San Luis Obispo County
Air Pollution Control District

Particulate Matter Report
Implementation of SB 656 Requirements

July 27, 2005

Executive Summary

Reducing particulate matter (PM) air pollution is one of the San Luis Obispo County Air Pollution Control District's (APCD or District) highest public health priorities. Exposure to particulate pollution is linked to increased frequency and severity of asthma attacks, pneumonia and bronchitis, and even premature death in people with pre-existing cardiac or respiratory disease. Those most sensitive to particle pollution include infants and children, the elderly and those with heart and lung disease. PM consists of very small solid and liquid particles suspended in the air; it includes particles smaller than 10 microns in size (PM_{10}) as well as the subset of fine particles smaller than 2.5 microns in size ($PM_{2.5}$). Particles with sizes between 2.5 and 10 microns are often referred to as coarse particles. The small size of $PM_{2.5}$ allows them to penetrate deep into the respiratory system, entering the blood stream and even passing through cell walls into structures within cells; this causes them to have a more direct and harmful health impact than the coarse fraction of PM_{10}.

San Luis Obispo (SLO) County is designated nonattainment for the state PM_{10} standard. Violations of the state standard continue to occur throughout the County several times a year. In general, the PM_{10} and $PM_{2.5}$ levels measured in SLO County result from human and natural sources and processes within and closely adjoining the county. The PM_{10} monitoring network in SLO County consists of six samplers located in Paso Robles, Atascadero, Morro Bay, San Luis Obispo, and two locations in the Nipomo area; $PM_{2.5}$ monitors are located at Atascadero and San Luis Obispo. Monitoring for PM_{10} and $PM_{2.5}$ occurs every sixth day in SLO County on a common nationwide schedule. As a result, it is estimated that the actual number of standard violations is about six times the reported count, though the true number of violations for any 365-day year is always somewhat uncertain. Between 1990 and 2003, District monitors measured an average of 15 exceedances of the state PM_{10} standard per year. Based on the sampling schedule described above, this is equivalent to an average of 90 days per year on which the health based standard for PM_{10} was exceeded in our county.

In 2003, the California Legislature enacted Senate Bill 656 (Sher) to reduce public exposure to particulate matter (PM_{10} and $PM_{2.5}$ -- collectively referred to as PM). SB 656 outlines an expeditious timeline for both the state and local air districts to follow. By January 1, 2005 the California Air Resources Board (ARB) was required to work in consultation with local air pollution control districts and adopt a list of PM reduction strategies. The list of measures must be the most readily available, feasible, and cost-effective control measures that could be employed by ARB and the air districts to reduce PM levels with the goal of making progress toward attainment of State and Federal PM_{10} and $PM_{2.5}$ standards. In addition, SB 656 also requires air districts throughout California to adopt a list of PM control strategies along with an implementation schedule for these measures by July 31, 2005.

This report describes the legislative directive and the steps taken by the District to meet the requirements of SB 656 and develop a list of control strategies with the associated rulemaking timeline to reduce PM from local sources. To provide adequate background on the issues, a summary of PM is included in Chapter 1 that outlines the State and

Federal air quality standards along with the health and environmental impacts of this pollutant. Chapters 2 and 3 provide a characterization of PM emissions and ambient concentrations in SLO County, including a summary of air quality trends gathered from the District's air monitoring network and a countywide inventory of PM emissions generated by local emission sources. Chapter 4 focuses on the control strategies and related implementation schedule recommended for Board adoption; it outlines the process and criteria used to evaluate the strategies and describes each control measure recommended for future rule adoption.

Each proposed control strategy recommended for future implementation will be subject to the APCD's rule adoption process that includes public notice and review, explanatory workshops, public hearings for Board consideration and approval, and CARB approval. Under SB 656, each air district is allowed to tailor its implementation schedule to its individual PM problem. Prioritization of the control strategies proposed for our county was based on the effect individual measures will have on health, air quality, emission reductions and cost-effectiveness using currently available data. A more refined and comprehensive analysis of these factors will be conducted during the rule adoption process for each measure.

Proposed PM Control Strategies and Rule Adoption Dates

Control Strategy	Specific Control Measure and Reported Cost-Effectiveness (C/E) if provided by ARB or respective Air District
2006 Rule Adoption Date	
Burn Measures	Modify APCD Rule 501 to establish the following: - permit system for residential green waste burning that occurs outside the URL/VRLs - prohibit burning within 1000 feet of Smoke Sensitive Sites that are located outside the URL/VRLs - prohibit the burning of poison oak *(C/E can not be calculated with traditional cost-effectiveness criteria)*
Refinery and Calciner Activities	Establish a regulation to reduce the sulfur dioxide emissions, the main secondary PM contributor in SLO County, from the coke calcining equipment ($1,155/ton of SO2 reduced)
Particulate Exhaust Concentrations	Combustion contaminants: - modify APCD Rule 403 C to limit combustion contaminants from 0.3 grains per dry standard cubic foot to 0.1 grain per cubic foot Grain loading: - modify APCD Rule 403 A to limit grain loading (PM exhaust concentration) from 0.3 grains per dry standard cubic foot to 0.1 grain per cubic foot *(There are no known sources that would be impacted by the proposed changes to Rule 403; however, the new standard might prompt some sources to improve their maintenance procedures or operational efficiency)* Visible emissions: - Modify APCD Rule 401 to further restrict visible emissions from 40% opacity to 20% opacity limit *(No significant costs are estimated due to this change)*
2007 Rule Adoption Date	
Storage, Handling and Transport of Petroleum Coke Coal and Sulfur	Establish a rule to limit opacity from operations to 10% for the handling of coke piles. Specific measures could include: - Best Available Control Measures (BACM) for any open piles of coal or sulfur - street-sweeping or limit silt loading on roads and truck exteriors with quarterly testing - paving and maintenance of roads - covers or slot-tops for transport trucks *(C/E ranges between $10,500 - $11,500 per ton of PM_{10} reduced)*
2007 - 2009 Rule Adoption Date	
Fugitive Dust	Establish requirements that would apply to a subset of the construction activities and open lands located throughout SLO County: - watering - chemical stabilizers / dust suppressants - track-out devices - enclosures / wind fencing for stockpiles *(C/E ranges from $300 per ton for a small site requiring only watering to $650,000 per ton for a site with stockpiles requiring 3-sided enclosures. During rule adoption time, the APCD will refine the specific measures to be considered and further analyze the C/E for each measure)*
2009 - 2010 Rule Adoption Date	
Unpaved & Paved Roads	Establish requirements that would apply to a subset of the unpaved and paved roads throughout SLO County: - speed limit reduction on unpaved roads - apply water, gravel or other dust suppressant - pave new and existing unpaved roads - PM_{10}-efficient street sweepers - apply soil stabilizers to unpaved road shoulders on existing paved roads with the highest average daily vehicle trips - road shoulder paving for all new or modified paved roads and add curbs and gutters to road shoulders *(C/E ranges from $126 for applying water to $554,000 for paving shoulders, curbs and gutters. During rule adoption time, the APCD will refine the specific measures to be considered and further analyze the C/E for each measure)*

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Chapter 1: Overview

1. *SB 656 Requirements*

In 2003 the California Legislature enacted Senate Bill 656 (SB 656, Sher), codified as Health and Safety Code (H&SC) section 39614, to reduce public exposure to PM_{10} and $PM_{2.5}$. SB 656 requires the California Air Resources Board (ARB), in consultation with local air pollution control districts, to develop and adopt by January 1, 2005 a list of measures designed to reduce PM_{10} and $PM_{2.5}$. The list must contain the most readily available, feasible, and cost-effective control measures that can be employed by ARB and the air districts to reduce PM_{10} and $PM_{2.5}$ (collectively referred to as PM), with the goal of making progress toward attainment of State and national health-based air quality standards. The list of measures is to be based on rules, regulations, and programs existing in California as of January 1, 2004 to reduce PM emissions from new, modified, and existing stationary, area, and mobile sources.

Under SB 656, ARB evaluated all the control measures, rules, regulations and programs that existed in California as of January 1, 2004 to reduce PM emissions from stationary, area and mobile sources statewide. After receiving comments from stakeholders and workshop attendees, the ARB successfully adopted a list of PM control measures at their November 19, 2004 Board meeting. In addition to identifying a wide variety of potential control strategies, ARB also provided cost-effectiveness information for measures where data was readily available. While these values need to be refined for each air district during the rulemaking process, they do provide general guidance on potential costs associated with different control strategies.

SB 656 further requires each air district to select applicable measures from the ARB list for local implementation; districts must adopt their own list of PM control measures and an implementation schedule by July 31, 2005. Finally, by January 1, 2009, the ARB must prepare a report describing actions taken to fulfill the requirements of the legislation as well as recommendations for further actions to assist in achieving the State PM standards. The bill requirements sunset on January 1, 2011, unless extended.

2. *Particulate Matter: Overview*

Particulate matter (PM) is a generic term used to describe a complex group of air pollutants that vary in size and composition, depending upon the location and time of its source. It is any material, except pure water, that exists in the solid, liquid or semi-volatile state in the atmosphere. The PM mixture of fine airborne solid particles and liquid droplets (aerosols) include components of nitrates, sulfates, elemental carbon, organic carbon compounds, acid aerosols, trace metals, and geological material. Some of the aerosols are formed in the atmosphere from gaseous combustion byproducts such as volatile organic compounds (VOCs), oxides of sulfur (SOx) and oxides of nitrogen (NOx). Airborne particles vary in size from coarse wind blown dust particles to fine particles that are directly emitted or formed chemically in the atmosphere. The EPA

document, "Air Quality Criteria for Particulate Matter,"[1] contains an extensive analysis of PM scientific information.

Federal and State Ambient Air Quality Standards

The United States Environmental Protection Agency (EPA) and ARB have adopted ambient air quality standards for PM_{10} and $PM_{2.5}$. California's standards are the most health protective standards in the nation, and are designed to provide additional protection for the most sensitive groups of people, including infants and children, the elderly, and persons with heart or lung disease.

The Federal 24-hour and annual health based ambient air quality standards for PM_{10} are 150 and 50 $\mu g/m^3$ respectively. The Federal 24-hour and annual standards for $PM_{2.5}$ are 65 and 15 $\mu g/m^3$ respectively. SLO County is in attainment for the Federal PM standards.

The considerably more stringent California 24-hour and annual health based ambient air quality standards for PM_{10} are 50 and 20 $\mu g/m^3$ respectively. The California 24-hour $PM_{2.5}$ standard has not yet been established, but is being considered at a level more stringent that the Federal 24-hour standard. California does have an annual $PM_{2.5}$ standard of 12 $\mu g/m^3$. SLO County is in attainment with the State annual $PM_{2.5}$ standard, but is nonattainment for California's 24-hour and annual PM_{10} standards. For more information on the County's PM attainment status, please reference Section 2.3 of this report.

Effects on the Environment

The fine particles that are linked to serious health effects are also a major cause of visibility impairment (regional haze) in many national parks. The term regional haze means haze that impairs visibility in all directions over a large area. Regional haze consists of sufficient smoke, dust, moisture, and vapor suspended in air to impair visibility. PM that is formed when gaseous pollutants react in the atmosphere contributes to regional haze. These particles often grow in size as humidity increases, further impairing visibility. Sources hundreds or even thousands of miles away can contribute to visibility problems at remote locations, such as the Grand Canyon. In many parts of the United States, the range of visibility has been reduced 70 percent from natural conditions. In the west, the visual range has been reduced over 60 percent. Haze currently reduces natural visibility in the West from approximately 140 miles to between 35 and 90 miles.[2]

3. *PM: Health Impacts*

Since 1996, there have been more than 800 new scientific studies published regarding the effects of airborne particulates on human health. Overall, the studies validate earlier research and confirm that inhalation of PM, especially fine particles, is associated with a

[1] U.S. Environmental Protection Agency, National Center for Environmental Assessment. 2004. Air Quality Criteria for Particulate Matter [Online]. Available at http://cfpub.epa.gov/ncea/cfm/partmatt.cfm (verified May 25, 2005).

[2] U.S. Environmental Protection Agency, Visibility web page: http://www.epa.gov/air/visibility/what.html (verified May 25, 2005).

wide range of significant health problems, including premature death; respiratory related hospital admissions and emergency room visits; aggravated asthma; acute respiratory symptoms, including aggravated coughing and difficulty in breathing; chronic bronchitis; decreased lung function (shortness of breath); and work and school absenteeism. New analyses show that long-term exposure can shorten lives by months or even years.

Particle size determines the deposition points within the respiratory system and thus is directly related to the nature and severity of health effects from exposure. Particles larger than 10 microns in aerodynamic diameter are deposited almost entirely in the nose and throat area, whereas fine and ultrafine particles are able to reach the alveoli (air spaces) deep in the lungs where they can remain for long periods.[3]

Those most at risk from exposure to fine particles include the elderly, sensitive individuals with pre-existing heart or lung disease, and children. Infants and children, particularly those with compromised respiratory systems, are especially sensitive to the effects of fine particle pollution because their respiratory systems are still developing and they inhale 50 percent more air per pound of body weight than adults.[4] As a result, exposure to fine particles is associated with increased frequency of childhood illnesses, including increased respiratory difficulties and reduced lung function that can cause aggravated coughing and difficulty or pain in breathing. This can result in school absences and limitations in normal childhood activities.[5, 6, 7, 8] Respiratory illness events in childhood (mostly viral) are also important determinants for future risk of chronic respiratory symptoms in adult life.[9]

Another susceptible population segment at risk from low-level exposures consists of elderly individuals with pre-existing cardiovascular and respiratory diseases, the majority of which are either current or former smokers. Smoking is an important risk factor, since it is the major cause of chronic obstructive pulmonary disease. Smoking may also be a key contributor to any low-level particulate matter exposure-induced exacerbation of respiratory infections among other adults and children and to any increased cancer mortality attributable to chronic ambient PM exposures.[10]

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[3] Health Effects Institute, HEI Perspectives, Insights from HEI's Research Programs, April 2002, HEI, Boston , MA, p.4, www.healtheffects.org.
[4] American Lung Association, Selected Key Studies on Particulate Matter and Health: 1997-2001, New Studies Confirm that Current Levels of Particulate Air Pollution are Harmful to Human Health, Updated March 5, 2001.
[5] Peters, J.M., et al. 1999. A study of twelve Southern California communities with differing levels and types of air pollution. II. Effects on pulmonary function. Am J Respir Crit Care Med. 159: 768-775.
[6] Avol, E.L., et al. 2001. Respiratory effects of relocating to areas of differing air pollution levels. Am J Respir Crit Care Med, 164: 2067-2072.
[7] Gauderman, W.J., et al. 2002. Association between air pollution and lung function growth in Southern California children: Results from a second cohort. Am J Resp Crit Care Med, 166(1): 74-84.
[8] Peters, J.M., et al. 2004. Epidemiologic investigation to identify chronic effects of ambient air pollutants in Southern California. California Air Resources Board Contract No. 94-331.
[9] Controlling Fine Particulate Matter Under the Clean Air Act: A Menu of Options. 1996. State and Territorial Air Pollution Program Administrators and Association of Local Air Pollution Control Officials.
[10] Ibid.

4. *Toxic Diesel PM*

In July of 1999, the ARB identified particulate matter from diesel-fueled engine exhaust (diesel PM) as a toxic air contaminant with no identified threshold level below which there are no significant effects. Each year in California, diesel PM contributes to an estimated 2,900 premature deaths, 3,600 hospital admissions, 240,000 asthma attacks and other respiratory ailments and 600,000 lost workdays.

The National Center for Environmental Assessment states that long-term (i.e., chronic) inhalation exposure to diesel PM is likely to pose a lung cancer hazard to humans, as well as damage the lung in other ways depending on exposure. Short-term (i.e., acute) exposures can cause transient irritation and inflammation, with symptoms being highly variable across the population. The assessment also cites emerging evidence indicating exacerbation of existing allergies and asthma symptoms.[11] In addition to PM, emissions from diesel-fueled engines include over 40 other cancer causing substances. Overall, emissions from diesel engines are responsible for the majority of potential airborne cancer risk from combustion sources in California.[12] [13]

In response to these significant findings, emission reduction efforts have been taking place on the Federal, State and local levels for quite some time. The following is a discussion of each:

Federal Programs to Reduce Diesel PM

The EPA has addressed diesel PM reductions with the National Clean Diesel Campaign (NCDC) which includes three approaches: 1) regulations for diesel engines and fuels, 2) voluntary incentive programs for existing diesel fleets, and 3) partnerships with businesses, community organizations and governmental agencies[14]. The EPA has devoted significant effort to ensuring the successful implementation of stringent new federal standards for diesel fuel and new diesel engines, including those for on and off-road, locomotive, and marine uses. EPA has established a 2014 target date for reducing emissions from existing diesel fleets with over 11 million diesel engines nationwide. Their control efforts will focus primarily on school buses, ports, construction equipment, freight transportation, airport ground support equipment and agriculture. Each program provides technical and financial assistance to stakeholders interested in reducing their fleets' emissions effectively and efficiently. Through the National Clean Diesel Campaign, EPA also works with a large cross section of stakeholders (e.g., business,

[11] U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment. 2002. Health Assessment Document for Diesel Engine Exhaust. EPA/600/8-90/057F [Online]. Available at http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=29060 (Verified May 31, 2005).

[12] California Air Resources Board diesel fact sheet. April 2004. California's Accomplishments in Reducing Diesel Particulate Matter Emissions [Online]. Available at www.arb.ca.gov/diesel/factsheets/factsheets.htm (Verified May 31, 2005).

[13] South Coast Air Quality Management District press release. February 5, 2004. AQMD Launches Major Study of Toxic Air Pollution in Southland – MATESIII [Online]. Available at www.aqmd.gov/news1/2004/matesiiipr.html (Verified May 31, 2005).

[14] U.S. Environmental Protection Agency. National Clean Diesel Campaign [Online] Available at www.epa.gov/cleandiesel/index.htm (Verified May 31, 2005).

community organizations, governmental agencies) to develop regional initiatives that reduce emissions across a large geographic area.

State Programs to Reduce Diesel PM

In October 2000, the ARB issued California's Diesel Risk Reduction Plan. This plan included three components: 1) engine and vehicle standards, 2) diesel fuel specifications, and 3) engine retrofit requirements[15]. The ARB has established regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and vehicles to reduce diesel PM emissions by about 90 percent overall from year 2000 levels. ARB's upcoming Phase 2 Diesel Fuel regulations will reduce sulfur content in diesel fuel to no more than 15 ppm, which is necessary for advanced diesel PM emission controls. ARB is also working on new retrofit requirements for existing on-road, off-road and stationary diesel-fueled engines and vehicles where determined to be technically feasible and cost-effective. California's three pronged approach to reduce diesel from mobile sources will greatly reduce the amount of PM that is generated statewide.

In addition to California's mobile source regulations, the ARB administers other programs that reduce PM from diesel sources. Through the Air Toxic Control Measures (ATCMs) emissions are being reduced from idling diesel engines and stationary source diesel engines. ARB also administers statewide incentive programs to voluntary reduce emissions from mobile sources. These grant programs provide funding to replace, repower or retrofit old diesel engines with new clean engine technologies or assist with the purchase of new alternative fueled vehicles to be used in lieu of diesel versions.

SLO County APCD's Effort to Reduce Diesel PM

While air districts are precluded from regulating mobile sources (e.g., planes, trains, marine vessels, on and off-road vehicles and equipment), the APCD manages many programs that target emission reductions from diesel combustion sources countywide. These strategies include: 1) mitigation under the California Environmental Quality Act (CEQA), 2) incentive programs for voluntary diesel emission reductions, 3) implementation of the State's Air Toxic Control Measures, and 4) public outreach campaign to increase awareness on the health affects of diesel PM.

Mitigation Under the California Environmental Quality Act: As a commenting agency in the California Environmental Quality Act (CEQA) review process for land use development, the APCD assesses the air pollution impacts and recommends appropriate mitigation for both the construction and operational phases of local projects. Once the project emissions are determined the total air quality impact is compared to the APCD's emission thresholds for NOx, ROG and PM to determine what type of mitigation is necessary to reduce project impacts to a level of insignificance. Depending on the scale of any diesel PM impact, some of the possible mitigation strategies include heavy-duty vehicle idling limitations, properly tuned engines, use of equipment that meets stringent engine emission standards or uses alternative fuels, repowering equipment or installation of PM control devices, or contribution funds for appropriate off-site emission reductions.

[15] California Air Resources Board. October 2000. Diesel Risk Reduction Plan [Online]. Available at www.arb.ca.gov/diesel/documents/rrpapp.htm (Verified May 31, 2005).

Incentive Programs: Since 1998 the APCD has implemented incentive programs that reduce diesel PM by providing grants to repower or retrofit old diesel engines with lower emitting diesel engines, or by assisting the transition from diesel to alternative fuels like compressed natural gas. The State provides some of these funds, primarily through the Carl Moyer and Lower Emission School Bus Programs. Grant funds are also generated locally through a surcharge on motor vehicle registrations (used for our MOVER Grant Program) and from mitigation fees to reduce impacts of large projects (e.g., Avila Beach and Guadalupe Dunes remediation, large development projects, etc.). Over the past eight years the APCD has successfully administered nearly $5 million in emission reduction grants, most of them focused on reducing emissions from mobile sources. Through the District's Carl Moyer, MOVER and various mitigation fund grant programs, over 1500 tons of emissions have been reduced throughout the County. These reductions have provided significant public health benefits that would not have been accomplished without these incentive-based grant programs.

While the Carl Moyer Program was originally developed to reduce NOx from diesel engines, the program has been quite successful at also reducing diesel PM. By way of example, in the first five years of the Carl Moyer Program, the APCD facilitated the replacement of 34 diesel engines with $592,496 from the state. These projects were very cost effective, averaging $3,363 per ton of NOx reduced compared to the state limit of $14,000/ton. In addition, these engine replacements are also projected to reduce 12.3 tons of diesel PM over the project lifetime. When these additional reductions are factored in, the average cost effectiveness for the first five years of implementing the Moyer Program in SLO County improves to $2,186 per ton reduced.

Implementation of State Air Toxic Control Measures: The APCD ensures that affected sources comply with the state adopted diesel Air Toxic Control Measures (ATCMs)[16] through permit requirements and periodic inspections. All diesel engines in SLO County 50 horsepower or greater in size are now subject to regulation and various control requirements, depending on their use characteristics.

Public Outreach Campaign: Public outreach is critical component to the accomplishment of the District mission. Due to the significant public health impacts of diesel PM, the District has developed a variety of outreach strategies to increase awareness of this issue. To inform affected sources of upcoming regulatory changes, the District utilizes direct mailings in the form of Compliance Advisories. Press releases are also distributed to the local media announcing air quality news related to grant funding, ATCM changes, training seminars and special events. As part of CEQA mitigation for diesel impacts, the APCD has prepared outreach materials for project applicants and local planning agencies to improve implementation of diesel PM controls for projects that exceed APCD emission thresholds. APCD staff also provides presentations on grant programs and the CEQA review process. The District's website (www.slocleanair.org) is

[16] California Air Resources Board. California's Diesel Risk Reduction Program [Online]. Available at www.arb.ca.gov/diesel/dieselrrp.htm (Verified June 1, 2005).

an ever growing tool to assist with the dissemination of information to individuals, business and organizations.

The APCD is also integrally involved in the Central Coast Clean Cities Coalition (C5). C5 is a partnership of public/private entities whose goal is to promote the use of alternative fuels vehicles (AFV) on the Central Coast. By working with area fleet operators, C5 sponsors training seminars, public events and grant funding workshops related to use of alternative fuels. Currently, C5 is working to receive the official "Clean Cities" designation by the U. S. Department of Energy which will enable the area to compete for federal funding aimed at improving the infrastructure for alternative fuels. For the past two years, the APCD has helped facilitate the National Alternative Fuel Vehicle (AFV) Day Odyssey which showcases local AFV that offer an option to diesel powered vehicles.

Chapter 2: SLO County Air Shed

1. *Geography, Demographics, Climate and Meteorology*

SLO County covers an area of about 3,300 square miles along the coast of central California. For geography, climate and meteorology the county can be divided into three general regions: 1) Coastal Plateau, 2) Upper Salinas River Valley, and 3) East County Plain. The Coastal Plateau is immediately inland from the Pacific Ocean and is typically five to ten miles wide. It ranges in elevation from sea level to about 500 feet above sea level, and is bounded on the northeast by the Santa Lucia Mountain Range. The Santa Lucia Range rises to roughly 3,000 feet elevation and runs parallel to the coast almost the entire length of the county. The Upper Salinas River Valley lies inland from the Santa Lucia Range in the northern portion of the county. The East County Plain lies further inland along the eastern flank of the county, and includes about one third of the county's area. About ¾ of the county's population of roughly 250,000 residents live and work in communities along the coast. Most of the remaining populace live and work along the Highway 101 corridor as that passes through the Upper Salinas River Valley. The East County Plain is rural and sparsely populated.

The climate of the county is characterized as Mediterranean, with warm, dry summers and cooler, relatively damp winters. Along the coast, mild temperatures prevail most of the year due to the moderating influence of the Pacific Ocean. The effects of the Pacific Ocean are diminished inland, and by major intervening terrain features such as the coastal Santa Lucia Mountain Range. As a result, inland areas experience a wider temperature range. Typical daily maximum summer temperatures average about 70° F near the coast, while inland valleys are often in the high 90's. Minimum winter temperatures run from the low 30's along the coast to the low 20's inland.

Regional meteorology is largely dominated by a persistent high pressure area which usually resides over the eastern Pacific Ocean. During spring and early summer, as the onshore breezes pass over the cool water of the ocean, fog and low clouds often form in the shallow marine air layer along the coast. Surface heating in the interior valleys partially dissipates this marine layer as it moves inland, although the marine layer

influence is still observed inland towards the center of the county. From November through April the Pacific High migrates southward, allowing northern storms to move across the county. Annual rainfall ranges from 16 to 28 inches along the Coastal Plateau, while the Upper Salinas River Valley generally receives about 12 to 20 inches of rain. The East County Plain is the driest area of the county with less than 12 inches of rain in a typical year.

Local meteorology, primarily in the form of wind velocity, wind persistence and the height and strength of temperature inversions, affects the behavior and fate of suspended particulate matter in the air. The origins and sizes of particulate air pollutants also play key roles in their behavior and fate.

Particle size distributions show that particles larger than $PM_{2.5}$ make up about half of PM_{10}. The coarse fraction of PM_{10} includes wind-blown dust and particles which have a soil origin. The coarse fraction also includes particles that originate from abrasion, such as those mixed into the air by the action of vehicle tires rolling on roadways. Having more mass, these tend to settle out of the air and deposit on surfaces more rapidly, with the largest particles depositing closer to their source. For the coarse fraction of PM_{10}, air pollutant behavior and impacts typically relate to the locations of nearby sources and receptors, and to the speed, direction and turbulence of wind carrying the particulate pollution from source to receptor.

The smaller suspended particles in $PM_{2.5}$ typically have a combustion origin, or result from the oxidation, chemical reaction, recombination, adsorption and/or coagulation of diverse aerosols and gaseous air pollutants. These smaller particles, which can be as tiny as larger molecules, remain suspended in the air far longer than coarse particles, for periods of days or weeks.

Regional meteorology plays a main role in the movement of these finer particles, and in the atmospheric chemistry that affects their transformation. Fine $PM_{2.5}$ particles are usually dispersed more uniformly over broad, regional areas than is PM_{10}. Fine particles in the air also travel much greater distances before settling out. Smoke from distant wildfires can sometimes be observed halfway around the earth from its source. In general, the PM_{10} and $PM_{2.5}$ levels measured in SLO County result from human and natural sources and processes within and closely adjacent to the county. Transport of particulate air pollutants from distant major urban areas, however, does sometimes play a role in local levels observed here. When that occurs, the transported air mass can sometimes be visible as an approaching haze.

Wintertime radiation inversions which result from loss of surface heat to a clear, dark night sky can severely limit vertical mixing of air pollutants emitted near the ground. In combination with smoke from open outdoor burning and the use of wood-fired stoves or fireplaces for residential heating, low wintertime radiation inversions can be a main contributor to higher levels of particulate matter that have been measured in the Upper Salinas Valley area of the county. Low inversions and burning combine to leave a smoky pall over some North County communities throughout much of the fall and winter.

2. *Monitoring Network and Special Studies*

Currently, there are nine permanent ambient air monitoring stations in SLO County. Six of these stations are operated by the APCD, with four of those permanently located in key communities where people live and work. The remaining two APCD stations are located in remote areas as pollutant transport research sites. In addition, the ARB operates two community stations in the county as part of their statewide network (one at Paso Robles and one in San Luis Obispo). One special purpose monitoring station is operated by a private contractor for the oil refinery located on the Nipomo Mesa. Except for the two APCD research stations, all stations report monitoring data to the Federal AIRS database.

The PM_{10} monitoring network in SLO County consists of samplers at Paso Robles, Atascadero, Morro Bay, San Luis Obispo, Mesa 2 and Nipomo Regional Park. $PM_{2.5}$ monitors are located at Atascadero and San Luis Obispo. In addition, a TEOM is operated at the Atascadero station for continuous measurement of PM_{10}. Although not an EPA-certified method for PM_{10} measurement, the TEOM provides valuable continuous measurement much like that of a gaseous pollutant analyzer. Except for the TEOM, the bulk of the PM_{10} and $PM_{2.5}$ data from the county consists of individual 24-hour samples, taken every sixth day by conventional filter-based EPA-certified devices.

PM_{10} sampling first began in SLO County at Morro Bay in 1986, shortly after the method was approved by EPA. PM_{10} sampling expanded over the next 5 years to roughly the current network of stations. $PM_{2.5}$ sampling at the two sites in the county network began operation in 1999, shortly after the new federal particulate standards and instrument method for $PM_{2.5}$ were established.

In a special particulate matter study, the District has recently completed operating five research stations for 12 months near the coast, from the Nipomo Mesa to the Oso Flaco basin. These stations included PM_{10} and $PM_{2.5}$ samplers, with elemental and ion analysis performed on selected filters. The study arose from concern over historically high particulate levels that have been measured in the area, and was designed to better define the probable origins of that particulate matter. The $PM_{2.5}$ devices used in the study are not EPA reference method samplers, and thus their data will not be reported to the AIRS database. When analysis and data evaluation have been completed by early 2006 however, the extensive study results should be very useful for local decision making.

3. *Air Quality Monitoring Results*

A common and important measure of PM_{10} and $PM_{2.5}$ data is the count of violation days for State or Federal 24-hour standards, since on days when a standard is exceeded, air quality is unhealthy for a significant segment of the public. The goal of air quality management, of course, is to reduce pollutant emissions to assure that public health is protected by minimizing or eliminating these violations of standards.

As noted in the Executive Summary, because PM_{10} and $PM_{2.5}$ samples are taken every sixth day in SLO County on a common nationwide schedule, the actual number of violations for any 365-day year is always somewhat uncertain. Federal monitoring guidelines recommend multiplying the number of measured violations by six to estimate

the number of actual violations in a given year. In presenting data in tables and graphs, the actual base count of sixth-day samples is typically used. This should always be considered in the context of the total number of samples taken that year, as in "three violation days out of 61 samples".

For PM_{10}, monitoring results from the permanent station locations around the county show that no site is entirely free of State standard violations; thus, the county is clearly not in attainment of the California 24-hour standard. On average, out of a usual total of 61 sampling days each year, 15 different exceedance days of California's 24-hour PM_{10} standard have been measured each year at monitoring stations within SLO County between the years of 1990 to 2003. Table 2.3-1 shows the number of violation days at each site since 1990, along with other key data. Long-term trends identified from air monitoring in the county are presented in Appendix A.

Table 2.3-1
RECENT PM_{10} DATA SUMMARY
1990 through 2003
Total Sample Days with State Standard Violations

	Paso	Atas	Moro	SLO	Nipo/ NRP	Ralc	UCD1/ Mesa2	Co. Total (diff. days)	Max Value ($\Phi g/m^3$)
2003	1	1	1	1	4	NA*	4	6	77
2002	0	0	1	0	2	21	5	21	178
2001	1	2	0	0	3	2*	8	13	115
2000	2	2	0	0	0	15	7	17	111
1999	1	0	0	0	0	5	4	8	90
1998	1	0	0	0	0**	13	4	16	73
1997	1	1	1	2	-	16	5	17	99
1996	0	0	0	0	0**	12	6	12	98
1995	3	3	0	1	1	14	4	17	99
1994	0	1	0	1	1	12	6	13	107
1993	2	5	2	1	1	19	10	21	141
1992	2	0	0	0	0	8	8	10	135
1991	(4)***	3	0	1	0	10	10*****	21	119
1990	(0)***	3	0	0	3	13	8	16	136

* PM10 data from Ralcoa taken from April, 2001 through February, 2002 were invalidated, and sampling at Ralcoa ceased after October, 2002. Ralcoa exceedance counts affect County totals.

** PM10 monitoring at the Nipomo Community Services District site ended in September, 1996 and resumed at the Nipomo Regional Park in June, 1998, so data for the years 1996 and 1998 are incomplete. No data are available for 1997.

*** PM10 monitoring in Paso Robles ended at the original downtown monitoring station after September 14, 1990 and resumed at the Sherwood Fire Station in September, 1991, so data for the years 1990 and 1991 are incomplete.

**** PM10 monitoring at UCD1 began in June, 1991, after the sampler was moved from UCD2, nearby, in May. For a 1991 UCD1 total, UCD2 exceedances are added to those from UCD1.

Chapter 3: Emissions Inventory

An effective PM control strategy cannot be developed without an understanding of the sources of emissions in SLO County. One tool that can be used for this evaluation is the Emissions Inventory. The inventory is a listing of all known sources of air pollution in the county, from planes, trains and automobiles to gas stations, asphalt batch plants, oil fields, and wildfires. In cooperation with the ARB, the APCD develops a complete Emissions Inventory (EI) each year. A summary of this data by source type is useful for determining which proposed control strategies have the potential for the greatest emission reductions.

The EI reveals that much of the directly emitted particulate matter comes from what are called "area" sources. These are things like road dust, farming, construction and demolition activities, and disbursed combustion sources. Agricultural burning and prescribed burning are also significant sources that the APCD has been working to reduce for many years. Mineral processing, off-road equipment and cooking also contribute directly to the problem. The top 25 sources of PM_{10} in SLO County are shown in Table B-1 in Appendix B.

In addition to the directly emitted PM, the EI data can be used to evaluate the sources of particulate precursors. NOx, reactive organic gases (ROG) and sulfur oxides can all react in the atmosphere to form secondary PM. The District's 1991 Clean Air Plan was very successful in reducing emissions of the ozone precursors NOx and ROG. Since our County is now in attainment of the state ozone standard, additional control measures for NOx and ROG are not being considered at this time as PM controls. However, one large source of sulfur oxides in this county that could be controlled to significantly reduce PM precursor emissions is the coke calciner at the oil refinery facility on the Nipomo Mesa; it is the source of over 90% of the SO2 emissions generated in this county and one of the largest point sources in California.

Emission Inventory Trends and Forecasts

In 1990, the ARB designated SLO County as nonattainment for the health-based state ozone standard. The APCD adopted its first Clean Air Plan in 1991 to outline a strategy to reduce the ozone precursors NOx and ROG. Successful implementation of the plan, along with emission reductions achieved with California's clean vehicle and fuel standards, has resulted in dramatic decreases in NOx and ROG emissions. And the citizens of SLO County witnessed a corresponding improvement in air quality, which was verified by ambient air monitoring. In January 2004, the ARB re-designated SLO County as being in attainment for the air quality standard for ozone photochemical smog.

As stated, the ozone control measures in the 1991 Clean Air Plan also provided substantial reductions in both directly emitted and secondary particulate matter. Unfortunately, these reductions have been offset by increases in PM emissions from roads and construction activities as the county grows. As a result, PM emissions in SLO County have remained relatively constant over the last 15 years. Recent projections show that particulate matter emissions will increase unless new control measures are adopted.

Table B-2 in Appendix B illustrates the emission trends and projections from 1990 to 2020.

Chapter 4: Control Strategies

1. *Control Strategy Evaluation*

In order to meet the newly enacted requirements in state law, a list of control strategies and the corresponding rule adoption schedule is required to be adopted by the APCD Board by July 31, 2005. Due to this expedited timeline, much of the technical evaluation required for rule adoption will be completed outside of the SB 656 implementation process and during the rule development process. Using air quality monitoring data and the emissions inventory, staff evaluated the list of control strategies available to reduce PM and determined which measures would best serve our county. The list of measures proposed for adoption at the July 27, 2005 APCD Board meeting is an evergreen list of strategies and implementation schedules that can be modified at any point by Board direction. A summary of the steps taken by staff to implement SB 656 requirements is given below.

To initiate efforts for SLO County, the APCD assembled a team of staff from our Planning, Technical Services and Engineering Divisions to evaluate the measures adopted by ARB and determine which control strategies would best serve our county. The first step was to identify which measures were already in place here, which measures were infeasible and which remaining measures could potentially assist our region in reaching attainment of the state PM standards. Of the 105 control measures identified and adopted by ARB, 62 are already in place or an equivalent measure has already been adopted in SLO County; 16 measures were deemed infeasible or did not apply to our region. Of the remaining 27 measures, staff used the following criteria to identify those most appropriate for Board consideration: cost-effectiveness, emission reductions, air toxic aspects, feasibility (technology and funding), public acceptability, local sources and time required for implementation. Through this process, five distinct categories of potential control strategies were identified for regulatory consideration in the effort to reach attainment of the state PM standard: paved and unpaved roads, agricultural and open burning, fugitive dust, refinery and Calciner activities and particulate exhaust concentrations.

The District conducted extensive outreach efforts to reach potentially affected parties. Workshop notices were distributed to over 300 businesses, organizations and individuals that include permitted sources and interested parties throughout the county. Presentations have also been given to various government agencies on the development of the list of PM control strategies and proposed rulemaking schedule, including the SLO County Health Commission, Regional Conservation District, City and County Planning Agencies and California Department of Forestry. Interagency coordination will continue throughout the control strategy review and adoption process as well as the rule development phase scheduled to begin in 2006.

On March 9, 2005 the APCD hosted the first public workshop on SB 656 requirements. This workshop provided an overview on particulate matter, including potential health impacts, local monitoring results, PM sources throughout SLO County and potential control strategies. The workshop was well attended by the public and gave staff the opportunity to hear initial comments from the public and to explain the requirements of SB 656 and the process the District will undertake to implement these requirements. A second workshop was conducted on May 12, 2005 to solicit public comments on the proposed list of PM control strategies being considered and the respective rule adoption schedule.

The APCD's website (www.slocleanair.org) was also utilized to distribute information to interested parties. Staff presentations and the draft report were posted on the website and available for individuals to review. At the July 27, 2005 APCD Board meeting, the report, public comments on the report and staff responses to those comments will be presented to your Board for consideration and adoption of the proposed control strategies.

2. *Proposed Control Strategies and Implementation Timeline*

Listed below is a brief summary of the five major PM control categories currently being considered by APCD. Those categories include paved and unpaved roads, open burning, fugitive dust, refinery and Calciner activities and particulate exhaust concentrations. This chart identifies each control strategy category, specific measures to consider under each category, cost-effectiveness (if available) and the proposed timeframe for rule adoption. In prioritizing these measures, consideration is based on the effect individual measures will have on health, air quality, emission reductions and cost-effectiveness using existing data from ARB and respective air districts. A more refined and comprehensive analysis of each control category and individual measures will be conducted during the rule development period. This evaluation will include an in-depth analysis of the specific components of each control measure, the measure's cost-effectiveness, application, and feasibility. It is important to note that during development of each rule public input will be actively sought through workshops and the draft rule review process, as well as at the APCD Board meetings when each rule will be formally considered for adoption.

Proposed PM Control Strategies and Rule Adoption Dates

Control Strategy	**Specific Control Measure and Reported Cost-Effectiveness (C/E) if provided by ARB or respective Air District**
2006 Rule Adoption Date	
Open Burning	Modify APCD Rule 501 to establish the following: - permit system for residential green waste burning that occurs outside the URL/VRLs - prohibit burning within 1000 feet of Smoke Sensitive Sites that are located outside the URL/VRLs - prohibit the burning of poison oak *(C/E can not be calculated with traditional cost-effectiveness criteria)*
Refinery and Calciner Activities	Establish a regulation to reduce the sulfur dioxide emissions, the main secondary PM contributor in SLO County, from the coke calcining equipment ($1,155/ton of SO2 reduced)
Particulate Exhaust Concentrations	Combustion contaminants: - modify APCD Rule 403 C to limit combustion contaminants from 0.3 grains per dry standard cubic foot to 0.1 grain per cubic foot Grain loading: - modify APCD Rule 403 A to limit grain loading (PM exhaust concentration) from 0.3 grains per dry standard cubic foot to 0.1 grain per cubic foot

	(There are no known sources that would be impacted by the proposed changes to Rule 403; however, the new standard might prompt some sources to improve their maintenance procedures or operational efficiency) Visible emissions: - Modify APCD Rule 401 to further restrict visible emissions from 40% opacity to 20% opacity limit *(No significant costs are estimated due to this change)*
2007 Rule Adoption Date	
Storage, Handling and Transport of Petroleum Coke Coal and Sulfur	Establish a rule to limit opacity from operations to 10% for the handling of coke piles. Specific measures could include: - Best Available Control Measures (BACM) for any open piles of coal or sulfur - street-sweeping or limit silt loading on roads and truck exteriors with quarterly testing - paving and maintenance of roads - covers or slot-tops for transport trucks *(C/E ranges between $10,500 - $11,500 per ton of PM_{10} reduced)*
2007 - 2009 Rule Adoption Date	
Fugitive Dust	Establish requirements that would apply to a subset of the construction activities and open lands located throughout SLO County: - watering - chemical stabilizers / dust suppressants - track-out devices - enclosures / wind fencing for stockpiles *(C/E ranges from $300 per ton for a small site requiring only watering to $650,000 per ton for a site with stockpiles requiring 3-sided enclosures. During rule adoption time, the APCD will refine the specific measures to be considered and further analyze the C/E for each measure)*
2009 - 2010 Rule Adoption Date	
Unpaved & Paved Roads	Establish requirements that would apply to a subset of the unpaved and paved roads throughout SLO County: - speed limit reduction on unpaved roads - apply water, gravel or other dust suppressant - pave new and existing unpaved roads - PM_{10}-efficient street sweepers - apply soil stabilizers to unpaved road shoulders on existing paved roads with the highest average daily vehicle trips - road shoulder paving for all new or modified paved roads and add curbs and gutters to road shoulders *(C/E ranges from $126 for applying water to $554,000 for paving shoulders, curbs and gutters. During rule adoption time, the APCD will refine the specific measures to be considered and further analyze the C/E for each measure)*

a. Measure Description

i. Fugitive Dust

Wind blown dust is a significant component of overall PM emissions in SLO County. Known as fugitive emissions, activities and land types contributing to this category of emissions include earth moving and grading operations, inactive disturbed land and open areas, unpaved parking lots and staging areas, bulk material storage piles, and track-out from construction and agricultural activities. A variety of control measures are available to reduce these emissions including watering (10-85% control efficiency depending on watering frequency), chemical stabilizers / dust suppressants (control efficiencies range from 60 - 84% depending on the product used and application rate), and track-out devices (control efficiencies 46 - 80%) and enclosures/wind fencing for stockpiles (60 - 80% control). Total emission reductions achieved will depend on the

type and scope of measures implemented and could require development and adoption of several different rules to address the variety of sources and activities.

ii. Paved & Unpaved Roads

Paved and unpaved roads represent 17% and 31% respectively of total PM_{10} emissions in SLO County. Control strategies to address these sources will need to consider both new and existing paved and unpaved roads. It is anticipated that any regulation to address this emissions source would establish specific applicability thresholds considering such factors as average daily trips and distances to populated areas or areas identified as sensitive receptors such as parks, elderly care facilities, daycares, schools, etc.

Possible regulatory requirements for paved roads could include: use of PM_{10}-efficient street sweepers, applying soil stabilizers to existing unpaved road shoulders, paving shoulders on new or modified paved roads, and/or adding curbs and gutters to some road shoulders. For unpaved roads, potential regulatory approaches include: speed limit reductions on certain roads; use of water, gravel, chip seal or other dust suppressants; and/or paving new and some existing unpaved roads. The projected emission reductions vary depending on the control method used and the amount of roads in the County that meet the future rule criteria. The potential PM_{10} reduction assessment would take place during rule development and would include specific cost effectiveness estimates for implementation in SLO County.

iii. Refinery Activities

Two new rules are proposed that would affect the oil refinery located on the Nipomo Mesa. The petroleum coke calciner at that facility generates over 90% of the sulfur dioxide emissions in this county, releasing 3,390 tons of SO2 in 2004. Sulfur dioxide is a secondary source of PM emissions because it can react in the atmosphere to form particulate aerosols. The California Legislature specifically stated in SB 656 that particulate precursors must also be controlled if a plan is to be effective. The proposed control strategy is based on the South Coast Air Quality Management District's Rule 1119, and would require a minimum 80% SO2 emission reduction from the calcining operation. Several different control technologies could be implemented to achieve this level of control.

The second control measure affecting the refinery would limit PM10 emissions from the storage and handling of sulfur and petroleum coke. Application of Best Available Control Measures would likely be required, which could include water spray, visible emission limits, street sweeping, and the enclosure of storage piles. Detailed cost effectiveness evaluations of each possible control measure will be performed before any new rule is proposed.

iv. Outdoor Burning

This series of control measures addresses the health and nuisance impacts of outdoor burning and recommends requiring permits for residential greenwaste burning, prohibiting burning near smoke sensitive populations and prohibiting the burning of

poison oak. The APCD already has a permitting system in place for all outdoor burning except residential green waste burning. Currently the District prohibits residential green waste burning within the boundaries of Village Reserve Lines (VRL) or Urban Reserve Lines (URL) where population densities increase the potential for adverse health impacts or nuisance. Residential green waste burning is still allowed on permissive burn days in rural lands in accordance with the APCD's Rule 501 restrictions. Because of efforts to promote alternatives to green waste burning countywide, rural residences now have options for green waste recycling or disposal that have reduced burning in rural lands.

Under the proposed measures, all residential green waste burning would be regulated by a permit system. The permits would prohibit burning within 1,000 feet of a Smoke Sensitive Site (such as schools and medical facilities) and the burning of poison oak. The APCD would continue its efforts to promote alternatives to burning in rural lands. Similar to the 1991and 1998 Clean Air Plans' control measure R-13 "Non-agricultural Open Burning", this measure's control efficiency would be 50%.

v. Visible Emission Limits

Current APCD Rule 401 limits visible emissions to 40% opacity (i.e., Ringlemann Number 2). Visible emissions could be smoke, dust or other particulate matter. Opacity in this regulation refers to the amount or percentage of light that is obstructed by the emissions. The current standard was adopted in 1976 with the District's initial rules and regulations. A modification to Rule 401 is being recommended to change the allowable visible emission limit from 40% to 20% opacity. This modification is very important in the District's efforts to reduce directly emitted PM. Although there are no known facilities in the county with continuous emissions that exceed 20% opacity, this new standard will encourage prudent equipment maintenance and operation. It will also be a useful tool to reduce and control fugitive dust emissions. All surrounding districts and most other areas in California have already adopted a more stringent 20% opacity standard, and most new equipment is designed to meet this more protective emission limit.

vi. Particulate Exhaust Concentrations

Current APCD Rule 403 contains two particulate exhaust concentration limits that are proposed for modification. Section A of this rule establishes a limit of 0.3 grains of particulate allowed per dry standard cubic foot of exhaust from a non-combustion exhaust stack. Section C.1 establishes the same limit for combustion sources. These limits are proposed to be reduced to 0.1 grains per dry standard cubic foot. Both of these new standards would reduce the amount of PM that is allowed to be directly emitted.

There are no known county sources whose continuous operations would violate these proposed new standards. However, a few sources source test results near the proposed new limits may choose to improve or modify their control equipment to ensure continued compliance. Other sources may be prompted to improve their

maintenance and operational procedures to minimize particulate emissions and reduce their potential for violating the new standards.

3. *Control Strategies in Place as of January 1, 2004*

a. APCD's Existing Rules & Programs

On November 18, 2004, the ARB approved a list of the 103 most readily available, feasible, and cost-effective control strategies that can be employed by air districts to reduce PM. Of the total strategies identified by the ARB, 63 are already in place or have equivalent control in the SLO County.

For many of the suggested control strategies, there are a limited number of existing facilities in our county with applicable equipment subject to the recommended control. These facilities have typically been controlled through the APCD's New Source Review (NSR) process and permit program. Rules 204, Requirements, and 219, Toxics New Source Review, provide a mechanism to require permits and controls for new, replacement, modified, or relocated emission units that have the potential to emit criteria or toxic air pollutants. Equipment which is not specifically exempted from permit by Rule 201, Equipment Not Requiring a Permit, is subject to the NSR process. If a permit is required, the facility and equipment would be required to use Reasonably Available Control Technology (RACT) or Best Available Control Technology (BACT) depending on the level of potential air emissions. If the APCD does not have a rule for the specific equipment or source type, RACT is often determined to be the application of another District's rule requirements for that source type. BACT determinations for specific source types are published in various district, state and federal clearinghouses.

An abbreviated list showing the title of the suggested control measure, equivalent District Rule or control strategy in place, ARB number, and a brief description of the control strategy is included in Appendix D of this report.

b. Incentive Programs

As discussed in Chapter 1.4 of this report, the APCD has an extensive number of grant programs that have earmarked funding for emission reduction programs countywide. Due to the success of these voluntary programs at reducing pollutant emissions, including PM, additional State funds will soon be available to expand the amount and number of grants that can be provided for local projects.

c. Public Education and Outreach

Providing public information and education to individuals countywide is an integral component of the District's efforts to achieve California's air quality standards. Its importance is emphasized in our Strategic Action Plan and specifically recognized in our mission statement, *"As stewards of healthful air, our mission is to realize and preserve clean air, promote community and individual responsibility for air quality through education and to provide efficient and cost-effective service"*. By increasing public awareness on county air quality issues, we hope to motivate more individuals and

organizations throughout our communities to assist in developing solutions to those issues.

The District's outreach strategies vary depending on the intended audience. Whether it's a community event, speaking engagement, distribution of brochures and flyers or media outreach, the APCD is continually working to increase awareness on critical air quality issues impacting SLO County. During new rule or program development the District will conduct public workshops and distribute public notices to key stakeholders who may be impacted by the proposed program or rule changes. The District's website (www.slocleanair.org) is an evergreen form of communication that is updated frequently and serves as an integral means for the District to disseminate air quality information to businesses, media and the public at large.

By partnering with local organizations and governmental agencies, the District participates in a variety of educational and environmental forums throughout the county to promote programs relating to clean air. These partnerships allow organizations to apply limited resources collectively and expand an outreach program to reach a larger audience. By joining efforts with Cal Poly and Cuesta College, the District can work effectively with faculty and students to develop and implement outreach materials to be used on a number of air quality programs throughout the County. We have been a long time sponsor of the annual Earth Day celebrations held each April, Clean Air Month observed each May, and Rideshare Week in October. We also sponsor and are an active participant in Pollution Prevention Week, held in September, which recognizes businesses and organizations for proactive efforts to reduce air pollution at the source before it is generated.

In SLO County, Latinos now comprise over sixteen percent of the total population. In 2000 the District launched its first ever Latino Outreach Project, a six month outreach program that focused on two cities in the south county. This project included the development of Spanish language brochures (foto novella style), posters and flyers; it was our first step in introducing APCD to the Latino population and begin building a bridge to better serve all SLO County residents. Since the pilot project, the District now develops many fact sheets and brochures in both English and Spanish. Public notifications distributed to neighborhoods in the county are also bi-lingual in nature.

4. *Infeasible / Non-Applicable Measures*

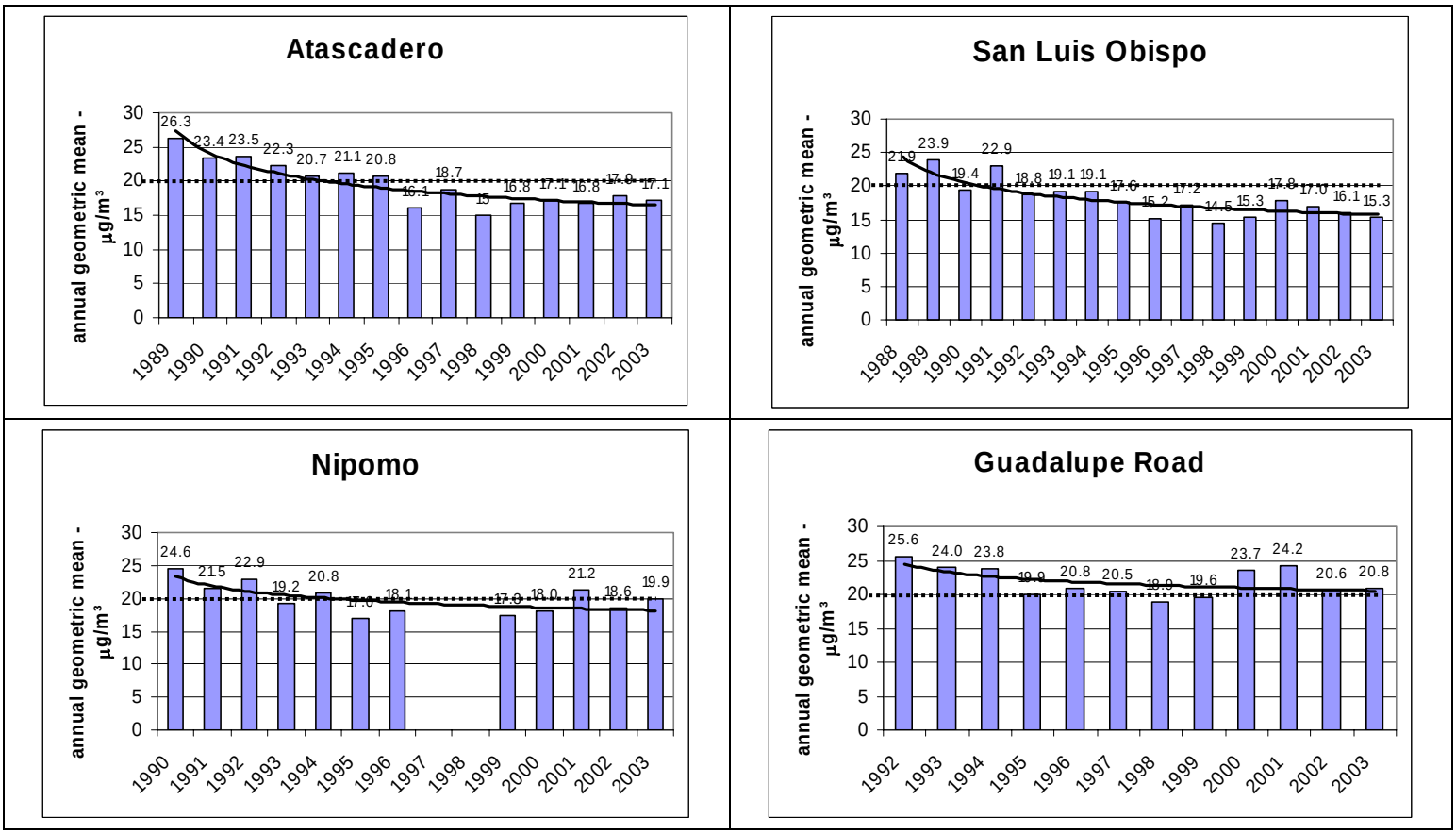
Sixteen control strategies from the ARB list were determined to be either infeasible or not applicable to the SLO County APCD. An abbreviated list showing the ARB number, description of the control strategy and a brief explanation why the strategy is either infeasible or not applicable is included in Appendix D.

Appendix A. Air Quality Trend Data

Because one year of PM10 or PM2.5 data from any single monitoring location typically consists of only about 60 sample values, long term trends are harder to define than for the more plentiful data from gaseous pollutant analyzers. From one sample day to another, individual sample values can vary considerably, yielding "noisy" data. Two useful trend indicators are to compare annual averages, and to compare the number of days that a standard is exceeded each year over a series of years.

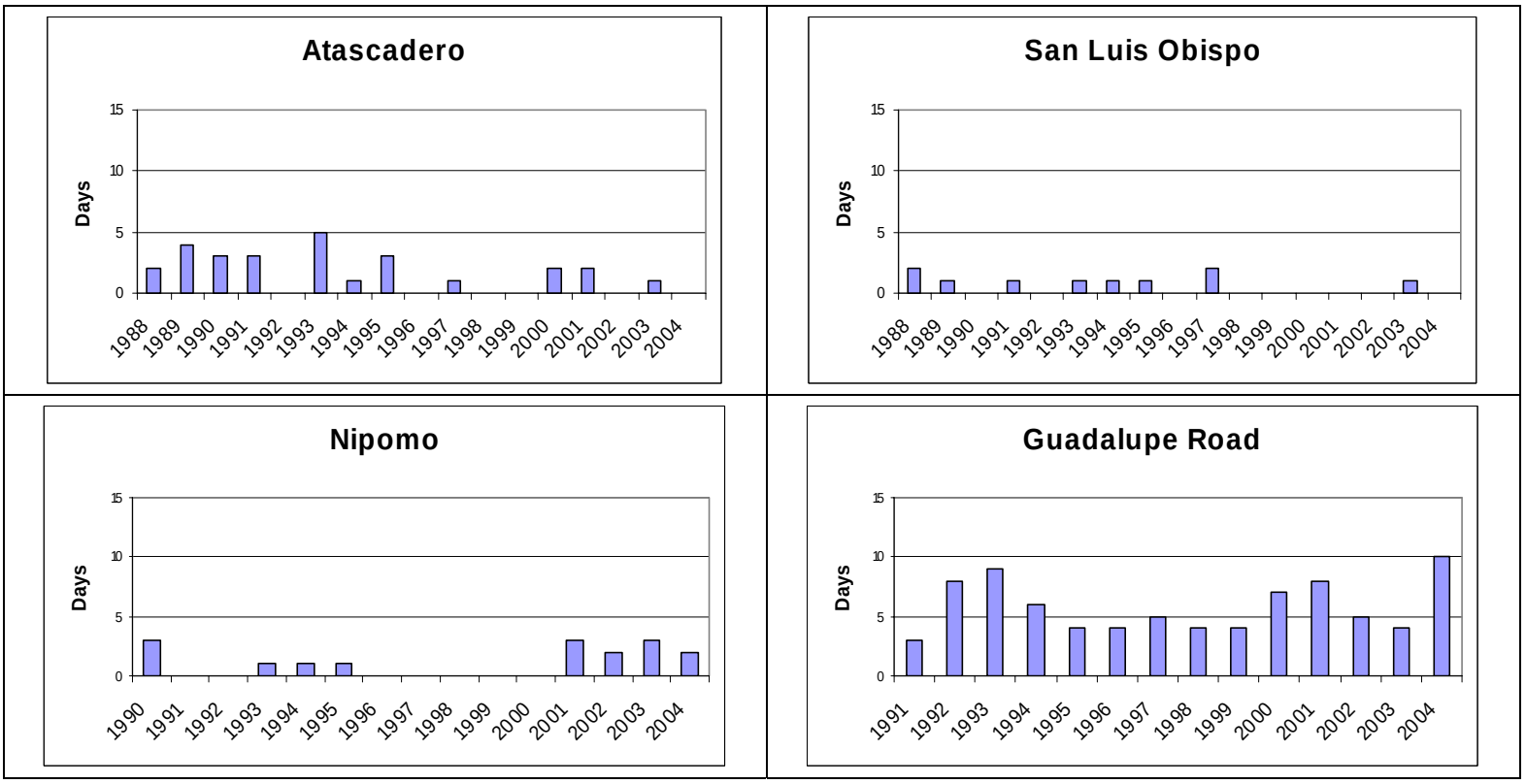
For PM10 data, which have been collected in SLO County from multiple stations since about 1990, annual geometric means from four key locations around the county are presented in Figure A-1. In each case, steady annual improvements can be seen. The early years of more rapid improvement may relate to aggressive reductions in NOx and ROG emissions due to local Clean Air Plan requirements to reduce stationary source emissions and increasingly stringent State controls on motor vehicles. These reductions in gaseous pollutants had the added benefit of reducing the secondary PM10 formed by those gases. Annual average PM10 improvements have been more modest in recent years, and may now have reached a plateau, representing a progressively closer balance between better emission controls and ongoing population growth.

Figure A-1: Annual Geometric Mean PM10 Trends



Trends in the annual number of violations of the State 24-hour PM10 standard measured at each of these locations are not as clear as in the annual average data, despite a 15 year sampling record. As a result, no trend lines are added. These numbers, presented in Table 2.2-1, are plotted for the same four key locations as in Figure A-2.

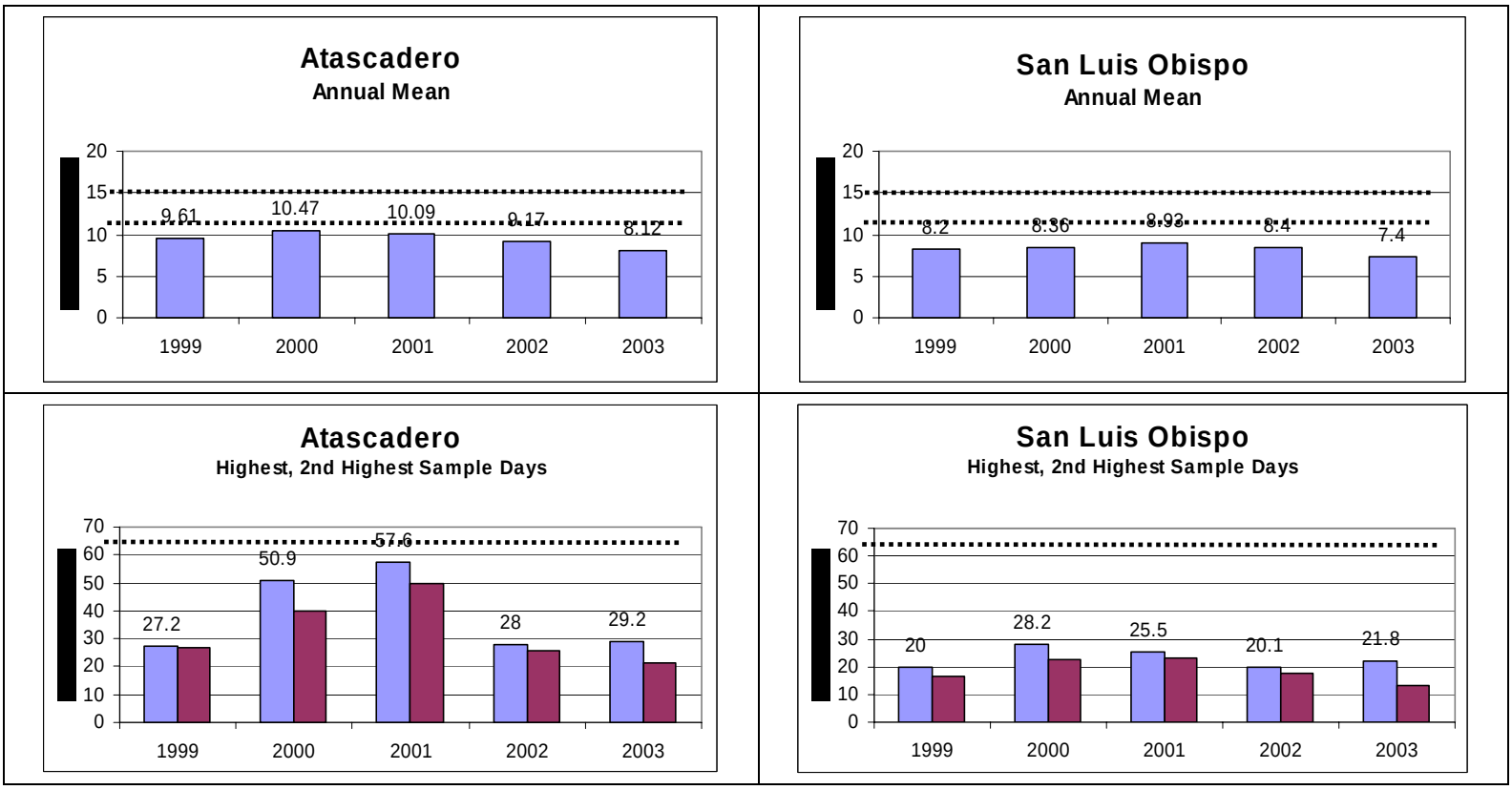
Figure A-2: State 24-Hour PM10 Standard Exceedance Days (Sample day count out of 61 each year)



The only clear finding from these charts is that violations of the State 24-hour PM10 standard are measured more frequently at out Guadalupe Road site on the Nipomo Mesa than at any other monitoring site in the county.

For PM2.5 sampling, which has been performed for only about 5 years here, it is also premature to reach any conclusions about trends, as evidenced in Figure A-3. From this initial monitoring period, data show the county to be in attainment of the State and National annual standards as well as the National 24-hour standard. The State 24-hour PM2.5 standard has not yet been established, but will likely be more health-protective than the National 24-hour standard. When that standard is set, it is likely that SLO County will be designated nonattainment for the new standard.

Figure A-3: PM 2.5 Monitoring Results



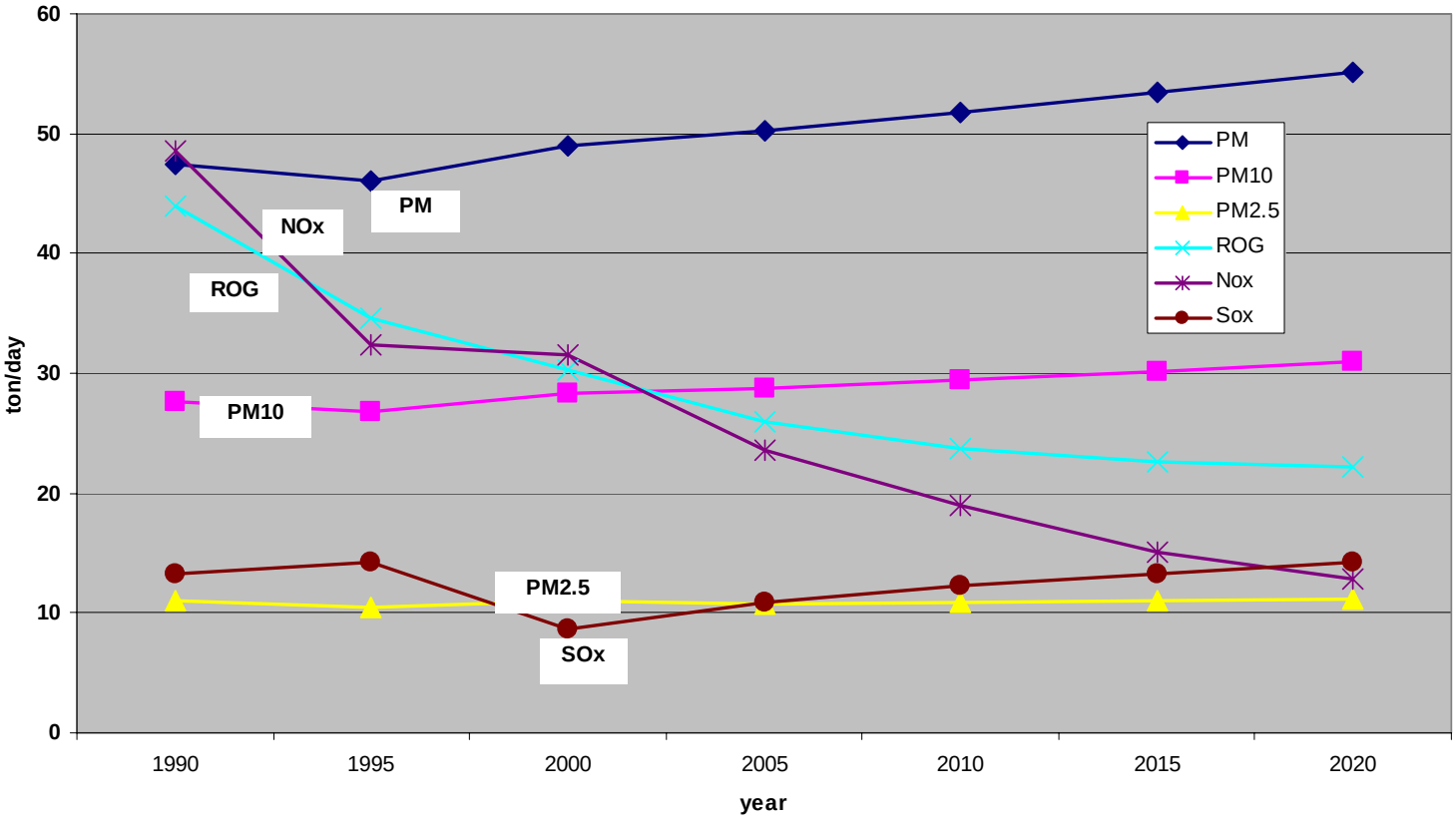
Appendix B. Emissions Inventory

Table B-1: Top 25 Sources of PM10 (tons/day)

2005	Source Category	PM10 (tpd)	% of Total
1	UNPAVED ROAD DUST	8.83	30.8%
2	PAVED ROAD DUST	4.8	16.7%
3	CONSTRUCTION AND DEMOLITION	4.06	14.2%
4	PRESCRIBED BURNING	2.53	8.8%
5	FARMING OPERATIONS (DUST)	1.97	6.9%
6	FUGITIVE WINDBLOWN DUST	1.75	6.1%
7	RESIDENTIAL FUEL COMBUSTION	1.74	6.1%
8	AG BURNING	0.88	3.1%
9	MINERAL PROCESSES (MINING, CEMENT MANUFACTURING)	0.31	1.1%
10	OFF-ROAD EQUIPMENT (LAWN/GARDEN, CONSTRUCTION)	0.28	1.0%
11	PETROLEUM MARKETING	0.26	0.9%
12	RECREATIONAL BOATS	0.18	0.6%
13	FARM EQUIPMENT (TRACTORS)	0.18	0.6%
14	ELECTRIC UTILITIES	0.15	0.5%
15	LIGHT AND MEDIUM DUTY TRUCKS	0.12	0.4%
16	COOKING	0.12	0.4%
17	LIGHT DUTY PASSENGER CARS	0.11	0.4%
18	SHIPS AND COMMERCIAL BOATS	0.1	0.3%
19	HEAVY DUTY DIESEL TRUCKS	0.09	0.3%
20	FOOD AND AGRICULTURE (CROP PROCESSING, WINERIES)	0.06	0.2%
21	TRAINS	0.05	0.2%
22	PETROLEUM REFINING (COMBUSTION)	0.03	0.1%
23	SERVICE AND COMMERCIAL (BOILERS, IC ENGINES)	0.02	0.1%
24	PETROLEUM REFINING (EVAPORATIVE LOSSES)	0.01	0.0%
25	MANUFACTURING AND INDUSTRIAL (BOILERS, IC ENGINES)	0.01	0.0%
	All other Sources	0.05	0.2%

Figure B-2: Emission Inventory Trends and Projections 1990 – 2020

This chart does not take into account any emission benefits from the proposed PM control strategies.



Appendix C. APCD's Evaluation of PM Measures

Paved and Unpaved Roads

I. PM10 Unpaved Roads Dust Control (ARB# 37)

II. Existing Regulation: None

III. Baseline Emissions: Unpaved Road Dust 3,210 tpy PM10, CARB Estimated Emissions Inventory 2004.

IV. Control Measure Description and Efficiency: Emissions from paved and unpaved roads are a major contributor to PM emissions in SLO County. Possible control measures to reduce emissions include speed limit reductions on unpaved roads (assume 0.077 lbs PM10 reduction/mile for every MPH the average speed is reduced); application of water, gravel or other dust suppressants (e.g. chemical dust suppressant >80% efficiency); chip seal unpaved roads (up to 50% control efficiency); or pave new and existing unpaved roads (2 lbs PM10 reduced per vehicle miles traveled).

V. Sources Affected and Emissions Subject to Control: Public and private unpaved roads with a defined level of traffic per day.

VI. Projected Emission Reduction: Varies depending on method used and amount of unpaved roads meeting rule criteria. The emission reductions for these potential measures can not easily be assessed without a thorough understanding of the number of unpaved roads to which these measures would apply. This assessment will take place during rule development.

VII. Enforceability: Rule would require implementation by affected municipalities and landowners. Rule would be enforced through inspections.

VIII. Cost Effectiveness ($/ton): Unpaved Roads: 25 mph speed limit-$1,080; Water, gravel or other dust suppressant (generally less cost effective than paving unpaved roads); chip seal -$126 to $595; Paving-$2,160 to $5,930; Paving Average - $3,540.

IX. Health, Welfare, Energy, and Social Impacts: PM emission reductions minimize adverse respiratory impacts on people and visible haze.

X. Public Acceptability: High for general public, low for landowners or municipalities with unpaved roads subject to the rule.

XI. Estimated Date of Adoption: 2009-2010.

XII. Implementation Schedule: On adoption of the rule for new road projects; phase-in schedule for existing roads.

XIII. Feasibility and Resources: The listed control measures are already proven and technically feasible for municipalities to implement. Resources to implement some of these measures may be a limiting factor. The impact on APCD enforcement resources will be moderate with the implementation of these measures.

XIV. Recommendation: Develop a new rule to address new unpaved road construction projects and a phase-in program for existing unpaved roads. The control measures would apply to unpaved roads with a specified number of average daily trips, and locations in close proximity to populated areas of the county.

XV. References: CARB Staff Report for Proposed List of Measures to Reduce Particulate Matter (October 18, 2004); SJVUAPCD Rule 8061 Paved and Unpaved Roads (August 19, 2004); SCAQMD Rule 1186 PM Emissions from Paved and Unpaved Roads and Livestock

Operations (April 2, 2004); Genesee County, MI. Policies, Practices and Procedures, Public Road Specifications & Requirements, Chip and Seal Resurfacing Policy. 2005. http://www.gcrc.org/policies_public_road_requirements.html; T. Kuennen. Oct. 2004. Surface Treatments: When Your Seals Make Sense. Better Roads for the Government/Contractor Project Team. www.betterroads.com.

XVI. Emission Documentation: 2004 Estimated Annual Average Emissions (ARB Website); Appendix G: Exhibit A-BACM Technological and Economic Feasibility Analysis (March 21, 2003) of SJVUAPCD PM Plan; Appendix G (April 2, 2004) of SCAQMD Final Staff Report for proposed amendments to rules 403, 1186 and 403.1.

XVII. Cost Documentation: CARB Staff Report for Proposed List of Measures to Reduce Particulate Matter (October 18, 2004); Appendix G: Exhibit A-BACM Technological and Economic Feasibility Analysis (March 21, 2003) of SJVUAPCD PM Plan; Appendix G (April 2, 2004) of SCAQMD Final Staff Report for proposed amendments to rules 403, 1186 and 403.1.

I. PM10 Paved Roads and Street Sweepers Dust Control (ARB# 33,34)

II. Existing Regulation: None

III. Baseline Emissions: Paved Road Dust 1,710 tpy PM10, CARB Estimated Emissions Inventory 2004.

IV. Control Measure Description and Efficiency: Emissions from paved and unpaved roads are a major contributor to PM emissions in SLO County. A variety of control measures are available to reduce these emissions. Possible measures for this county include use of PM_{10}-efficient street sweepers (86% emission reduction with needed return time of 8.6 days); apply soil stabilizers to unpaved road shoulders on existing paved roads with the highest average daily vehicle trips (ADVT; 80% emission reduction efficiency); road shoulder paving for all new or modified paved roads and add curbs and gutters to road shoulders (59% emission reduction efficiency; 42% track out emission reduction).

V. Sources Affected and Emissions Subject to Control: Public and private paved roads with a defined level of traffic per day.

VI. Projected Emission Reduction: Varies depending on method used and amount of paved roads meeting rule criteria. The emission reductions for these potential measures cannot easily be assessed without a thorough understanding of the number of existing paved roads to which these measures would apply. This assessment will take place during the rule development.

VII. Enforceability: Rule would require implementation by affected municipalities and landowners. Rule would be enforced through inspections.

VIII. Cost Effectiveness: Street Sweeping-$33 to $1,070; Soil stabilizers to unpaved shoulders-$7,290 to $11,300; Road shoulder paving- $13,800 to $554,000 and $1,350 to $5,700; Curb & gutter road shoulder-$5,577.

IX. Health, Welfare, Energy, and Social Impacts: PM emission reductions minimize adverse respiratory impacts on people and visible haze.

X. Public Acceptability: High for general public, low for landowners or municipalities with paved roads subject to the rule.

XI. Estimated Date of Adoption: 2009-2010.

XII. Implementation Schedule: On adoption of the rule for new road projects; phase-in schedule for existing roads and street sweeper replacement.

XIII. Feasibility and Resources: The listed control measures are already proven and therefore technically feasible for municipalities to implement; however, resources to implement some of these measures may be a limiting factor. The impact on APCD enforcement resources will be minimal to moderate with the implementation of these measures.

XIV. Recommendation: Develop a new rule to address the new paved road construction projects and a phase-in program for existing paved roads and street sweeper replacement. The control measures in this rule would apply to roads with a specified number of average daily trips, and locations in close proximity to populated areas of the county.

XV. References: CARB Staff Report for Proposed List of Measures to Reduce Particulate Matter (October 18, 2004); SJVUAPCD Rule 8061 Paved and Unpaved Roads (August 19, 2004); SCAQMD Rule 1186 PM Emissions from Paved and Unpaved Roads and Livestock Operations (April 2, 2004).

XVI. Emission Documentation: 2004 Estimated Annual Average Emissions (ARB Website); Appendix G: Exhibit A-BACM Technological and Economic Feasibility Analysis (March 21,

2003) of SJVUAPCD PM Plan; Appendix G (April 2, 2004) of SCAQMD Final Staff Report for proposed amendments to rules 403, 1186 and 403.1.

XVII. Cost Documentation: CARB Staff Report for Proposed List of Measures to Reduce Particulate Matter (October 18, 2004); Appendix G: Exhibit A-BACM Technological and Economic Feasibility Analysis (March 21, 2003) of SJVUAPCD PM Plan; Appendix G (April 2, 2004) of SCAQMD Final Staff Report for proposed amendments to rules 403, 1186 and 403.1.**I.**

Fugitive Dust

I. PM Fugitive Dust Control – Construction & Windblown Dust (ARB# 24, 26, 32, 36, 39, 40, 41, 42, 27)

II. Existing Regulation: None

III. Baseline Emissions: 1,530 tons/yr PM10 based on 2004 Emission Inventory

IV. Control Measure Description and Efficiency: Emissions from construction sites and fugitive wind blown dust are a significant contributor to PM emissions in SLO County. Sources of emissions from these categories includes earth moving and grading operations; inactive disturbed land and open areas, unpaved parking lots and staging areas, bulk material storage piles; and track-out from construction and agricultural activities. A variety of control measures are available and could be used to control these emissions. Possible control measures include watering (10-85% control efficiency depending on watering frequency); chemical stabilizers/dust suppressants (60% to 84% control efficiencies depending on the product and application rate); track-out control devices (control efficiencies 46% to 80%); and enclosures/wind fencing for stockpiles (60-80 control efficiency). The emission reductions will be dependent on the type and number of measures implemented. Several rules may be required to establish control measures for these activities. The control efficiencies are based on data published in the San Joaquin Valley PM Plan and supporting documentation referenced in Section XVII below.

V. Sources Affected and Emissions Subject to Control: All construction sites, inactive disturbed land, bulk material storage/stockpiles and track out associated with agriculture activity.

VI. Projected Emission Reduction: Due to the wide variety of sources and potential control measures available it is estimated the emission reductions could range from 250-500 tons/year of PM. These estimated are based on control efficiencies presented above and emissions numbers from the 2004 emission inventory.

VII. Enforceability: Inspection and visible emission evaluation would be performed to determine compliance with this requirement. Enforceability coordinated with lead Planning Agency.

VIII. Cost Effectiveness: Due to the wide variety of sources and potential control measures available it is estimated the cost effectiveness could range from $300 per ton for a small site requiring only watering to $650,000 per ton for a site with stockpiles requiring 3-sided enclosures..

IX. Health, Welfare, Energy, Social Impacts and Air Toxics: Decrease in PM emissions and visible haze.

X. Public Acceptability: Since many of the proposed requirements are already recommended as part of the CEQA review process and routinely implemented at construction sites, it is anticipated that these measures would be viewed by the public as acceptable.

XI. Priority/Estimated Date of Adoption: Medium 2007-2009

XII. Implementation Schedule: 12- 18 months.

XIII. Feasibility: As part of the CEQA review process all development sites greater than four acres are required to implement dust control measures. Dust mitigation measures are also recommended for smaller sites (less than four acres) to prevent nuisance complaints. Therefore, the requirements outlined for this proposed measures are currently feasible and being implemented at the present time. Agricultural track-out limitations would most likely be required only in high VMT regions of SLO County.

XIV. Recommendation: Adopt a Fugitive Dust Rule that will pertain to the activities described above.

XV. References: SJVUAPCD Rules 8011, 8021, 8031, 8041, 8051, 8071 and SCAQMD Rule 403

XVI. Emission Documentation: 2004 emission inventory

XVII. Cost Documentation: ARB Staff Report, Proposed List of Measures to Reduce Particulate Matter - PM_{10} and PM 2.5, Appendix D approved November18, 2004; SJVUAPCD PM Plan 2003 Appendix G BACM/BACT Demonstration for Source of PM and Precursors in the SJV Air Basin dated April 28, 2003, and Appendix G Exhibit A. Sierra Research Final BACM Technology and Economic Feasibility Analysis, dated March 21, 2003; SJVUAPCD Final Draft Staff Report May 20, 2004.

Outdoor Burning

I. Outdoor Burning Permits Required (ARB# 23)

II. Existing Regulation: Rule 501 – Open Burning

III. Baseline Emissions: The total emissions from county non-agricultural open burning are estimated to be 883 ton/yr PM10; 555 ton/yr ROG.

IV. Control Measure Description and Efficiency: This series of control measures addresses the health and nuisance impacts of outdoor burning and recommends requiring permits for residential greenwaste burning. The APCD already has a permitting system in place for all outdoor burning except residential green waste burning. Currently the District prohibits residential green waste burning within the boundaries of Village Reserve Lines (VRL) or Urban Reserve Lines (URL) where population densities increase the potential for adverse health impacts or nuisance. Residential green waste burning is still allowed on permissive burn days in rural lands in accordance with the APCD's Rule 501 restrictions. Because of efforts to promote alternatives to green waste burning countywide, rural residences now have options for green waste recycling or disposal that have reduced burning in rural lands. Under the proposed measures, all residential green waste burning would be regulated by a permit system. The APCD would continue its efforts to promote alternatives to burning in rural lands. Similar to the 1991and 1998 Clean Air Plans' control measure R-13 "Non-agricultural Open Burning", this measure's control efficiency would be 50%.

V. Sources Affected and Emissions Subject to Control: Residential green waste burning under Rule 501; approximately 2000 residences may still burn countywide. Under the permit program and promotion of alternatives to burning, it is estimated that 10% of those still allowed to burn may choose alternatives to burning.

VI. Projected Emission Reduction: Emission reductions = 42.2 tons/yr PM10; 34.1 tons/yr ROG. Burn permit information can be used to promote alternatives to burning, better estimate the emissions and work with the applicant to minimize impacts from burning.

VII. Enforceability: Permit and permit fee system for residential green waste burning.

VIII. Cost Effectiveness: Cannot be calculated with traditional cost-effectiveness criteria; primary costs will be APCD permit fees for burning or any costs associated with using alternatives to burning. Feasible alternatives to burning in rural lands include composting, mulching, animal foraging, mowing and discing. Current landfill disposal cost for a pickup truck load averages $20 plus fuel cost. This is an important fiscal measure to recover a portion of District costs to implement Rule 501 and promote alternatives to burning.

IX. Health, Welfare, Energy, and Social Impacts: Possible decrease in particulate matter, VOC and NOx, CO, toxic air contaminant emissions.

X. Public Acceptability: High to affected public, low to potential burners.

XI. Priority and Estimated Date of Adoption: High priority under Fiscal Plan. Adopt in 2006, implement during the 2006/2007 burn season.

XII. Implementation Schedule: 2 years.

XIII. Feasibility and Resources: Feasible with the permit and partially funded from permit fee system.

XIV. Recommendation: Modify Rule 501.

XV. References: NCUAQMD Regulation 2; SLOAPCD Clean Air Plans 1991 and 1998.

XVI. Emission Documentation: 2004 Emissions Inventory, Air Resources Board Almanac

XVII. Cost Documentation: San Luis Obispo County Solid Waste Coordinator; Integrated Waste Management Authority, Cold Canyon Landfill, Chicago Grade Landfill, Paso Robles Landfill.

I. Limits during Burn Days in Smoke Sensitive Areas (ARB# 18)

II. Existing Regulation: Rule 501 – Open Burning

III. Baseline Emissions: The total emissions for the Range Improvement and Open Burning Categories = 923 ton/yr PM10; 577 ton/yr ROG. Smoke sensitive areas have not yet been designated in SLO County, but it is assumed that most burning is not done near sensitive sites.

IV. Control Measure Description and Efficiency: This measure restricts the burning of green waste on parcels in close proximity to Smoke Sensitive Areas. SLO Co. APCD already prohibits residential green waste burning in communities designated by Village Reserve Lines (VRL) or Urban Reserve Lines (URL) where many smoke sensitive sites are located. Currently, residential green waste burning can only be conducted on a permissive burn day in rural lands in accordance with SLO Co. APCD Rule 501 restrictions. In the proposed measure, residential green waste burning in rural lands would be regulated by a permit system. Permits issued for residential green waste burning under Rule 501 would prohibit burning within 1000 feet of Smoke Sensitive Site. Smoke Sensitive Sites are defined as schools, day care centers, parks, hospitals, nursing homes and other public or private health care facilities. SLOAPCD would promote alternatives to burning in rural lands near Smoke Sensitive Sites. Control Efficiency assumed to be 50% based on the 1991and 1998 Clean Air Plans control measure R-13 “Non-agricultural Open Burning”.

V. Sources Affected and Emissions Subject to Control: Residential green waste burning under Rule 501; approximately 2000 residences may still burn countywide – of these around 10% percent may be located within 1000 feet of a smoke sensitive site.

VI. Projected Emission Reduction: Emission reductions = 42.2 tons/yr PM10; 34.1 tons/yr ROG. Emission reductions are expected to be negligible compared to the overall County burning emissions, but will result in increased health protection for sensitive individuals.

VII. Enforceability: Permit and permit fee system for residential green waste burning.

VIII. Cost Effectiveness: Health and nuisance based measure impacting smoke sensitive sites.

IX. Health, Welfare, Energy, and Social Impacts: Potential decrease in particulate matter, VOC and NOx, CO and toxic air contaminant emissions.

X. Public Acceptability: High to affected public, low to potential burners.

XI. Priority and Estimated Date of Adoption: High priority under Fiscal Plan. Adopt in 2006, implement during the 2006/2007 burn season.

XII. Implementation Schedule: 2 years.

XIII. Feasibility and Resources: Feasible with the permit and partially funded from permit fee system. No additional staff required to implement rule.

XIV. Recommendation: Modify Rule 501.

XV. References: MBUAPCD Rule 438; SLOAPCD Clean Air Plans 1991 and 1998.

XVI. Emission Documentation: 2004 Emissions Inventory, Air Resources Board Almanac.

XVII. Cost Documentation: N/A

I. Preparation of Fuels & Management of Burns (ARB# 22b)

II. Existing Regulation: Rule 501 – Open Burning

III. Baseline Emissions: The total emissions for the Range Improvement and Open Burning Categories = 923 ton/yr PM10; 577 ton/yr ROG. Burning of poison oak likely represents a very small fraction, less than 1% of that total.

IV. Control Measure Description and Efficiency: This measure restricts the burning of poison oak, to reduce acute toxic impact. This is assumed to be a small percentage of overall burning, but a significant health benefit. Under the APCD's existing Rule 501, residential green waste burning is prohibited in communities designated by Village Reserve Line (VRL) or Urban Reserve Line (URL). Currently, residential green waste burning can only be conducted on a permissive burn day in rural lands in accordance with Rule 501 restrictions. In the proposed measure, Rule 501 would be modified to prohibit the burning of poison oak. Residential green waste burning would be regulated by a permit system. Permits issued for residential green waste burning under Rule 501 will prohibit the burning of poison oak. SLO Co. APCD will promote alternatives to burning in rural lands. Control Efficiency assumed to be 50% based on analysis of the 1991and 1998 Clean Air Plans control measure R-13 "Non-agricultural Open Burning".

V. Sources Affected and Emissions Subject to Control: Residential green waste burning under Rule 501; approximately 2000 residences are still allowed to burn countywide– of these it is estimated about 1% may have poison oak that is burned.

VI. Projected Emission Reduction: Emission reductions = 4.2 tons/yr PM10; 3.4 tons/yr ROG. Emission reductions are expected to be negligible compared to the overall County burning emissions. This measure is being proposed to protect sensitive individuals and to reduce toxic impacts, not for its potential for emission reduction.

VII. Enforceability: Permit and permit fee system for residential green waste burning.

VIII. Cost Effectiveness: Unknown costs. However it is assumed that there are cost-effective and feasible alternatives to burning, including animal foraging, mowing and discing.

IX. Health, Welfare, Energy, and Social Impacts: Potential decrease in particulate matter, VOC and NOx, CO, toxic air contaminant emissions, toxins from poison oak

X. Public Acceptability: High.

XI. Priority and Estimated Date of Adoption: High priority under Fiscal Plan. Adopt in 2006, implement during the 2006/2007 burn season.

XII. Implementation Schedule: 2 years.

XIII. Feasibility and Resources: Feasible with the permit and partially funded from permit fees.

XIV. Recommendation: Modify Rule 501.

XV. References: MBUAPCD Rule 438; SLOAPCD Clean Air Plans 1991 and 1998.

XVI. Emission Documentation: 2004 Emissions Inventory, Air Resources Board Almanac

XVII. Cost Documentation: N/A

Refinery and Calciner Activities

I. Petroleum Coke Calcining Operations (SOx): (ARB# 50)

II. Existing Regulation: None

III. Baseline Emissions: 3407 ton/yr SO2, 3-yr average from the 2001-2003 Emissions Inventories

IV. Control Measure Description and Efficiency: Requires 80% reduction in sulfur dioxide (SO2) emissions from coke calcining equipment using one or more of several available control options. Implementation of this measure would require the adoption of a new rule. This measure is based on SCAQMD Rule 1119 which requires uncontrolled emissions of SO2 from coke calcining equipment to be reduced by 80%. Add-on control equipment would have to be installed to achieve this reduction.

V. Sources Affected and Emissions Subject to Control: ConocoPhillips Carbon Plant at the refinery on the Nipomo Mesa.

VI. Projected Emission Reduction: 3066 ton/yr SO2

VII. Enforceability: Stack testing would regularly be performed to ensure compliance.

VIII. Cost Effectiveness ($/ton reduced): $1,155/ton of SO2 reduced

IX. Health, Welfare, Energy, and Social Impacts: In addition to the SO2 reduction, control equipment would also likely reduce directly emitted particulate matter and some toxic air contaminants.

X. Public Acceptability: high to surrounding community and high countywide

XI. Priority and Estimated Date of Adoption: High priority; 2006

XII. Implementation Schedule: Two years

XIII. Feasibility and Resources: The level of control specified in this measure is technologically feasible and has been successfully achieved at other facilities. Several different control technologies could be implemented including wet or dry scrubber systems. The estimated additional man-hours required per year by the District to enforce this control measure is 16 hours. This estimate is based on field and office activities that may be required to track compliance.

XIV. Recommendation: This single source is responsible for over 90% of the county's total SO2 emissions. A rule with an 80% SO2 reduction requirement is appropriate, technically feasible and cost-effective.

XV. References: Variance 04-03; SCAQMD Rule 1119

XVI. Emission Documentation: Emission Inventory data from 2001, 2002 and 2003. Average SO2 emissions from Kiln Stack = 3407 ton/yr.

XVII. Cost Documentation: ConocoPhillips submittal for Variance 04-03 Condition F: Sulfur Oxides Control Technologies Report. Ducon semi-dry flue gas desulfurization system capital cost estimate = $6,400,000; annual operating and maintenance cost = $2,900,000. Assume 10 year life; annual cost = 2,900,000 + 6,400,000/10 = $3,540,000 Potential reduction = 3407 ton/yr x 90% control = 3,066 ton/yr. Cost effectiveness = $3,540,000/3,066 = $1,155/ton reduced.

I. Storage, Handling, and Transport of Petroleum Coke, Coal, and Sulfur (ARB# 29)

II. Existing Regulation: None

III. Baseline Emissions: PM10 = 1.6 ton/yr from wind blown fugitive coke emissions.

IV. Control Measure Description and Efficiency: Limits opacity from operations to ½ Ringelmann (10% opacity); ensures enclosure of all coke piles including compliance schedule; requires District-approved plan or Best Available Control Measures (BACM) for any open piles of coal or sulfur; requires street-sweeping or limits silt loading on roads and truck exteriors with quarterly testing; requires paving and maintenance of roads; requires covers or slot-tops for transport trucks.

V. Sources Affected and Emissions Subject to Control: ConocoPhillips refinery on the Nipomo Mesa

VI. Projected Emission Reduction: To be determined during rulemaking process

VII. Enforceability: Minimal enforcement time needed after containment structures are installed.

VIII. Cost Effectiveness: $10,000 - $11,500 per ton of PM10 reduced.

IX. Health, Welfare, Energy, and Social Impacts: Undetermined at this time, to be further studied. State Regional Water Quality Control Board has identified the storage piles as a likely source of surface water contamination.

X. Public Acceptability: General public likely to support if aware of rule development.

XI. Priority and Estimated Date of Adoption: Medium, 2007

XII. Implementation Schedule: Tiered schedule to start in two years.

XIII. Feasibility and Resources: Proven control strategy now in place in the South Coast Air Basin.

XIV. Recommendation: Further study needed for emissions and control rates.

XV. References: SCAQMD Rule 1158

XVI. Emission Documentation: Authority to Construct engineering evaluation, D. Dixon, 4/26/04.

XVII. Cost Documentation: SCAQMD Rule 1158 staff report.

Particulate Exhaust Concentrations

I. Combustion Contaminants (ARB# 90)

II. Existing Regulation: Rule 403 C. currently limits combustion contaminants to 0.3 grains per dry standard cubic foot.

III. Baseline Emissions: N/A

IV. Control Measure Description and Efficiency: Prohibits combustion contaminant discharges from the burning of fuel exceeding 0.23 grams per cubic meter (0.1 grain per cubic foot) of gas calculated to 12% of carbon dioxide at standard conditions. Implementation of this control measure would require Rule 403 to be modified. Although there are no known sources that would be immediately affected, this is an important control strategy that would limit directly emitted fine particulate matter.

V. Sources Affected and Emissions Subject to Control: No known county facilities.

VI. Projected Emission Reduction: This rule modification might prompt some sources to improve the operational efficiency of their equipment, but immediate reductions are not anticipated.

VII. Enforceability: High, this standard can easily be measured at stacks. This proposed modification would improve the District's ability to limit directly emitted particulate matter.

VIII. Cost Effectiveness: N/A

IX. Health, Welfare, Energy, and Social Impacts: Effective at reducing fine PM.

X. Public Acceptability: High

XI. Priority and Estimated Date of Adoption: High, 2006

XII. Implementation Schedule: 1 year

XIII. Feasibility and Resources: Proven emission reduction control strategy used throughout California.

XIV. Recommendation: Modify Rule 403

XV. References: SJVUAPCD Rule 4301, MDAQMD Rule 409

XVI. Emission Documentation: N/A

XVII. Cost Documentation: N/A

I. Grain Loading (ARB# 91)

II. Existing Regulation: Rule 403 A currently limits grain loading (PM exhaust concentration) to 0.3 grains per dry standard cubic foot.

III. Baseline Emissions: N/A

IV. Control Measure Description and Efficiency: Prohibits release or discharge into the atmosphere from any source or single processing unit particulate matter emissions in excess of 0.1 grains per cubic foot of dry exhaust gas at standard conditions. Implementation of this control measure would require Rule 403 to be modified. A stricter standard would be adopted to limit directly emitted particulate matter.

V. Sources Affected and Emissions Subject to Control: None

VI. Projected Emission Reduction: There are no known sources in the county with continuous emissions that exceed the proposed new standard. A few sources have occasionally had stack testing results near or exceeding this proposed limit. This new standard might prompt some sources to improve their maintenance procedures or operational efficiency to avoid violations, which would result in some emission reductions.

VII. Enforceability: High, this standard can easily be measured at stacks. This proposed modification would improve the District's ability to limit directly emitted particulate matter.

VIII. Cost Effectiveness: N/A

IX. Health, Welfare, Energy, and Social Impacts:

X. Public Acceptability: High, measure is targeting visible plumes.

XI. Priority and Estimated Date of Adoption: High, 2006

XII. Implementation Schedule: 1 year

XIII. Feasibility and Resources: Proven, readily available control strategies.

XIV. Recommendation: Modify Rule 403

XV. References: SJVUAPCD Rule 4201

XVI. Emission Documentation: N/A

XVII. Cost Documentation: N/A

I. Visible Emission Limits: (ARB# 89)

II. Existing Regulation: District Rule 401, Visible Emissions

III. Baseline Emissions: N/A

IV. Control Measure Description and Efficiency: This control strategy would modify an existing rule to further restrict visible emissions. Discharges to the atmosphere would be prohibited which are: 1) as dark or darker in shade as that designated as No. 1 on the Ringlemann Chart (20% opacity), as published by the United States Bureau of Mines, or 2) of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in 1). These discharges could be smoke from a stack or fugitive dust emissions. The current District standard is 40% opacity; many other districts statewide have adopted a 20% opacity limit.

V. Sources Affected and Emissions Subject to Control: There are no known sources in the District that would have to make changes to comply with this new standard. However some sources may choose to make improvements, and this stricter standard would be an important tool in the effort to reduce fugitive dust emissions. As a prohibitory rule, it would be applicable to new and existing sources.

VI. Projected Emission Reduction: Not known

VII. Enforceability: High. This proposed modification would improve the District's ability to limit directly emitted particulate matter, and would be an important compliance tool for reducing dust and smoke emissions. District compliance staff is required to regularly be certified as visible emission evaluators.

VIII. Cost Effectiveness: No significant new costs are expected.

IX. Health, Welfare, Energy, and Social Impacts: Most modern equipment and processes are designed to run with little or no visible emissions, so meeting the requirements of this rule should not be difficult.

X. Public Acceptability: Very high from general public – historic source of complaints.

XI. Priority and Estimated Date of Adoption: High, 2006

XII. Implementation Schedule: Six months to one year.

XIII. Feasibility and Resources: Very feasible, proven control strategies throughout California; resources TBD

XIV. Recommendation: Modify Rule 401

XV. References: SBCAPCD Rule 302, SJVUAPCD Rule 4101

XVI. Emission Documentation: N/A

Appendix D. APCD's List of Measures

The following table gives a brief listing and explanation of several control strategies that are already in place or have equivalent control in SLO County.

Table D.1: Control Strategies with Adopted Rules or Equivalent Control

Title	APCD Rule	ARB #	Brief description
Residential Wood Burning Public Awareness Program	N/A	1	Brochures, website, media, events
Wood Burning Devices	504	4, 5 & 6	Requires certified wood burning heaters
Wood Moisture Content	504	11	Limits moisture content in wood for sale
Prohibit Fuel Types	504	12	Burning garbage, plastic, etc. prohibited
Prohibit Green Waste Burning	501	14, 15	Burning prohibited where waste service is available and in highly populated areas
Mechanized Burners	204 - NSR	19	Require permits for mechanized burners
Performance Standards for Allowed Burns	501	20, 21 & 22	Stds. for drying times, burn duration, preparation of fuels & burn management
Construction: Demolition	CEQA	25	Limits fugitive dust emissions and track-out including construction and demolition activities associated with new development.
Carryout and Track-out	CEQA	30	Track-out requirement for construction and demolition activities associated with new development.
Carryout and Track-out: Clean-up Methods	CEQA	31	Track-out requirement for construction and demolition activities associated with new development, CEQA review allow applicant to select method of track-out control / clean-up methods.
Boilers, Steam Generators, and Process Heaters (NOx)	430 & 204	45	Limits NOx emissions from new, existing and modified units
Turbines (NOx)	204 - NSR	46	Limits NOx emissions from new turbines
Internal Combustion Engines	431	47	Limits NOx emissions from IC engines
Lime Kilns (NOx)	204 - NSR	48	Limits NOx emissions from lime kilns
Cement Kilns (NOx, PM)	204 - NSR	49	Limits emissions from new cement kilns
Glass Melting Furnaces	204 - NSR	51.a	Limits NOx from glass melting furnaces
Residential Furnaces (NOx)	428	51.b	Limits NOx from central furnaces
Res. Water Heaters (NOx)	428	52	Limits NOx from residential water heaters
Compost, Chipping and Grinding Facilities	204 - NSR	54, 55 & 56	Permits required for new compost, chipping and grinding operations
Gasoline Dispensing Facilities	424	57	Limits VOC emissions from GDFs

Title	APCD Rule	ARB #	Brief description
Organic Liquid Storage	425	58	Limits VOC emissions from storage tanks
Fugitive Equipment Leaks (Valves and Flanges)	417	59	Limits VOC emissions from equipment at refineries, chemical plants, etc.
Coatings & Ink Manufacturing	204 - NSR	60	Operational requirements for manufacturing
Fiberboard Manufacturing	204 - NSR	61	Limits VOC emissions from new mfg.
Food Product Manufacturing and Processing	204 - NSR	62	Limits VOC emissions from solvents used in food product mfg. and processing
Pharmaceuticals and Cosmetics Manufacturing	204 - NSR	63	Equipment and operational requirements for new manufacturing facilities
Polyester Resin Operations	204 - NSR	64	Limits VOC emissions from new polyester resin operations
Polymeric Cellular Products (Foam)	204 - NSR	65	Limits VOC emissions from new polymer and foam product manufacturing
Surfactant Manufacturing	204 - NSR	66	Limits VOC from surfactant manufacturing
Adhesives & Sealants	204 - NSR	67	Limits VOC emissions from large, new operations applying adhesives and sealants
Architectural Coatings	433	68	Limits VOC emissions from the application, manufacture & sale of architectural coatings
Glass Coatings	204 - NSR	69	Limits VOC emissions from new operations
Graphic Arts	204 - NSR	70	Limits VOC emissions from new operations
Magnet Wire Coating	204 - NSR	71	Limits VOC emissions from new operations
Marine Coating Operations	204 - NSR	72	Limits VOC emissions from new operations
Metal Container, Closure, and Coil Coating Operations	204 - NSR	73	Limits VOC emissions from new operations
Metal Parts & Products Coatings	411	74	Limits VOC emissions from metal parts and products coating operations
Motor Vehicle Assembly Line Coating Operations	204 - NSR	75	Limits VOC emissions from new operations
Paper, Fabric, and Film Coating Operations	204 - NSR	76	Limits VOC emissions from new operations
Plastic, Rubber, and Glass Coating Operations	204 - NSR	77	Limits VOC emissions from new operations
Screen Printing Operations	204 - NSR	78	Limits VOC from new, large operations
Spray Booth Facilities	204 - NSR	79	Limits VOC emissions from new operations
Motor Vehicle Refinishing	423	80	Limits VOC emissions from spray booths and portable coating operations
Wood Flat Stock Coatings	204 - NSR	81	Limits VOC emissions from new operations

Title	APCD Rule	ARB #	Brief description
Wood Products Coatings	204 - NSR	82	Limits VOC emissions from new operations
Degreasing Operations	416	84	Limits VOC emissions from degreasing
Use of Solvents	204 - NSR	85	Limits VOC emissions from new operations
Soil Decontamination	204 - NSR	86	Limits VOC emissions from new operations
Solid Waste Landfills (VOC)	426	87	Requires gas collection and control systems at large solid waste landfills
DMV Fund Program	MOVER	92	Funds used for grants to reduce air pollution from motor vehicles, to implement relevant transportation control measures (TCMs) and establish and enhance innovative public education programs that focus on reducing motor vehicle emissions.
Heavy-Duty Engine Incentive Program	Moyer	93	Moyer Program funds used to reduce fleet emissions; Duke, Lopez, Avila, Guad, BUG
Lower Emission School Bus Program (LESBP)	LESBP	94	Provides financial incentives to school districts to replace older school buses
Moyer Program	Moyer	95	Provides funds for equipment modifications or replacements that reduce NOx & PM
Sacramento Emergency Clean Air Transporation Program	Future Moyer	96	Provides funds to encourage cleanup of Heavy Duty Diesel truck fleets
Light and Medium Duty Vehicle Program	MOVER, SULEV	97	Provides incentives for new alternative fuel vehicles
Transportation Outreach Program	Transportation Choices	100	Assists employers with voluntary trip reduction programs and incentives
Public Awareness Programs	TCP & C5	102	Assists public with transportation choices

The following table gives a brief listing and explanation of several control strategies that were determined to be either infeasible or not applicable (NA) to the San Luis Obispo County APCD.

Table D.2: Control Strategies That Are Infeasible or Not Applicable

ARB #	Control Strategy	Explanation Why Infeasible/NA
2	Mandatory residential wood combustion curtailment during periods with predicted high PM	No local daily forecast ability
3	Voluntary residential wood combustion curtailment during periods with predicted high PM	No local daily forecast ability
7	Limit the number of wood-burning devices in new residential developments	Not covered by Rule 504, but could be addressed with CEQA review
8	Limit the number of wood-burning appliances that may be installed in new nonresidential properties.	Not covered by Rule 504, but could be addressed with CEQA review
9	Limit the number of additional wood-burning devices that may be installed in existing properties	Not covered by Rule 504, but could be addressed with CEQA review
10	Replacement of non (EPA) -certified wood-burning devices upon sale of property	Considered during development of Rule 504, but had to be abandoned due to public sentiment, very unpopular
13	Prohibit all outdoor residential open burning	Insufficient alternatives such as garbage & green waste collection in many rural county areas
16	Prohibit residential open burning within small lots and setbacks	Burning already restricted on nearly all small lots areas under Rule 501; low number of small lots exist in rural areas with insufficient alternatives
17	Mandatory curtailment of non-agricultural open burning during periods with predicted high PM or ozone levels	No local daily forecast ability
35	Require vacuum street sweeping to remove sand & cinders used for anti-skid material on icy roads	N/A
38	Control fugitive dust from weed abatement activities	Staffing limitations and enforceability

ARB #	Control Strategy	Explanation Why Infeasible/NA
43	Require 50% vegetation cover, or 75% wet or saturated water cover, or 4-inch deep gravel on open areas that may cause or contribute to an exceedance of the federal PM-10 standard	This measure was a specific response to an Owens Lake Board Order; not applicable to SLO County
99	Require employers with 250 or more employees to implement a program to reduce vehicle emissions	District adopted Rule 901, Commute Alternatives Rule, in 1995, but it was prohibited by H&SC 40929(a)
101	Spare the Air Program, outreach to encourage reduction of transportation related emissions	No local daily forecast ability
103	Procure grants for transportation projects from other funding sources including the federal Congestion Mitigation & Air Quality Improvement program	CMAQ funds not available because District is in attainment for Federal Ozone Standard

Appendix E. Public Comments Received and APCD Response

I. Verbal Comments from Workshop #1 (March 9, 2005)

a. Questions concerning Rule development process:

- Will the secondary environmental impacts of the PM control measures be considered (chip seal water runoff issue given as an example)?
- Will street sweeping be required?
- Are the PM controls really cost-effective?
- What about leaf blowers?
- Will the cost analysis include economic benefit from reduced health impacts?
- Be realistic and address the issues that can be accomplished.
- Will there be additional controls for fireplaces like catalytic converters, certified inserts?

APCD Response: *The state law driving this process assumes a detailed analysis of individual measures would occur in each district's rule development process. Our proposed measures were chosen from the California Air Resources Board's (ARB) list of "All Feasible Measures" as required by law. These measures were compiled by the State from proven programs currently functioning in air district's throughout California. During the San Luis Obispo County Air Pollution Control District's (APCD or District) actual rule development process, each proposed control strategy is developed into a proposed local draft rule that may be significantly different than the proposed measure or even be dropped if unfeasible for our county. The proposed rule is then further analyzed for emission reductions, cost effectiveness, and secondary impacts. The rule development process includes ample opportunity for public input through public workshops, public review and comment and a public adoption hearing.*

b. Comments and Questions on PM monitoring

- How about monitoring improvements in Morro Bay like continuous PM monitoring?
- Will you require Continuous Emission Monitors on the new Morro Bay Power Plant?
- More air monitoring locations are needed near train stations; for example, evaluate asthma incidence versus air pollution levels.

APCD Response: *Expanded monitoring was not included as a requirement in the newly enacted state law (SB 656), which focuses on developing strategies to reduce PM in an expedited fashion. Monitoring modifications would require more substantial planning and funding than is available during the SB 656 process. Since PM monitoring will likely change in the coming years, the APCD*

will keep note of these suggestions and consider them in the Air District's annual strategic planning update. Our District currently has a diverse monitoring network and performs more air monitoring per capita than most other districts in the state.

The Morro Bay Power Plant burns natural gas, which is considered Best Available Control Technology for PM emissions from combustion sources. This together with the tall stacks, which were designed for high emitting oil fuel, makes the impact of the power plant on Morro Bay's PM levels very small compared to other sources. Nonetheless, the conditions of construction placed on the proposed plant will result in additional monitoring in Morro Bay if the new plant is built.

c. Diesel PM Comments

- Diesel has the highest particulate impacts, but the PM Plan doesn't seem to focus on that.
- The low-hanging fruit should be considered first. Idling diesel trucks & locomotives?
- Biofuel use in SLO County should be encouraged.

APCD Response: *Diesel risk reduction is such a high priority statewide that the ARB has developed an extensive Diesel Risk Reduction Plan that covers all aspects of diesel exhaust. This effort, which includes many new State Air Toxic Control Measures (ATCMs), is separate from the feasible measures program. The APCD must implement the ATCMs for those sources we regulate. Currently the Air District is implementing ATCMs for Stationary Diesel engines and portable engines that are subject to our permitting requirements. In addition, the ARB has adopted regulations and ATCMs for mobile sources, including fuel, vehicle exhaust specifications and fleet requirements for diesel trucks and school buses. Emissions from trains are currently being evaluated statewide and a proposal for their control should be forthcoming soon. Mobile source regulations are established by the U.S. Environmental Protection Agency (EPA) and ARB, and fall outside the APCD's jurisdiction. The APCD does work with local coalitions on outreach campaigns that expand awareness on alternative fuel technologies (including biodiesel) available in today's marketplace.*

d. Nipomo Dunes Comments

- The District should advise people moving to the Nipomo Mesa that PM from dunes have health impacts.
- What is the nature of emissions from dunes area?

APCD Response: *We are currently completing a special air monitoring study of PM in the Nipomo area that is separate from the list of feasible control measures. Our analysis of that study may result in modifications and or additional control strategies outside the feasible control measure list.*

e. General Comments

- Statewide PM control measures should be included.
- Will mining and off shore oil activities be included?

APCD Response: *The ARB in their November 2004 Board action adopted a list of statewide control measures that fall within the jurisdiction of the state agency. In addition, the SB 656 process should result in more statewide uniformity as all Districts must adopt those measures that will work within their districts. Mining and offshore oil activities, like all other permitted facilities, would be subject to any applicable measures contained in our proposed list.*

f. Natural PM Control Measures

- Credit should be given for sources that naturally reduce PM.
- What about natural sources of PM, like pollen, rural/agriculture emissions?
- Measures should include planting more trees, native shrubs and greenbelts around communities.

APCD Response: *Natural sources of PM and natural control strategies are associated with the APCD's CEQA development review and are included in our comments on general plan updates and specific development projects. We often suggest vegetation measures, including increased tree planting, in those comments.*

II. Verbal Comments from Workshop #2 (May 12, 2005)

a. Paved/unpaved Roads

- Will the measures apply to private, public, or both?
- Are we trying to control nature?
- Will road requirements apply to new projects only or will they phase into existing roads as well?
- For Ag operations, the criteria will make a big difference.

APCD Response: *During the rule development process the APCD will thoroughly research all potential control strategies and identify those which are most feasible for our region. Key determining factors on which roads will be affected, public or private, include vehicle trips/use on roads and proximity to population. The rules will be designed to control vehicular impact on natural and paved surfaces and not nature itself. The specific criteria for Ag and road classifications will be determined during the rule development process.*

b. General Comments

- How do we determine the dust (PM) amounts in our county inventory?
- Will the measures be prioritized based on their effectiveness for protecting community health?

APCD Response: *Emissions inventories are created through a mix of both individual site data and "area" emissions sources. Area source emissions are calculated based on regional estimates using standard emission factors and county specific data such as vehicle miles traveled, miles of unpaved roads, and acres farmed. The Air District's mission is to protect public health. Those feasible measures with the most significant potential for reducing emissions and public exposure will be a priority.*

c. Cost-effectiveness Questions

- How does $/ton relate to actual costs to owner/project proponent?
- The District should focus on the most effective measures.

APCD Response: *The cost-effectiveness in $/ton reduced relates to total cost for a project in a broad sense. The total emissions from the source multiplied by the $/ton should result in an approximate cost for the individual project. All the proposed rules will be analyzed for cost-effectiveness, compared with accepted values throughout the state and compared with each other to ensure that the costs of a rule are not out of line with accepted values.*

d. Fugitive Dust

- A lot of construction best management practices may be too costly for the Ag community.
- Isn't Ventura County more like us than the San Joaquin Valley? We should use Ventura as our model.

APCD Response: *During the rule development process the applicable requirements for each affected party will be determined with consideration of the cost impact on that party. Both Ventura County and the San Joaquin Valley will be adopting new rules based on the same master list we must use, so comparing the two at this point would not be appropriate.*

e. Local Industry Activities

- How much of a problem is our SO_2 emissions?
- What about SO_2 from power plants, like the Morro Bay Power Plant?

APCD Response: SO_2 *is a primary pollutant with established health-based air quality standards; this means that as a gas, it is harmful by itself. In addition, it plays a role in PM generation when it combines with other common chemicals and water vapor to produce particulates. It is possible for 1 pound of* SO_2 *to combine with available reactants like ammonia to form more than 2.5 pounds of airborne particulate.*

Power plants that burn high sulfur fuels like coal, petroleum coke, and fuel oils generate significant SO_2 *emissions. However, our local power plant uses natural gas and produces very little* SO_2*, less than 1% of the County total.*

f. Particulate Exhaust Concentrations

- Why are just industrial facilities targeted and not residential fireplaces?

  APCD Response: *New residential fireplaces are subject to PM standards under the APCD's existing Rule 504, adopted in 1993.*

III. Public Comments at APCD Board Meeting (5-18-05)

a. Additional PM Measures for Morro Bay

- Additional PM monitoring is needed in Morro Bay.
- Take this opportunity to implement additional PM reductions from the Morro Bay Power Plan.

  APCD Response: *See responses above (I.b. Comments & Questions on PM Monitoring and II.e. Local Industry Activities).*

IV. Comments from the San Luis Resource Conservation District Meetings (5-20-05 and 6-17-05)

a. Financial Assistance for Rule Implementation

- Will there be outreach assistance in the form of financial aid to help cover costs of compliance with the new requirements?

  APCD Response: *Grant funds are currently available through the APCD to reduce diesel PM emissions by re-powering or retrofitting old diesel engines with lower emitting diesel engines, assisting with the transition from diesel to alternative fuels such as compressed natural gas, installing particulate filters on applicable equipment or the purchase of equipment like chippers to eliminate burning green waste.*

b. County by County Differences

- Concerns were expressed that requirements might be different from county to county.

  APCD Response: *The District will research and evaluate the control measures implemented by other neighboring air districts and, to the extent feasible, will make our measures consistent with surrounding districts.*

c. Environmental Assessment of Control Strategies

- Concerns were expressed that single resource agencies often focus on one aspect of a problem and by addressing it can cause other problems. For example, using chemical stabilizers can contribute to other environmental problems, like runoff.

APCD Response: *The Air District will solicit input from other resource agencies during the rule development process, and an environmental review will be conducted on applicable control strategies.*

d. Stakeholder Involvement

- It was recommended that a multi-disciplinary task force be used to evaluate the various control measures as they move forward, and District representatives should consider attending workshops which address various road stabilization methods.

APCD Response: *Workshops will be held during the rule development process and input will be solicited from other agencies. A multi-disciplinary task force may be established to evaluate specific measures on a case by case basis.*

V. Written Comments from ConocoPhillips on the Coke Calcining Measure (June 17, 2005)

a. Secondary Formation of PM

- This is the only proposed measure from ARB's list in the plan that does not identify PM as an emission that is reduced. (Cleaning Operations also does not identify PM as an emission that is reduced, but this measure is slated for further study).

APCD Response: *With the exception of SO_2, most significant industrial precursors to PM were significantly reduced in the mid 1990's under the District's Clean Air Plan (CAP) and state programs for ozone attainment. The reduction in NOx and VOC achieved through those efforts corresponds with a general decrease in PM levels measured at county monitoring stations over the same period. This has occurred despite the population growth that has occurred over the last decade. Since PM reduction was not part of the CAP, SO_2 emissions were not addressed until now. The ConocoPhillips calciner stack is responsible for over 96 percent of stationary source SO_2 emissions in SLO County.*

b. Effectiveness of Control Strategies

- Because the ARB list specifically identifies those types of emissions that are reduced by each control measure, and PM is not listed under Petroleum Coke Calcining Operations, it is either ineffective at reducing PM, or, at least requires further study to determine its effectiveness.

APCD Response: *ARB's "All Feasible Measures" list included many control strategies that addressed precursor emissions. Many of these measures were already adopted by the APCD board in the 1990 CAP (see response above V.a.). Since the PM report is more of a planning outline and is not a rule adoption procedure, specific evaluation of this measure will occur during the rule development process. However, studies conducted around the world have shown that acid deposition, ambient particulate concentration, and regional haze are all reduced when SO_2 emissions decline.*

c. Feasibility of Control Strategies

- The Control Measure summary for Petroleum Coke Calcining Operations does not address the feasibility of resources required for implementation. In addition, less severe controls, which might be more cost-effective, are not considered. Further study would allow time for consideration of alternatives.

  APCD Response: *In addition to the responses above that also apply to this comment, the Air District believes that sufficient data exists from existing control systems to show that a rule similar to the State's model measure can be implemented cost-effectively when compared to the other measures proposed. The control equipment costs used for this measure evaluation were submitted to the District by ConocoPhillips. Using that data, this measure is determined to be cost-effective in terms of dollars per ton of SO_2 reduced. The total control costs are high because the potential emission reduction is very high – over six million pounds of SO_2 per year.*

d. Further Study

- PM in the Nipomo area is greatly influenced by airborne sand and dust from the Nipomo Dunes. Control of the calciner may have an infinitesimally small effect on ambient PM 10 levels even if the SO_2 emitted actually converted to PM. Because of the extreme cost of these controls, and their potential to require permanent shut down of the calciner, further study is needed to determine their effectiveness.

  APCD Response: *The Air District is currently studying PM levels and potential sources on the Mesa; the results of that study will be available prior to the rule development process. We are aware that SO_2 conversion to particulate is known to occur over varying time frames and distances depending upon weather patterns and available reactants. The APCD will evaluate the affects of any proposed rule on both our County and neighboring Santa Barbara County to ensure that any adopted rule has a benefit corresponding to its cost. Particulate matter resulting from SO_2 emissions from the calciner is almost entirely $PM_{2.5}$, which has more detrimental health implications than the coarse fraction of PM_{10}.*

- Although the ARB list makes no mention of this proposed measure reducing PM, the Control Measure Summary states "In addition to SO_2 reduction, control equipment would also likely reduce directly emitted particulate matter and some toxic air contaminants." Rather than speculating on the likelihood of the proposed controls reducing PM, further study is needed to determine the effectiveness of the proposed control measure.

  APCD Response: *Besides being the source of the majority of the county's SO_2, the calciner stack emissions also include significant quantities of directly emitted particulate matter, sulfuric acid and hydrogen chloride. Since most SO_2 control systems use a caustic scrubber solution, the installation of such a system would result in considerable reductions in acidic gases, mists and particulate emissions. These anticipated reductions will be further evaluated and quantified during the rule making process.*

VI. Written Comments from City of San Luis Obispo on Draft PM Report (July 6, 2005)

a. Meeting State PM_{10} standards

- The report states that SLO County is designated as a non-attainment area for the state PM_{10} standard. Appendix A – Air Quality Trend Data (p. A-2) shows that annual average PM_{10} levels in SLO County have been improving annually since 1989. How far from meeting state standards is the SLO County District? Or put another way, how many tons of PM would have to be reduced annually in SLO County to meet state standards? How does this compare with other regions statewide.

  APCD Response: *Since PM_{10} sampling began in SLO County, our annual averages have improved, although levels haven't actually declined over the past 9 years. The county mainly fails to meet attainment due to 24-hour samples that periodically exceed the state standard at every monitoring station in the county. Multiplied by 6, as discussed in the report, these exceedances make attainment of the PM standard a distant goal at best, but one we must work hard to accomplish. Achieving attainment and assuring clean air throughout the county will require an adequate margin of safety beyond just meeting the simple numerical standard. We have no means to determine how many tons of emission reductions will be needed to achieve that goal, hence the "evergreen" aspect of the SB 656 process, and the provisions for revisits as needed in future years. We also face the ongoing challenge of increasing population and vehicle miles traveled eroding the advances we make in emission controls.*

b. Public Comments

- The report notes that two public workshops were held (March 9 and May 12, 2005); however, the comments received and APCD's responses are not included in the Draft. City concerns and suggestions raised at the March 9 workshop do not appear to have been addressed.

  APCD Response: *Public comments received at the March 9 workshop were reviewed and discussed at the second public workshop held on May 12. In addition, the comments received at both workshops were also summarized at the May 18 APCD Board meeting. Appendix E of the Particulate Matter Report provides the APCD response for each public comment received to date.*

c. Evaluate Measures Fully Before Adoption

- SB 656 calls for implementation measures to be "readily available, feasible, and cost-effective." Some of the proposed implementation measures in the district's plan do not appear feasible, or their cost effectiveness is highly questionable. The report notes that further "rule making" would be required, including evaluation and public hearings, to establish these measure; however adopting them now as part of the implementation plan may give these measures a presumption of validity before detailed feasibility and fiscal impact studies are done.

APCD Response: *As outlined in SB 656, air districts throughout California are required to adopt an implementation schedule for PM control strategies by July 31, 2005. The list of strategies proposed by staff for Board adoption was drawn from a much broader list adopted by ARB in November 2004. In order to be included on the ARB list, each measure must have been in existence at an Air District in California as of January 2004 and deemed a feasible and cost effective strategy for that region. Nonetheless, Board action today to adopt the proposed PM implementation schedule primarily provides guidance to direct staff efforts in a more comprehensive evaluation of the most promising emission reduction strategies. That evaluation will include a thorough analysis of each individual control measure for cost-effectiveness, feasibility and applicability that will be used by staff and the Board in a public process to determine if the measure is appropriate for adoption as a regulation. Adopting the implementation schedule does not lock the District into moving forward with rule adoption if a measure is deemed in-feasible and/or cost prohibitive. The implementation schedule is an evergreen list of measures that can be modified by the APCD Board when deemed necessary.*

d. Diesel Engine PM Emissions

- The report notes that emissions from diesel engines are responsible for the majority of public health hazards due to toxic PM, yet the proposed PM control strategies do not address diesel engine emissions. SB 656 states that along with local districts, the implementation plan will "identify a list of all readily available, feasible and cost-effective measures that could be employed by the state board *and local air districts* to reduce PM_{10} and $PM_{2.5}$ from diesel powered engines in stationary and mobile applications, including but not limited to, measures that do any of the following:

  i. Utilize available federal, state and local funds, including but not limited to, Congestion Management and Air Quality (CMAQ) Improvement funds, to upgrade and replace heavy-duty engines with cleaner alternatives.

APCD Response: *The Air District is already implementing a wide variety of grant programs using state funds and local project mitigation fees to upgrade and replace heavy-duty engines with cleaner alternatives (see Measures 92-97 in Appendix D, Table D.1). Federal funding, such as the CMAQ funds, is not available to regions that are in compliance with the federal ozone standard.*

  ii. Require the use of low-sulfur diesel fuel.

APCD Response: *The APCD is currently implementing and enforcing several Air Toxic Control Measures (ATCMs) for diesel equipment that require the use of CARB-certified low-sulfur diesel fuel. Over 250 stationary diesel engines, including backup generators, have been permitted to ensure compliance with the ATCM requirements, including the use of low-sulfur diesel. In addition, state requires a switch to ultra low sulfur diesel (15 ppm sulfur maximum) throughout California by the end of 2006.*

iii. Promote and require local government solicitations that reward utilization of lower-emitting heavy-duty vehicles and equipment.

APCD Response: *The Air District already promotes and encourages the use of lower-emitting vehicles, engines and equipment through grant and incentive programs, outreach efforts and mitigation recommendations for CEQA projects (see Measures 92-97, 100 and 102 in Appendix D, Table D.1).*

iv. Establish heavy-duty vehicle idling restrictions.

APCD Response: *Heavy-duty vehicles are controlled by state and federal regulations. As part of the SB 656 requirements, ARB has already adopted 37 statewide measures, with 28 more measures proposed for adoption. Included in the adopted measures are ATCMs to Limit Diesel-Fueled Commercial Motor Vehicle Idling and to Limit School Bus Idling and Idling at Schools.*

v. Are there measures possible that should be included in the implementation plan that could effectively reduce diesel emissions in SLO County?

APCD Response: *The Air District currently evaluates and regulates stationary sources of diesel emissions through Rule 219, Toxics New Source Review. In addition, mitigation measures for diesel emissions from construction activities are implemented through CEQA project review. The APCD also implements and enforces state ATCMs for the control of diesel emissions. A Diesel Risk Management Plan is now under development is now under development to determine if there are other feasible strategies in addition to these that can be implemented to reduce public exposure and health risk from diesel emissions.*

e. Unpaved and Paved Roads PM Emissions

- The report states that emissions from paved and unpaved roads are the main contributor to PM emissions in SLO County, accounting for 47.5 percent of total PM_{10} emissions. Yet mobile sources such as passenger cars, farm equipment, light and medium duty trucks, heavy duty diesel trucks, and trains are estimated to account for just fewer than 2 percent total PM 10 emissions countywide. Appendix C, Paved and Unpaved Roads, references documents prepared in other districts. What is the basis for the SLO County data? Reliability? How do our percentages compare with other areas, such as the San Joaquin Valley or Ventura/Santa Barbara areas?

APCD Response: *Dust emissions from paved and unpaved roads account for 48% of SLO County's PM_{10} emissions according to ARB calculations. These emissions are caused by the abrasion and entrainment of fine particles from the roadway surface by vehicle tires. Exhaust emissions from mobile sources in the county contribute an additional 2% of the total PM_{10} emissions. The ARB uses vehicle miles traveled in the county and miles of unpaved roads to estimate paved and unpaved roadway dust emissions; the amount of fuel burned is used to estimate exhaust emissions. The ARB annually updates the Emissions Inventory for every county with this information. This process undergoes several quality*

assurance steps, including comparisons to other counties. While this data represents estimates and not measured values, the emission factors used in the calculations are based on measurements from field studies and represent the best data currently available. The APCD is confident of the reliability of this process and recognizes that vehicle miles traveled and the resulting emissions in the county increase annually. The percentage of PM10 emissions contributed by paved and unpaved roads relative to total PM10 emissions in any given air district varies from region to region based on vehicle travel, miles of unpaved roads, amount of agriculture and other major sources of PM, prevailing wind strength and other factors.

f. Fiscal Impact of Road Dust Measures.

- Two proposed PM Control strategies in the category of Unpaved and Paved Roads could have significant fiscal consequences for County and city governments: 1) the possible requirement to pave existing unpaved roads or provide other dust-suppressant surfacing or road shoulder paving, and 2) the possible requirement to provide "PM 10 efficient street-sweepers."

APCD Response: *Paving and the use of dust-suppressants on existing unpaved roads or shoulders are recognized by the state as cost-effective PM10 reduction measures. Staff recognizes the potentially significant fiscal implications of these measures to local government and will work closely with local officials in evaluating their feasibility and scope. If the measures are deemed appropriate at some level after the extensive review process, traffic volume and public exposure will likely be key criteria for how and where to focus the control effort.*

With regard to PM10 efficient street-sweepers, this measure is being effectively implemented elsewhere in the state and APCD will evaluate it for local implementation. Staff recognizes that early replacement of existing equipment could be costly for local jurisdictions. However, the cost differential between PM10 efficient and inefficient sweepers is relatively small; thus, a possible focus for rule development could be to require purchase of PM10 efficient street-sweepers when old units are replaced or when new units are added to a fleet.

g. Surfacing Unpaved Roads

- SLO cities and the unincorporated County contain hundreds of unpaved roads, both public and private. At a typical paving cost (2" A.C. blanket over compacted aggregate base), this could result in construction and ongoing inspection/repair costs of well into the millions for SLO County governments. Put another way, at the report's estimated cost of $3,540 per ton of PM 10 reduced, what is the projected cost to meet state standards, assuming this measure accounts for roughly one-half the reduction? The costs to pave, resurface, and inspect these roads – even if limited to only those most frequently used – would be a significant fiscal impact to local governments already grappling with state–mandated costs. The measure assumes enforceability through implementation by "affected municipalities and landowners." (Appendix C, p. A-7). Before adopting such a far-reaching requirement, staff recommends your Board clearly identify the need, effectiveness, feasibility and short and long-term costs of this measure.

APCD Response: *As identified in the previous response, APCD staff are well aware of the potential fiscal implications of this measure and will thoroughly evaluate its feasibility and scope through an open public process before bringing a recommendation to our Board. We will research and compile the best available information from affected stakeholders, including municipalities and private land owners, to evaluate this measure, using the type of cost factors identified in the comment. Prior to adopting, amending or repealing a rule or regulation, the District must consider the cost-effectiveness of a control measure and the District Board must make findings of necessity, authority, clarity, consistency, non-duplication and reference in accordance with California Health & Safety Code Sections 40703 and 40727.*

h. Street-Sweeping

- Like many cities, San Luis Obispo utilizes street sweeper vehicles to clean its streets. The City already uses equipment and methods that minimize dust emissions. It is not clear from the report what constitutes a "PM 10-efficient street sweeper", whether these are readily available to purchase, or how much they cost. It would be most beneficial if this information were made available before adopting such a measure to help San Luis Obispo and other jurisdictions understand its implications.

APCD Response: *See response above (VI. f. Fiscal Impact of Road Dust Measures Additional Alternatives)*

g. Additional Alternatives

- The report includes five proposed PM control strategies, and lists measures already in place, or measures considered but deemed infeasible, or not applicable in Appendix D. Several additional measures may also merit study, for example:

  i. *Tree Planting.* Numerous studies show that trees help remove particulate pollution from the air. Extensive tree planting countywide, including both native California and, where appropriate, ornamental tree species, along roads, in and near urbanized areas, and as wind rows in agricultural areas, may provide an environmentally sound, cost effective alternative to increased road paving.

  APCD Response: *District staff commonly recommend tree planting through the CEQA review process to offset impacts from development projects that exceed the APCD's emission thresholds. However, as pointed out in the comment, it may be appropriate to examine this strategy as a potential control measure for Board consideration to broaden its application and effectiveness beyond our current case-by-case approach.*

  ii. *Sanitary Landfills and Sand/Gravel Mining Sites.* Addressing earth moving, filling, and sifting operations at landfills in and adjacent to SLO County may help reduce windblown dust and PM 10. Additional landscaping, dust fencing, watering, or other measures may be cost effective.

APCD Response: *The Air District currently requires permits for sanitary landfills and sand/gravel mining sites. However, studying the potential for additional dust controls at these sites is appropriate and will be evaluated by staff for potential Board consideration.*

iii. *Railroad Engine Idling.* A recurring source of complaints, in terms of noise and pollution is idling railroad engines in the San Luis Obispo area. Efforts to curb this have met with mixed results, and the problem isn't easy to solve, in part because of overlapping government jurisdictions. While railroads are a matter of federal jurisdiction, land use, environmental and air quality are matters of local/statewide concern and may be appropriate to address in the report and implementation plan.

APCD Response: *Federal law significantly restricts District authority in this area. We have worked with the railroad over the past several years to establish no-idling zones near residential areas close to the San Luis Obispo train station; this has helped significantly, but has not completely resolved the problem. The District will continue to work with the state and railroad companies to address this issue. The ARB recently finalized a Memorandum of Understanding with the BNSF Railway and Union Pacific Railroad Companies, effective June 30, 2005, which includes a Locomotive Idling-Reduction Program.*