SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Sample Construction Scenarios for Projects Less than Five Acres in Size

February 2005

Author: James Koizumi, Air Quality Specialist
Reviewed By: Steve Smith, Ph.D. – Program Supervisor
Jeri Vogue - Senior Deputy District Counsel
Technical Assistance: Barbara A. Radlein, Air Quality Specialist

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

CHAIRMAN: WILLIAM A. BURKE, Ed.D.
Speaker of the Assembly Appointee

VICE CHAIRMAN: S. ROY WILSON, Ed.D.
Supervisor, Fourth District
Riverside County Representative

MEMBERS:

MICHAEL D. ANTONOVICH
Supervisor, Fifth District
Los Angeles County Representative

JANE W. CARNEY
Senate Rules Committee Appointee

BEATRICE J.S. LAPISTO-KIRTLEY
Mayor, City of Bradbury
Cities Representative, Los Angeles County, Eastern Region

RONALD O. LOVERIDGE
Mayor, City of Riverside
Cities Representative, Riverside County

JAN PERRY
Councilmember, Ninth District
Cities Representative, Los Angeles County, Western Region

MIGUEL A. PULIDO
Mayor, City of Santa Ana
Cities Representative, Orange County

GARY OVITT
Supervisor, Fourth District
San Bernardino County Representative

JAMES SILVA
Supervisor, Second District
Orange County Representative

CYNTHIA VERDUGO-PERALTA
Governor's Appointee

DENNIS YATES
Mayor, City of Chino
Cities Representative, San Bernardino County

EXECUTIVE OFFICER:

BARRY R. WALLERSTEIN, D.Env.

Acknowledgements

The following members of the Localized Significance Threshold Working Group and interested parties provided valuable input and their assistance was greatly appreciated.

Name	**Agency Representatives**
Ms. Detrich Allen represented by Ms. Renee Brandt	City of Los Angeles, Environmental Affairs Department
Dr. Hsiaoching Chen	Los Angeles County Regional Planning
Mr. Bill Piazza	Los Angeles Unified School District
Mr. Randy Scott	County of San Bernardino Planning Department
Name	**Industry Representatives**
Mr. Mark Hagmann*	PCR Services Corporation
Mr. Bill LaMar*	California Small Business Alliance
Mr. Michael Lewis*	Construction Industry Air Quality Coalition
Mr. Clayton Miller	Construction Industry Air Quality Coalition
Mr. Jeb Stuart*	Construction Industry Air Quality Coalition
Ms. Carla Walecka*	Realtors Committee on Air Quality
Mr. Lee Wallace*	Sempra Energy Utilities
Mr. Rick Zbur	Latham & Watkins
Name	**Environmental/Community Representatives**
Mr. Bahram Fazeli	Communities for a Better Environment

* Interested party, non-Working Group Member attendee

TABLE OF CONTENTS

CHAPTER 1

USING THE SAMPLE CONSTRUCTION SCENARIOS

INTRODUCTION

In accordance with South Coast Air Quality Management District (SCAQMD) Governing Board's direction, staff has developed the localized significance threshold (LST) methodology and mass rate look-up tables, which were formally adopted by the Governing Board on October 3, 2003 for voluntary use by other public agencies. The mass rate LST look-up tables are only applicable to the following criteria pollutants: oxides of nitrogen (NO_X), carbon monoxide (CO), and particulate matter less than 10 microns in aerodynamic diameter (PM10). The mass rate look-up tables were developed for each source receptor area (SRA) and can be used on a voluntary basis by public agencies to determine whether or not a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards, and are developed based on the ambient concentrations of that pollutant for each source receptor area. For PM10 LSTs, mass rate look-up tables were derived based on requirements in SCAQMD Rule 403 – Fugitive Dust.

Intended Use of LSTs by Local Public Agencies

The use of LSTs is voluntary, to be implemented at the discretion of local public agencies acting as a lead agencies pursuant to the California Environmental Quality Act (CEQA) or the National Environmental Policy Act (NEPA). Detailed information on the methodology used to derive the mass rate LST look-up tables can be viewed at the following SCAQMD website address: http://www.aqmd.gov/hb/031034a.html.

LSTs Applicability

LSTs would only apply to projects that must undergo an environmental analysis pursuant to CEQA or the National Environmental Policy Act (NEPA). Projects that are statutorily or categorically exempt under CEQA would not be subject to LST analyses. Projects exempt from CEQA also include infill projects that meet the H&S Code provisions or projects identified by lead agencies as ministerial. The methodology and screening tables have been prepared to be included as an appendix to the *SCAQMD CEQA Air Quality Handbook (Handbook).*

Mass rate LST Look-Up Tables Applicability

The mass rate LST look-up tables apply only to projects that are less than or equal to five acres. Lead agencies may use the mass rate LST look-up tables to determine localized air quality impacts or use the LST mass look-up tables as a screening tool. If the project exceeds any applicable LST when the mass rate look-up tables are used in a screening analysis, then project specific air quality modeling may be performed. In the event that the project area exceeds five acres, it is recommended that lead agencies perform project-specific air quality modeling for these larger projects.

PM10 LSTs were derived based on concentration requirements in Rule 403 – Fugitive Dust, and tend to be more limiting than the CO or NOx LSTs. The Handbook, however, identifies a substantial number of PM10 (fugitive dust) mitigation measures that may be used to mitigate project PM10 emissions to less than the relevant PM10 mass rate LST. In general, LSTs are derived based on the location of the activity (i.e., the SRA); the project emission rates of NO_X, CO, and PM10; and the distance to the nearest exposed individual. The location of the activity and the distance to the nearest exposed individual can be determined by maps, aerial and site

photos, or site visits. To calculate NOx, CO, and PM10 emissions, the methodologies, emission factors and/or rates identified in the *Handbook* may be used (see Chapter 9 and the Appendix to Chapter 9). Relative to construction, the lead agency may use the sample construction scenarios described in the following sections. If lead agencies use the mass rate LST look-up tables and determine that the proposed project under consideration exceeds any applicable LST, they may choose to apply any of the substantial number of applicable mitigation measures identified in Chapter 11 of the *Handbook* to the proposed projects (see Appendix H).

Format and Use of This Document

This document is intended to provide local lead agencies with the information necessary to perform a localized air quality analysis. The format of this document consists of the following.

Chapter 1

- Introduction
- Background - contains information on the development of the LSTs.
- The Pilot Study - describes the pilot study that was conducted to develop more accurate sample construction scenarios. The actual sample construction scenarios can be found in Appendices A through E.
- Sample Construction Scenarios - explains the three ways that the construction scenarios can be use by lead agencies, which include using the sample construction scenarios to represent the proposed project, using the sample construction scenario spreadsheets as a template or basis to prepare project-specific analyses, or using a combination of those approaches for various proposed project phases.

Chapter 2

- Applying the Sample Construction Scenarios - this chapter provides guidance for applying the sample construction scenarios to specific projects when the projects do not conform exactly to the characteristics of the applicable sample construction scenario.

Appendices

- Appendices A through E - contain each individual sample construction scenario, one through five acres, respectively.
- Appendix F - provides the sources of emission factors and emission calculation methodologies.
- Appendix G - provides simplified off-road emission factors to assist planners with calculating construction equipment emissions.
- Appendix H - contains a list of mitigation measures and control efficiencies from the SCAQMD's *CEQA Air Quality Handbook* to assist planners with identifying measures to mitigate impacts from a project.
- Appendix I - contains a table that allows planners to identify the source receptor area of their proposed project from the city where the proposed project would be located. The source receptor area is used to identify which LST from the mass rate LST look-up tables is applicable to the proposed project.
- Appendix J - details how to scale mass rate LSTs for proposed projects with plot sizes that are in between the plot sizes in the mass rate LST look-up tables.

- Appendix K - contains the mass rate look-up tables for proposed project site between one and five acres for each source receptor area.

BACKGROUND

The LST methodology is applicable to projects where emission sources occupy a fixed location. This means that the LST methodology will apply to projects during construction because, although construction equipment may move around the construction site, their movements are restricted to a fixed location. The LST methodology would typically not apply to the operational phase of project because emissions are primarily generated by mobile sources traveling on local roadways over potentially large distances or areas. LSTs would apply to the operational phase of a project, if the project includes stationary sources or attracts mobile sources that may spend long periods queuing and idling at the site. For example, the LST methodology could apply to projects such as warehouse/transfer facilities.

During development of the LST methodology and mass rate look-up tables, SCAQMD staff received comments stating that using the LSTs may require a more detailed analysis of air quality impacts than are currently prepared. As a result, local planners requested guidance on setting up construction scenarios and assistance with calculating construction air quality impacts in addition to using the methodologies in the *Handbook*.

In response to this request, in October 2003 SCAQMD staff developed three sample construction scenarios, one-acre, two-acre, and five-acre in size, where construction impacts do not exceed the most stringent LSTs. The sample scenarios were designed to be used by local lead agencies as models or templates for analyzing construction air quality impacts for projects undergoing an environmental analysis under CEQA or the National Environmental Policy Act NEPA.

At the October 3, 2003 Governing Board Hearing, SCAQMD staff presented the LST methodology, mass rate look-up tables, and the sample construction scenarios to the Governing Board for consideration. The Governing Board adopted the LST methodology[1] pursuant to CEQA Guidelines Section 15064.7. However, in the adopting resolution, the Governing Board directed staff to conduct a nine-month phase-in period for field testing. The objective of the field testing was to conduct a pilot program with cities and local contractors to assess any potential implementation issues and report to the SCAQMD's Mobile Source Committee, at which time the Mobile Source Committee would formally approve complete implementation of the LST methodology or provide further direction. Staff was also asked to expand the list of sample construction scenarios to reduce resource impacts to local government and contractors by streamlining the construction analysis, updating mitigation measures with notations as to the appropriateness of specific measures for projects of different sizes, and reconvening the working group to review the results of the field testing and evaluate refinements or improvements needed to further simplify use of the LST methodology for local lead agencies.

[1] It should be noted that the action taken by the Governing Board was to adopt the LST methodology. The reason for adopting the methodology rather than the mass rate look-up tables is that the mass rate look-up tables for CO and NOx are based on ambient concentrations. Because monitored ambient concentrations change from year to year, the mass rate look-up tables must be modified annually to reflect the most recent three years of monitored data. This approach allows staff to update the mass rate emission tables without approval from the Governing Board. Governing Board approval is required if the LST methodology is modified.

COLLECTION OF ADDITIONAL INFORMATION

In order to improve the construction scenarios additional information that characterize typical construction site equipment and activities was required. To this end, SCAQMD staff conducted a construction site survey and updated off-road and on-road emission factors. SCAQMD staff worked with construction and building industries to develop a questionnaire for use at construction sites to gather accurate information to better estimate emissions from construction equipment based on their typical operations for projects less than five acres. The SCAQMD hired a consultant to conduct construction site surveys throughout the Basin. The consultant surveyed approximately 50 construction sites and compiled information on the various construction phases including demolition, site preparation, construction of structures, etc. This information was compiled, analyzed, and used to develop conservative emission estimates from "typical" construction site scenarios for five sample construction scenarios based on area: one-, two-, three-, four-, and five-acre project areas. Types of construction projects surveyed included schools, churches, libraries, retail establishments, restaurants, service stations, office buildings, warehouses, storage facilities, hotels, and multiple family dwellings (Table 1).

Table 1
Typical Types of Projects by Size (Area)

One-acre	Two-acre	Three-acre
o Restaurant	o Commercial Office Buildings	o Reconstruction of Street
o Church	o Retail Garden Center	o Residential Subdivision
o Education Center	o Public Library	o Multi-story Apartments
o Office and Warehouse	o Condominiums	o Bank
o Supermarket	o Hotel	o Hotel
o Single and Multi-Family Dwelling	o Single and Multi-Family Dwelling	o Multi-story Offices
	o Remodel Classrooms	o College
	o Multi-story Worship Center	o Storage Facility
	o Retail Department Store	o Car Dealership
	o Retail Shopping Center	
	o Restaurant	
	o Multi-story Self Storage	
	o Tenant Improvement	

Note: Four- and five-acre projects would include the same types of projects identified in the table under two- and three-acre project types.

Based on the results of the construction site survey, SCAQMD staff has developed typical construction site scenarios for projects less than five acres that do not exceed the LSTs for any pollutant. A "typical" construction scenario means that the construction does not require additional activities such as major cut-and-fill for projects located on a hill or steep grade; or major soil excavation and hauling off-site for a project that includes sub-grade levels or parking; or demolition of buildings greater than 50 feet tall. A typical construction scenario may also include multiple story buildings, as they do not necessarily require additional equipment.

Multiple story buildings may simply require additional time (days) to complete construction. Lead agencies with proposed projects that involve construction of a multi-storied building can use the sample construction scenarios to directly represent the proposed project as long as the amounts and types of the construction equipment are consistent with those in the sample construction scenarios. Aside from these restrictions, the sample construction scenarios can be applied to any type of construction project, commercial, residential, educational, etc. (Table 1). Additional technical enhancements were made to update off-road and on-road emission factors based on ARB's Off-Road and EMFAC2002 models that will simplify emission calculations from off-road and on-road[2] equipment.

Future Enhancements

Staff welcomes input and feedback from interested parties for improving the accuracy of the construction scenarios. Staff will also consider developing additional construction scenarios that may be generally applicable to a range of different land use projects. SCAQMD staff is available to assist lead agencies or project proponents in addressing implementation issues.

For those parties interested in information on the methodology for deriving the LSTs, the reader is referred to the following document *Draft Localized Significance Threshold Methodology*. For additional information on analyzing air quality impacts in general, the reader is referred to the following available sources: *Handbook*, U.S. EPA's *AP-42*, or to California Air Resources Board's URBEMIS2002 model at the following internet address: http://www.arb.ca.gov/planning/urbemis/urbemis.htm.

SAMPLE CONSTRUCTION SCENARIOS

SCAQMD staff has prepared sample construction scenarios that generically represent a broad range of project types that occur in the district, e.g., commercial, residential, educational, etc., (Table 1). Each sample construction scenario is divided into five non-overlapping phases: demolition, site preparation, grading, building, and architectural coatings and paving. Based on actual construction equipment and activity (hours of operation, area disturbed, dirt and debris handled, etc.) obtained from the construction site surveys, the sample construction scenarios in Appendices A through E represent projects that do not exceed the most stringent localized significance thresholds identified in the mass emission look-up tables. The sample construction scenarios spreadsheets can be downloaded from the SCAQMD's website at http://www.aqmd.gov/ceqa/hdbk.html. The most stringent localized significance thresholds represent the lowest allowable mass emissions for a pollutant from any SRA. In practice, if the lead agency calculates mass emissions from a proposed project, the resulting emissions should be compared to the appropriate mass rate look-up table based on the proposed project location (SRA), project size (area), and distance to the sensitive receptor.

For lead agencies that do not perform project-specific calculations or modeling to analyze localized air quality impacts, sample construction scenarios can be used based on the needs and/or air quality analysis expertise of the local lead agencies. The local lead agencies can use the sample construction scenarios to varying degrees including relying completely on the

[2] Emissions for a localized impact analysis would include only those emissions that occur on-site, such as watering truck travel, or haul/delivery truck travel through the site. Emissions from on-road vehicles off-site would not be included in a localized impact analysis; however, these emissions should be included in the regional impact analysis.

relevant sample construction scenario to represent the proposed project to selecting a sample construction scenario as a starting point for the air quality analysis and then modifying the equations or assumptions to fit site-specific characteristics of the project undergoing the environmental analysis. The following subsections describe the ways in which the sample construction scenarios might be used by local lead agencies.

1. Sample Construction Scenario Representative of Proposed Project – No Modification

If a proposed project is five acres or less and does not require additional construction activities such as major cut-and-fill, or excavation for sub-grade levels or parking, or demolition of a structure taller than 50 feet, the lead agency can use the applicable sample construction scenario to represent the emissions and impacts from the propose project instead of preparing a project-specific construction air quality analysis. No additional quantification of construction emissions would be necessary. Using the sample construction scenario to represent the emissions and impacts from the propose project would allow the lead agency to conclude that localized air quality impacts during construction do not exceed any applicable LSTs in the mass rate tables. Like any other condition proposed in air quality analysis, if a lead agency decides to use a sample construction scenario to represent a proposed project, the lead agency would be required to ensure that actual project construction parameters generally are similar to, or less than, the construction parameters described in the sample project. Construction parameters include number of pieces and size of construction equipment, operating hours, area disturbed, dirt or debris handled, etc. To ensure that the sample construction scenarios are implemented, the lead agency could require the project proponent to adhere to the construction scenario as either part of the project description that is approved by the decision makers or as mitigation in an approved mitigation monitoring plan.

2. Sample Construction Scenario as a Basis for Estimating Emissions with Project Specific Information – Use of Scenarios as a template

In this situation, the lead agency wishes to establish project-specific construction scenarios for each construction phase. The lead agency would use the sample scenarios as templates or a basis to estimate project-specific emissions and analysis. The lead agency would calculate project-specific construction air quality impacts by using the same methodologies used to derive the sample construction scenarios, but tailoring them to fit the project-specific characteristics for the project under consideration. Lead agencies can download the spreadsheets used to derive the sample projects from the SCAQMD's website at http://www.aqmd.gov/ceqa/hdbk.html, and then use the spreadsheets to develop scenarios that fit their proposed project by changing the types, dimensions and numbers of equipment, workers, operation schedules, areas disturbed, dirt and debris handled, and trips described in the sample scenarios. Spreadsheet options that can be changed include the following:

- The number, rating, or load of equipment
- The number of workers
- The daily hours of use for equipment or operations
- The amounts of materials handled
- The size of the areas disturbed
- The dimensions of the structures demolished or built
- The mitigation measures or control efficiencies

- The lengths or number of trips
- The types of operations
- The emission equations or parameters used in the equations
- LSTs from project specific source receptor areas. Use the city of proposed project and the table in Appendix I to find the source receptor area of the proposed project, and then use the LST mass rate look-up tables to find the corresponding LSTs.

The shaded cells in the sample construction scenario spreadsheets are typical values that lead agencies may wish to modify using site specific parameters. The spreadsheets will automatically re-calculate results when the shaded cells are modified. Changing the values in the shaded cells will not affect the integrity of the worksheets. However, adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

When modifying the spreadsheets lead agencies should consider the following issues:

- Verify that units of values entered are the same as the units associated to the cell. If the units do not match the equations will not calculate emissions correctly. Values should be converted to the same units as the cells in the spreadsheet before they are entered into the spreadsheet.
- If lines (rows) are added, verify that equations copied are referencing the correct cells. Use the text equation example or equations in other related Excel cells as an example. Also, verify that the summation cells are correct. If a line is added at the end of a series of rows, the summation cells may not include the added rows.
- After the individual phase spreadsheets are modified, verify that summary tables (spreadsheets) are referencing the correct cells.

For example, during the grading phase for a one-acre site the applicable sample construction scenario assumes that the following pieces of equipment would be used: a rubber tired dozer, motor grader, water truck, tractor/loader/backhoe, and haul truck. If the proposed project site requires only fine grading, then the lead agency could omit the haul truck (onsite) and haul truck offsite and adjust the hours of operation for the remaining pieces of equipment to calculate the maximum daily emissions for the proposed project. The amount and types of construction equipment are key parameters affecting construction emissions from a project. The emission results can then be compared to the applicable LSTs based on project size, receptor distance, and SRA.

3. Combined Representation and Template Analyses

When developing construction scenarios for the various construction phases, the local lead agency may conclude that some of the project construction phases closely match the sample construction scenario, while other construction phases are substantially different than the applicable sample construction scenario phase. In this situation the lead agency can apply a sample construction scenario phase to represent an applicable similar proposed project construction phase without further analysis. The same considerations described under the "sample construction scenario as representative of a proposed project" discussion apply here, that is, the construction project should be a "typical' construction project and the lead agency

should ensure that the representative sample construction scenario parameters are adhered to. For the construction phase scenarios that are substantially different than the sample construction scenarios, the lead agency may download the appropriate spreadsheets, customize the options as necessary, compile the emission results and compare the results to the applicable mass rate LST.

Conclusion

SCAQMD staff is available to assist lead agencies or project proponents in implementing the LST methodology and using the sample construction scenarios in an appropriate manner. If the air quality analysis results in emissions that exceed the applicable mass rate LST, feasible mitigation measures, if available, should be applied to the project. A number of potential mitigation measures are identified in Chapter 11 of the Handbook, which are also presented in Appendix H of this document.

CHAPTER 2

APPLYING THE SAMPLE CONSTRUCTION SCENARIOS

Application Summary
Common Questions

APPLICATION SUMMARY

The sample construction scenarios were developed such that resulting emissions would not exceed the most stringent LSTs in the mass rate look-up tables. The most stringent localized significance thresholds represent the lowest allowable mass emissions for a pollutant from any SRA. In practice, if the lead agency calculates mass emissions from the proposed project, resulting emissions should be compared to the appropriate mass rate look-up table based on the proposed project location (SRA), project size (area), and distance to the sensitive receptor.

The sample construction scenarios were initially derived using construction estimator reference guides (e.g., Walkers, 2002; Richardson Engineering Services, 1996, Caterpillar Performance Handbook, 2002, etc.), which are used by contractors to bid for jobs. The scenarios were then revised based on the results of surveys conducted at active construction sites, which represent a variety of land use types (Table 1-1). In general, construction equipment and activity, hours of operation, and number of construction workers tend to be consistent across a wide variety of land use types. Therefore, the sample construction scenarios would apply to land use types in addition to those listed in Table 1, as long as the structures to be constructed are similar in size and there are no additional construction activities such as major cut-and-fill for projects located on a hill or steep grade; major soil excavation and hauling off-site for a project that includes sub-grade levels or parking; or demolition of buildings taller than 50 feet. Lead agencies for these unlisted land use types can use the sample construction scenarios to represent the proposed projects or as a basis to estimate emissions using project-specific information as part of the environmental analysis. Results can then be compared to the appropriate mass rate LST look-up tables. The following information is provided to assist the local lead agency with determining whether or not the sample construction scenarios can be used for their project and if the mass rate LST look-up tables can be used to determine localized air quality impacts.

COMMON QUESTIONS

What if the actual construction of the project does not exactly correspond to the sample construction scenario?

The sample construction scenarios were developed with information obtained at actual construction sites. As a result, it is expected that the sample construction scenarios would generally reflect construction equipment and activities used at construction sites for projects less than or equal to five acres, assuming the project does not include additional activities such as major cut-and-fill, etc. It is likely that during actual construction, a piece of equipment may occasionally need to operate for a couple of extra hours a day due to unanticipated contingencies. The sample construction scenarios may still be used in this situation as long as the additional operating hours were not expected to be required during the planning analysis or occur over an extended duration of time. It may be possible to allow one piece of equipment to operate additional hours routinely, if operation of other similar types of equipment is curtailed. This type of give and take should be explicitly described in the mitigation monitoring plan or project description if the sample project scenario parameters are included in the project description.

What is not acceptable is to routinely operate equipment substantially more hours per day than specified in the sample project scenario or use a greater number of pieces of equipment. This caveat applies to all construction phases. If it appears that the actual construction parameters

will be substantially different than those described in the sample construction scenario, then the contractor will need to work with the lead agency to identify ways to ensure that construction air quality impacts do not exceed the relevant mass rate LSTs. This may include limiting which pieces or types of equipment can be operated simultaneously, curtailing the total hours of operation of all or a portion of the construction equipment, applying additional mitigation measures, or replacing some equipment types with equipment with a smaller horsepower rating, etc.

What is a "similar" type project?

A similar type of project to those identified in Table 1 is a project that is generally the same size and is expected to have a similar construction schedule and activities as the types of projects presented in Table 1. Table 1 presents project types surveyed and that were used to develop the sample scenarios. The specific type of project (such as a shopping center, an apartment building, a service station, etc.) is not as important as the type and number of pieces of equipment, area disturbed, the amount of materials handled, and duration of each of the construction phases. The duration of each construction phase is of particular concern. The amount of work completed in a day is directly tied to the number and capacity of equipment available. The shorter the duration of a phase the more equipment is needed. Therefore, if a project is proposed to be completed in a shorter duration of time than presented in the sample construction scenarios, the number of pieces of equipment may need to be increased. Table 2 provides some general guidelines for determining if a project is similar to the sample projects.

Table 2
Shortest Phase Durations for Sample Projects[a]

Project Size (building square feet)	Demolition	Site Preparation	Grading	Building Construction	Coating and Paving
1 Acre 40,000 sq ft structure	10 Days	1 Day	2 Days	2 Days	2 Days
2 Acre 87,000 sq ft structure	20 Days	2 Days	4 Days	3 Days	5 Days
3 Acre 124,000 sq ft structure	20 Days	3 Days	6 Days	3 Days[b]	10 Days
4 Acre 175,000 sq ft structure	20 Days	4 Days	6 Days	4 Days	14 Days
5 Acre 164,000 sq ft structure	20 Days	5 Days	8 Days	5 Days	18 Days

a) 1, 2, 3, and 5 acre parameters were estimated from survey information. 4 acre parameters were developed from information from the 1, 2, 3, and 5 acre sites.
b) Interpolated value from 3 and 5 acre survey information.

What if my proposed project's emissions exceed an LST?

If a lead agency estimates emissions from a proposed project and the emissions exceed any LST in the sample construction scenarios, the lead agency may choose to compare the emission estimates to the appropriate mass rate look-up table based on location (SRA), project size (area), and distance to the sensitive receptor. Alternatively, the lead agency may consider refining emission estimates or applying mitigation measures to reduce proposed project emissions. See the following discussion. Lastly, the lead agency may decide to estimate concentrations at the

receptors around the proposed project-site using an air dispersion model such as ISCST3. Lead agencies that choose dispersion modeling should follow the approach presented in the *Draft Localize Significance Threshold Methodology*.

How do I find the project specific LST?

The LSTs presented in the sample construction scenarios are the "worst-case" LSTs. The "worst-case" is the lowest allowable mass emission based on standard modeling meteorological data, the highest pollutant concentration measured at the nearest ambient air quality monitoring station over the past three years[3] (or 10.4 micrograms per cubic meter for construction PM10 and 2.5 micrograms per cubic meter for operational PM10), and with receptors 25 meters or closer to the propose project site. LSTs are dependent on the proposed project acreage, ambient air quality, meteorological data, and distance to the receptor. The lead agency may choose use the emission calculations in the sample construction scenarios, but use the mass rate look-up tables to determine the LSTs for the source receptor area where the proposed project is to be located according to project size and distance to the sensitive receptor.

To find the LSTs for the source receptor area where the project is located, the lead agency would need to know the city where the proposed project would be located. The lead agency would use the table in Appendix I to find the source receptor area from the city where the proposed project would reside. Second, the lead agency would use the SRA to locate the LSTs from the mass rate LST look up tables by project acreage.

For example, a one-acre office building is proposed to be constructed in Pasadena, where the nearest receptor is 100 meters away. According to Appendix I, Pasadena is in Source Receptor Area 8 – West San Gabriel Valley. The LSTs associated with Source Receptor Area 8 (NOx = 134 pounds per day, CO = 925 pounds per day, and PM10 = 85 pounds per day) may be used in place of the "worst-case" LSTs presented in the sample construction scenarios. The regional significance thresholds are 100 pounds per day of NOx, less than 550 pounds per day of CO, less than 75 pounds per day of VOC, less than 150 pounds of SOx, and less than 150 pounds per day of PM10. The NOx and CO LSTs are greater than the regional significance thresholds of 100 pounds per day of NOx and 550 pounds per day of CO. The only LST that is more stringent than a regional significance threshold is the PM10 LST of 85 pounds per day of PM10 (the regional significance threshold is 150 pounds per day of PM10). To be considered less than significant, the proposed project may not exceed the localized significance thresholds and the regional significance thresholds. In this example, if PM10 emissions are less than 150 pounds per day, but exceed the localized significance threshold (85 pounds per day) the proposed project would be considered significant for localized PM10 air quality impacts.

What actions can be taken to reduce emission impacts by refining emission estimates?

The lead agency should determine which pollutants exceed the applicable LSTs and focus on refining emission estimates for those pollutants. The most restrictive LST is the PM10 LST, since the district is non-attainment for PM10. Therefore, it is likely that if the project exceeds an

[3] The highest concentration over the last three years was used for all source receptor areas except for SRA 7 -East San Fernando Valley and SRA – 29 Banning Airport, because of nearby large single sources or events affecting the monitoring data. For these two source receptor areas the concentration for the last reported year (2003) was used.

LST, it would be the PM10 LST. It is possible that the proposed project may exceed more than one LST (e.g., PM10 and NOx).

Emission estimates can be refined by using more precise methodologies, emission factors or project specific parameters. The emission methodologies presented in the sample construction scenarios are generic methodologies developed by EPA, CARB and SCAQMD. Lead agencies can use alternative methodologies or emission factors to estimate emissions. However, the lead agency should reference any alternative methodologies and emission factors used, and provide sufficient documentation so that the public can easily follow the emission estimation.

The parameters presented in the sample construction scenarios are generic parameters developed by USEPA, CARB and SCAQMD. The lead agency may also substitute project specific parameters. For example, the silt content and moisture content used in the sample construction scenarios were taken from USEPA's AP-42. These values may be replaced by project specific silt content and moisture content. The maximum daily average wind speeds were developed by the SCAQMD from meteorological data across all source receptor areas. Lead agencies may use the maximum daily average wind speeds for the proposed projects specific source receptor area. Vehicle speeds, capacities and on-site distances traveled were based on assumption. Lead agencies may develop vehicle speeds, capacities and on-site distances based on project specific data. The amount of area disturbed, dirt and debris handled and equipment profiles were developed from construction surveys. Lead agencies may replace these parameters with project specific data.

In addition, lead agencies may also decide to adjust construction equipment hours, or the number or type of equipment on-site at any given time. Reducing the length of time certain pieces of equipment are used each day, amount of equipment operated each day, or the types of equipment that can be operated at the same time may reduce emissions. For example, if a project proponent requires both a bulldozer and a grader, but knows that neither will be on-site at the same time; the lead agency may estimate daily emissions for operations with bulldozer and graders separately. These two sets of independent emission estimates can then be compared separtely to the LSTs.

What actions can be taken to reduce emission impacts?

The lead agency should determine which pollutants exceed the applicable LST and focus on mitigation for those pollutants. The most restrictive LST is the PM10 LST, since the district is in non-attainment for PM10. Therefore, it is likely that if the project exceeds an LST, it would be the PM10 LST. It is possible that the proposed project may exceed more than one LST (e.g., PM10 and NOx).

The LST mass rate look-up tables do contain dust suppression techniques required by SCAQMD Rule 403. Rule 403 requirements must be met by all projects and are not considered mitigation. Therefore, the sample construction scenario emission estimates are considered unmitigated. A list of possible mitigation measures beyond Rule 403 requirements are presented in Appendix H of this document. The mitigation measures chosen by lead agencies should then be included in an approved mitigation monitoring plan.

What if the propose project acreage is between the project acreages on the LST mass rate look-up tables?

In this situation, the lead agency has two options. The first and easiest option would be to use the sample construction scenario and LSTs for acreage that is smaller than the proposed project. For example, if the proposed project is 2.5 acres, then use the two-acre sample construction scenario and LSTs.

The second option would be to develop LSTs from a ratio of the known LSTs for the smaller and larger acreages. For example, if the proposed project is 3.7 acres, then LSTs for 3.7 acres can be predicted from three and four acre mass rate LST look-up table values by a ratio of the areas. Appendix K contains a methodology for estimating the LSTs by linear regression.

If the second option is chosen, the sample construction scenario worksheets should be modified to reflect the 3.7-acre site. Either the three or the four acre sample construction scenario workbook can be used as a template. Each construction phase worksheet should be adjusted to reflect the 3.7 acre site. The structure dimensions in demolition and construction should be changed to project specific dimensions. The area disturbed in the site preparation and grading phases should be changed with project specific dimensions. The time length of each phase should be adjusted with project specific information. The amount of dirt and debris handled should be changed in the site preparation and grading phases. The truck trips and vehicle distance for trucks and bulldozers will change automatically when the area disturbed is changed in the site preparation and grading phases. The amount of demolition, debris handled, and truck trips in the demolition phase will change automatically when the size of the building is changed. The type and number of equipment, hours of operation and crew sizes should be adjusted with project specific information in each phase. If any of these values are not known, the lead agency may decide to approximate these values through linear regression from the three or four acre sample construction scenario values.

Lead agencies may chose to alter any other methodology, emission factor or parameter to better reflect the actual project characteristics.

What if a scenario for a larger project has more similarities to my project than the scenario for the actual size of my project?

The project proponent may use a larger scenario or phase of a larger scenario to represent their project. However, the project proponent would be required to compare the emission estimates from the larger scenario with the mass rate LSTs associated with the proposed project size. The lead agency would need to estimate emissions using site-specific parameters. The easiest method would be to modify the example scenario spreadsheets with project specific parameters. See the procedures outlined in the second method of using the sample construction scenarios under the Sample Construction Scenarios section in Chapter 1.

For example, if the amount of earth proposed to be moved in a two-acre project may be similar to the amount of earth moved in the three acre scenario, then the three-acre scenario can be used as a surrogate or modified with project specific information. The emissions from the sample scenario used to represent the proposed project or modified three-acre scenario would be compared to the two-acre mass rate LSTs, since the project is actually two-acres.

Why weren't the scenarios designed to be "worst-case" options maximizing emissions?
The sample construction scenarios were developed as average "worst-case" scenarios. SCAQMD developed parameters used in the scenarios from a construction site survey (see Pilot Study in Chapter 1 of this document). The survey provided information from approximately 50 sites, across SCAQMD jurisdiction, over a variety of project types. SCAQMD staff used the shortest number of days for phase completion (Table 2); and the upper ranges of areas disturbed, structure dimensions, areas paved, debris handled, etc. The average numbers of pieces of equipment, types of equipment, and operation hours were used. By using the shorter number of days per phase; the upper ranges of activities, areas disturbed and materials handled; and the average activity and number of pieces of equipment used an average "worst-case" was developed.

Since SCAQMD staff believes that the survey was representative of the projects under its jurisdiction and the average "worst-case" parameters were used to estimate emissions, few projects are expected to generate more emissions. Therefore, the emissions presented in the scenarios are likely "worst-case," since they represent actual construction activities.

It is difficult to develop the absolute "worst-case" scenario that has emissions that are only slightly below the LSTs, since there are many combinations of equipment, operation and material handling. SCAQMD staff developed one-, two- and five-acre scenarios for the October 2003 Governing Board Meeting based on "worst-case" parameters from building and construction estimators. The building industry stated that building and construction estimators use national averages that do not adequately represent Southern California. The use of survey data addresses the building industries' concerns.

Can the mass rate LST look-up tables be used to evaluate multi-storied structures?
Yes, in general the mass rate LST look-up tables can be used to evaluate multi-storied structures. Multi-storied structures were included in the construction survey. Demolition is directly related to structure size, since the amount of building debris handled is estimated from the volume of the building. Therefore, lead agencies should verify that the structure demolished is less than 50 feet tall as presented in the sample constructions scenarios. If the size of the proposed structure to be demolished, the amount and type of equipment is similar and the number of days spent demolishing the structure is equivalent or less, then the sample scenario can be used to represent the proposed project demolition phase. If the proposed project parameters are greater, the lead agency should modify the spreadsheets accordingly.

The size of the structure in the structure construction phase is not directly related to the emissions. The size of the structure is related to the amount and types of construction equipment used in the survey. However, if a project builds a larger structure using the same amount of equipment, the same amount of emissions should be generated. Therefore, the amount, types and operating hours of the equipment are more accurate predictors of emissions in the structure construction phase. Consequently, the lead agency should use the construction equipment parameters as a gauge to whether or not a proposed project can be represented by a sample construction scenario.

However, if the structure is multi-storied, because it includes below ground levels; the sample construction scenarios would not apply. The sample construction scenarios only consider dirt and debris hauling from grading and clearing operations. Excavation would require more equipment and more haul trips. Lead agencies or project proponents would be expected to estimate emissions for excavation.

Why do the scenarios use un-realistically large parameters?
Some of the parameters used in the sample construction scenarios are larger than those typically allowed by regulation or practice. For example, most planning commissions will not allow buildings to occupy the entire lot, but require a certain amount of parking, landscaping and sidewalks.

The survey forms were populated with check boxes to allow ease in completing the forms and to aid participants in completing the forms with the appropriate information in a prompt and consistent fashion. However, one disadvantage with using the check boxes was that for categories with large values ranges were used, such as building foot print, asphalt area, concrete area, area disturbed, dirt or debris handled, or distance traveled. Number of days each phase lasted, number of pieces of equipment, hours operated per day, and horsepower ratings were collected as discrete numbers. SCAQMD staff used the higher value in the range unless, the higher value was not appropriate. For example, one range for the building footprint is 41,000 to 60,000 square feet. However, one acre is approximately 43,000 feet. Therefore, if the proposed site is one acre then the maximum physical footprint area approximately 43,000 square feet. In practice, the city or county building codes may not allow a project proponent to build a structure that completely fills the site.

By using the upper limits of the ranges the emissions are conservatively estimated. Where these values are greater than allowed by city or county building code, the project emissions would likely be less than those in the sample construction scenarios. Since the sample construction scenario emissions are below the LSTs, projects that generate less emission than the sample construction scenarios would also be less than significant for construction emissions.

Why do the structure size and paving parameters appear to contradict each other?
The structure area on the one-, two-, and three- acre sample construction scenarios are approximately the same size as the site area; and the pavers are reported to operate six to eight hours per day. These parameters are consistent with the site area. However, as stated earlier, the parameters used to develop the sample construction scenarios were obtained from the construction survey. The parameters are the average "worst-case" values developed per phase not by project. Therefore, the "worst-case" structure construction might not have included paving and the "worst-case" paving phase might have included paving a site to be used as a parking lot. Therefore, it is not expected that all of the information between phases would be consistent. But, by using the average "worst-case" values, the sample construction scenarios should represent most proposed projects less than five acres in the SCAQMD's jurisdiction.

Where should the emission estimates and localized air quality impact analysis be presented?

The sample construction scenarios used to represent a proposed project, the modified spreadsheets or project specific analysis should be included as an attachment or appendix to the CEQA document. A detailed explanation of why the sample construction scenarios are appropriate to be used to represent the proposed project, or how the sample construction scenarios were modified with site specific information, or documentation of the project specific analysis should also be included. The explanation should present enough detail for other agencies or the public to understand what was done and why it was appropriate. A summary of the analysis and conclusions should be included in the text of the CEQA document.

Any additional mitigation or restrictions on activities or equipment should be clearly presented in the text of the CEQA document and in the mitigation monitoring plan.

What if I need further assistance?

Further assistance can be found by contacting the SCAQMD CEQA Section at (909) 396-3109 or submitting an e-mail to CEQA_admin@aqmd.gov.

APPENDIX A - ONE ACRE SITE EXAMPLE

APPENDIX B - TWO ACRE SITE EXAMPLE

APPENDIX C - THREE ACRE SITE EXAMPLE

APPENDIX D - FOUR ACRE SITE EXAMPLE

APPENDIX E - FIVE ACRE SITE EXAMPLE

APPENDIX F - EXAMPLE CONSTRUCTION EMISSION ESTIMATION DOCUMENTATION

EXAMPLE CONSTRUCTION EMISSION ESTIMATION DOCUMENTATION[a]

Project Size (building footprint sqft)	Demolition	Site Preparation	Grading	Building Construction	Coating and Paving
1 Acre 40,000 sq ft building	10 Days	1 Day	2 Days	2 Days	2 Days
2 Acre 87,000 sq ft building	20 Days	2 Days	4 Days	3 Days	5 Days
3 Acre 124,000 sq ft building	20 Days	3 Days	6 Days	3 Days[b]	10 Days
4 Acre 175,000 sq ft building	20 Days	4 Days	6 Days	4 Days	14 Days
5 Acre 164,000 sq ft building	20 Days	5 Days	8 Days	5 Days	18 Days

c) 1, 2, 3, and 5 acre parameters were estimated from survey information. 4 acre parameters were developed from information from the 1, 2, 3, and 5 acre sites.

d) Interpolated value. Shortest duration in survey was 110 days.

SITE CHARACTERISTICS

Project Size	Demolition	Site Preparation	Grading	Building Construction	Coating and Paving
1 Acre	41,000 sq ft structure	40,000 sq ft disturbed	40,000 sq ft disturbed	41,000 sq ft structure	41,000 sq ft structure
2 Acre	87,000 sq ft structure	87,000 sq ft disturbed	87,000 sq ft disturbed	87,000 sq ft structure	87,000 sq ft structure
3 Acre	124,000 sq ft structure	130,000 sq ft disturbed	130,000 sq ft disturbed	124,000 sq ft structure	124,000 sq ft structure
4 Acre	150,000 sq ft structure	175,000 sq ft disturbed	175,000 sq ft disturbed	150,000 sq ft structure	150,000 sq ft structure
5 Acre	164,000 sq ft structure	200,000 sq ft disturbed	200,000 sq ft disturbed	164,000 sq ft structure	164,000 sq ft structure

EMISSION CALCULATION SOURCES

Off-Road Construction Equipment

Emission calculations for off-road equipment are based on emission factors provided by the California Air Resource Board (ARB) from their Off-Road Mobile Source Model, which can be downloaded from the SCAQMD website at http://www.aqmd.gov/ceqa/hdbk.html. The emission factors included in Appendix G represent a composite emission factor for each off-road construction equipment category in units of pounds of emissions per hour. These off-road emission factors will replace the emission factors in the SCAQMD CEQA Air Quality Handbook (CEQA Handbook), September 1993, Tables A9-8-A and A9-8-B.

The emission factors in Appendix G represent the overall fleet mix for the year specified, for each of the off-road construction equipment categories. The average horsepower and load factor

are incorporated into each of the composite emission factors. Therefore, the equation for calculating combustion emissions from construction equipment is:

$$E_{pollutant} = EF_{polluant,\ year} \times T$$

Where

$E_{pollutant}$ is the emissions per piece of construction equipment (pounds per day)

$EF_{polluant,\ year}$ is the off-road emission factor for a specified piece of equipment for the pollutant of concern for a specified year (See Appendix G for and example for 2005) (pounds per hour)

T is the number of hours the equipment is operated on a daily basis (hours per day)

Fugitive Dust

- Material Handling Demolition Debris
  - Equation 1 for drop loading - USEPA, *Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources (AP-42)*, 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p. 13.2.4-3. This equation is also presented in the USEPA, *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*, EPA-450/2-9-004, September 1992, p 2-28.
  - Floor space to waste tonnage modification from USEPA, *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*, EPA-450/2-9-004, September 1992, p 2-28 (0.046 tons per square foot). Waste tonnage = Floor Space of Building, square feet x 0.046 tons per square foot.
  - Aerodynamic Particle Size Multiplier – < 10 micrometers (0.35) from USEPA, *AP-42*, 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p. 13.2.4-3.
  - Mean Wind Speed – Maximum daily average wind speed (10 mph) estimated from 1981 SCAQMD meteorological data (http://www.aqmd.gov/metdata/).
  - Moisture Content – USEPA, *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*, p 2-28. Default moisture content for demolition debris (2 percent).
  - Watering three times a day to satisfy Rule 403– Sixty-eight percent reduction in fugitive dust. SCAQMD, *CEQA Handbook*, Table A11-9-A, p A11-77.
- Material Handling Soil (Drop Loading)
  - Equation 1 for drop loading - USEPA, *AP-42*, 1998, Section 13.2.4 Aggregate Handling and Storage Piles, p. 13.2.4-3.
  - Aerodynamic Particle Size Multiplier – < 10 micrometers (0.35) from USEPA, *AP-42*, 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p. 13.2.4-3.
  - Mean Wind Speed – Maximum daily average wind speed (10 miles per hour) estimated from 1981 SCAQMD meteorological data (http://www.aqmd.gov/metdata/).
  - Moisture Content – USEPA, *AP-42*, Table 11.9-3, p 11.9-9, overburden, geometric mean (7.9 percent).
  - Watering three times a day to satisfy Rule 403– Sixty-eight percent reduction in fugitive dust. SCAQMD, *CEQA Handbook*, Table A11-9-A, p A11-77.
- Material Handling Soil (Clearing)
  - Motor Grader

        - Equation for grading - USEPA, *AP-42*, 1998, Section 11.9 Western Surface Coal Mining, Table 11.9-1, p. 11.9-5. Grading.
        - Vehicle Speed – Assumed to be 3 miles per hour.
        - Vehicle Miles Traveled – Estimated by assuming a 13-foot blade with a 2-foot overlap (11-foot effective width) traveling over the area disturbed.
    - Bulldozer
        - USEPA, *AP-42*, 1995, Table 11.9-1, p 11.9-5, equation for bulldozing, overburden, particulate less than 10 microns in aerodynamic diameter.
        - Silt Content – USEPA, *AP-42*, Table 11.9-3, p 11.9-9, overburden, geometric mean (6.9 percent).
        - Moisture Content – USEPA, *AP-42*, Table 11.9-3, p 11.9-9, overburden, geometric mean (7.9 percent).
        - Watering three times a day to satisfy Rule 403– Sixty-eight percent reduction in fugitive dust. SCAQMD, *CEQA Handbook*, Table A11-9-A, p A11-77.
    - Scraper
        - USEPA, AP-42, July 1998, Equation 1b and Table 13.2.2-2, AP-42, December 2003. Also see comment g of Table 11.9-1.
        - Mean vehicle weight - estimated from 631G Model Scraper Caterpillar Performance Handbook, Edition 33. Scraper in the same horsepower range (450-490 hp) as the composite ARB emission factors. (120,460 pound empty with a 75,000 pound capacity).
        - Caterpiller G31G has a 11.5 foot wide blade, with an assumed 2 foot overlap (9.5 foot wide).
- Grading
    - Grader
        - Equation for grading - USEPA, AP-42, 1998, Section 11.9 Western Surface Coal Mining, Table 11.9-1, p 11.9-5, Grading.
        - Vehicle Speed – Assumed to be 3 mph.
        - Vehicle Miles Traveled – Estimated by assuming a 13-foot blade with a 2-foot overlap (11-foot effective width) traveling over the area disturbed.
        - Watering three times a day to satisfy Rule 403– Sixty-eight percent reduction in fugitive dust. SCAQMD, CEQA Handbook, Table A11-9-A, p A11-77.
    - Scraper
        - USEPA, AP-42, July 1998, Equation 1b and Table 13.2.2-2, AP-42, December 2003. Also see comment g of Table 11.9-1.
        - Mean vehicle weight - estimated from 631G Model Scraper Caterpillar Performance Handbook, Edition 33. Scraper in the same horsepower range (450-490 hp) as the composite ARB emission factors. (120,460 pound empty with a 75,000 pound capacity).
        - Caterpiller G31G has a 11.5 foot wide blade, with an assumed 2 foot overlap (9.5 foot wide).
- Storage Piles
    - USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Equation 2-12, p 2-25, also referenced in SCAQMD *CEQA Handbook*, Table A9-9-E, p A9-99.

  - Silt Content – USEPA, *AP-42*, Table 11.9-3, p 11.9-9, overburden, geometric mean (6.9 percent)
  - Number of days with > 0.01 inches of precipitation per year - SCAQMD *CEQA Handbook*, Table A9-9-E-2, p A9-99.
  - Percentage of time that the unobstructed wind speed exceeds 12 mph at mean pile height – 100% based on review of 1981 SCAQMD meteorological data (http://www.aqmd.gov/metdata/).
  - Watering three times a day to satisfy Rule 403– Sixty-eight percent reduction in fugitive dust. SCAQMD, *CEQA Handbook*, Table A11-9-A, p A11-77.
- On-site, On-road Vehicle Travel
  - CARB, EMFAC2002 (version 2.2) Burden Model with the following options selected: Winter season, 2005 calendar year, 75 ºF (2003 AQMP), 40 percent relative humidity (2003 AQMP).
  - Number of Haul Truck Trips – Estimated from amount of dirt and debris moved by haul trucks with 30 cubic yard haul capacity over the time length of the construction phase.
  - Haul Truck Miles Traveled On-site – Assumed to be 0.1 miles through facility.
  - Water Truck Miles Traveled On-site – Estimated by assuming a six foot wide truck traveling over the area disturbed.

SIGNIFICANCE THRESHOLDS

- Regional significance thresholds from Chapter 6 of SCAQMD, *CEQA Handbook, p 6-1 through p 6-4.*
- Localized significance thresholds from Attachment D - Draft Localized Significance Threshold Methodology of Governing Board Agenda Item 36. *Implement FY 2002-03 Environmental Justice Enhancement I – 4: Continue to Develop Localized Significance Thresholds for Subregions of the Air District as Another Indicator of CEQA Significance,* July 11 2003. Most stringent of LST among all SRA for each site size category was used.

APPENDIX G - ARB OFF-ROAD EMISSION FACTORS

Table G-1
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
Equipment Name	Hp	CO (lb/day)	NOx (lb/day)	PM10 (lb/day)	SOx (lb/day)	VOC (lb/day)
Bore/Drill Rigs	15	0.035	0.07	0	0	0
	25	0.067	0.123	0	0	0
	50	0.228	0.28	0.027	0.073	0.058
	120	0.471	0.822	0.072	0.166	0.101
	175	0.693	1.295	0.062	0.291	0.109
	250	0.316	1.632	0.038	0.388	0.063
	500	0.516	2.294	0.06	0.563	0.085
	750	1.035	4.806	0.111	1.146	0.123
	9999	1.549	9.819	0.214	1.719	0.516
	Composite	0.492	1.512	0.063	0.327	0.102
Cement and Mortar Mixers	15	0.032	0.058	0.005	0	0.012
	25	0.116	0.18	0.013	0	0
	Composite	0.039	0.068	0.005	0	0.011
Concrete/Industrial Saws	25	0	0.143	0	0	0
	50	0.354	0.337	0.044	0.08	0.177
	120	0.529	1.099	0.101	0.161	0.151
	175	1.029	2.353	0	0.294	0
	Composite	0.458	0.825	0.075	0.129	0.151
Cranes	50	0.313	0.252	0.034	0.055	0.136
	120	0.362	0.698	0.076	0.109	0.105
	175	0.456	1.024	0.065	0.167	0.108
	250	0.26	1.31	0.042	0.233	0.085
	500	0.405	1.88	0.062	0.326	0.117
	750	0.664	3.259	0.103	0.56	0.172
	Composite	0.368	1.157	0.059	0.196	0.102
Crawler Tractors	50	0.354	0.284	0.047	0.055	0.158
	120	0.501	1.043	0.103	0.142	0.153
	175	0.735	1.752	0.106	0.251	0.184
	250	0.599	2.256	0.095	0.345	0.179
	500	1.502	3.218	0.131	0.469	0.243
	750	2.47	5.819	0.229	0.86	0.433
	9999	4.253	9.458	0.334	1.219	0.743
	Composite	0.675	1.617	0.106	0.232	0.174
Crushing/Proc. Equipment	50	0.636	0.512	0.071	0.104	0.244
	120	0.634	1.322	0.131	0.18	0.194
	175	1.018	2.426	0.147	0.346	0.254
	250	0.888	3.335	0.138	0.513	0.296
	500	2.19	4.649	0.19	0.675	0.348
	750	3.148	7.222	0.185	0.926	0
	9999	8.704	18.889	0.556	2.407	1.852
	Composite	0.909	1.857	0.131	0.268	0.236

Table G-1 (Cont.)
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
Equipment Name	Hp	CO (lb/day)	NOx (lb/day)	PM10 (lb/day)	SOx (lb/day)	VOC (lb/day)
Dumpers/Tenders	25	0.045	0.078	0	0	0
	Composite	0.045	0.078	0	0	0
Excavators	25	0.049	0.113	0.007	0	0.07
	50	0.266	0.254	0.031	0.06	0.094
	120	0.497	0.917	0.096	0.159	0.135
	175	0.596	1.291	0.076	0.233	0.128
	250	0.312	1.681	0.047	0.329	0.096
	500	0.446	2.168	0.063	0.423	0.117
	750	0.722	3.783	0.095	0.722	0.19
	Composite	0.481	1.302	0.07	0.243	0.12
Forklifts	50	0.271	0.182	0.029	0	0.109
	120	0.257	0.521	0.06	0	0.084
	175	0.362	0.863	0.059	0.001	0.1
	250	0.271	1.103	0.048	0.001	0.091
	500	0.51	1.415	0.062	0.001	0.113
	Composite	0.268	0.508	0.054	0	0.09
Generator Sets	15	0.037	0.067	0.008	0	0.017
	25	0.057	0.101	0.013	0	0.036
	50	0.313	0.33	0.037	0	0.116
	120	0.529	1.108	0.094	0.001	0.152
	175	0.766	1.842	0.096	0.002	0.178
	250	0.666	2.588	0.09	0.002	0.185
	500	1.333	3.853	0.134	0.003	0.265
	750	2.157	6.356	0.218	0.005	0.441
	9999	5.189	14.059	0.487	0.01	1.109
	Composite	0.338	0.699	0.051	0.001	0.101
Graders	50	0.339	0.301	0.025	0.075	0.126
	120	0.521	1.029	0.103	0.162	0.148
	175	0.676	1.562	0.092	0.257	0.159
	250	0.414	1.988	0.064	0.357	0.13
	500	0.565	2.426	0.078	0.414	0.157
	750	0.976	5.366	0	0.732	0
	Composite	0.567	1.623	0.084	0.276	0.148
Off-Highway Tractors	120	0.6	1.4	0	0	0
	175	0.779	1.858	0.111	0.27	0.194
	250	0.461	1.745	0.072	0.27	0.137
	750	2.896	7.029	0.274	1.052	0.514
	9999	5.054	11.583	0.414	1.529	0.899
	Composite	0.744	2.076	0.101	0.31	0.184

Table G-1 (Cont.)
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
Equipment Name	Hp	CO (lb/day)	NOx (lb/day)	PM10 (lb/day)	SOx (lb/day)	VOC (lb/day)
Off-Highway Trucks	175	0.743	1.712	0.113	0.258	0.183
	250	0.443	2.087	0.074	0.345	0.147
	500	0.742	3.062	0.111	0.493	0.209
	750	1.172	5.069	0.179	0.819	0.341
	9999	2.58	8.709	0.265	1.157	0.659
	Composite	0.765	3.119	0.112	0.493	0.22
Other Construction Equipment	15	0.039	0.062	0.006	0.001	0.026
	25	0.047	0.105	0.01	0	0.052
	50	0.338	0.307	0.041	0.068	0.136
	120	0.578	1.206	0.111	0.175	0.165
	175	0.605	1.45	0.081	0.221	0.15
	500	1.203	3.011	0.112	0.459	0.212
	Composite	0.625	1.481	0.07	0.223	0.136
Pavers	25	0.092	0.214	0	0	0
	50	0.287	0.286	0.034	0.066	0.102
	120	0.458	0.865	0.086	0.15	0.123
	175	0.667	1.472	0.083	0.266	0.143
	250	0.389	2.057	0.058	0.401	0.115
	500	0.457	2.208	0.065	0.424	0.112
	Composite	0.449	0.894	0.067	0.165	0.12
Paving Equipment	25	0.049	0.098	0.01	0	0.041
	50	0.291	0.265	0.034	0.054	0.112
	120	0.39	0.815	0.075	0.118	0.114
	175	0.577	1.379	0.077	0.21	0.138
	250	0.407	1.566	0.061	0.254	0.117
	Composite	0.419	0.961	0.069	0.144	0.117
Plate Compactors	15	0.018	0.029	0.002	0	0.009
	Composite	0.018	0.029	0.002	0	0.009
Rollers	15	0.025	0.039	0.004	0.001	0.016
	25	0.051	0.103	0.009	0.001	0.038
	50	0.259	0.264	0.031	0.062	0.09
	120	0.387	0.732	0.071	0.127	0.104
	175	0.558	1.231	0.069	0.224	0.119
	250	0.306	1.606	0.044	0.317	0.089
	500	0.428	2.061	0.061	0.397	0.113
	Composite	0.371	0.774	0.059	0.139	0.097
Rough Terrain Forklifts	50	0.393	0.356	0.046	0.081	0.143
	120	0.43	0.81	0.085	0.135	0.119
	175	0.675	1.487	0.089	0.259	0.151
	250	0.366	1.869	0.054	0.354	0.125
	500	0.521	2.496	0.077	0.463	0.129
	Composite	0.456	0.89	0.084	0.15	0.123

Table G-1 (Cont.)
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
Equipment Name	Hp	CO (lb/day)	NOx (lb/day)	PM10 (lb/day)	SOx (lb/day)	VOC (lb/day)
Rubber Tired Dozers	175	0.66	1.396	0.075	0.264	0.189
	250	0.656	2.475	0.103	0.38	0.193
	500	1.503	3.271	0.132	0.479	0.246
	750	2.079	4.957	0.191	0.738	0.342
	9999	3.645	8.571	0.296	1.084	0.985
	Composite	1.209	3.037	0.123	0.453	0.232
Rubber Tired Loaders	25	0.06	0.134	0	0	0
	50	0.377	0.33	0.044	0.074	0.137
	120	0.412	0.775	0.083	0.127	0.116
	175	0.584	1.284	0.079	0.221	0.132
	250	0.319	1.658	0.05	0.309	0.101
	500	0.488	2.332	0.073	0.429	0.137
	750	0.989	4.965	0.15	0.904	0.3
	9999	1.862	7.542	0.191	1.098	0.477
	Composite	0.438	1.253	0.073	0.221	0.119
Scrapers	120	0.69	1.404	0.147	0.202	0.21
	175	0.857	2.053	0.126	0.307	0.219
	250	0.638	2.692	0.102	0.435	0.201
	500	1.166	3.768	0.142	0.582	0.27
	750	1.912	6.595	0.248	1.03	0.477
	Composite	1.001	3.203	0.133	0.496	0.249
Signal Boards	15	0.024	0.037	0.004	0.001	0.013
	50	0.415	0.39	0.049	0.073	0.244
	120	0.566	1.179	0.107	0.172	0.159
	175	0.865	2.076	0.114	0.319	0.21
	250	0.688	2.665	0.098	0.448	0.218
	Composite	0.086	0.183	0.013	0.024	0.03
Skid Steer Loaders	25	0.047	0.101	0.01	0.002	0.04
	50	0.216	0.241	0.026	0.061	0.071
	120	0.271	0.487	0.047	0.092	0.067
	Composite	0.222	0.31	0.032	0.067	0.068
Surfacing Equipment	50	0.159	0.143	0.016	0.032	0
	120	0.53	0.985	0.076	0.152	0
	175	0.505	1.212	0	0.202	0
	250	0.452	1.709	0.05	0.302	0
	500	1.014	2.602	0.101	0.403	0.189
	750	1.456	4.175	0.146	0.631	0
	Composite	0.778	1.988	0.077	0.312	0.105

Table G-1 (Cont.)
ARB Off-Road Emission Factors

Year - 2005		Pollutant				
Equipment Name	Hp	CO (lb/day)	NOx (lb/day)	PM10 (lb/day)	SOx (lb/day)	VOC (lb/day)
Tractors/Loaders/Backhoes	25	0.079	0.138	0.013	0	0.05
	50	0.476	0.36	0.052	0.072	0.185
	120	0.408	0.849	0.087	0.112	0.127
	175	0.638	1.517	0.096	0.21	0.163
	250	0.648	2.441	0.1	0.349	0.249
	Composite	0.424	0.858	0.086	0.115	0.132
Trenchers	15	0.036	0.051	0.004	0	0.04
	25	0.11	0.242	0.026	0	0.076
	50	0.296	0.322	0.036	0.078	0.101
	120	0.416	0.771	0.074	0.14	0.109
	175	0.726	1.577	0.085	0.298	0.152
	250	0.406	2.243	0.055	0.461	0.156
	500	0.565	2.783	0.073	0.565	0.122
	750	0.845	5.915	0	0.845	0
	Composite	0.381	0.652	0.059	0.127	0.108
Welders	15	0.043	0.079	0.007	0	0.016
	25	0.073	0.112	0.011	0	0.035
	50	0.321	0.291	0.037	0	0.123
	120	0.285	0.596	0.055	0	0.086
	175	0.571	1.349	0.063	0.001	0.143
	Composite	0.236	0.333	0.035	0	0.084
Emission factors for 2006 through 2020 may be downloaded from the SCAQMD web page at http://www.aqmd.gov/ceqa/handbook/offroadEF05_20.xls.						

APPENDIX H - POSSIBLE MITAGATION MEASURES

MITIGATION MEASURE RESOURCES

The following are methods or techniques that may be applied to various operations or equipment when appropriate to mitigate estimated emissions.

Fugitive Dust Mitigation Measures

- SCAQMD, *CEQA Handbook*, Tables 11-4, page 11-15 and A11-9-A, page A11-77.

Emission Source	Mitigation Measure	Emission Reduction Efficiency	Favorable Factors
Fugitive dust/ Construction	Apply non-toxic chemical soil stabilizers according to manufactures' specifications, to all inactive construction areas (previously graded areas inactive for ten days or more)	30%-65%*	Stabilizers applied in sufficient concentration to provide erosion protection for at least on year
Fugitive dust/ Construction	Replace ground cover in disturbed areas as quickly as possible	15%-49%*	Small, densely planted ground cover
Fugitive dust/ Construction	Enclose, cover, water twice daily, or apply non-toxic soil binders, according to manufactures' specifications, to exposed stockpiles (i.e., gravel, sand, dirt) with five percent or greater soil content	30%-74%*	Automatic water mist or sprinkler systems should be installed in areas with stockpiles
Fugitive dust/ Construction	Water active sites at least twice daily	34%-68%*	Water at sufficient frequency to keep soil moist enough so visible plumes are eliminated
Fugitive dust/ Construction	Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour	Not quantified	
Fugitive dust/ Construction	Monitor for particulate emissions according to District-specified procedures	Not quantified	

Emission Source	Mitigation Measure	Emission Reduction Efficiency	Favorable Factors
Fugitive dust from roads	All trucks hauling, dirt, sand, soil or other loose materials are to be covered, or should maintain at least two feet of freeboard in accordance with CVC Section 23114, (freeboard means vertical space between the top of the load and top of the trailer)	7%-14%*	Tightly secured covering to truck
Fugitive dust from roads	Sweep streets once a day if visible soil materials are carried to adjacent streets (recommend water sweepers with reclaimed water)	25%-60%*	Sweep streets immediately after period of heaviest vehicular track-out

			activity
Fugitive dust from roads	Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip.	40%-70%*	Set up truck washing area on paved access road area so subsequent truck travel on unpaved roads can be eliminated
Fugitive dust from roads	Pave construction roads that have a truck volume of more than 50 daily trips by construction equipment, or 150 total daily trips for all vehicles	92.5% (91% for trucks 94% for passenger vehicles)	
Fugitive dust from roads	Pave construction access roads at least 100 feet onto the site from main road	92.5% (91% for trucks 94% for passenger vehicles)	
Fugitive dust from roads	Pave construction roads that have a daily traffic volume of less than 50 vehicular trips.	92.5% (91% for trucks 94% for passenger vehicles)	
Fugitive dust from roads	Apply water three times daily, or non-toxic stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces	45%-85%*	Use non-toxic chemicals that are formulated for unpaved road surfaces
Fugitive dust from roads	Traffic speeds on all unpaved roads to be reduced to 15 miles per hour or less	40%-70%*	Effective traffic control

* Use the lowest value if better information is not known. If higher than the lowest value is used, please provide the supporting analysis and data in the environmental documentation.

Combustion Emissions Mitigation Measures

Alternative Diesel Fuels

Alternative Diesel Fuel	NOx	PM	HC	Toxics
Aquazole fuel[a]	16%	60%	25% lower than diesel vehicle emission standard	No Increase
Clean Fuels Technology - water emulsified diesel fuel[b]	15%	58%	25% lower than diesel vehicle emission standard	No Increase
O_2diesel ethano-diesel fuel (O_2Diesel)[c]	1.6%	20%	25% lower than diesel vehicle emission standard	No Increase

a) Air Resources Board, Letter from Dean C. Simeroth to Dr. Phillippe Mulard, August 9, 2002.
b) Air Resources Board, Letter from Dean C. Simeroth to Dan Klaich, September 9, 2003.
c) Air Resources Board, Letter from Dean C. Simeroth to James Peeples, September 23, 2003.

APPENDIX I - SOURCE RECEPTOR AREA BY CITY

Table I-1
Source Receptor Area by City

Name	SRA Zone
Acton	15
Agoura Hills	6
Aguanga	27
Alberhill	25
Alhambra	8
Aliso Viejo	20
Alondra Park	3
Alta Loma	32
Altadena	8
Anaheim	17
Arcadia	9
Arrowbear Lake	37
Arrowhead Highlands	37
Artesia	4
Atwood	16
Avalon	0
Avocado Heights	11
Azusa	9
Baldwin Park	9
Banning	29
Bassett	11
Beaumont	29
Bell	12
Bell Gardens	5
Bellflower	5
Belltown	23
Bermuda Dunes	30
Beverly Hills	2
Big Bear City	38
Big Bear Lake	38
Bloomington	34
Blue Jay	37
Bradbury	9
Brea	16
Bryn Mawr	35

Name	SRA Zone
Burbank	7
Cabazon	29
Calabasas	6
Calimesa	28
Canyon Lake	25
Capistrano Beach	21
Carson	4
Cathedral City	30
Cedar Glen	37
Cedarpines Park	37
Cerritos	4
Charter Oak	9
Cherry Valley	29
Chino	33
Chino Hills	33
Citrus	9
City Terrace	1
Claremont	10
Clifton	3
Coachella	30
College Heights	32
Colton	34
Commerce	5
Compton	12
Cornell	6
Corona	22
Costa Mesa	18
Coto de Caza	21
Covina	9
Cowan Heights	17
Crafton	35
Crestline	37
Cudahy	12
Culver City	2
Cypress	17

Table I-1 (Cont.)
Source Receptor Area by City

Name	SRA Zone
Dana Point	21
Del Aire	3
Del Rosa	34
Desert Center	31
Desert Hot Springs	30
Devore	32
Diamond Bar	10
Dominguez	4
Downey	5
Duarte	9
Dunlap Acres	35
East Compton	12
East Hemet	28
East Highlands	34
East La Mirada	5
East Los Angeles	11
East Pasadena	8
East San Gabriel	8
Edgemont	24
El Casco	28
El Cerrito	22
El Monte	9
El Segundo	3
El Toro	19
Emerald Bay	20
Florence	12
Florence-Graham	12
Fontana	34
Foothill Ranch	19
Fountain Valley	17
Fullerton	16
Garden Grove	17
Gardena	3
Glen Avon	23

Name	SRA Zone
Glendale	7
Glendora	9
Glenview	2
Gorman	15
Grand Terrace	34
Green Valley Lake	37
Guasti	33
Hacienda Heights	11
Hawaiian Gardens	4
Hawthorne	3
Hemet	28
Hermosa Beach	3
Hidden Hills	6
Highgrove	23
Highland	34
Home Gardens	22
Homeland	24
Huntington Beach	18
Huntington Park	12
Idyllwild	30
Idyllwild-Pine Cove	30
Indian Wells	30
Indio	30
Industry	11
Irvine	20
Irwindale	9
La Canada Flintridge	8
La Crescenta	8
La Crescenta-Montrose	8
La Habra	16
La Habra Heights	11
La Mirada	5
La Palma	16
La Puente	11

Table I-1 (Cont.)
Source Receptor Area by City

Name	SRA Zone
La Verne	10
Ladera Heights	2
Laguna Beach	20
Laguna Hills	20
Laguna Niguel	21
Laguna Woods	20
Lake Arrowhead	37
Lake Elsinore	25
Lake Forest	19
Lakeland Village	25
Lakeview	24
Lakewood	4
Las Flores	21
Lawndale	3
Lemon Heights	19
Lennox	3
Loma Linda	35
Lomita	3
Long Beach	4
Los Alamitos	17
Los Angeles	2
Los Nietos	5
Los Serranos	33
Lynwood	12
Malibu	2
Malibu Beach	2
Malibu	2
Manhattan Beach	3
March AFB	23
Marina del Rey	2
Mayflower Village	9
Maywood	1
Mecca	30
Mentone	35
Midway	17
Mira Loma	23

Name	SRA Zone
Monrovia	9
Montclair	32
Montebello	11
Monterey Park	11
Montrose	8
Moreno Valley	24
Mount Baldy	15
Mountain Center	28
Murrieta	26
Murrieta Hot Springs	26
Muscoy	34
Narod	33
Newhall	13
Newport Beach	18
Newport Coast	20
Norco	22
North El Monte	9
Norwalk	5
Nuevo	24
Oasis	30
Ontario	33
Orange	17
Orange Park Acres	17
Otterbein	10
Palm Desert	30
Palm Desert Country	30
Palm Springs	30
Palos Verdes Estates	3
Panorama Heights	17
Paramount	5
Pasadena	8
Pedley	23
Perris	24
Pico Rivera	5
Pine Cove	28
Placentia	16

Table I-1 (Cont.)
Source Receptor Area by City

Name	SRA Zone
Point Dume	2
Pomona	10
Portola Hills	19
Prado Dam	22
Quail Valley	24
Rancho Mirage	30
Rancho Mirage	30
Rancho Palos Verdes	3
Rancho Santa Margarita	19
Redlands	35
Redondo Beach	3
Rialto	34
Rimforest	37
Riverside	23
Rolling Hills	3
Rolling Hills Estates	3
Romoland	24
Rosemead	11
Rossmoor	17
Rowland Heights	10
Rubidoux	23
Running Springs	37
San Antonio Heights	32
San Bernardino	34
San Clemente	21
San Dimas	10
San Fernando	7
San Gabriel	8
San Jacinto	28
San Joaquin Hills	20
San Juan Capistrano	21
San Juan Hot Springs	21
San Marino	8
Santa Ana	17
Santa Ana Heights	18

Name	SRA Zone
Santa Clarita	13
Santa Fe Springs	5
Santa Monica	2
Saugus	13
Scotland	36
Seal Beach	18
Sedco Hills	25
Sierra Madre	9
Signal Hill	4
Silverado	19
Skyforest	37
Sleepy Hollow	33
Smiley Park	37
South El Monte	11
South Fontana	34
South Gate	12
South Laguna	20
South Pasadena	8
South San Gabriel	11
South Whittier	5
South Whittier	5
Stanton	17
Sun City	24
Sunnymead	24
Sunnyslope	23
Sunset Beach	18
Surfside	18
Temecula	26
Temple City	9
Thermal	30
Thousand Palms	30
Thousand Palms	30
Top of the World	20
Topanga	2
Torrance	3

Table I-1 (Cont.)
Source Receptor Area by City

Name	SRA Zone
Trabuco Highlands	21
Tustin	17
Tustin Foothills	17
Twin Peaks	37
Upland	32
Val Verde	13
Valinda	11
Valle Vista	28
Valley View Park	37
Verdemont	34
Vernon	1
View Park	1
View Park-Windsor Hills	1
Villa Park	17
Vincent	9
Walnut	10
Walnut Park	12
West Carson	3

Name	SRA Zone
West Compton	12
West Covina	11
West Hollywood	2
West Puente Valley	11
West Whittier	11
West Whittier-Los Nietos	5
Westlake Village	6
Westminster	17
Westmont	3
Whittier	11
Wildomar	25
Willowbrook	12
Winchester	24
Windsor Hills	1
Yorba Linda	16
Yucaipa	35
Woodcrest	23

APPENDIX J - EMISSION ESTIMATION METHODOLOGY

EMISSION ESTIMATION METHODOLOGY FOR LST

1. **Divide project into phases.** The following provides a list of typical construction phases of a project.
   - Demolition
   - Site Preparation - Clearing/Grubbing
   - Scraping/Grading
   - Trenching
   - Building construction
   - Architectural/asphalt paving/concrete paving
   - Operation

   Notes: The above list represents typical construction phases, there may be phases of construction that are either not necessary for a project or that are necessary, but not identified on the list above. If one or more of the phases are not included in the project, there will be no emissions impacts. For example, for a project where construction will occur on vacant land, there would be no demolition phase, thus for the demolition phase of construction there would be no emissions impact. There may be, however, other construction phases that may be included such as filling or excavating that are not identified in the list above that should be included.

2. **Estimate on-site NOx, PM10, and CO emissions for each of the construction phases identified.** For each construction phase, the following on-site emission estimates are needed:
   - NOx, PM10, and CO combustion emissions from off-road construction equipment (such as bull dozers, tractors, loaders, cranes, etc.); and
   - PM10 fugitive dust emissions from construction activities.

   Notes:
   - *Emission estimates for off-site on-road emissions are not needed for determining the significance for LST, however, these emissions are needed to determine of the project exceeds regional air quality thresholds.*
   - *Estimates can be generated from design plans, contractor estimates, similar projects, URBEMIS2002, or construction estimators.*

   Example of emissions calculation for off-road construction equipment.
   Demolition phase:

   PM10 Demolition Emissions for 1 Acre Project

Equipment	Number of Pieces	Emission Factor (pounds/hour)	Daily Operating Time (hours/day)	Emissions (pounds/day)
Concrete/Industrial Saw	1	0.075	8.0	0.60
Tractor/Loader/Backhoe	2	0.086	8.0	1.38
Rubber Tired Dozer	1	0.123	1.0	0.12
Total PM10 Combustion Emissions				**2.10**

NOx Demolition Emissions for 1 Acre Project

Equipment	Equipment Pieces	Emission Factor (pounds/hour)	Daily Operating Time (hours/day)	Emissions (pounds/day)
Concrete/Industrial Saw	1	0.825	8.0	6.60
Tractor/Loader/Backhoe	2	0.858	8.0	13.73
Rubber Tired Dozer	1	3.037	1.0	3.04
Total NOx Emissions				**23.37**

3. For each construction phase, Compare estimated emission to significance thresholds.
   - Criteria pollutant mass emissions can be compared to regional significance thresholds found in Chapter 6 of the SCAQMD CEQA Handbook.
   - Criteria pollutant mass emissions can be compared to localized significance thresholds found on SCAQMD website http://www.aqmd.gov/hb/attachments/030736b.doc. Use the table in Appendix I to determine the Source Receptor Area from the city of the proposed project. Then use the Source Receptor Area to find the LSTs for the project on the mass rate LST look-up tables.

4. If emissions exceed significance thresholds develop mitigation measures. Mitigation measures can be found in Chapter 11 of the SCAQMD *CEQA Handbook* or documents provided by other agencies or organizations.

APPENDIX K - LINEAR REGRESSION

EXAMPLE PROBLEM

Estimate the PM10 mass rate LST for a 3.7 acre site from the three and four acre values in the Mass rate LST look-up tables.

Hand Calculation Method

PM10 LST from mass rate look-up tables

PM10 LST for a three acre site at 25 feet from the receptor = 7 pounds per day

PM10 LST for a four acres site at 25 feet from the receptor = 9 pounds per day

Linear Regession

$y = a + bx$

where, $a = Y - bX$

$b = [n\Sigma xy - (\Sigma x)(\Sigma y)]/[n\Sigma x^2 - (\Sigma x)^2]$

n = number of points

Y = mean of y values

X = mean of x values

therefore,

for (3, 7) and (4, 9)

n = 2

Y = (7+9)/2 = 8

X = (3+4)/2 = 3.7

a = 8 – (2)(3.5) = 1

$b = [2(57) - (7)(16)]/[2(25) - (7)^2] = 2$

y = 1 + 2x = 1 + 2(3.7) = 8.4 pounds per day for a 3.7 acre site at 25 feet from the receptor

Excel Method

PM10 LST from mass rate look-up tables

PM10 LST for a three acre site at 25 feet from the receptor = 7 pounds per day

PM10 LST for a four acres site at 25 feet from the receptor = 9 pounds per day

Data Points Entered into Excel Worksheet

	A	B
1	x-value Area of Site (acreage)	y-value LST (mass/day)
2	3	7
3	4	9
4	3.5	

Excel Formula

= FORECAST(x,known_y's,known_x's)

where, x = the data point for which you want to predict a value
known_y's = the dependent array or range of data
known_x's = the independent array or range of data

= FORECAST(A4,B1:B2,A1:A2) or FORECAST(3.7,{7,9},{3,4})

= 8.4 pounds per day for a 3.7 acre site at 25 feet from the receptor

APPENDIX L - 2001–2003 LOCALIZE SIGNIFICANCE THRESHOLD MASS–RATE LOOK–UP TABLES

Table L-1.
2001 – 2003 Thresholds for Construction and Operation with Gradual Conversion of NOx to NO_2

SRA No.	Source Receptor Area	Allowable emissions (lbs/day) as a function of receptor distance (meters) from site boundary									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	111	112	124	159	250	162	162	166	189	267
2	Northwest Coastal LA County	147	151	175	225	353	208	208	225	268	346
3	Southwest Coastal LA County	147	152	174	225	353	209	209	226	267	377
4	South Coastal LA County	125	129	150	197	311	177	177	192	233	331
5	Southeast LA County	124	128	148	192	301	176	176	191	227	321
6	West San Fernando Valley	136	140	161	209	326	192	192	208	248	349
7	East San Fernando Valley*	124	128	148	191	299	176	176	190	226	319
8	West San Gabriel Valley	113	116	134	174	272	160	160	173	206	290
9	East San Gabriel Valley	187	237	338	537	1,051	272	317	424	607	1,101
10	Pomona/Walnut Valley	172	216	310	495	970	251	291	385	558	1,016
11	South San Gabriel Valley	130	133	152	193	302	187	187	198	231	322
12	South Central LA County	113	117	134	173	272	160	160	173	206	290
13	Santa Clarita Valley	147	151	173	225	353	208	208	224	265	377
15	San Gabriel Mountains	147	151	173	225	353	208	208	224	265	377
16	North Orange County	102	105	121	158	251	144	144	156	186	267
17	Central Orange County	137	143	168	210	327	196	196	215	254	350
18	North Coastal Orange County	158	164	189	244	382	226	226	244	288	408
19	Saddleback Valley	158	163	188	244	380	224	224	243	289	407
20	Central Orange County Coastal	158	164	189	244	382	226	226	244	288	408
21	Capistrano Valley	158	163	188	244	380	224	224	243	289	407
22	Norco/Corona	144	180	260	413	809	209	242	322	467	847
23	Metropolitan Riverside County	144	180	260	413	809	209	242	322	467	847
24	Perris Valley	144	180	260	413	809	209	242	322	467	847
25	Lake Elsinore	230	288	415	661	1,294	334	388	515	747	1,356
26	Temecula Valley	230	288	415	661	1,294	334	388	515	747	1,356
27	Anza Area	230	288	415	661	1,294	334	388	515	747	1,356
28	Hemet/San Jacinto Valley	230	288	415	661	1,294	334	388	515	747	1,356
29	Banning Airport*	230	291	423	674	1,327	335	389	520	766	1,390
30	Coachella Valley	215	270	388	619	1,213	314	364	481	697	1,270
31	East Riverside County	215	270	388	619	1,213	314	364	481	697	1,270
32	Northwest San Bernardino Valley	172	216	310	495	970	251	291	385	558	1,017
33	Southwest San Bernardino Valley	172	216	310	495	970	251	291	385	558	1,017
34	Central San Bernardino Valley	172	216	310	495	970	251	291	385	558	1,016
35	East San Bernardino Valley	172	216	310	495	970	251	291	385	558	1,016
36	Central San Bernardino Mountains	172	216	310	495	970	251	291	385	558	1,017
37	West San Bernardino Valley	172	216	310	495	970	251	291	385	558	1,016
38	East San Bernardino Mountains	172	216	310	495	970	251	291	385	558	1,016

Table L-1.
2001 – 2003 Thresholds for Construction and Operation with Gradual Conversion of NOx to NO_2 (Continued)

SRA No.	Source Receptor Area	Allowable emissions (lbs/day) as a function ofreceptor distance (meters) from site boundary				
		5 Acre				
		25	50	100	200	500
1	Central LA	238	238	249	259	316
2	Northwest Coastal LA County	310	310	326	360	448
3	Southwest Coastal LA County	310	310	327	360	448
4	South Coastal LA County	263	263	277	309	392
5	Southeast LA County	262	262	276	305	382
6	West San Fernando Valley	286	286	301	332	415
7	East San Fernando Valley*	262	262	276	304	379
8	West San Gabriel Valley	238	238	251	277	345
9	East San Gabriel Valley	475	475	601	786	1,251
10	Pomona/Walnut Valley	438	438	550	718	1,153
11	South San Gabriel Valley	282	282	289	317	383
12	South Central LA County	238	238	251	277	345
13	Santa Clarita Valley	310	310	326	358	446
15	San Gabriel Mountains	310	310	326	358	446
16	North Orange County	214	214	226	249	315
17	Central Orange County	289	289	308	345	418
18	North Coastal Orange County	335	335	354	390	484
19	Saddleback Valley	334	334	351	388	484
20	Central Orange County Coastal	335	335	354	390	484
21	Capistrano Valley	334	334	351	388	484
22	Norco/Corona	365	365	459	601	964
23	Metropolitan Riverside County	365	365	459	601	964
24	Perris Valley	365	365	459	601	964
25	Lake Elsinore	584	584	734	961	1,542
26	Temecula Valley	584	584	734	961	1,542
27	Anza Area	584	584	734	961	1,542
28	Hemet/San Jacinto Valley	584	584	734	961	1,542
29	Banning Airport*	585	585	738	976	1,577
30	Coachella Valley	548	548	688	898	1,442
31	East Riverside County	548	548	688	898	1,442
32	Northwest San Bernardino Valley	438	438	550	718	1,154
33	Southwest San Bernardino Valley	438	438	550	718	1,154
34	Central San Bernardino Valley	438	438	550	718	1,154
35	East San Bernardino Valley	438	438	550	718	1,153
36	Central San Bernardino Mountains	438	438	550	718	1,154
37	West San Bernardino Valley	438	438	550	718	1,154
38	East San Bernardino Mountains	438	438	550	718	1,153

* 2003 highest monitored concentration only.

Table L-2.
2001 – 2003 CO Emission Thresholds for Construction and Operation

SRA No.	Source Receptor Area	Allowable emissions (lbs/day) as a function of receptor distance (meters) from site boundary									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	443	671	1,019	1,947	6,449	663	926	1,451	2,429	7,014
2	Northwest Coastal LA County	452	721	1,068	2,053	6,747	658	957	1,458	2,555	7,350
3	Southwest Coastal LA County	274	456	890	1,779	5,848	393	605	1,198	2,209	6,370
4	South Coastal LA County	417	681	1,013	1,975	6,547	589	908	1,373	2,450	7,120
5	Southeast LA County	442	670	997	1,930	6,334	645	925	1,361	2,393	6,903
6	West San Fernando Valley	216	329	697	1,786	5,848	318	450	850	2,164	6,376
7	East San Fernando Valley	356	520	995	1,916	6,295	553	750	1,313	2,383	6,858
8	West San Gabriel Valley	328	486	924	1,780	5,848	492	677	1,218	2,212	6,376
9	East San Gabriel Valley	603	908	1,864	4,751	20,081	909	1,279	2,343	5,547	21,451
10	Pomona/Walnut Valley	378	576	1,109	2,807	12,464	542	826	1,449	3,263	13,222
11	South San Gabriel Valley	546	701	1,022	1,936	6,361	755	1,051	1,414	2,429	6,931
12	South Central LA County	37	57	105	259	1,131	54	82	138	302	1,199
13	Santa Clarita Valley	423	654	988	1,911	6,294	623	885	1,356	2,362	6,852
15	San Gabriel Mountains	423	654	988	1,911	6,294	623	885	1,356	2,362	6,852
16	North Orange County	347	435	640	1,247	4,156	496	636	874	1,535	4,514
17	Central Orange County	305	475	888	1,659	5,418	428	642	1,205	2,103	5,912
18	North Coastal Orange County	333	500	929	1,785	5,870	481	692	1,247	2,216	6,405
19	Saddleback Valley	515	751	1,212	2,335	7,648	700	1,108	1,653	2,899	8,338
20	Central Orange County Coastal	333	500	929	1,785	5,870	481	692	1,247	2,216	6,405
21	Capistrano Valley	515	751	1,212	2,335	7,648	700	1,108	1,653	2,899	8,338
22	Norco/Corona	418	620	1,230	3,158	13,913	591	872	1,552	3,635	14,734
23	Metropolitan Riverside County	418	620	1,230	3,158	13,913	591	872	1,552	3,635	14,734
24	Perris Valley	418	620	1,230	3,158	13,913	591	872	1,552	3,635	14,734
25	Lake Elsinore	650	964	1,913	4,913	21,425	920	1,357	2,415	5,655	22,898
26	Temecula Valley	650	964	1,913	4,913	21,425	920	1,357	2,415	5,655	22,898
27	Anza Area	650	964	1,913	4,913	21,425	920	1,357	2,415	5,655	22,898
28	Hemet/San Jacinto Valley	650	964	1,913	4,913	21,425	920	1,357	2,415	5,655	22,898
29	Banning Airport	907	1,281	2,379	5,655	23,351	1,352	1,824	3,103	6,735	24,935
30	Coachella Valley	904	1,270	2,329	5,532	22,757	1,304	1,819	3,063	6,537	24,309
31	East Riverside County	904	1,270	2,329	5,532	22,757	1,304	1,819	3,063	6,537	24,309
32	Northwest San Bernardino Valley	679	1,111	2,192	5,210	21,423	948	1,457	2,881	6,155	22,891
33	Southwest San Bernardino Valley	679	1,111	2,192	5,210	21,423	948	1,457	2,881	6,155	22,891
34	Central San Bernardino Valley	407	653	1,341	3,467	15,541	582	883	1,690	3,998	16,474
35	East San Bernardino Valley	475	745	1,531	4,031	17,824	703	1,043	1,928	4,618	18,942
36	Central San Bernardino Mountains	679	1,111	2,192	5,210	21,423	948	1,457	2,881	6,155	22,891
37	West San Bernardino Valley	407	653	1,341	3,467	15,541	582	883	1,690	3,998	16,474
38	East San Bernardino Mountains	475	745	1,531	4,031	17,824	703	1,043	1,928	4,618	18,942

* 2003 highest monitored concentration only.

Table L-2.
2001 – 2003 CO Emission Thresholds for Construction and Operation (Continued)

SRA No.	Source Receptor Area	Allowable emissions (lbs/day) as a function ofreceptor distance (meters) from site boundary				
		5 Acre				
		25	50	100	200	500
1	Central LA	1,268	1,570	2,423	3,644	8,625
2	Northwest Coastal LA County	1,299	1,500	2,194	3,502	8,465
3	Southwest Coastal LA County	789	970	1,763	3,248	7,861
4	South Coastal LA County	1,081	1,393	2,203	3,548	8,763
5	Southeast LA County	1,197	1,530	2,194	3,502	8,536
6	West San Fernando Valley	613	745	1,239	2,696	7,892
7	East San Fernando Valley	994	1,282	2,018	3,497	8,462
8	West San Gabriel Valley	906	1,133	1,856	3,247	7,865
9	East San Gabriel Valley	1,636	2,134	3,485	7,341	25,326
10	Pomona/Walnut Valley	965	1,290	2,304	4,445	15,199
11	South San Gabriel Valley	1,373	1,804	2,301	3,640	8,563
12	South Central LA County	108	136	223	415	1,378
13	Santa Clarita Valley	1,252	1,447	2,193	3,479	8,438
15	San Gabriel Mountains	1,252	1,447	2,193	3,479	8,438
16	North Orange County	860	1,078	1,410	2,248	5,524
17	Central Orange County	785	1,029	1,784	3,115	7,337
18	North Coastal Orange County	950	1,124	1,894	3,269	7,890
19	Saddleback Valley	1,343	1,762	2,665	4,255	10,320
20	Central Orange County Coastal	950	1,124	1,894	3,269	7,890
21	Capistrano Valley	1,343	1,762	2,665	4,255	10,320
22	Norco/Corona	1,078	1,429	2,360	4,801	16,845
23	Metropolitan Riverside County	1,078	1,429	2,360	4,801	16,845
24	Perris Valley	1,078	1,429	2,360	4,801	16,845
25	Lake Elsinore	1,677	2,223	3,671	7,468	26,203
26	Temecula Valley	1,677	2,223	3,671	7,468	26,203
27	Anza Area	1,677	2,223	3,671	7,468	26,203
28	Hemet/San Jacinto Valley	1,677	2,223	3,671	7,468	26,203
29	Banning Airport	2,768	3,122	4,897	9,365	29,403
30	Coachella Valley	2,489	3,121	4,868	9,189	28,677
31	East Riverside County	2,489	3,121	4,868	9,189	28,677
32	Northwest San Bernardino Valley	1,748	2,244	4,123	8,648	27,012
33	Southwest San Bernardino Valley	1,748	2,244	4,123	8,648	27,012
34	Central San Bernardino Valley	1,155	1,406	2,508	5,311	18,844
35	East San Bernardino Valley	1,226	1,711	2,899	6,061	21,945
36	Central San Bernardino Mountains	1,748	2,244	4,123	8,648	27,012
37	West San Bernardino Valley	1,155	1,406	2,508	5,311	18,844
38	East San Bernardino Mountains	1,226	1,711	2,899	6,061	21,945

Table L-3.
2001 – 2003 PM10 Emission Thresholds for Operation

SRA No.	Source Receptor Area	Significance Threshold of 2.5 µg/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	1	3	24	45	66	2	6	27	48	69
2	Northwest Coastal LA County	1	3	20	37	54	1	5	22	39	56
3	Southwest Coastal LA County	1	3	19	35	51	2	5	21	37	53
4	South Coastal LA County	1	3	21	40	58	2	5	23	42	60
5	Southeast LA County	1	3	23	44	64	2	5	25	46	66
6	West San Fernando Valley	1	2	21	39	57	1	4	22	41	59
7	East San Fernando Valley	1	3	19	34	50	2	5	21	36	52
8	West San Gabriel Valley	1	3	20	38	56	1	4	22	40	58
9	East San Gabriel Valley	1	3	27	50	74	2	5	29	52	76
10	Pomona/Walnut Valley	1	2	20	37	55	1	4	22	39	57
11	South San Gabriel Valley	1	3	21	38	56	2	5	23	41	59
12	South Central LA County	1	3	19	35	51	1	5	21	37	53
13	Santa Clarita Valley	1	3	18	33	48	1	4	20	35	50
15	San Gabriel Mountains	1	3	18	33	48	1	4	20	35	50
16	North Orange County	1	2	18	35	51	1	4	20	36	53
17	Central Orange County	1	3	21	40	58	1	4	23	42	60
18	North Coastal Orange County	1	3	19	34	50	2	5	21	36	52
19	Saddleback Valley	1	3	17	30	44	1	4	18	32	46
20	Central Orange County Coastal	1	3	19	34	50	2	5	21	36	52
21	Capistrano Valley	1	3	17	30	44	1	4	18	32	46
22	Norco/Corona	1	3	26	50	74	1	4	28	52	76
23	Metropolitan Riverside County	1	3	24	45	66	1	5	26	47	68
24	Perris Valley	1	3	24	45	66	1	5	26	47	68
25	Lake Elsinore	1	3	24	45	66	1	5	26	47	68
26	Temecula Valley	1	3	24	45	66	1	5	26	47	68
27	Anza Area	1	3	24	45	66	1	5	26	47	68
28	Hemet/San Jacinto Valley	1	3	24	45	66	1	5	26	47	68
29	Banning Airport	1	4	46	88	130	2	7	55	103	150
30	Coachella Valley	1	3	28	54	79	2	5	53	102	150
31	East Riverside County	1	3	28	54	79	2	5	53	102	150
32	Northwest San Bernardino Valley	1	3	37	71	105	1	4	22	40	58
33	Southwest San Bernardino Valley	1	3	37	71	105	1	4	22	40	58
34	Central San Bernardino Valley	1	3	26	49	73	2	5	28	52	75
35	East San Bernardino Valley	1	3	29	56	82	2	5	31	58	85
36	Central San Bernardino Mountains	1	3	37	71	105	1	4	22	40	58
37	West San Bernardino Valley	1	3	26	49	73	2	5	28	52	75
38	East San Bernardino Mountains	1	3	29	56	82	2	5	31	58	85

Table L-3.
2001 – 2003 PM10 Emission Thresholds for Operation (Continued)

SRA No.	Source Receptor Area	Significance Threshold of 2.5 µg/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site				
		5 acres				
		25	50	100	200	500
1	Central LA	4	12	33	55	76
2	Northwest Coastal LA County	3	9	26	43	60
3	Southwest Coastal LA County	3	11	27	43	58
4	South Coastal LA County	3	10	29	48	67
5	Southeast LA County	3	10	30	51	71
6	West San Fernando Valley	3	8	27	45	64
7	East San Fernando Valley	3	10	26	42	57
8	West San Gabriel Valley	3	9	27	45	63
9	East San Gabriel Valley	3	10	34	57	81
10	Pomona/Walnut Valley	3	9	26	44	61
11	South San Gabriel Valley	3	10	28	46	64
12	South Central LA County	3	10	26	41	57
13	Santa Clarita Valley	3	9	25	40	56
15	San Gabriel Mountains	3	9	25	40	56
16	North Orange County	3	8	25	41	58
17	Central Orange County	3	9	28	47	66
18	North Coastal Orange County	3	10	26	42	57
19	Saddleback Valley	3	9	23	37	51
20	Central Orange County Coastal	3	10	26	42	57
21	Capistrano Valley	3	9	23	37	51
22	Norco/Corona	3	9	33	57	82
23	Metropolitan Riverside County	3	10	31	52	73
24	Perris Valley	3	10	31	52	73
25	Lake Elsinore	3	10	31	52	73
26	Temecula Valley	3	10	31	52	73
27	Anza Area	3	10	31	52	73
28	Hemet/San Jacinto Valley	3	10	31	52	73
29	Banning Airport	5	16	59	102	145
30	Coachella Valley	3	10	36	62	88
31	East Riverside County	3	10	36	62	88
32	Northwest San Bernardino Valley	4	12	46	81	115
33	Southwest San Bernardino Valley	4	12	46	81	115
34	Central San Bernardino Valley	3	11	34	57	81
35	East San Bernardino Valley	3	10	37	64	91
36	Central San Bernardino Mountains	4	12	46	81	115
37	West San Bernardino Valley	3	11	34	57	81
38	East San Bernardino Mountains	3	10	37	64	91

Table L-4.
2001 – 2003 PM10 Emission Thresholds for Construction

SRA No.	Source Receptor Area	Significance Threshold of 10.4 µg/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site									
		1 Acre					2 Acre				
		25	50	100	200	500	25	50	100	200	500
1	Central LA	5	14	101	188	274	8	24	111	199	286
2	Northwest Coastal LA County	4	11	82	153	225	6	19	90	161	232
3	Southwest Coastal LA County	4	13	80	146	213	7	22	89	155	221
4	South Coastal LA County	4	12	89	165	242	6	20	97	174	251
5	Southeast LA County	4	12	97	182	266	6	20	105	190	275
6	West San Fernando Valley	3	10	86	163	239	5	17	93	170	246
7	East San Fernando Valley	4	12	77	142	207	6	20	85	151	216
8	West San Gabriel Valley	3	11	85	159	233	6	18	93	167	242
9	East San Gabriel Valley	4	13	111	209	306	7	21	119	217	315
10	Pomona/Walnut Valley	3	10	83	156	228	5	17	90	163	236
11	South San Gabriel Valley	4	13	87	160	234	7	21	95	169	244
12	South Central LA County	4	12	79	145	212	6	20	86	153	220
13	Santa Clarita Valley	3	11	74	137	201	6	18	82	145	209
15	San Gabriel Mountains	3	11	74	137	201	6	18	82	145	209
16	North Orange County	3	10	77	144	211	5	16	84	151	219
17	Central Orange County	4	11	88	165	242	6	19	96	173	251
18	North Coastal Orange County	4	13	77	142	206	7	21	86	150	215
19	Saddleback Valley	3	11	69	127	185	6	18	76	134	192
20	Central Orange County Coastal	4	13	77	142	206	7	21	86	150	215
21	Capistrano Valley	3	11	69	127	185	6	18	76	134	192
22	Norco/Corona	3	11	109	208	306	6	18	117	216	315
23	Metropolitan Riverside County	4	11	99	186	274	6	19	107	195	283
24	Perris Valley	4	11	99	186	274	6	19	107	195	283
25	Lake Elsinore	4	11	99	186	274	6	19	107	195	283
26	Temecula Valley	4	11	99	186	274	6	19	107	195	283
27	Anza Area	4	11	99	186	274	6	19	107	195	283
28	Hemet/San Jacinto Valley	4	11	99	186	274	6	19	107	195	283
29	Banning Airport	6	18	192	366	540	10	31	229	428	626
30	Coachella Valley	4	12	118	224	330	7	21	128	234	340
31	East Riverside County	4	12	118	224	330	7	21	128	234	340
32	Northwest San Bernardino Valley	4	13	154	295	435	6	18	93	167	242
33	Southwest San Bernardino Valley	4	13	154	295	435	6	18	93	167	242
34	Central San Bernardino Valley	4	12	109	206	302	7	21	118	215	312
35	East San Bernardino Valley	4	12	122	231	341	6	20	131	241	352
36	Central San Bernardino Mountains	4	13	154	295	435	6	18	93	167	242
37	West San Bernardino Valley	4	12	109	206	302	7	21	118	215	312
38	East San Bernardino Mountains	4	12	122	231	341	6	20	131	241	352

Table L-4.
2001 – 2003 PM10 Emission Thresholds for Construction (Continued)

SRA No.	Source Receptor Area	Significance Threshold of 10.4 µg/m^3 Allowable emissions (lbs/day) as a function of receptor distance (meters) from boundary of site				
		5 Acre				
		25	50	100	200	500
1	Central LA	16	50	139	228	318
2	Northwest Coastal LA County	12	39	110	181	251
3	Southwest Coastal LA County	14	46	111	177	243
4	South Coastal LA County	13	41	120	199	278
5	Southeast LA County	13	41	126	212	297
6	West San Fernando Valley	11	35	111	188	265
7	East San Fernando Valley	13	42	108	173	239
8	West San Gabriel Valley	12	37	112	187	262
9	East San Gabriel Valley	13	42	141	239	337
10	Pomona/Walnut Valley	11	35	109	182	255
11	South San Gabriel Valley	14	43	118	193	268
12	South Central LA County	13	41	107	172	238
13	Santa Clarita Valley	12	38	102	167	232
15	San Gabriel Mountains	12	38	102	167	232
16	North Orange County	11	34	103	171	240
17	Central Orange County	12	38	117	195	274
18	North Coastal Orange County	14	43	109	174	239
19	Saddleback Valley	11	36	95	154	213
20	Central Orange County Coastal	14	43	109	174	239
21	Capistrano Valley	11	36	95	154	213
22	Norco/Corona	11	36	137	238	339
23	Metropolitan Riverside County	13	40	128	216	304
24	Perris Valley	13	40	128	216	304
25	Lake Elsinore	13	40	128	216	304
26	Temecula Valley	13	40	128	216	304
27	Anza Area	13	40	128	216	304
28	Hemet/San Jacinto Valley	13	40	128	216	304
29	Banning Airport	21	66	245	424	603
30	Coachella Valley	14	44	151	259	366
31	East Riverside County	14	44	151	259	366
32	Northwest San Bernardino Valley	16	49	193	336	480
33	Southwest San Bernardino Valley	16	49	193	336	480
34	Central San Bernardino Valley	14	44	141	239	337
35	East San Bernardino Valley	13	42	154	267	379
36	Central San Bernardino Mountains	16	49	193	336	480
37	West San Bernardino Valley	14	44	141	239	337
38	East San Bernardino Mountains	13	42	154	267	379