2.5

A series of annual air quality simulations was conducted to assess the local Santa Clarita emissions contribution to its observed PM10 air quality profile. The UAMAERO-LT regional particulate simulation model used in the 2003 AQMP annual PM10 modeling analyses was simulated for the 2002 modeling inventory (see Table 3-1) and the AQMP modeling domain. The Santa Clarita Valley subset of the 5 square kilometer modeling domain is evaluated for this portion of the analysis.

The UAMAERO-LT simulation model provides predictions of both PM10 and the PM2.5 fraction. While PM2.5 is not routinely measured in the Santa Clarita Valley, the model predictions are driven by the regional emissions and they afford a perspective of the expected local impact. A first simulation removed all area source emissions from the city of Santa Clarita (but included the mobile source contribution). A second simulation doubled the mobile source emissions over the current level while leaving the area source emissions unchanged.

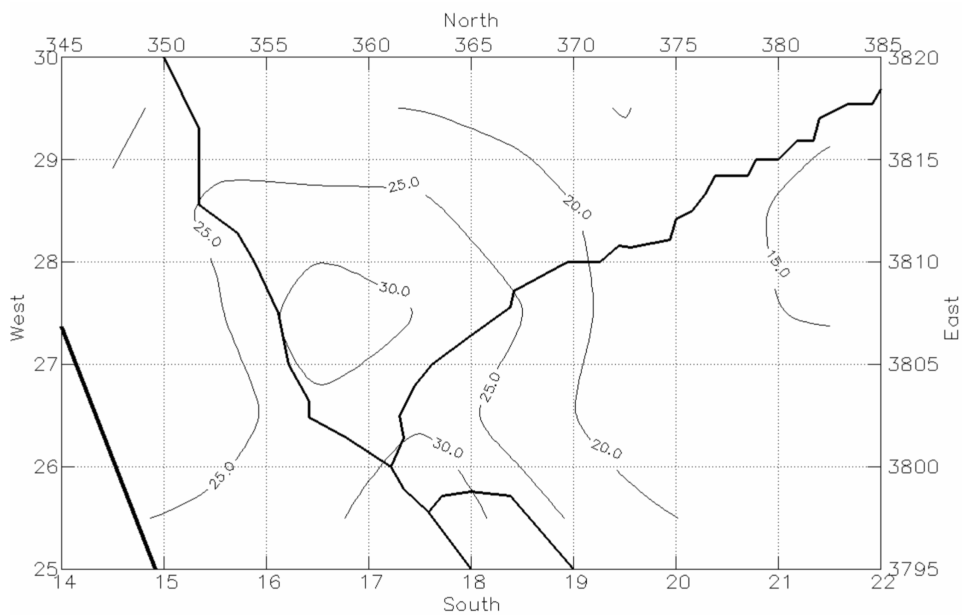

FIGURE 4-1

2002 Simulated Annual Average Santa Clarita PM10 (µg/m3)

While construction contributes to a portion of the mobile source emissions, its direct impact is in the area source category. By taking the area source emissions out of Santa Clarita, an estimate can be made of the impact of current (2002) construction to dust levels in the area. Doubling the mobile source emissions provides an estimate of the impact of growth on the community after the construction activities have stabilized. The impact of future construction emissions on Santa Clarita particulate air quality is addressed separately, and discussed in a later section of this document.

Table 4-1 summarizes the results of these sensitivity analyses. From the 2003 AQMP air quality simulations, PM2.5 accounts for roughly 57 percent of the PM10 total mass concentration in the city of Santa Clarita. When area source emissions were removed from the city of Santa Clarita, the PM10 concentrations were projected to decrease by an average of 10 percent. For the same emissions scenario, PM2.5 concentrations were predicted to decrease by approximately 7 percent. When mobile source emissions were doubled, only a nominal increase in PM10 and PM2.5 concentrations was predicted. What can be inferred from these analyses is that current construction activities are an identifiable contributor to particulate levels in the community; however, the overwhelming contribution is from upwind transport.

In addition, growth within the valley (excluding direct construction emissions or mining activities) will have a nominal impact on air quality.

TABLE 4-1

Annual Particulate Air Quality Simulation Sensitivity Analyses Summary: Percentage Change in Concentration from 2002 Base Emissions

	No Area Sources	**Doubled Mobile Source Emissions**
PM10	-10 %	+1%
PM2.5	-7%	+2%

5.0 PARTICULATE SIMULATIONS: CONSTRUCTION AND DEVELOPMENT

A significant portion of the analysis was directed towards determining the impact of future construction on PM10 air quality in the Santa Clarita Valley. The AQMP 2006 and 2010 future year projections of air quality in the Santa Clarita Valley reflect the growth estimates provided by the Southern California Association of Governments (SCAG). Regardless, the Santa Clarita Valley is not expected to complete its build-out by 2010. City growth estimates expect place construction activities continuing over the next 25 to 30 years. Included in this estimate is the development of Newhall Ranch which will produce more than 21,000 homes before the project is completed. In the short term, mining activities from the Soledad Sand and Gravel Mining Project (Cemex/TMC) located to the east of the city are expected to commence mid-decade and expand operations at an accelerated rate thereafter. This will result in increased local particulate emissions.

Two sensitivity analyses were conducted to estimate the potential impacts of construction and mining to the air quality profile. These included simulating (1) the simultaneous build-out of all recorded, pending and approved land parcels in the valley over a 25-year period and (2) the phased development of the Cemex/TMC mining operations. The 25-year build-out of the valley was simulated to determine the additional annual impact on PM10 air quality that would be added to the current profile. It is noted that the simultaneous build-out of all parcels over the 25-year period is unlikely; however, this estimate places and upper bound on the estimated PM10 impact.

5.1 Emissions for the Twenty-five Year Build-Out

Residential construction growth and associated PM10 emissions were determined for each available land parcel by scaling development on an acreage basis to the profile of development determined for the Newhall Ranch project. PM10 emissions from multi-dwelling, commercial and industrial development were scaled on an acreage basis and then allocated based on required time estimated for building construction (e.g. a commercial dwelling requires 1 year to complete construction). Figure 5-1 depicts the distribution of parcel tracts in the study area with the modeling grid overlaid. CARB construction emissions factors were used to translate development into PM10 emissions. The phased and maximum allowable PM10 emissions for the Cemex/TMC mining operations were extracted from the project's Final Environmental Impact Statement (EIS) and the Consent Decree settlement document in the lawsuit Cemex v. County of Los Angeles (Case Number CV-02-747 DT).

Figure 5-2 depicts the daily PM10 emissions expected to result from the projected 25-year build-out of the Santa Clarita Valley overlaid on the modeling grid. The daily PM10 emissions total just over 3 tons per day in the Valley. As an example of the diversity of the development, Table 5-1 lists the tracts that contribute to the construction estimation and their status for development for grid 19,29. Fifteen tracts covering 1,567 acres of land in the 5 square kilometer grid are projected to contribute 337 lbs of PM10 emissions on a daily basis.

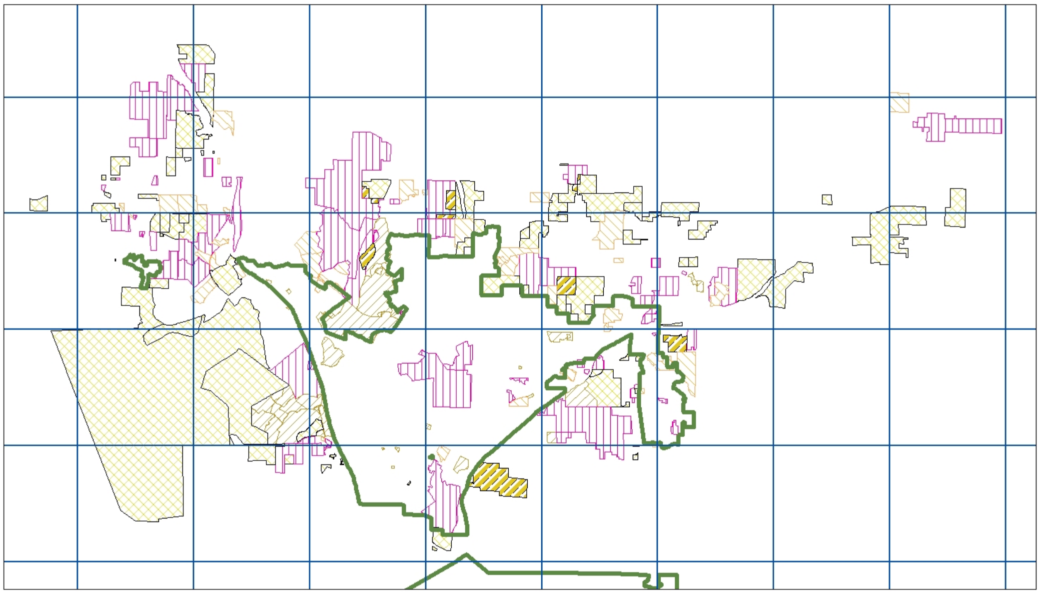

FIGURE 5-1

Santa Clarita Land Parcel Subdivisions

j \ i	*15*	*16*	*17*	*18*	*19*	*20*	*21*	*22*
30	**387**	**130**	**182**	**62**	**101**	**18**	**7**	**99**
29	**365**	**411**	**378**	**288**	**337**	**143**	**81**	**42**
28	**552**	**383**	**90**	**101**	**273**	**46**	**0**	**0**
27	**227**	**44**	**15**	**266**	**13**	**0**	**0**	**0**
26	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

FIGURE 5-2

25-Year Build-Out Grid Level PM10 Emissions (lbs/day)
(Grid coordinates are listed as italics)

TABLE 5-1

Parcel Tracts Contributing PM10 Emissions in Grid 19,29 (Shaded in Figure 5-2)

TRACT	STATUS	ACRES
44967	RECORDED	338
45416	RECORDED	115
46353	APPROVED	65
46626	RECORDED	79
46716	APPROVED	30
49024	PENDING	37
49621	APPROVED	9
50467	PENDING	58
50846	PENDING	477
52194	PENDING	63
52355	APPROVED	33
52777	PENDING	79
52790	APPROVED	53
52990	PENDING	79
53074	APPROVED	52

5.2 PM10 Emissions from the Cemex/TMC Mining Site

As previously stated, PM10 emissions from the Cemex/TMC mining site reflect the projected routine operation and maximum allowable levels of production for two scheduled, phase-in periods. The emissions for the mining site (located in grid 21,29) were extracted from the Final EIS for the project. For all scenarios, the mining site was assumed to operate on a Monday through Friday schedule for 16 hours a day. Figure 5-3 depicts the topography of the Cemex/TMC mining site in reference to the surrounding area.

Mining operations were projected to occur in two phases: Phase I, years 1-10; and Phase II, years 11-20. The PM10 emissions for Phase I were estimated at 445 lbs/day. Phase II emissions were estimated at 641 lbs/day. As part of the Concent Decree settlement document, a maximum allowable PM10 emissions rate of 761 lbs/day was included in the finer scaled PM10 analysis. This rate reflected a maximum allowable production rate of five million tons of excavation per year. All mining emissions were allocated to grid 21,29 for the analysis.

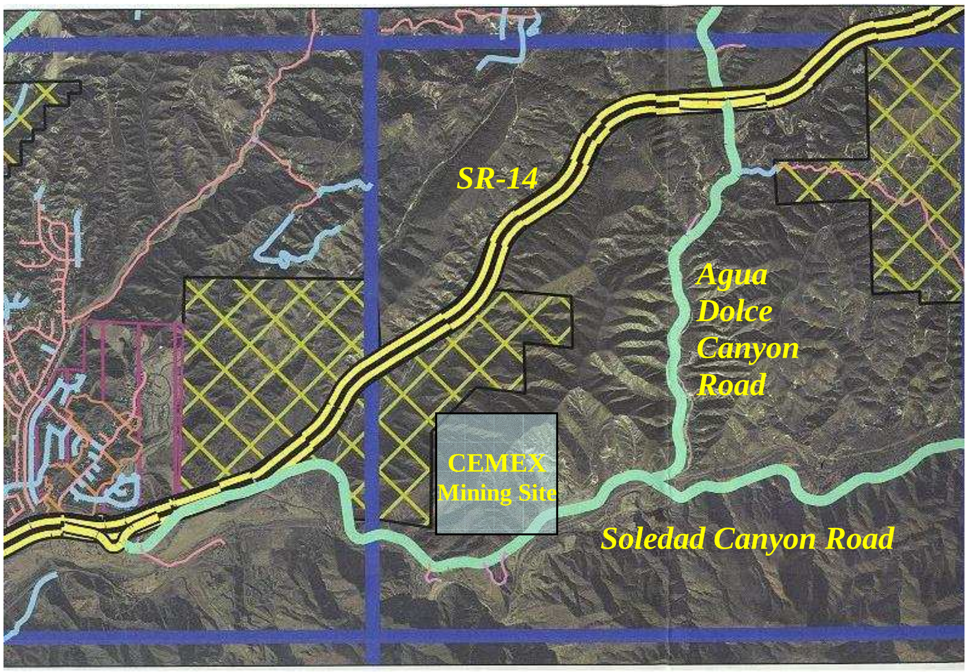

FIGURE 5-3

Cemex/TMC Mining Site in Soledad Canyon

5.3 Projected Future Year Impacts from Sensitivity Analyses

The projected PM10 impacts from the 25-year build-out and the two phases of mining operations were simulated to determine the upper bounds of additional PM10 that would be expected to impact the Santa Clarita Valley in the near term (1-10 years) and long term (10-20 years). The additional PM10 impacts from the 25-year build-out and the Phase I mining operation are presented in Figure 5-4. A maximum increase in annual PM10 concentration of 5 $\mu g/m^3$ is projected from the 25-year build-out. The predicted impact of the Cemex/TMC mining operation is approximately 2 $\mu g/m^3$, focused on the immediate area surrounding the mine. When the mining operation shift to Phase II, the impact will increase to 3 $\mu g/m^3$; however, there will be no net change in the impact caused by the 25-year build-out.

Figure 5-5 combines the projected 25-year annual build-out and Phase I mining operations PM10 impacts with the observed 2002 concentrations. Figure 5-6 repeats this process for the annual 25-year build-out impact and Phase II mining operations and the 2006 AQMP projected PM10 air quality. (While 2006 is within the Phase I time frame, future year modeling beyond 2006 shows little change in the spatial distribution and concentration levels in the Santa Clarita portion of the modeling domain; as a consequence 2006 is representative of the Phase-II projected PM10 baseline). As depicted, the federal PM10 standard would not be exceeded with the proposed build-out or development of the mining site in either the near-term or long-term analysis. PM10 air quality would exceed the more protective California standard in both scenarios.

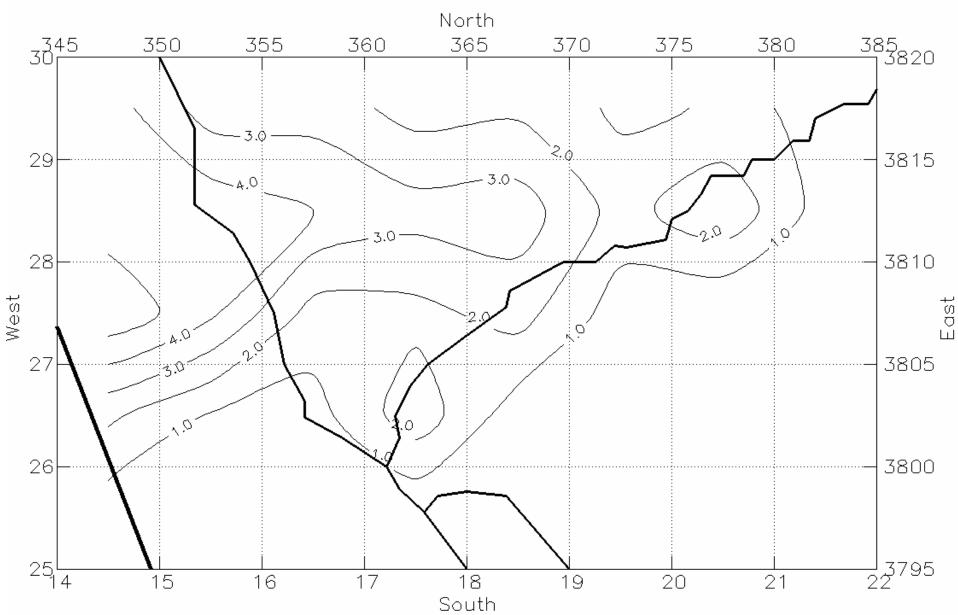

FIGURE 5-4

Simulated Annual PM10 Impact (μg/m^3): 25-Year Build-Out & Phase I Mining

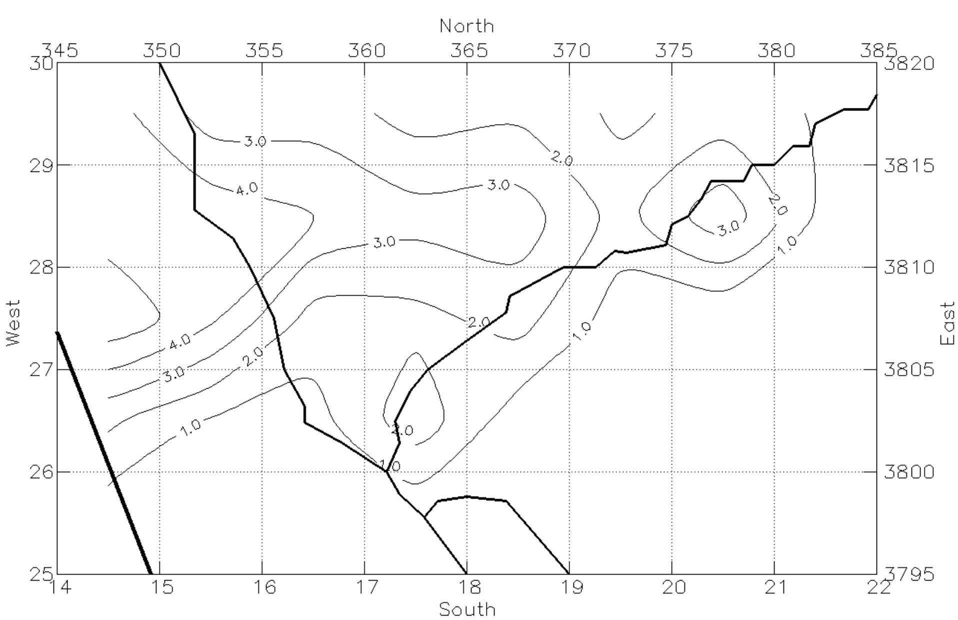

FIGURE 5-5

Simulated Annual PM10 Impact (μg/m^3): 25-Year Build-Out & Phase II Mining

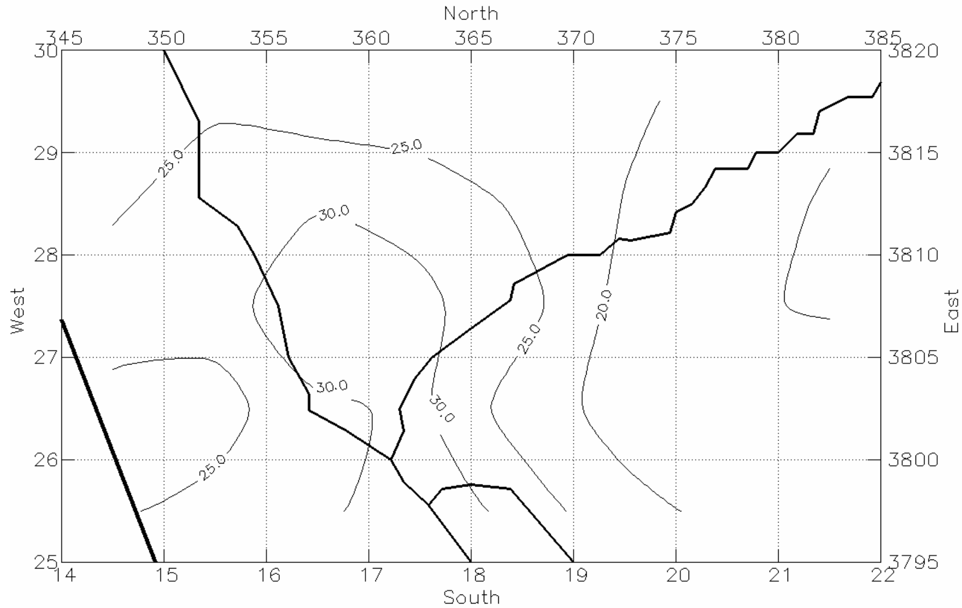

FIGURE 5-6

Simulated 2002 Annual PM10 (µg/m³) With Build-Out and Phase I Cemex/TMC Mining

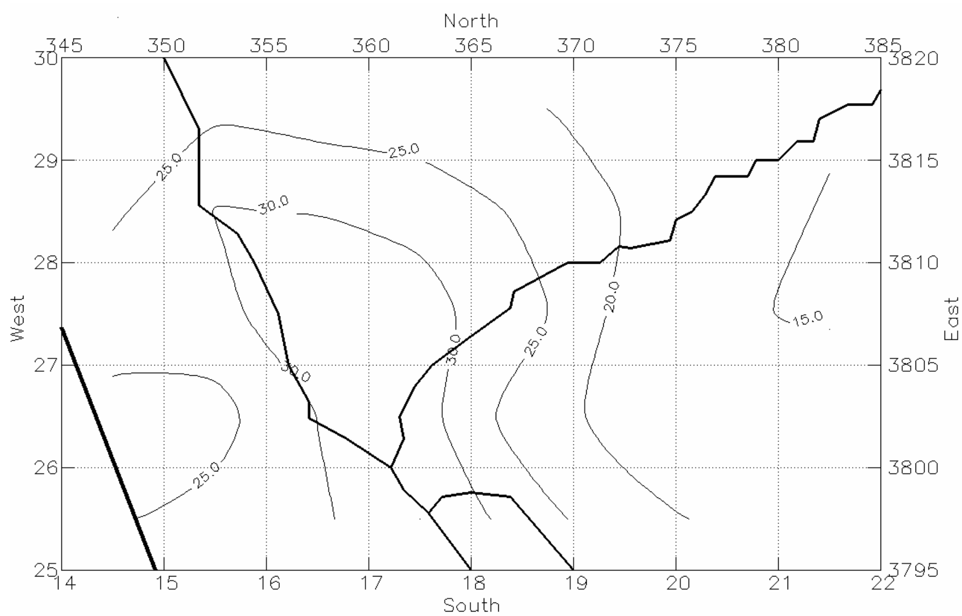

FIGURE 5-7

Simulated 2006 Annual PM10 (µg/m³) With Build-Out and Phase II Cemex/TMC Mining

5.4 Simulating Cemex/TMC Emissions at a Finer Scale of Resolution

The preceding PM10 simulations provided the regional impacts due to growth and development of the Cemex/TMC mining site. However, the 5 square kilometer grid resolution does not lend itself to determining the local impacts from the mine operations to nearby sensitive receptors of PM10. A second sensitivity modeling simulation analysis was conducted to determine the finer scale gradient of projected PM10 impact. This analysis used the U.S. EPA ISCST3 point source model to simulate mining operations and determine the offsite impacts at a grid resolution of 500 meters. Annual average PM10 concentrations were calculated for each grid intersection or "flag pole" emanating from the mine boundary at 500 m intervals out to 5 km.

Figure 5-8 depicts the mining site with the 500 m and 5 km grid overlaid. The closest residential dwelling is located approximately 500 m to the south of the mining site and the nearest sensitive receptor (school) is located approximately 4,500 m to the west of the mining site.

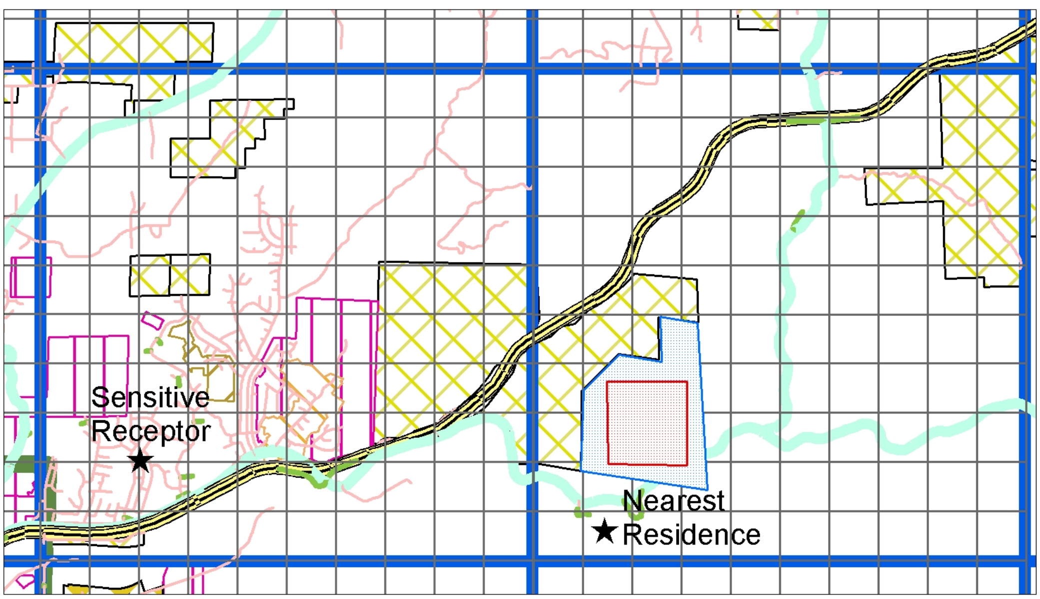

FIGURE 5-8

Cemex/TMC Mining Site With Flag Pole Grid

The simulation was conducted for a one-year period using both urban and rural meteorology developed for the mining site from the 1998-99 MATES-II meteorological modeling data. In general, simulations using a Gaussian model in the Basin are conducted using the urban meteorological assumption. Due to its unique topography, the Santa Clarita Valley was simulated using both the urban and rural meteorological assumptions to bound the analysis.

Table 5-2 summarizes the results of the simulations. As expected, the modeling analysis using the rural meteorological option produced the highest impacts to the community with concentrations projected to reach approximately 18 µg/m^3 at the fence line. The maximum impacts to the nearest residence and nearest sensitive receptor (Phase II using the rural option) were calculated at 12.5 and 0.2 µg/m^3 respectively. When the flag pole concentrations were averaged over the 5 square km grid (21,29), the average impact was consistent with that simulated using the AQMP modeling platform. In all of the scenarios, including the rural maximum allowable case, the projected impact added tot he baseline PM10 would not result in a violation of the federal annual average standard.

TABLE 5-2

ISCST3 Simulated PM10 Impacts (µg/m^3) from Cemex/TMC Mining Site

Impacted Receptor	**Phase I**		**Phase II**		**Maximum Allowable**	
	Urban	Rural	Urban	Rural	Urban	Rural
5-Km^2 Grid Average	1.4	3.1	2.0	4.5	2.6	5.7
Fence Line	4.2	12.2	6.0	17.6	7.7	22.3
Nearest Residential	2.9	8.7	4.2	12.5	5.3	15.9
City Line - Canyon Country	0.3	0.7	0.4	1.0	0.5	1.3
Northeast Modeling Region	0.2	0.4	0.3	0.6	0.4	0.7
Nearest Sensitive Receptor	0.1	0.2	0.1	0.2	0.2	0.3

6.0 RISK FROM DIESEL PARTICULATES

The final phase of the analysis focused on the potential toxic impact or "risk" that could arise from the development of the Cemex/TMC mining site due to emissions of diesel particulate, both from in-situ operations and from gravel hauling offsite.

Risk is expressed as a probability of the development of excess cancer cases to the community based upon a lifetime (70 years) of exposure. The 1999 Multiple Air Toxics Exposure Study II (MATES II) analysis conducted for the South Coast Air Basin estimated that the Santa Clarita average community risk from all sources of toxic emissions was approximately 500 in million. (The basin-wide average estimated by MATES II exceeded 1,400 in one million). Exposure to diesel particulates was the major driver of risk to the community.

Diesel particulates have been shown to have a unit risk factor of 300 in one million for every 1.0 $\mu g/m^3$ of exposure. As a consequence, even comparatively small emissions can have a significant increased risk to the community. For comparison purposes, AB2588-Air Toxics "Hot Spots" Program notification and risk reduction levels are 10 and 25 in one million. Risk is presented in this analysis for both the urban and rural meteorological assumptions. In general, the SCAQMD uses the urban meteorological mode for hazardous risk assessments. Since the Santa Clarita Valley has a rural component, the simulations were conducted for the rural mode as well as the urban model. The assessment of risk using the two meteorological assumptions places an upper bound on the expected risk to the community.

6.1 In-Situ Mining Operations

Table 6-1 provides the Final EIS estimated annual diesel emissions rates for the various operations option and load considerations for the Cemex/TMC mine. Note: emissions for Phase II operations decrease compared with Phase I. This reflects the implementation of federal and California diesel control measures later in this decade. The diesel emissions were used to scale the ISCST3 predicted point source impacts to determine risk to the community neighboring the mining site. The results of the analysis are presented in Table 6-2.

TABLE 6-1

Diesel Particulate Emissions From Cemex/TMC Mine

Operation Option	**Annual Emissions Rate**
Phase I	1,528 lb/yr
Phase I Maximum Allowable	3,043 lb/yr
Phase II	1,431 lb/yr
Phase II Maximum Allowable	1,817 lb/yr

TABLE 6-2

ISCST3 Simulated Risk from Diesel Particulate from Cemex/TMC Mining
(Increased Probability of Excess Cancers Per Million People Exposed)

Impacted Receptor	Phase I				Phase II			
	Average Operations		Maximum Allowable		Average Operations		Maximum Allowable	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Fence Line	16	47	32	93	15	44	18	52
Nearest Residential	11	33	22	66	10	31	12	37
City Line - Canyon Country	1	3	2	6	1	2	1	3
Northeast Modeling Region	1	2	2	4	1	1	1	2
Nearest Sensitive Receptor	0	1	1	2	0	1	0	1

The maximum risk predicted by the model simulation occurs at the fence line of the mining site for the Phase I maximum allowable emissions scenario and the rural meteorology option. The maximum predicted risk to the nearest residence exceeds the 25 in one million criteria required for implementing risk reduction measures for the rural meteorology scenarios. However, when the impacts are estimated for the Santa Clarita city line and the nearest sensitive receptor (i.e. school), regardless of the emissions rate or meteorology, the risk falls below 10 in one million. Figure 6-1 depicts this tight gradient of impact for the rural meteorological mode, this time drawn over the two square kilometer grid used for the MATES II analysis. Impacts offsite quickly dissipate with distance from the Cemex/TMC Soledad Canyon facility.

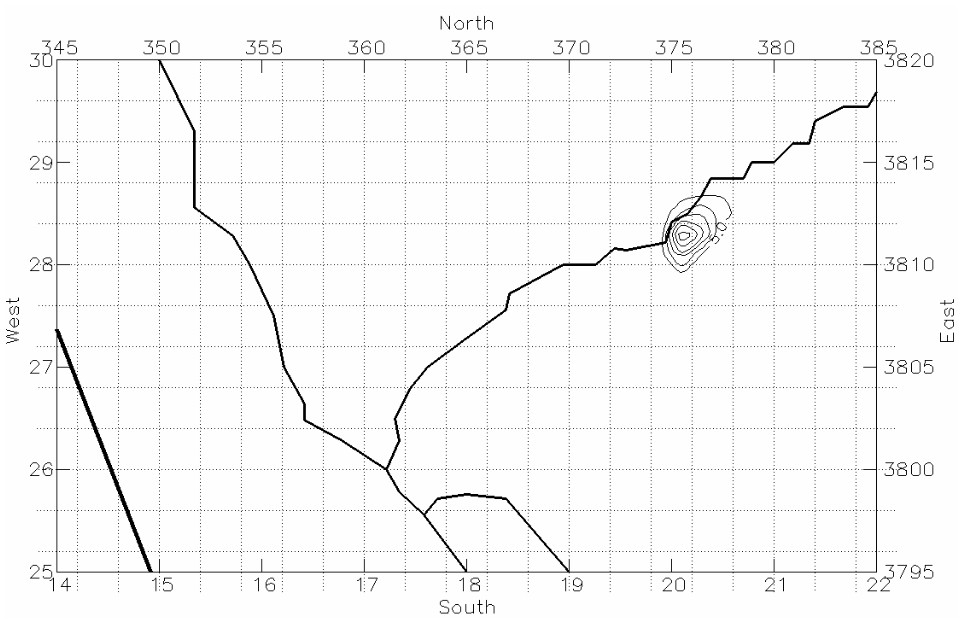

FIGURE 6-1

ISCST3 Phase I Simulated Diesel Risk From Cemex/TMC Mine Operations: Rural Mode (Increased Probability of Excess Cancers Per Million People Exposed)

6.2 Gravel Hauling Operations

The simulation of risk due to diesel emissions was not limited to in-situ operations but extended beyond the mine due to gravel hauling through the Santa Clarita Valley to local end users and recipients in adjacent valleys. Based upon assumptions provided in the Final EIS, Phase I gravel hauling from the mine will result in 347 round trips by heavy-duty diesel trucks. Phase II will see an increase to 582 round trips. The truck hauling operations are expected to continue 24 hours a day with truck traveling at an average speed of 45 mph. Emission rates for heavy-duty diesels operating under these two travel scenarios (Phase I, 0.312 grams/mile; Phase II, 0.185) were extracted from the CARB EMFAC2002 emissions factor model.

Note again, the emissions rate for Phase II operations is lower than for Phase I reflecting the required introduction of cleaner vehicles and fuels. As a consequence, the daily emissions rate (truck trips multiplied by the appropriate diesel emissions factor) for Phase I and Phase II gravel hauling operations are essentially equal. Since the difference between the estimated daily emissions rates is nominal, (Phase I being slightly higher), the projected Phase I risk from diesel truck hauling operations stands as a baseline for this analysis and is the only assessment presented.

If the option is exercised to expand gravel production to the maximum allowable rate provided in the Consent Decree, then hauling and the number of truck trips is expected to increase accordingly. Phase I projected risk due to diesel truck emissions under the maximum allowable production rate is estimated to increase by approximately 70 percent over the baseline while Phase II projected risk is estimated to increase by approximately 19 percent over the baseline.

The EIS provided some direct guidance on the direction of truck hauling with 95 percent of the transit moving west towards Santa Clarita and San Fernando Valleys and 5 percent routed east towards the Antelope Valley. However the truck routing through the Santa Clarita Valley was not explicitly provided. Based on estimates of population growth rates and estimates of future aggregate consumption (EIS Table 1.1-3), it was assumed that 54 percent of the westward-bound hauling would be earmarked for the San Fernando Valley traveling exclusively along SR 14. The remaining 46 percent of the westward-bound hauling would fill the needs of the Santa Clarita Valley and would be split between routes including SR 14 and Soledad Canyon Road. Gravel hauling was assumed to extend as far west as the Newhall Ranch development.

Meteorological data sets for four representative locations in the Santa Clarita Valley and the ISCST3 dispersion model were used to calculate diesel impacts to the Santa Clarita Valley for both urban and rural modes. The impacts were calculated for a one kilometer grid for each meteorological data set and the results were merged to provide a mapping of probable diesel impacts and risk to the Valley.

Figure 6-2 depicts the estimated baseline risk from truck hauling for the urban meteorological assumption. In isolated areas, risk exceeds 10 in one million with the maximum impact occurring along the SR 14 freeway. When the less dispersive rural meteorological assumption is used, the impacts increase along the SR 14 corridor and expand along Soledad Canyon Road. (See Figure 6-3). The highest estimated risk for both model simulations occurs near the SR 14 - Soledad Canyon Road separation with a maximum of 25 in one million for the rural meteorological option. In addition the maximum risk to a sensitive receptor occurs within one kilometer of the SR 14 freeway with values of 7 in one million for the urban meteorological mode and 20 in one million for the rural mode.

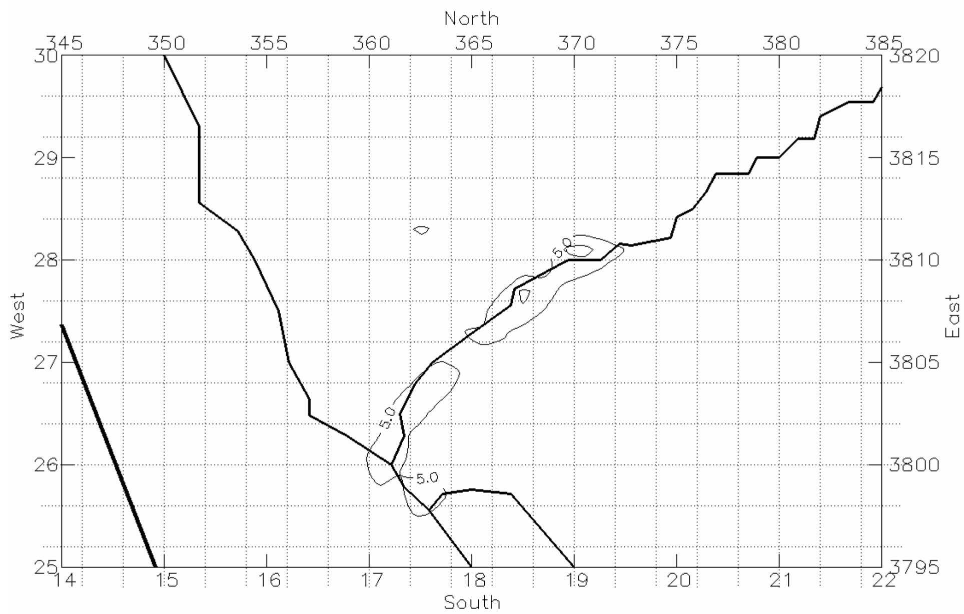

FIGURE 6-2

Simulated Baseline Diesel Risk from Cemex/TMC Gravel Hauling Operations: Urban Mode (Increased Probability of Excess Cancers Per Million People Exposed)

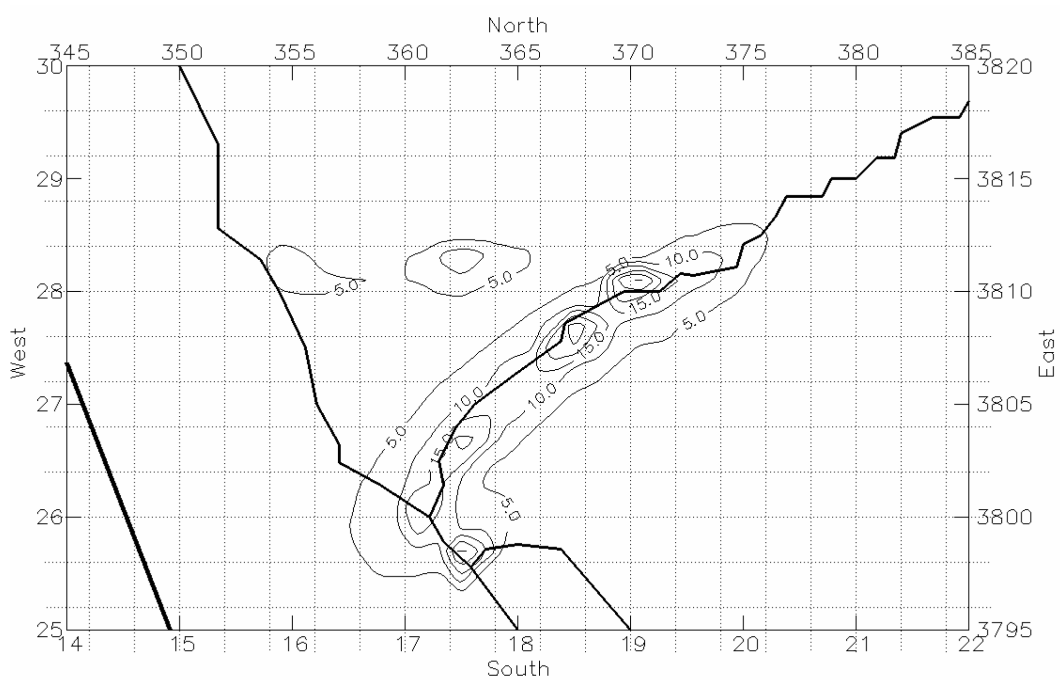

FIGURE 6-3

Simulated Baseline Diesel Risk From Cemex/TMC Gravel Hauling Operations: Rural Mode (Increased Probability of Excess Cancers Per Million People Exposed)

6.3 Merged Diesel Risk: Mining and Gravel Hauling Operations

Figure 6-4 shows the simulated baseline risk when the mining and gravel hauling operations are merged (for the rural meteorological assumption). Because of the localized impact caused by the in-situ mining operations, there is very little overlapping risk caused by the hauling operations. As a consequence, the results of the risk assessment reported through the table and graphics in the two previous sections do not change significantly when the analyses are merged.

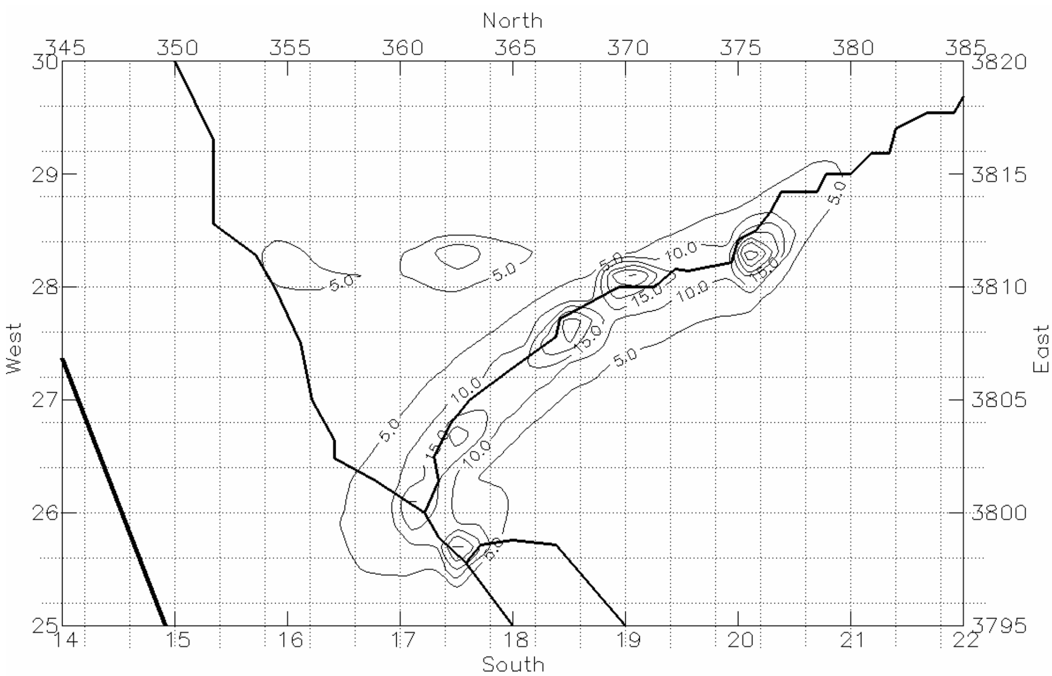

FIGURE 6-4

Merged Baseline Diesel Risk From Cemex/TMC Mining and Gravel Hauling Operations: Rural Mode (Increased Probability of Excess Cancers Per Million People Exposed)

7.0 POTENTIAL MITIGATION ACTIONS

The City of Santa Clarita is drafting an aggressive air quality element to its General Plan that will contain many potential mitigation measures to offset the air quality impacts associated with growth and regional transport of smog. The draft element includes measures that address traffic flow through the Valley, the use of alternatively fueled city vehicles and refueling stations, and rideshare programs, among others that address the city's commitment to reducing regional smog. Two bullet lists follow which provide potential additional mitigation measures that specifically address impacts from the issues of PM10 fugitive dust associated with growth and diesel mobile source emissions from the development of the Soledad Canyon mining site.

7.1 Potential Mitigation Measures for PM10 Fugitive Dust

Rule 403-Fugitive Dust provides a comprehensive list of dust control measures. Required control measures and recommended guidance measures that go beyond the requirements of Rule 403 can be implemented to mitigate fugitive dust emissions during construction and operation of aggregate handling facilities. For example, where Rule 403 identifies an option for implementing several control measures, mitigation measures can include several or all of the control measures and recommended guidance. In addition, mitigation measures can also include increasing the frequency of measures, such as watering, to go beyond the recommended guidance under Rule 403.

- Installation of monitoring devices around perimeter of site to collect samples during the construction and operation of the project to ensure that the PM10 levels do not exceed 50 $\mu g/m^3$ pursuant to requirements under Rule 403.

- Signs posted with a phone number for the public to report dust problems.

- Apply water three times daily, or non-toxic soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging areas or unpaved road surfaces (compared to watering twice daily as the minimum required by Rule 403).

- Pave construction roads that have a traffic volume of more than 50 daily trips by construction equipment, 150 total daily trips for all vehicles (compared to watering twice daily as the minimum required by Rule 403).

- Pave all construction access roads at least 100 feet onto the site from the main road (for sites $\leq$ 5 acres or $\leq$ 100 cubic yards daily import/export of bulk material).

- Pave construction roads that have a daily traffic volume of more than 50 vehicular trips (compared to watering twice daily as the minimum required by Rule 403).

7.2 Potential Mitigation from Diesel Mobile Sources

- Use of aftertreatment control technologies such as diesel oxidation catalysts.
- Use of alternative diesel fuels such as emulsified diesel fuel.
- Provide a minimum buffer zone of 300 meters between truck traffic and/or and sensitive receptors.
- Re-route truck traffic by adding direct off-ramps for the truck traffic or by restricting truck traffic on certain sensitive routes.
- Improve traffic flow by signal synchronization.
- Enforce truck parking restrictions.
- Develop park-and-ride programs.
- Restrict truck engine idling.
- Restrict operation to “clean” trucks.
- Provide electrical hook-ups for trucks that need to cool their load.
- Electrify auxiliary power units.
- Provide onsite services to minimize truck traffic in or near residential areas, including, but not limited to, the following services: meal or cafeteria service, automated teller machines, etc.
- Require or provide incentives to use low-sulfur diesel fuel with particulate traps.
- Conduct air quality monitoring at sensitive receptors.